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Scraping the surface of a hyperdiverse group—new genera and species of Ecuadorian Pselaphinae (Coleoptera, Staphylinidae), with an emphasis on the cloud forest fauna

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Abstract

Based on existing collections and new field collections, 339 new species and 18 new genera of Pselaphinae are described from Ecuador. The majority of these taxa originate from cloud forest sites in Pichincha, Tungurahua, Carchi, Cotopaxi, and Napo Provinces. A smaller proportion are from coastal forests (Guayas, Manabí, Santa Elena, and Esmeraldas Provinces), as well as Amazonian lowlands (Sucumbíos, Orellana, Pastaza, and Napo Provinces) and Páramo sites at high elevations (Carchí, Pichincha, Imbabura, Cotopaxi, Chimborazo, Cañar, and Azuay Provinces). Most species are known from single sites, with only a small number spanning multiple sites, suggesting a highly diverse fauna characterized by high local endemicity. The following 339 species are described as **spp. nov.**: Batrisini: 41 species of *Arthmius* LeConte (*A. orientalis*, *A. cruciatus*, *A. rikchak*, *A. imitator*, *A. recaldeorum*, *A. menguali*, *A. calcaratus*, *A. awki*, *A. festivus*, *A. galeatus*, *A. penicillus*, *A. politus*, *A. smithae*, *A. atillo*, *A. igneus*, *A. aculeus*, *A. turgidus*, *A. canandensis*, *A. villamarini*, *A. mindoensis*, *A. tungurahua*, *A. pachamama*, *A. francoi*, *A. minor*, *A. dolens*, *A. condor*, *A. montanus*, *A. papyrus*, *A. cuyabeno*, *A. orbis*, *A. aries*, *A. anzus*, *A. sumak*, *A. pazminoi*, *A. rex*, *A. intricatus*, *A. insectus*, *A. tigrillo*, *A. discors*, *A. cervoides*, *A. amazonus*), *Iteticus oculatus*, two species of *Oxarthrius* Reitter (*O. formicatus*, *O. tiputinus*), five species of *Syrbatus* Reitter (*S. cununero*, *S. chelatus*, *S. spicatus*, *S. triceratops*, *S. yarinae*), *Syrmocerus swingi*; Clavigerini: four species of *Fustiger* LeConte (*F. bucina*, *F. canistrum*, *F. chuku*, *F. tullu*); Bythinoplectini: ten species of *Besucheteidos* Comellini (*B. alternans*, *B. sofiae*, *B. ecominga*, *B. egens*, *B. perpolita*, *B. kapya*, *B. otonga*, *B. shina*, *B. simbanai*, *B. dilatata*), five species of *Hendecameros* Comellini (*H. cabezon*, *H. ceiba*, *H. grandis*, *H. tenuis*, *H. tumes*); Dimerini: seven species of *Barroeuplectoides* Park (*B. cujigualpai*, *B. donaritae*, *B. dracula*, *B. micros*, *B. obliquus*, *B. pululahuae*, *B. pyramicus*), two species of *Tuberoplectus* Park (*T. conjugator*, *T. licens*); Euplectini: *Euplectamecia suffusa*; Jubini: six species of *Arctophysis* (*A. lanigera*, *A. marginata*, *A. nebulosa*, *A. orellanae*, *A. rara*, *A. sumaco*), three species of *Barrojuba* Park (*B. penicillata*, *B. solea*, *B. tetricum*), three species of *Endytocera* Sharp (*E. conjectrix*, *E. rostrata*, *E. serrata*), 72 species of *Jubus* Schaufuss (*J. placero*, *J. basantesi*, *J. pichinchae*, *J. fuscus*, *J. mashi*, *J. pinzai*, *J. intrepidus*, *J. paku*, *J. indiscretus*, *J. pusillus*, *J. cribratus*, *J. digitatus*, *J. tishechkini*, *J. dentiventer*, *J. acuminatus*, *J. pseudacuminatus*, *J. telus*, *J. katsu*, *J. perplexus*, *J. effertus*, *J. pectineus*, *J. effeminatus*, *J. gyrus*, *J. excavatus*, *J. diazi*, *J. mutabilis*, *J. cavus*, *J. piscator*, *J. stipulatus*, *J. reptans*, *J. tetrad*, *J. clavus*, *J. vortex*, *J. cochleatus*, *J. arquus*, *J. sextus*, *J. parallelus*, *J. kiru*, *J. triticius*, *J. humboldti*, *J. monilicornis*, *J. triangularis*, *J. marissae*, *J. amplexus*, *J. sulcatus*, *J. culebrillas*, *J. cusicayo*, *J. ataorupagui*, *J. chongon*, *J. depressus*, *J. lunaris*, *J. limaorum*, *J. pendulus*, *J. tibiodentatus*, *J. spiralis*, *J. iactus*, *J. fraternus*, *J. denticulatus*, *J. risus*, *J. vulgus*, *J. pradoi*, *J. specus*, *J. kutsi*, *J. ruku*, *J. superbus*, *J. sebagoides*, *J. lyriformis*, *J. compactus*, *J. vipereus*, *J. cinctus*, *J. tamizado*, *J. tumidus*), four species of *Phamisus* Aubé (*P. angelicus*, *P. beatus*, *P. cataracta*, *P. hatunpaku*), 19 species of *Sebaga* Raffray (*S. colunca*, *S. sapan*, *S. nocturna*, *S. agilis*, *S. bifoveata*, *S. scurra*, *S. calcis*, *S. ampla*, *S. prodigiosa*, *S. pulga*, *S. alpina*, *S. cirrata*, *S. simia*, *S. karu*, *S. rumipamba*, *S. laxa*, *S. ukupacha*, *S. diffusa*, *S. renata*); Metopiasini: *Rhinoscepsis diabolicus*; Trichonychini: *Biblomelba umbracula*, five species of *Chakanamecia* **gen. nov.** (*C. daga* [the type species], *C. micra*, *C. mora*, *C. panoptes*, *C. pichan*), *Thesiastes stellata*, three species of *Thesium* Casey (*T. apicale*, *T. crenulatum*, *T. magnaclavus*), three species of *Verabarolus* Park (*V. obcasus*, *V. puyu*, *V. scabrifrons*), *Cupiloides joniceus* **gen. and sp. nov.**, two species of *Dalmosanus* Park (*D. carinatus*, *D. myops*), *Melba tabugae*, three species of *Pachamelba* **gen. nov.** (*P. otongachi*, *P. subtilis*, *P. yanayacu* [type species]), *Trimiopsis peragena*, *Meandrophilus petrus* **gen. and sp. nov.**, *Placamecia virgenensis* **gen. and sp. nov.**; Trogastrini: three species of *Rhexius* LeConte (*R. acutigens*, *R. collaris*, *R. micros*), nine species of *Eurhexius* Sharp (*E. profundus*, *E. pilosus*, *E. cavipygus*, *E. dentipes*, *E. mirapygus*, *E. sol*, *E. excavatus*, *E. unguifer*, *E. napoensis*), five species of *Kapyatrog* **gen. nov.** (*K. chevere* [type species], *K. hirsutus*, *K. mayu*, *K. pichi*, *K. saladero*), five species of *Rhexinia* LeConte (*R. laloloori*, *R. seca*, *R. purun*, *R. asperata*, *R. spinipes*), six species of *Xerhius* Raffray (*X. blanco*, *X. confundens*, *X. crucifer*, *X. flordelis*, *X. multidentatus*, *X. undulatus*), two species of *Allparhexius* **gen. nov.** (*A. barbatus* [type species], *A. cuspidatus*), two species of *Mukirhexius* **gen. nov.** (*M. furtivus*, *M. microps* [type species]), seven species of *Tinkuna* **gen. nov.** (*T. andina*, *T. borea*, *T. geniculata*, *T. gracilis* [type species], *T. inquisitor*, *T. jarrini*, *T. josti*); Euplectitae, *incertae sedis*: *Formivagus bullatus* **gen. and sp. nov.**, *Kunkashka sumaco* **gen. and sp. nov.**; Brachyglutini: 19 species of *Euphalepsus* Reitter (*E. arguelloi*, *E. globosus*, *E. tactus*, *E. disobediens*, *E. foedus*, *E. gemellus*, *E. inclani*, *E. lopezi*, *E. obediens*, *E. sinchi*, *E. supercilius*, *E. syrbatoides*, *E. tuberculigens*, *E. vibrissus*, *E. abrazero*, *E. bidens*, *E. gigas*, *E. illuminatus*, *E. yunkaruna*), four species of *Nanocephalus* **gen. nov.** (*N. chinchin* [type species], *N. macrops*, *N. tenuis*, *N. timens*), 15 species of *Globa* Raffray (*G. angulipes*, *G. armada*, *G. ascia*, *G. dientita*, *G. falx*, *G. herniata*, *G. inflexa*, *G. mola*, *G. nauta*, *G. orbifer*, *G. pantex*, *G. pernix*, *G. pustulifer*, *G. vex*, *G. wira*), two species of *Muyu* **gen. nov.** (*M. huambulae* [type species], *M. merae*), three species of *Pelota* **gen. nov.** (*P. astada* [type species], *P. monocera*, *P. riparia*), five species of *Reichenbachia* Jeannel (*R. anka*, *R. anxia*, *R. cosangae*, *R. garciae*, *R. atricornis*), two species of *Scalenarthrus* LeConte (*S. calix*, *S. umina*), *Decarthron varita*, three species of *Eupsenius* LeConte (*E. crassus*, *E. deflexus*, *E. quil*), *Eupsenina guayasensis*, five species of *Tumbaga* **gen. nov.** (*T. chiruisla*, *T. esmeralda*, *T. guandera*, *T. montana* [type species], *T. ukumari*); Iniocyphini: *Batriphysis constrictus*, *Batrisobryaxis bipox*, *Dalmoburis amator*, *Dalmonexus bellator*, two species of *Trimicerus* Motschulsky (*T. fenestratus*, *T. horarius*); Proterini: three species of *Harmomima* Raffray (*H. glabra*, *H. prominens*, *H. sulcata*), two species of *Nunkui* **gen. nov.** (*N. lineata* [type species], *N. parallela*); Goniaceritae, *incertae sedis*: four species of *Ayapuna* **gen. nov.** (*A. advector*, *A. goaltalensis*, *A. sculptilis*, *A. tunda* [type species]), two species of *Zhapra* **gen. nov.** (*Z. candelaria*, *Z. maldonadae* [type species]);

Tyrini: *Cercoceropsis pacifica*, *Circocerus kuru*, six species of *Hamotus* Aubé (*H. asymmetricus*, *H. auritus*, *H. cactus*, *H. horrens*, *H. obliquus*, *H. manabensis*), and three species of *Ephimia* Reitter (*E. arcifer*, *E. confusa*, *E. hanak*).

Key words: leaf litter, tropical biodiversity, endemicity, cloud forest, beetles

Resumen

Basándonos en colecciones existentes y nuevas recolectas de campo, se describen 339 nuevas especies y 18 nuevos géneros de Pselaphinae de Ecuador. La mayoría de estos taxones provienen de bosques nubosos en las provincias de Pichincha, Tungurahua, Carchi, Cotopaxi y Napo. Una menor proporción proviene de bosques costeros (provincias de Guayas, Manabí, Santa Elena y Esmeraldas), así como de las tierras bajas amazónicas (provincias de Sucumbíos, Orellana, Pastaza y Napo) y de páramos de alta montaña (provincias de Carchi, Pichincha, Imbabura, Cotopaxi, Chimborazo, Cañar y Azuay). La mayoría de las especies se conocen de un solo sitio, y solo un pequeño número se encuentra en múltiples sitios, lo que sugiere una fauna altamente diversa caracterizada por una alta endemicidad local. Las siguientes 339 especies se describen como **spp. nov.**: Batrisini: 41 especies de *Arthmius* LeConte (*A. orientalis*, *A. cruciatus*, *A. rikchak*, *A. imitator*, *A. recaldeorum*, *A. menguali*, *A. calcaratus*, *A. awki*, *A. festivus*, *A. galeatus*, *A. penicillus*, *A. politus*, *A. smithae*, *A. atillo*, *A. igneus*, *A. aculeus*, *A. turgidus*, *A. canandensis*, *A. villamarini*, *A. mindoensis*, *A. tungurahua*, *A. pachamama*, *A. francoi*, *A. minor*, *A. dolens*, *A. condor*, *A. montanus*, *A. papyrus*, *A. cuyabeno*, *A. orbis*, *A. aries*, *A. anzus*, *A. sumak*, *A. pazminoi*, *A. rex*, *A. intricatus*, *A. insectus*, *A. tigrillo*, *A. discors*, *A. cervoides*, *A. amazonus*), *Iteticus oculatus*, dos especies de *Oxarthrius* Reitter (*O. formicatus*, *O. tiputinus*), cinco especies de *Syrbatus* Reitter (*S. cununero*, *S. chelatus*, *S. spicatus*, *S. triceratops*, *S. yarinae*), *Syrmocerus swingi*; Clavigerini: cuatro especies de *Fustiger* LeConte (*F. bucina*, *F. canistrum*, *F. chuku*, *F. tullu*); Bythinoplectini: diez especies de *Besucheteidos* Comellini (*B. alternans*, *B. sofiae*, *B. ecominga*, *B. egens*, *B. perpolita*, *B. kapya*, *B. otonga*, *B. shina*, *B. simbanai*, *B. dilatata*), cinco especies de *Hendecameros* Comellini (*H. cabezon*, *H. ceiba*, *H. grandis*, *H. tenuis*, *H. tumes*); Dimerini: siete especies de *Barroeuplectoides* Park (*B. cujigualpai*, *B. donaritae*, *B. dracula*, *B. micros*, *B. obliquus*, *B. pululahuae*, *B. pyramicus*), dos especies de *Tuberoplectus* Park (*T. conjugator*, *T. licens*); Euplectini: *Euplectamecia suffusa*; Jubini: seis especies de *Arctophysis* (*A. lanigera*, *A. marginata*, *A. nebulosa*, *A. orellanae*, *A. rara*, *A. sumaco*), tres especies de *Barrojuba* Park (*B. penicillata*, *B. solea*, *B. tetricum*), tres especies de *Endytocera* Sharp (*E. conjectrix*, *E. rostrata*, *E. serrata*), 72 especies de *Jubus* Schaufuss (*J. placero*, *J. basantesi*, *J. pichinchae*, *J. fuscus*, *J. mashi*, *J. pinzai*, *J. intrepidus*, *J. paku*, *J. indiscretus*, *J. pusillus*, *J. cribratus*, *J. digitatus*, *J. tishechkini*, *J. dentiventer*, *J. acuminatus*, *J. pseudacuminatus*, *J. telus*, *J. katsu*, *J. perplexus*, *J. effertus*, *J. pectineus*, *J. effeminatus*, *J. gyrus*, *J. excavatus*, *J. diazi*, *J. mutabilis*, *J. cavus*, *J. piscator*, *J. stipulatus*, *J. reptans*, *J. tetrad*, *J. clavus*, *J. vortex*, *J. cochleatus*, *J. arquus*, *J. sextus*, *J. parallelus*, *J. kiru*, *J. triticius*, *J. humboldti*, *J. monilicornis*, *J. triangularis*, *J. marissae*, *J. amplexus*, *J. sulcatus*, *J. culebrillas*, *J. cusicayo*, *J. ataorupagui*, *J. chongon*, *J. depressus*, *J. lunaris*, *J. limaorum*, *J. pendulus*, *J. tibiodentatus*, *J. spiralis*, *J. iactus*, *J. fraternus*, *J. denticulatus*, *J. risus*, *J. vulgus*, *J. pradoi*, *J. specus*, *J. kutsi*, *J. ruku*, *J. superbus*, *J. sebagoides*, *J. lyriformis*, *J. compactus*, *J. vipereus*, *J. cinctus*, *J. tamizado*, *J. tumidus*), cuatro especies de *Phamisus* Aubé (*P. angelicus*, *P. beatus*, *P. cataracta*, *P. hatunpaku*), 19 especies de *Sebaga* Raffray (*S. colunca*, *S. sapan*, *S. nocturna*, *S. agilis*, *S. bifoveata*, *S. scurra*, *S. calcis*, *S. ampla*, *S. prodigiosa*, *S. pulga*, *S. alpina*, *S. cirrata*, *S. simia*, *S. karu*, *S. rumipamba*, *S. laxa*, *S. ukupacha*, *S. diffusa*, *S. renata*); Metopiasini: *Rhinoscepsis diabolicus*; Trichonychini: *Biblomelba umbracula*, cinco especies de *Chakanamecia* **gen. nov.** (*C. daga* [especie tipo], *C. micra*, *C. mora*, *C. panoptes*, *C. pichan*), *Thesiastes stellata*, tres especies de *Thesium* Casey (*T. apicale*, *T. crenulatum*, *T. magnaclavus*), tres especies de *Verabarolus* Park (*V. obcasus*, *V. puyu*, *V. scabrifrons*), *Cupiloides joniceus* **gen. y sp. nov.**, dos especies de *Dalmosanus* Park (*D. carinatus*, *D. myops*), *Melba tabugae*, tres especies de *Pachamelba* **gen. nov.** (*P. otongachi*, *P. subtilis*, *P. yanayacu* [especie tipo]), *Trimiopsis peragena*, *Meandrophilus petrus* **gen. y sp. nov.**, *Placamecia virgenensis* **gen. y sp. nov.**; Trogastrini: tres especies de *Rhexius* LeConte (*R. acutigens*, *R. collaris*, *R. micros*), nueve especies de *Eurhexius* Sharp (*E. profundus*, *E. pilosus*, *E. cavipygus*, *E. dentipes*, *E. mirapygus*, *E. sol*, *E. excavatus*, *E. unguifer*, *E. napoensis*), cinco especies de *Kapyatrog* **gen. nov.** (*K. chevere* [especie tipo], *K. hirsutus*, *K. mayu*, *K. pichi*, *K. saladero*), cinco especies de *Rhexinia* LeConte (*R. laloloori*, *R. seca*, *R. purun*, *R. asperata*, *R. spinipes*), seis especies de *Xerhius* Raffray (*X. blanco*, *X. confundens*, *X. crucifer*, *X. flordelis*, *X. multidentatus*, *X. undulatus*), dos especies de *Allparhexius* **gen. nov.** (*A. barbatus* [especie tipo], *A. cuspidatus*), dos especies de *Mukirhexius* **gen. nov.** (*M. furtivus*, *M. microps* [especie tipo]), siete especies de *Tinkuna* **gen. nov.** (*T. andina*, *T. borea*, *T. geniculata*, *T. gracilis* [especie tipo], *T. inquisitor*, *T. jarrini*, *T. josti*); Euplectitae, *incertae sedis*: *Formivagus bullatus* **gen. y sp. nov.**, *Kunkashka sumaco* **gen. y sp. nov.**; Brachyglutini: 19 especies de *Euphalepsus* Reitter (*E. arguelloi*, *E. globosus*, *E. tactus*, *E. disobediens*, *E. foedus*, *E. gemellus*, *E. inclani*, *E. lopezi*, *E. obediens*, *E. sinchi*, *E. supercilius*, *E. syrbatoides*, *E. tuberculigens*, *E. vibrissus*, *E. abrazero*, *E. bidens*, *E. gigas*, *E. illuminatus*, *E. yunkaruna*), cuatro especies de *Nanocephalus* **gen. nov.** (*N. chinchin* [especie tipo], *N. macrops*, *N. tenuis*, *N. timens*), 15 especies de *Globa* Raffray (*G. angulipes*, *G. armada*, *G. ascia*, *G. dientita*, *G. falx*, *G. herniata*, *G. inflexa*, *G. mola*, *G. nauta*, *G. orbifer*, *G. pantex*, *G. pernix*, *G. pustulifer*, *G. vex*, *G. wira*), dos especies de *Muyu* **gen. nov.** (*M. huambulae* [especie tipo], *M. merae*), tres especies de *Pelota* **gen. nov.** (*P. astada* [especie tipo], *P. monocera*, *P. riparia*), cinco especies de *Reichenbachia* Jeannel (*R. anka*, *R. anxia*, *R. cosangae*, *R. garciae*, *R. atricornis*), dos especies de *Scalenarthrus* LeConte (*S. calix*, *S. umina*), *Decarthron varita*, tres especies de *Eupsenius* LeConte (*E. crassus*, *E. deflexus*, *E. quil*), *Eupsenina guayasensis*, cinco especies de *Tumbaga* **gen. nov.** (*T. chiruisla*, *T. esmeralda*, *T. guandera*,

T. montana [especie tipo], *T. ukumari*); INIOCYPHINI: *Batriphysis constrictus*, *Batrisobryaxis bipox*, *Dalmoburis amator*, *Dalmonexus bellator*, dos especies de *Trimicerus* Motschulsky (*T. fenestratus*, *T. horarius*); PROTERINI: tres especies de *Harmomima* Raffray (*H. glabra*, *H. prominens*, *H. sulcata*), dos especies de *Nunkui* **gen. nov.** (*N. lineata* [especie tipo], *N. parallela*); GONIACERITAE, *INCERTAE SEDIS*: cuatro especies de *Ayapuna* **gen. nov.** (*A. advector*, *A. goaltalensis*, *A. sculptilis*, *A. tunda* [especie tipo]), dos especies de *Zhapra* **gen. nov.** (*Z. candelaria*, *Z. maldonadae* [especie tipo]); TYRINI: *Cercoceropsis pacifica*, *Circocerus kuru*, seis especies de *Hamotus* Aubé (*H. asymmetricus*, *H. auritus*, *H. cactus*, *H. horrens*, *H. obliquus*, *H. manabensis*), y tres especies de *Ephimia* Reitter (*E. arcifer*, *E. confusa*, *E. hanak*).

Introduction

The rove beetle subfamily Pselaphinae is one of the most diverse subfamilial lineages of Coleoptera (Chandler 2001; Parker 2016), numbering over 10,000 species with many times that many surely remain undescribed. Taxonomic progress on the Neotropical members of the group has been slow but steady, with episodes of activity from the mid-late 1800s (Raffray 1904a; b, 1905, 1908; Reitter 1882, 1883, 1888) into the early-mid 20th century (Casey 1887; Park 1942, 1944, 1945; Park *et al.* 1976), and on into the modern era (Asenjo 2016; Carlton 1989; Carlton *et al.* 2004; Carlton & Leschen 1996; Chandler 1975, 1992a; b, 2002, 2013, 2023; Comellini 1979, 1981a, 1983, 1985, 1994, 1998, 2000; Franz 1996; Parker 2014; Parker & Maruyama 2013; Parker & Owens 2018; Vásquez-Vélez 2016). Most descriptive work on Pselaphinae in the neotropics has focused on early collections from a few areas, principally Amazonia, secondarily southeastern Brazil, especially the German-influenced areas of Santa Catarina, and then somewhat more recently in Panama (Chandler 1992a; b) and Mexico (Chandler 2002; Park 1944, 1945, 1946a). Most recently, Pselaphinae has been the focus of some community level work (Carlton *et al.* 2004), and descriptions of distinctive species/genera (e.g. Comellini 1993, Asenjo 2016, Asenjo *et al.* 2017, 2019a, 2023), but relatively few larger scale taxonomic treatments (but see Vásquez-Vélez 2016).

Research attempting to address the taxonomic impediment in hyperdiverse groups has struggled to find an appropriate balance between speed/efficiency and thoroughness (Fernandez-Triana 2022). Most critiques have decried overemphasis on the former to the detriment of the latter, and the possibility that a DNA barcode might be necessary to identify a species has presented a particularly problematic pill to swallow. While truly cryptic species, distinguishable by no morphological characters, are clearly real (Caterino & Harden 2024; Hebert *et al.* 2004; Hendrixson & Bond 2005; Li & Wiens 2023; Porco *et al.* 2012), in groups and areas where the overwhelming majority of species remain undescribed, such questions are practically immaterial. Many highly distinctive species remain to be recognized, and doing so quickly is essential to characterizing and ultimately protecting these faunas.

One of the most problematic issues remains the inaccessibility of old, distant, and poorly preserved type material. A large proportion of the Neotropical pselaphine fauna was described by workers who had little concern for fine-scale species discrimination, and the early descriptions are brief, superficial, only very rarely illustrated, and lacking in the details (particularly of male genitalic morphology) necessary to confidently recognize species. At the same time many of those type collections reside in difficult-to-access European collections, and their curators are understandably anxious about permitting dissections (even when specimens are known to be male) due to the considerable potential for damage. Workers wishing to work on such faunas are either held to unreasonable expectations of diligence, or forced to fly blind, with neither option conducive to rapid taxonomic progress. In this treatment I more or less choose the latter option, though facilitated by a number of fortuitous circumstances.

One in particular is the existence and availability of photographic records for a couple of rich historical collections of Pselaphinae. Through the foresight and generosity of Dr. Christopher Carlton, large parts of the pselaphine type collections of Raffray (at the Muséum National d'Histoire Naturelle, Paris) and Sharp (The Natural History Museum, London) are viewable online (through Dr. Carlton's Flickr account). These provided exceptionally useful snapshots of over 400 neotropical species.

Secondly, for better or worse, the pselaphine fauna of Ecuador has received next to no dedicated attention, and the number of species explicitly reported from the country is very small. Park (1942) reported exactly 1 species (*Hamotus fuscopilosus*) from Ecuador. Even now, it appears that no more than 13 pselaphine species have been specifically reported from Ecuador (Asenjo *et al.* 2019b, and references therein). Yet field surveys reveal even single site faunas to be more than ten times as rich. Carlton *et al.* (2004) reported 178 species from Yasuní Research Station, and estimated at least 70 more. Ecuador's neighbors are little better documented. Newton (2015) reported 22 pselaphine species from Peru, and Newton *et al.* (2005) reported 73 from Colombia, acknowledging in either case that the numbers only scratched the surface. Any described but undocumented species that do occur within Ecuador's borders are most likely to be those occurring in the Amazonian lowlands, where distributions of species tend to be somewhat more extensive. Therefore, my primary (though not exclusive) focus on species found in the higher elevations will help ensure that these species have not been previously described. More importantly, by providing a model wherein focused collections are quickly sorted, barcoded (where possible, though not critical), dissected, and described, I hope to encourage further treatments of this type.

An additional challenge in undertaking such an approach is ensuring that species, while perhaps clearly new, are assigned correctly to genera. This is a

significantly underappreciated impediment. Nearly a year of preparatory work with those keys that do exist has not alleviated it entirely. Many described genera are poorly characterized or based on one or two divergent species, making assignment almost subjective in many cases. However, the question of gross species richness is largely independent of classification, and much more significant in conservation terms. While mistakes in generic assignments with rapid taxonomic approaches may be expected, addressing those and refining species assignments subsequently seems entirely acceptable.

In this study, my fundamental goals are to improve documentation of the litter-inhabiting Pselaphinae of a major biodiversity hotspot, and to encourage and facilitate continuing work on this exceptionally rich fauna. Because relatively little work has focused on leaf-litter communities in the region, targeted fieldwork is essential. Gathering fresh material also facilitates the use of a barcode-enhanced workflow. Thus, from all sites, I attempted to sequence representatives of all morphospecies of Pselaphinae, to provide precise genetic centroids for new species concepts, and to allow for some preliminary assessments of the degree of cryptic, beta diversity among sites. This study emphasizes cloud forest sites, arrayed along the eastern (Amazonian) and western (Pacific) slopes of the Andes, between 1800 and 2500m in elevation. However, other available collections that emphasized litter sampling and that were sufficiently fresh to entrain into a barcoding workflow were also incorporated, including some from Pacific coastal and lowland Amazonian sites. These allow some assessment of broader lineage distributions, and provide broader modern documentation of morphology and DNA, which should make subsequent assignments of new collections from across the region to higher and lower taxa somewhat more straightforward.

Given the meager previous documentation of the Ecuadorian pselaphine fauna, this paper includes nearly all species known from the country. Three genera have been treated separately, *Bibrax* Fletcher (Tapuy-Avilés *et al.* 2025), *Metopiellus* Raffray (Tapuy-Avilés *et al.* 2026) and *Panabachia* Park (Muñoz-Tobar & Caterino 2025), and a few genera have previously reported species that are not treated here. A complete country-level checklist is forthcoming (Muñoz-Tobar and Caterino, in prep.) In addition, a key to all the genera known for the country, and the Neotropical region more broadly, is also in preparation (Chandler and Caterino, in prep.)

Materials and methods

Specimens were collected by leaf litter sifting at sites ranging in elevation from 250 to 2600m, emphasizing but not exclusively in cloud forest habitats. Selected specimens from other available, pre-existing samples were also incorporated. These collections and the genetic work herein were permitted by 'Contrato marco' #s: MAATE-DBI-CM-2024-0406 and MAATE-CMARG-2023-0031-ACT-003, respectively, from Ministerio del Ambiente, Agua y Transición Ecológica de Ecuador. Specimens at Universidad San Francisco de Quito are under 'patent' (permit) No. 006- 2015-FAU-DPAP-MA issued by the Ministry of Environment of Ecuador.

Specimens were Berlese extracted into 100% ethanol and stored at −20°C. Specimen vouchers, including all holotypes, are deposited in the Instituto Nacional de Biodiversidad Collection (with database numbers as MECN-EN XXXXXX) in Quito, Ecuador; in the Universidad San Francisco de Quito Insect Collection (ZSFQ-i-XXXXXX), Quito, Ecuador; and in the Zoological Museum of the Pontificia Universidad Católica del Ecuador (QCAZ-I-XXXXXX), Quito, Ecuador, as detailed in the species treatments below. In the main text, I report complete label data for all type specimens but only location summaries for nontypes. All field sites referenced in the paper are shown and labelled in Figure 1. Individual species level-distribution maps are not provided, as most are known from single sites.

Berlese samples were sorted to morphospecies, and

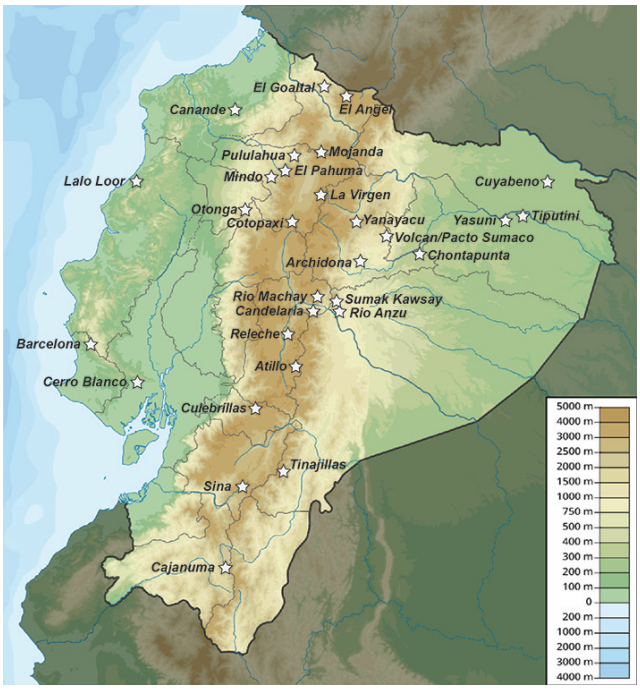

FIGURE 1. Map of all sites referenced in the species descriptions.

one male and one female individual (where distinguishable) of each morphospecies were separated out for COI barcoding. Individuals to be barcoded were imaged in multiple views using a Macropod microphotography system (Macroscopic Solutions LLC), with the whole body suspended in gel hand sanitizer on a depression slide under a cover slip. Approximately 12–20 images per view were focus stacked using Zerene Stacker (1.04; Richland, WA, USA). The specimen was then segregated to a separate well of a 96 well plate, and the abdomen was separated from the thorax using a sterilized pin. Genomic DNA was isolated using the HotShot approach (Truett *et al.* 2000), digested using an NaOH+EDTA solution,

heated at 80°C for 120 minutes, then neutralized with Tris-HCL (40mM). Following extraction, male genitalia were dissected out, and voucher morphology was examined using an Olympus SZ9.5 stereomicroscope, with temporary glycerin-mount slides of male genitalia examined using a Nikon compound microscope and imaged using Mitutoyo10× -20× objectives with the Macropod system (Macroscopic Solutions, LLC).

The full barcoding region of COI was amplified using a unique combination of primers mcLCO1490 (KGTCAACAAAYCAYAARGAYATTGG) and BR2 (TCDGGRTGNCCRAARAAYCA; Elbrecht and Leese 2017), each labeled with a 13bp index, derived from a set developed by Srivathsan *et al.* (2019). PCR products were combined, purified using AMPure beads, and prepared for Nanopore sequencing using Oxford Nanopore's Ligation Sequencing Kit (SQK-LSK114), then sequenced on a MinION using several 10.4.1 version Flongle Flowcells. Nanopore reads were basecalled using the 'super-accurate' algorithm of Guppy (v6.1.2), then demultiplexed using ONTbarcoder v0.1.9 (Srivathsan *et al.* 2021), with minimum coverage set at 5. FASTA files from all sequencing runs were combined and aligned with the online version of Mafft v7 (Katoh *et al.* 2017) using the auto strategy. In the text, those species whose barcodes were successful are indicated following the species name. All barcode sequences have been deposited in GenBank, with GenBank accessions (PX930199–PX930392) detailed in Supplementary Table 1.

Species descriptions are relatively terse, avoiding repetition of characters invariant in the genus or among closely related species and focusing on those characters most useful for identification. These are almost invariably secondary sexual characters and fine details of male genitalia, although in many cases specifics of sculpturing, setation, body size, and other non-sex-linked characters have been found useful and are also treated. Type series are generally limited to a single sampling locality, unless multiple localities are very proximate. This represents something of an enhanced 'turbo-taxonomy' approach (e.g., Meierotto *et al.* 2019, Sharkey *et al.* 2021), whereby molecular delimitation can provide one criterion for species delineation that is then complemented by morphological evaluation and diagnosis (comparable to Riedel *et al.* 2013; Hartop *et al.* 2022), although in this case, barcodes were not obtained for all the new species.

Generic assignments of new species are based on identification using primary literature (Park 1942, 1952a; b; Park *et al.* 1976; Raffray 1904a; b, 1905) aided considerably by an unpublished Neotropical key shared by Donald Chandler (Chandler and Caterino, in prep.). Images in original publications or on public servers were particularly helpful. Two of the most useful were the Field Museum's online type specimen database (https://collections-zoology.fieldmuseum.org/list) and a Flickr folder of images of Pselaphine types from the Muséum National d'Histoire Naturelle (Paris: https://www.flickr.com/photos/12666884@N00/albums/72177720307505149/) and The Natural History Museum (London: https://www.flickr.com/photos/12666884@N00/albums/72157632034127970/) taken by Dr. Chris Carlton.

The higher classification used here follows that on the current Catalog of Life (CoL), curated by Dr. Alfred Newton (and that of Asenjo *et al.* 2019, in their synopsis of Staphylinidae from Latin America). The supertribes, tribes, subtribes, and genera are in the CoL are listed simply in alphabetical order, and I follow that convention here as well. I have separated subtribes in the Brachyglutini, where they refer to better-supported subgroups of genera, but not in other tribes. In larger genera I have ordered species according to some presumptions/hypotheses of relationships, so that the most similar species are near one another. These are explained in the 'Remarks' section under each of the relevant genera. Otherwise, species order is alphabetical and/or arbitrary.

I present habitus photographs of nearly all species, even in cases where, by the text, external differences are not singled out as diagnostic. Nevertheless, there will be subtle, difficult-to-describe differences in shape, body proportions, and coloration visible in the photographs that may facilitate identification even in the absence of discrete differences. (By the same token, however, users should keep in mind that individual level variation in maturity, preservation, and preparation might suggest differences that will not be informative for species level ID—caveat emptor!) Within all figures, external and genitalia, thick lines separate distinct species while thin lines separate distinct views of the same species.

Terminology: Left and right, when referring to parts of the male genitalia (or otherwise) are always referring to the morphological left and right side of the beetle, such that if the aedeagus were extruded naturally, the right side of the beetle and the right side of the aedeagus would correspond. In photos presented here, with the basal bulb to the left and aedeagal apex to the right, right refers to the upper surface/edge, and left to the lower. Total specimen length (TL) is reported as the sum of head length, pronotum length, elytral length, and abdomen length. Each of these measurements was made separately as a straight line parallel to the plane of the body part. Therefore the sum is as if the body was stretched out to its full length, although this is not necessarily how long the species, especially the more globular ones, would appear in life. Similarly, the length relative to the scale bars in the figures may appear somewhat at odds with the body length reported in the descriptions, since the specimens depicted will vary in degree of head and abdomen extension. Length ranges are provided for genera wherein more than one species is described here. These do not account for previously described species, as measurements reported in the literature are not necessarily directly comparable.

Taxonomy

Batrisitae: Batrisini

Arthmius LeConte, 1849
Figs 2–18

One hundred and one described species are included in this genus from Central and South America (Asenjo *et al.* 2019). Most species have been described from Amazonian Brazil, with a few other scattered species from Venezuela, Colombia, and Bolivia. None have yet been described or reported from the country of Ecuador. Forty-one new species are described below.

Park (1942) suggested that *Arthmius* were principally to be found in warmer, wetter areas, and that they would be rare in higher latitudes or elevations. Several species below are, however, described from cloud forest, and even higher elevation Páramo habitats, indicating that they are by no means limited to lowland forests, however diverse they may be there.

Diagnosis. (TL: 1.3–2.9mm, Avg. 2.1mm) *Arthmius*, as Batrisini, have the first antennomere emarginate at the dorsal and ventral apices and have the paratergites of the abdomen indistinct, with at most carinae marking their position on the first four tergites. Among Batrisini, *Arthmius* are distinguished by having 1–3 distinct basal elytral foveae (lacking in *Batriscydmaenus* Parker & Owens), but lacking subhumeral foveae (present in *Iteticus* Raffray and *Batoctenus* Sharp), pronotal tubercles (present in *Oxarthrius* Reitter), or lateral longitudinal pronotal sulci (*Syrbatus* Reitter). *Arthmius* species also have the lateral pronotal foveae distinctly located on the dorsum, rather than interrupting the lateral margin (*Syrmocerus* Raffray). Chandler (unpub., pers. comm) has suggested that at least *Syrbatus* might be a synonym of (presumably derived from within) *Arthmius*, and it is conceivable that *Syrmocerus* is as well. Many species of *Arthmius* are distinguished by distinctive male secondary characters on the head and antennae, while male modifications of various parts of the legs and ventrites are also common.

Remarks. Of previously described species, those from Colombia (*A. triangularis* Raffray, *A. luzerae* Reitter, *A. planifrons* Schaufuss, *A. trifoveolatus* (Schaufuss), and *A. rugiceps* (Schaufuss)) and Peru (*A. elegantulus* Fletcher, *A. laevipennis* Fletcher, *A. magnus* Fletcher, *A. peruvianus* Raffray) might be considered candidates for the Ecuadorian fauna, although more likely in the eastern lowlands than the cloud forest. Given the brevity of their original descriptions (some from females) and lack of illustrations it is nearly impossible to connect any named species with available morphospecies. At a minimum this will require dissection of the relevant types and illustration of their male genitalia.

The 8 species groups established by Raffray (1904) and followed by Park (1942) are mostly based on the positions of secondary sexual characters. Species of group VII for example, possess male modifications of the vertex and the clypeus, but not the legs or antennae. The key alternatives "normal" or "abnormal" are difficult to apply in practice, since groups exhibit a wide variety of modifications of the respective body parts, from very subtle to radical, and it is questionable whether some of the slighter modifications, denticles on one or more trochanters, or slight enlargement of one or more antennomeres were always noted. Furthermore, it is evident that for the most part only those species exhibiting relatively conspicuous secondary modifications have been recognized and described previously. Thus many of the species described below would fall in group VIII, in which the legs, head, and and antennae are all allegedly 'normal'. While somewhat convenient for organizing the species for presentation, I do not give these groups much credence for indicating relationships, the understanding of which will be a much longer-term endeavor.

The only male genitalia of any *Arthmius* species to have been illustrated or described in any detail are those of *A. corradus* Becker and Sanderson, *A. torcerus* Becker and Sanderson, and *A. curvicornis* (Schaufuss) (all in Becker and Sanderson 1953a, 1953b), *A. singularis* Schaufuss from Chile (in Jeannel 1962), and *A. similis* Franz and *A. mochae* Franz (Franz 1996). Considering these and the new species below, the aedeagus of the majority of species conforms to a fairly consistent general plan, in which the basal bulb is reduced to a rather weakly sclerotized, thick horizontal ring, broadly open dorsally and ventrally, with a tegmen projecting off its distal end that is quite variously ornamented. It is, however, highly varied in detail. While the specific arrangements of the 'ornaments' lend themselves to proposing some subgroups, it is unclear how or whether they correspond to Raffray's groups that are based on secondary sexual characters. Below I provide some loose groupings of the newly described species based principally on aedeagal characters, hopefully to help guide interpretation and placement of species described in the future. It may be hoped that the genitalia of previously described species may eventually be examined, to help place them in a more informed morphological scheme.

Almost no barcodes were obtained for *Arthmius* species, indicating some mutation(s) incompatible with existing insect barcode primers.

Group 1. Basal bulb relatively small, forming a horizontal ring, open dorsally and ventrally (e.g. Figs 4A–N), usually concave below; tegmen with a single, simple, sclerotized distal process. While the simple genitalia of these does seem meaningfully similar, and potentially indicative of relatedness, externally these species do not exhibit any particularly useful characters for recognition. Most have subtle, or no modifications of the male head (exception, *A. imitator*, which exhibits a deep, setose, sulcus; Fig. 3D), while having antennomeres V and VII at least slightly enlarged (or significantly, as in *A. orientalis*; Fig. 2A).

Included species: *A. orientalis*, *A. cruciatus, A. rikchak*, *A. imitator*, *A. recaldeorum*, *A. menguali*, *A. calcaratus*.

Group 2. Basal bulb a little more substantial, with the basal edge in particular convex basad and usually enclosing more of the dorsal diaphragm (e.g. Figs 4O–R, 7, 9, 12, 14); tegmen with discretely sclerotized dorsal hook and an apicoventral process. This general form has several variations:

Group 2a. Dorsal tegmenal hook and apicoventral process simple, with a weakly sclerotized mediodistal process between them (e.g. Figs 4O–R, 7). As with group 1, I can find no external characters that would appear to unite or diagnose these species collectively.

Included species: *A. awki*, *A. galeatus*, *A. penicillus*, *A. politus*, *A. smithae*, *A. atillo*, *A. igneus*, *A. aculeus*, *A. turgidus*, *A. festivus*.

Group 2b. Dorsal tegmenal process wide apically, not acute (e.g. Fig. 9); apicoventral process borne on a transverse basal shelf, extending laterad to left, apically upturned; weakly sclerotized mediodistal process long, sinuate. These three species are rather closely related, and do share some external characters, including relatively sparse, long, nearly erect setae, and distinctly punctate head and pronotum. Males of all three have a fairly simple vertex, and a median longitudinal frontal carina (Fig. 3R–T).

Included species: *A. canandensis*, *A. villamarini*, *A. mindoensis*.

Group 2c. Dorsal tegmenal hook simple; more than one apicoventral process present (may be elaborate) (e.g. Fig. 12); weakly sclerotized mediodistal process present. This is probably a group of convenience, bringing together a few species with multipronged distal tegmenal processes, unlikely to be closely related. Thus, no external characters are cited.

Included species: *A. tungurahua*, *A. pachamama*, *A. francoi*.

Group 2d. Dorsal tegmenal hook present, usually simple (e.g. Fig. 14); apicoventral process simple but may be expanded; no mediodistal process. The absence of the mediodistal process may be informative (i.e. a loss), or may be plesiomorphic. The first four species listed here are more similar than any are to the last two, also dissimilar to each other, the first four sharing the discretely more strongly sclerotized dorsal hook (or hooks, in the case of *A. dolens*). In the last two, the entire aedeagus is more uniformly sclerotized. None of the group 2d species share any obviously useful external characters.

Included species: *A. minor*, *A. dolens*, *A. condor*, *A. montanus*, *A. papyrus*, *A. cuyabeno*.

Group 3. This group of species does not fit well in the current concept of *Arthmius*, while at least some of them appear to be closely related to each other. Chandler (unpublished key) has acknowleged a new batrisine genus that likely encompasses one or more of these species, and characterized it thus: "pronotum lacking antebasal sulcus, smoothly convex between lateral antebasal foveae; abdomen somewhat globular, lateral margins of long first tergite parallel". Most of these fit this characterization well, and in addition lack a lateral carina on any abdominal segment (Fig 15), whereas other *Arthmius* retain a lateral marginal carina on at least the first segment. Most have also lost any basal elytral foveae (otherwise almost universally retained in *Arthmius*). Other things these share with many *Arthmius* (and the likely derivative *Syrbatus*) are male modifications of the head and 5th antennomere, convex elytra, and a depressed last male ventrite. Beyond these features, however, they present a complicated diversity of characters relative to other neotropical Batrisini and to each other. I do not, therefore, feel justified in establishing any new genus or genera for these at this point, until a greater diversity of neotropical Batrisini can be better assessed and incorporated.

Included species: *A. orbis*, *A. aries*, *A. anzus*, *A. pazminoi*, *A. sumak*, *A. rex*.

Group 4. This final 'group' includes several species without obvious close relatives, or a couple in which conflict between external and genitalic characters makes their placement in *Arthmius* questionable, with further discussion of such issues in the remarks under each species.

Included species: *A. intricatus*, *A. insectus*, *A. tigrillo, A. discors, A. cervoides*, *A. amazonus*.

Arthmius Group 1

Arthmius orientalis **sp. nov.**
Figs 2A–C, 3A, 4A–B

Type material. Holotype ♂ (MECN-EN 40851): "ECUADOR: Tungurahua, -1.4349˚, -78.3113˚, NaturetrekCandelariaRes, 2178m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13204, Morphosp. Cnd.020"; deposited in MECN. **Paratypes** (5♂, 13♀): same general locality and date as type; 7: same data as type; 2: -1.4342˚, -78.3118˚, 2140m; 8: -1.4328˚, -78.3121˚, 2054m; 1: -1.4357˚, -78.3111˚, 2218m (MECN-EN 40361, 40364, 40366, 40369–40372, 40375, 40385, 40390, 40396, 40397, 40399, 40400, 40405, 40406, 40408, 40409). **Other material:** 3♂, 11♀: Napo: Estación Biológica Yanayacu [-0.59˚, -78.89˚, 2200m] (MECN-EN 40694, 40708, 40716, 40986–40997); 3♀: Tungurahua: Río Machay Reserve [-1.39˚, -78.29˚, 2100m] (MECN-EN 40298, 40306, 40325); 1♂, 2♀: "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" (MECN-EN 42054, 42038, 42039).

Diagnosis. (TL: 2.1mm) Body darkly orange, legs and antennae lighter, impunctate, rather sparsely setose, short recumbent hairs interspersed with longer, erect, recurved setae on abdomen and elytra; basal setae of head and pronotum shorter and suberect; head quadrate; male vertex unmodified; eyes large, protuberant; anterior corners of frons slightly elevated above antennal bases; antennae not too elongate, scape thick, cylindrical, less than twice as long as wide, II ovoid, III–IV narrow at base, slightly longer than wide, V and VII distinctly swollen (Fig. 2A), VI very small, VIII globular, IX–XI forming loose club, IX and X globular, about as long as wide, XI about twice

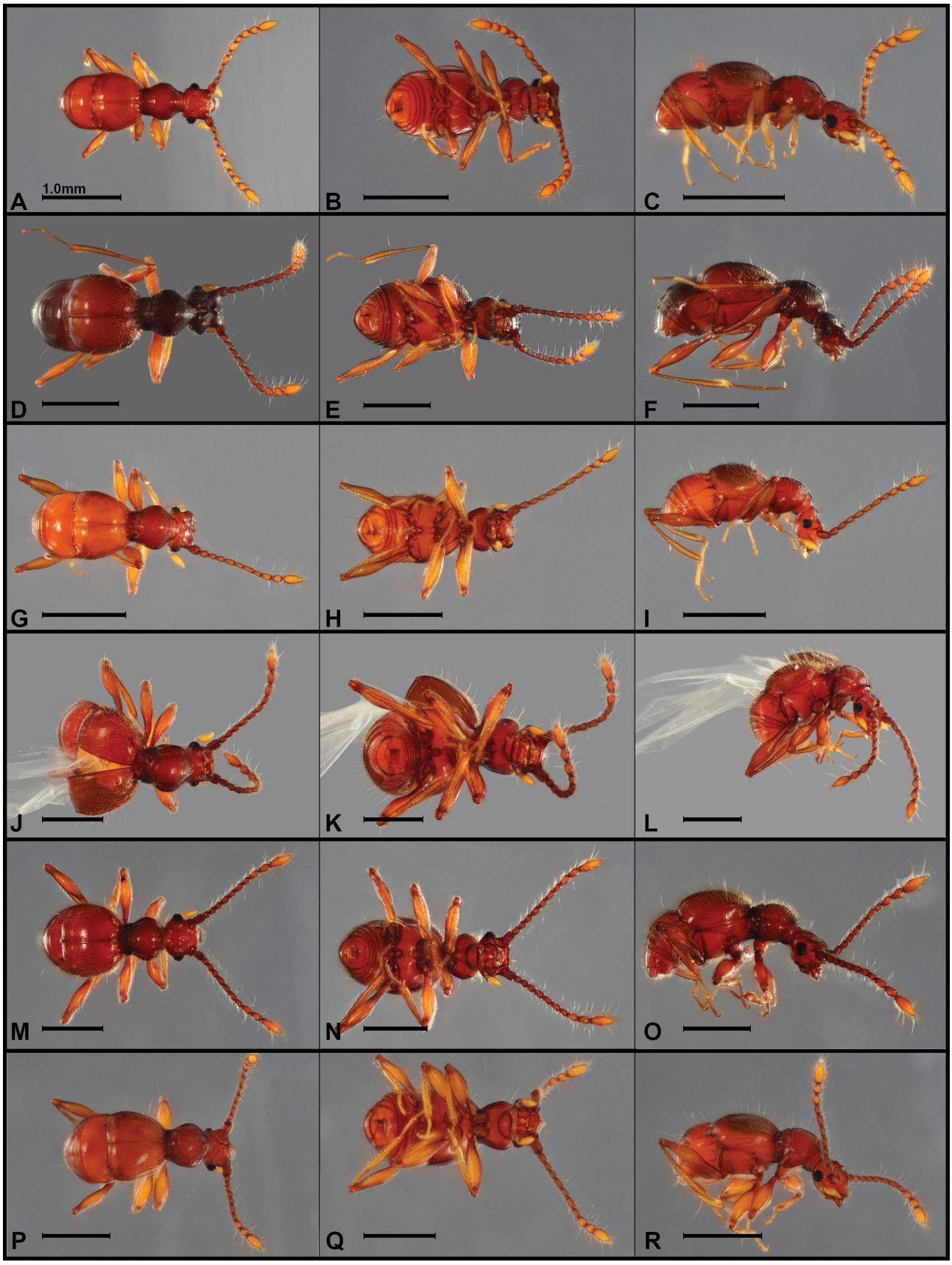

FIGURE 2. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. orientalis* **D–F** *A. cruciatus* **G–I** *A. rikchak* **J–L** *A. imitator* **M–O** *A. recaldeorum* **P–R** *A. menguali.* Scale bars = 1.0mm.

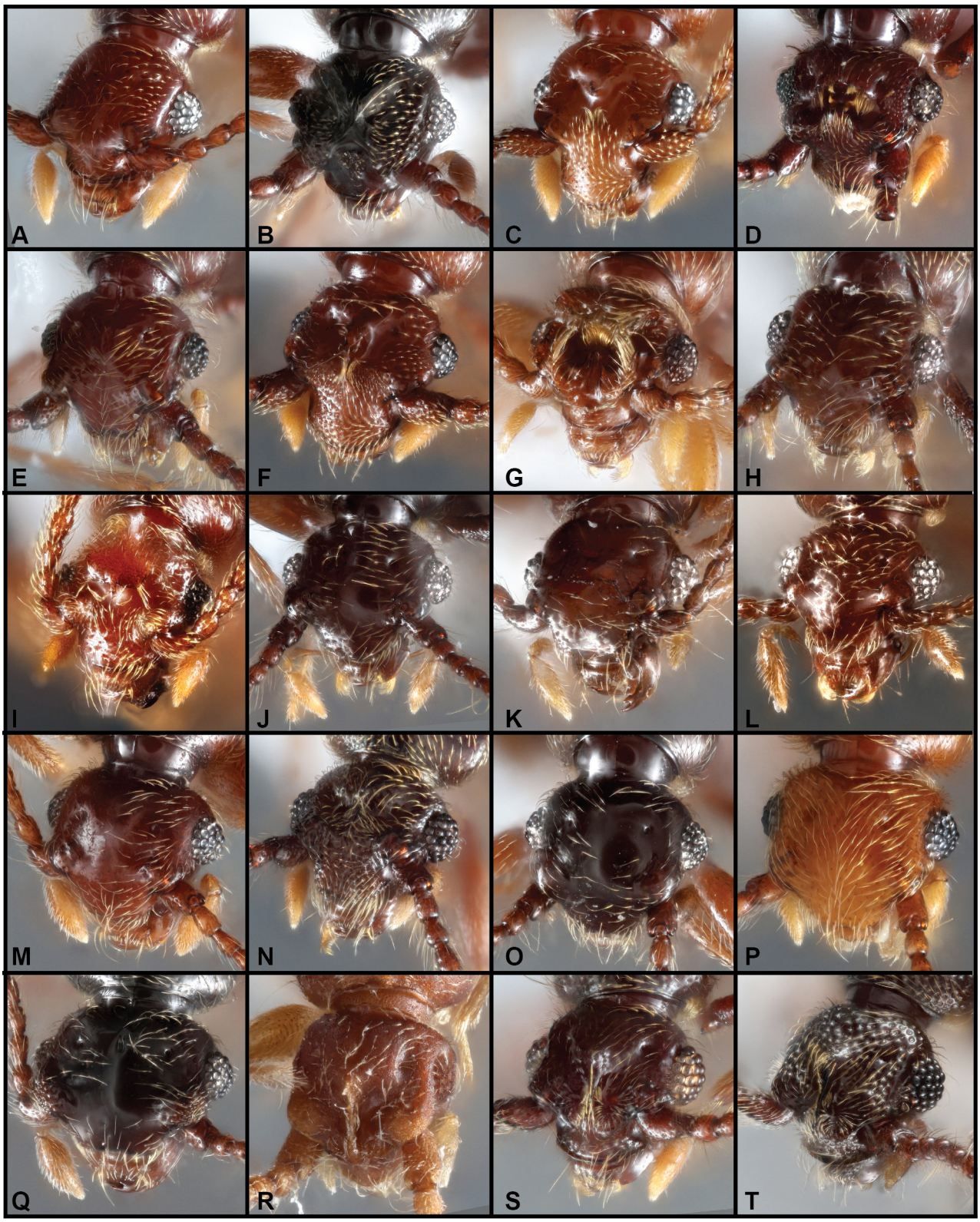

FIGURE 3. Frontal photos, male *Arthmius* spp. **A** *A. orientalis* **B** *A. cruciatus* **C** *A. rikchak* **D** *A. imitator* **E** *A. recaldeorum* **F** *A. menguali* **G** *A. calcaratus* **H** *A. awki* **I** *A. galeatus* **J** *A. penicillus* **K** *A. politus* **L** *A. smithae* **M** *A. atillo* **N** *A. igneus* **O** *A. aculeus* **P** *A. turgidus* **Q** *A. festivus* **R** *A. canandensis* **S** *A. villamarini* **T** *A. mindoensis.*

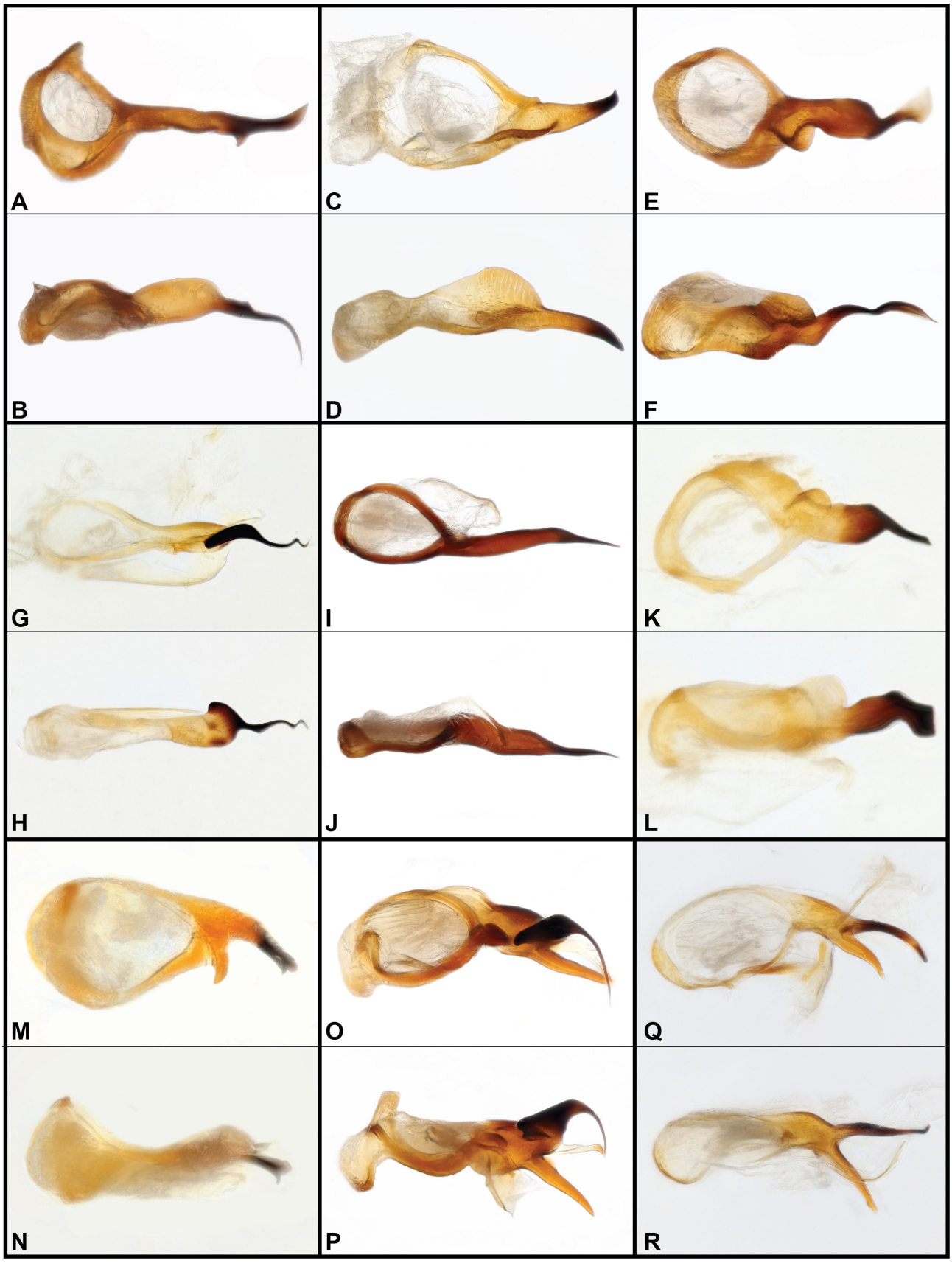

FIGURE 4. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. orientalis* **C, D** *A. cruciatus* **E, F** *A. rikchak* **G, H** *A. imitator* **I, J** *A. recaldeorum* **K, L** *A. menguali* **M, N** *A. calcaratus* **O, P** *A. awki* **Q, R** *A. galeatus*.

as long as X, apex subacute; pronotum widest near front, sides rounded, narrowed to neck and base; basolateral foveae shallow, connected by arcuate, transverse sulcus; elytra convex, with sides rounded, each with three distinct dorsobasal foveae; flight wings present; penultimate male ventrite shallowly depressed, with distinct brushes of recurved setae at posterolateral corners; male venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 4A, B) simple, basal bulb low, broadly open dorsally and ventrally, and small, accounting for only about one-third of aedeagal length; tegmen extending from its distal midpoint as a laterally compressed arm, narrowing just beyond its midpoint to a more strongly sclerotized, thin distal hook, with a distinct marginal tooth at its base.

Etymology. The species' name refers generally to the 'oriente', as eastern Ecuador is commonly referred to, given its relatively wide distribution in the mountains of the eastern Andes.

Distribution. This species is known from both sides of the Río Pastaza watershed, Tungurahua, Ecuador, as well as ~100km to the north, at the Estación Biológica Yanayacu, in Napo Province.

Remarks. While comparable male antennal modifications are known in other described *Arthmius* spp., they are rare among upper elevation species in the region. Here, the slightly triangular antennomere V (Fig. 2A), reduced antennomere VI and more simply swollen antennomere VII are distinctive, as is the penultimate abdominal ventrite (Fig. 2B) having dense brushes of setae at the posterolateral corners.

Females are recognizable by similarly modified antennomeres; antennomeres V and VII are slightly swollen, and VI is especially small between them.

Arthmius cruciatus **sp. nov.**
Figs 2D–F, 3B, 4C–D

Type material. Holotype ♀ (MECN-EN 40944): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol. Yanayacu, Ridge Tr., 2397m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12928, Morphosp. Yn.A.003"; deposited in MECN. **Paratypes** (3♂, 2♀): same general locality and date as type; 2: -0.5935˚, -77.8982, Piha Tr., 2356m; 2: -0.5939˚, -77.8980˚, Ridge Tr., 2368m; 1: -0.5973˚, -77.8933, Ridge Tr., 2224m (MECN-EN 40945–40949). **Other material:** (5♂, 2♀): Tungurahua, Río Machay Reserve [-1.38˚, -78.29˚, 2400m] (MECN-EN 40201, 40207, 40213, 40219, 40248, 40272); (2♂): Tungurahua, Cerro Candelaria Reserve [-1.44˚, -78.31˚, 2240m] (MECN-EN 40345, 40785).

Diagnosis. (TL: 2.3mm) Body dark rufescent, pronotum and head darker than legs, elytra, and abdomen; body with sparse, short recumbent setae and few longer suberect setae interspersed; male head broad, subquadrate, wide to front; vertex with foveae on either side of a low, subpyramidal median tumescence, obliquely depressed in front; vertex with long setae projecting inward (Fig. 3B), meeting over tumescence; frons with round, densely and finely punctate patch immediately anterad tumescence; eyes protruding, finely faceted; antennae elongate, scape short and cylindrical, antennomeres II–VIII longer than wide, V and VII of male particularly so and very weakly swollen on inner margins with additional median setae, IX–XI widened into loose club; pronotum strongly narrowed to rear, widest in front of middle, with transverse basal sulcus between small lateral foveae, pair of depressions behind sulcus; long setae inserted near posterolateral foveae extending anteromediad, nearly meeting at midline; elytra broadly rounded, each with three dorsobasal foveae; subhumeral foveae and striae lacking; abdomen with single carina at margin of each segment; apex of male protibia with small, perpendicular, hooked apical spur at inner corner; male legs long, slender; male mesotrochanter with dense brush of short setae (Fig. 2E); male penultimate ventrite (Fig. 2E) almost entirely deeply depressed, sides raised, forming posteriorly directed hooks (Fig. 2F) at posterior corners. Aedeagus (Fig. 4C, D) with low basal bulb broadly open ventrally and dorsally, thicker (dorsoventrally) at base, narrowed apicad; tegmen extended from just right of center into long, straight, apically strongly sclerotized, bluntly acute process; left edge of basal bulb contined as low vertical ridge that merges with base of tegmenal process.

Etymology. This species is named for the cruciate setae on the head and pronotum.

Distribution. This species has a rather broad distribution in Ecuador's eastern Andean cloud forests, known from Yanayacu Biological Station in Napo Province south to the Cerro Candelaria Reserve, in Tungurahua, a distance of just over 100km.

Remarks. The male vertex of this species is distinctive, having anteriorly convergent vertexal ridges behind lateral depressions, and a setose frontal shelf in the middle of the broad epistomal region (Fig 3B). Females are slightly smaller, with shorter legs, and lacking the vertexal tumescence, leg, and ventrite modifications of the males. They are recognizable in having weak, oblique vertexal impressions anteromediad the foveae and in having similar cruciate long setae of the head and pronotum.

This species name refers to the fairly distinctive pattern of long cruciate setae both on the head, where they are aligned with the oblique vertexal depressions, and on the pronotum.

Arthmius rikchak **sp. nov.**
Figs 2G–I, 3C, 4E–F

Type material. Holotype ♂ (MECN-EN 40842): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13195, Morphosp. Cnd.011"; deposited in MECN. **Paratypes** (2♂): same general locality and date as type, but -1.4349˚, -78.3113˚, 2178m (MECN-EN 40367, 40376.

Diagnosis. (TL: 2.1mm) Body orange, impunctate, rather sparsely setose, short recumbent hairs interspersed

with much longer, erect, recurved setae; head quadrate; male vertex slightly elevated at middle between and behind vertexal foveae (Fig. 3C), with weak longitudinal carina extended anterad to frons; eyes large, protuberant; anterior corners of frons elevated above antennal bases; clypeus setose; antennae elongate, scape thick, cylindrical, less than twice as long as wide, II elongate ovoid, III–VIII narrower, widened to apex, slightly longer than wide, V and VII longer, IX–XI forming weak, elongate club, IX and X slightly bulbous apically, XI about twice as long as X; pronotum widest near front, sides rounded, narrowed to neck and base; basolateral foveae shallow, connected by arcuate, transverse sulcus; pronotal base with weak series of shallow impressions; elytra convex with sides rounded, each with three distinct dorsobasal foveae; flight wings present; male mesotibia with truncate inner apical spur; penultimate male ventrite strongly, transversely depressed. Aedeagus (Fig. 4E, F) simple, with basal bulb low, slightly bulbous basally, broadly open dorsally and ventrally; tegmen narrow, flattened, extending from apex of basal bulb, with large, blunt tooth at base of left side, abruptly narrowed before apex, apical lobe with narrow base and lightly sclerotized, semicircular tip.

Etymology. The species name comes form a Kichwa word meaning 'identical,' referring to its close similarity to many other species.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. Externally this species is weakly distinct from others, distinguishable primarily by the combination of a weak carina on the male vertex, enlarged apical spurs on the male mesotibiae, and the transversely depressed penultimate male ventrite.

Arthmius imitator **sp. nov.**
Figs 2J–L, 3D, 4G–H

Type material. Holotype ♂ (MECN-EN 41964): "ECUADOR: Napo, -0.5947˚, -77.8945˚, Est. Biol. Yanayacu, Piha Tr., 2248m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12977, Morphosp. Yn.A.046" / "MECN-EN 41964"; deposited in MECN. **Paratypes** (1♂): same locality as type, but -0.5986˚, -77.8949˚, Stream Tr., 2185m, 10.IX.2024 (MECN-EN 41965).

Diagnosis. (TL: 2.9mm) Body orange, with sparse recumbent setae and much longer erect setae interspersed; head quadrate, vertexal foveae small, inconspicuous; male frons (Fig. 3D) with deep but short transverse impression, vertex carinate above, with tufts of setae at either side, and small oblique channels opening onto frons; frons slightly elevated over antennal bases, densely covered with thick, erect setae; eyes hemispherical, protuberant; antennae rather elongate, antennomeres II–IV slightly longer than wide, V–VIII distinctly longer (though VIII shorter than VII or IX), IX–XI forming loose, setose club; pronotum wider towards front, margins emphasized by lateral longitudinal impressions (Fig. 2J); lateral foveae distinct, connected by deep, curved transverse sulcus; elytra broadly rounded, each with three distinct dorsobasal foveae; subhumeral foveae absent; basal abdominal segment with two lateral carinae, other segments with single carina; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 4G, H) with low basal bulb broadly open ventrally and dorsally; narrowing evenly to weakly sclerotized median tegmen, tegmen bearing very strongly, discretely sclerotized apical process, dorsoventrally bladelike at base, immediately narrowed into fine apical style that twists to acute apex.

Etymology. The species name refers to the duplicity of having *Syrbatus*-like external characters and *Arthmius*-like male genitalia.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species was intially thought to be a species of *Syrbatus* due to the lateral longitudinal pronotal impressions, but the aedeagus is unmistakably *Arthmius*-like, suggesting that this is convergence. These impressions are shallower than in any true *Syrbatus* species. So the combination of those with the unique configuration of male vertexal modifications will distinguish this species from others in either genus.

Arthmius recaldeorum **sp. nov.**
Figs 2M–O, 3E, 4I–J

Type material. Holotype ♂ (MECN-EN 40854): "ECUADOR: Tungurahua, -1.4343˚, -78.3114˚, NaturetrekCandelariaRes, 2145m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13207, Morphosp. Cnd.023"; deposited in MECN. **Paratypes** (3♂): same general locality and date as type; 2: same data as type; 1: -1.4342˚, -78.3118˚, 2140m (MECN-EN 40380, 40381, 40384).

Diagnosis. (TL: 2.6mm) Body large, orange, with moderately dense, suberect body setae interspersed with longer, erect setae; head quadrate, with large protuberant eyes; vertexal setae deeply impressed; male head lacking secondary modifications, weakly carinate at base and midline; antennae elongate, scape cylindrical, antennomere II short, subquadrate, II–IV slightly longer than wide, widened to apex, V–VIII distinctly longer than wide, V and VII especially, IX–XI forming loose club; pronotum with sides rounded, widest anterad middle; lateral subbasal foveae present, connected by arcuate transverse sulcus; elytra with sides rounded, each with three distinct basal foveae; subhumeral fovea absent; flight wings present; legs lacking obvious secondary sexual characters; male penultimate abdominal ventrite depressed discretely in apical half, with distinct ridge surrounding its basal edge (Fig. 2O). Aedeagus (Fig. 4I, J) very flat, basal bulb small and ring-like, broadly open dorsally and ventrally; tegmen simple, long, consisting of single tapering, slightly sinuate, apically strongly sclerotized and narrowly acute process.

Etymology. The name of this species honors the Recalde family, who have been associated with Ecominga's Río Pastaza area reserves since, and even before, their inception. As guides, guards, and naturalists, they have ensured the security and sanctity of these natural treasures. Fausto 'Tito' Recalde was my guide on the trip that collected this species, and he deserves recognition for its discovery.

Distribution. This species is known only from the Naturetrek Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua Province, Ecuador.

Remarks. This species exhibits few distinctive external characters, such a lack itself being somewhat unusual. The discretely and anteriorly margined depression of the male penultimate ventrite is the most distinctive thing about it.

Arthmius menguali **sp. nov.**
Figs 2P–R, 3F, 4K–L

Type material. Holotype ♂ (MECN-EN 40941): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Piha Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12947, Morphosp. Yn.A.016"; deposited in MECN. **Paratypes** (2♂): same locality as type (MECN-EN 40942–40943).

Diagnosis. (TL: 2.2mm) Body orange, smooth, with sparse short, recumbent setae and scattered much longer, erect setae; male head roundly widened in front of eyes, depressed on either side of an interrupted median longitudinal carina (Figs 2R, 3F), posteriorly acute behind interruption, forming a diminishing ridge anteriorly; antennae moderately elongate, antennomeres II–IV barely longer than wide, V & VII about twice as long as wide, slightly swollen on inner edge, VI & VIII shorter, IX–XI forming loose club; pronotum with weak lateral foveae and weak, straight transverse sulcus; elytra rounded at sides, narrow anteriorly, each with three dorsobasal foveae; subhumeral foveae absent, subhumeral stria weak; abdominal segments with single lateral marginal carina; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 4K, L) with low basal bulb broadly open ventrally and dorsally, thicker (dorsoventrally) at base, narrowed apicad; tegmen extended from right of center, dorsoventrally flattened at base, then twisted into apically laterally flattened blade, blade bent ventrad toward square apex; tegmen with a conspicuous, rounded dorsal lobe at its base.

Etymology. I name the species in recognition of the camaraderie of dipterist Dr. Ximo Mengual on this field trip. Dr. Mengual suggested I sample along the trail that yielded this species.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is best recognized by the interrupted male frontal carina.

Arthmius calcaratus **sp. nov.**
Figs 3G, 4M–N, 5A–C

Type material. Holotype ♂ (MECN-EN 40765): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13110, Morphosp. RAn.001"; deposited in MECN.

Diagnosis. (TL: 2.0mm) Body orange, smooth, rather sparsely clothed with medium-length semirecumbent setae, with longer setae interspersed along sides of pronotum, elytra, and abdominal tergites; head of male (Figs 3G, 5C) deeply transversely impressed, nearly from eye to eye, with vertex forming setose, weakly dentate shelf above depression; frons depressed between setose lateral ridges, setae directed inward; frons beneath flat except for deep, narrow, glabrous notch, with well-defined sides and erect distal tooth; eyes large, protuberant, with about 35 facets; antennae elongate, antennomere I short, cylindrical, II elongate oval, III–IV beadlike, V and VII longer, bearing whorls of long setae (like club segments), VI and VIII simply ovoid, IX–XI forming elongate, loose club; pronotum widened to front, sides rounded, base weakly constricted; lateral pronotal foveae weakly impressed, with shallow, arcuate sulcus between, very long lateral setae at its sides; elytra with sides rounded, each with weak basal carina and sutural plus two lateral basal foveae; abdomen with sides weakly margined, 1st tergite with lateral longitudinal striae connected by basal arch; male mesotrochanter with large posterior spur; male mesotibia with enlarged apical spur; male last ventrite simply depressed, moderately setose. Aedeagus (Fig. 4M, N) with basal bulb low, broadly open dorsally and ventrally, basal margin elevated, narrowed distally; tegmen very simple, with two apical processes lying in same plane as basal bulb, with small inner apical lobe short, acute, directed mediad/leftward, and larger apical process more strongly sclerotized, dark, with subquadrate apex and small, digitiform tooth along inner margin.

Etymology. This species name refers to the limestone-rich region in the eastern Andean foothills that it occurs in.

Distribution. This species is known only from lower part of the Río Pastaza Watershed, at the Río Anzu Reserve in Pastaza Province, Ecuador, a transitional area between montane and lowland tropical forest.

Remarks. The completely transversely impressed vertex, in combination with the glabrous median frontal notch and well-developed mesotrochanteral and mesotibial spurs will help distinguish this species.

***Arthmius* Group 2a**

Arthmius awki **sp. nov.**
Figs 3H, 4O–P, 5D–F

Type material. Holotype ♂ (MECN-EN 40798): "ECUADOR: Tungurahua, -1.3829˚, -78.2909˚, Río Machay Reserve, 2402m, 12.XI.2024, M.Caterino,

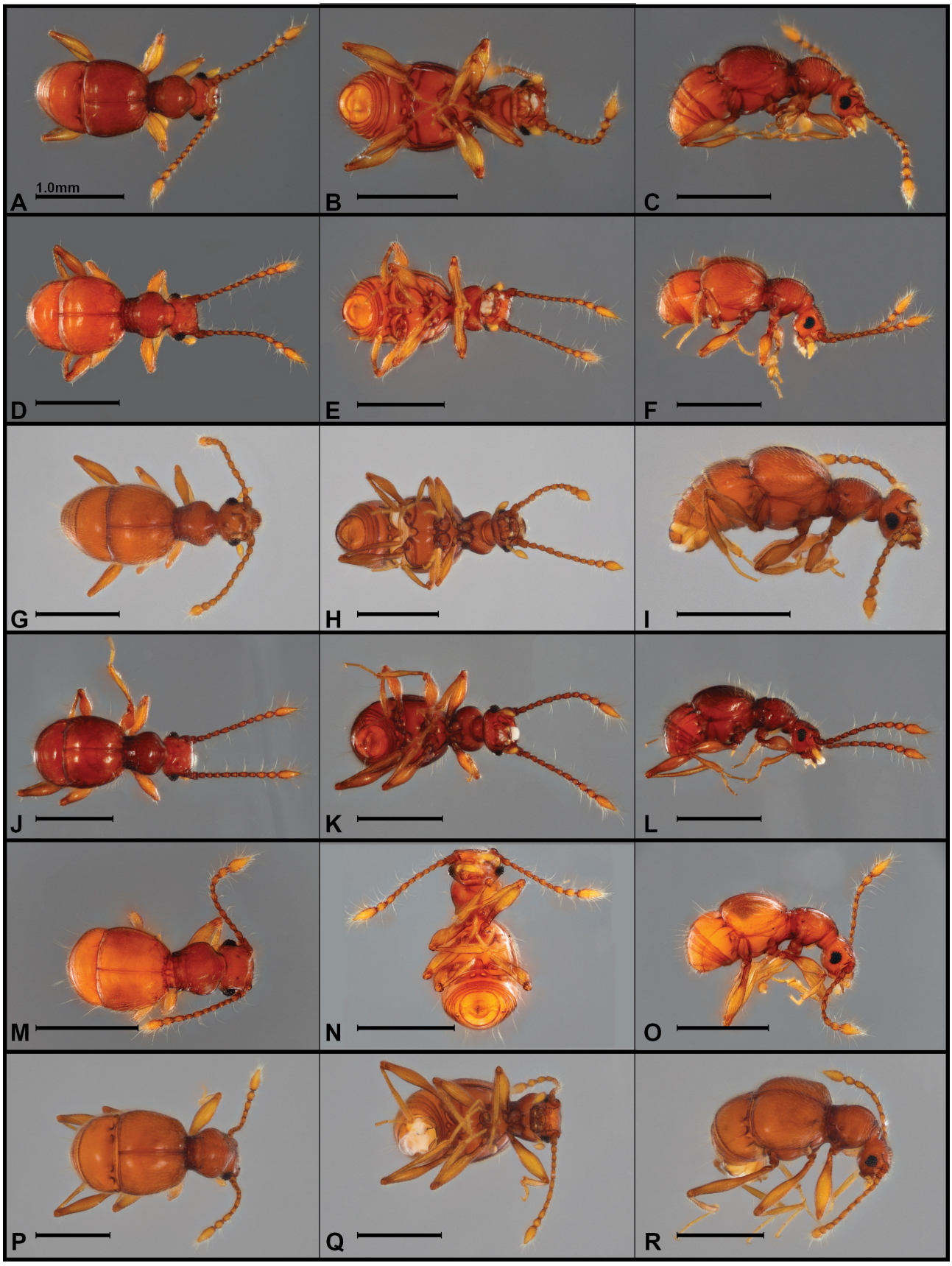

FIGURE 5. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. calcaratus* **D–F** *A. awki* **G–I** *A. galeatus* **J–L** *A. penicillus* **M–O** *A. politus* **P–R** *A. smithae.* Scale bars = 1.0mm.

sifted litter" / "Caterino DNA voucher, Ext. MSC-13151, Morphosp. Mch.014"; deposited in MECN. **Paratypes** (1♂, 7♀, same date general locality as type): 1: same data as type; 3: -1.3895˚, -78.2929˚, 2239m; 1: -1.3921˚, -78.2932˚, 2100m; 2: -1.3821˚, -78.2902˚, 2402m; 1: -1.3812˚, -78.2895˚, 2416m (MECN-EN 40209, 40212, 40216, 40226, 40279, 40290, 40294, 40313).

Diagnosis. (TL: 2.1mm) Body reddish-orange; dorsum uniformly setose, most setae suberect with longer, erect, recurved setae interspersed; head subquadrate; vertexal foveae rather dorsal; male vertex (Fig. 3H) unmodified; antennal bases slightly elevated and more punctate; eyes medium-sized, protuberant, occupying most of genal surface; antennae elongate, scape thick, cylindrical, less than twice as long as wide, antennomere II elongate, ovoid, III–VIII narrower, widened to apex, slightly longer than wide, V and VII longer, cylindrical, IX–XI forming elongate club, IX and X slightly bulbous apically, XI about 2.5× as long as X; pronotum widest near front, sides rounded, narrowed to neck and base; basolateral foveae shallow, connected by arcuate, transverse sulcus; pronotal base with series of shallow impressions; elytra convex with sides rounded, each with three distinct dorsobasal foveae; flight wings present; male pro- and mesotrochanters with small denticles; apex of male protibia with comb of setae; male mesotibia with modified inner apical spur; penultimate male ventrite simply and shallowly depressed. Female last tergite and sternite convex and punctate along apices. Aedeagus (Fig. 4O, P) with basal bulb low, slightly bulbous basally, with low dorso- and ventrobasal ridges, broadly open dorsally and ventrally; tegmen with short, broad base extending from apex of basal bulb, widening slightly to right side shelf bearing straight, acute, apicoventrally directed process; left side of tegmen bearing strongly sclerotized, strongly downturned hook; basally weakly, apically more distinctly sclerotized process extending distad from apex of tegmen below dorsal hook.

Etymology. This species' name comes from a Kichwa word meaning 'nobility'.

Distribution. This species is known only from cloud forests north of the Río Pastaza, in the Río Machay Preserve, Tungurahua Province, Ecuador

Remarks. This species exhibits only subtle male secondary sexual characters, on the trochanters and tibiae of the pro- and mesothoracic legs. The aedeagus represents a common configuration, with a discretely sclerotized dorsal hook, a simple apicoventral process, and a weakly sclerotized process between them, and is best recognized by their specific shapes.

Arthmius galeatus **sp. nov.**
Figs 3I, 4Q–R, 5G–I

Type material. Holotype ♂ (ZSFQ-i13677): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v-1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12421, Pselaphinae" / "iZSFQ-i13677"; deposited in ZSFQ. **Paratypes** (4♂): same locality and dates as holotype, 1900–2500m, hand collecting, beating, litter sifting, and understory fogging (ZSFQ-i23371–i23374). **Other material** (1♂): "Ecuador: Pichincha, Nanegalito, 7 km S on Nono Road, 1540m, 0˚0'23"N, 78˚40'36"W, 26–27 Oct 1999, Z.H. Falin, ECU1F99031 ex. UV light" (QCAZ).

Diagnosis. (TL: 2.5mm) Body orange, with rather dense, semirecumbent golden setae; male head (Figs 3I, 5G, 5I) broad, with wide, subquadrate, elevated frontal process, deeply excavate and glabrous beneath, setose above; eyes projecting, coarsely faceted; pronotum narrowed basally, with lateral foveae connected by complete shallow transverse impression; elytra swollen, convex, with three basal foveae, no subhumeral fovea; 1st tergite longer than next two combined; mesotrochanter with distinct spine; apical mesotibial spur enlarged, sinuous. Aedeagus (Fig. 4Q, R) with basal bulb low, base weakly convex, elongate oval, broadly open above and below; tegmen bifurcate from common base, dorsal lobe thin, weakly sinuate, strongly sclerotized, curving mediad, narrowed to slightly upturned apex; ventral lobe similar in length to dorsal, deflected ventrad, narrowing slightly to bluntly rounded apex.

Etymology. This species' name comes from a latin term for 'helmeted', referring to its male vertexal headgear.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is easily recognized by the wide, raised and forward-curved male vertexal process.

Arthmius penicillus **sp. nov.**
Figs 3J, 5K–L, 7A–B

Type material. Holotype ♂ (MECN-EN 40864): "ECUADOR: Tungurahua, -1.4327˚, -78.3120˚, NaturetrekCandelariaRes, 2145m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13217, Morphosp. Cnd.033"; deposited in MECN.

Diagnosis. (TL: 2.0mm) Body large, orange, with sparse, suberect body setae interspersed with longer, erect setae; head quadrate, with large protuberant eyes; vertexal setae deeply impressed; male head lacking secondary modifications, weakly carinate at base and midline; antennae elongate, scape cylindrical, antennomere II short, subquadrate, II–IV slightly longer than wide, widened to apex, V–VIII distinctly longer than wide, V and VII especially, IX–XI forming loose club; pronotum with sides rounded, widest anterad middle; lateral subbasal foveae present, connected by arcuate transverse sulcus; elytra with sides rounded, each with three distinct basal foveae; subhumeral fovea absent; flight wings present; male protrochanter with long distal seta; male protibia slightly expanded at apex; male mesotrochanter with long cluster of apical setae (Fig. 5L); male mesotibia with short, oblique apical spur; male penultimate ventrite depressed, rugosely punctate, and setose in apical two-thirds.

Aedeagus (Fig. 7A, B) with basal bulb reduced, broadly open dorsally and ventrally; median lobe with dorsal process strongly sclerotized, strongly bent, apex acute; ventral lobe straight, projecting obliquely apicoventrad, apically truncate; thin, weakly sclerotized lobe extending distad between them.

Etymology. This species' name refers to the distinctive 'brush' of setae on the male mesotrochanter. It is used as a noun in apposition.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua Province, Ecuador.

Remarks. Lacking modifications of the male head, this species can be best recognized by the cluster of setae on the male mesotrochanter (Fig 5L), for which it is named.

Arthmius politus **sp. nov.**
Figs 3K, 5M–O, 7C–D

Type material. Holotype ♂ (MECN-EN 40892): "ECUADOR: Morona-Santiago, -3.0234˚, -78.5893˚, Limón Indanza, Área Ecológica de Conservación Municipal Tinajillas—Río Gualaceño, 2311m, 31.I.2025, M. Barreno | M. Basantes" / "Caterino DNA voucher, Ext. MSC-13311, Morphosp. Tin.004"; deposited in MECN. **Paratype** (1♀): same data as type (MECN-EN 41966).

Diagnosis. (TL: 1.8mm) Body orange, smooth, with sparse, subrecumbent setae on elytra and abdomen, semierect setae on pronotum, longer, erect setae interspersed, particularly on abdomen; head subquadrate, raised slightly over antennal insertions; vertexal foveae distinct, widely separated; male head without secondary sexual modifications; eyes protuberant, occupying most of lateral surface of gena; antennae elongate, most intermediate antennomeres, especially V and VII, longer than wide, IX–XI forming narrow, loose club; pronotum widest near front, sides rather distinctly constricted anterad and basad; lateral foveae shallow, with weakly arcuate transverse sulcus between them; elytra convex, sides rounded, each with sutural and two lateral basal foveae; 1st abdominal tergite about 3× as long as 2nd or 3rd, with short basolateral carinae; male mesotrochanter with weak denticle, mesotibia with weakly modifed spur; metatibia with long seta just basad midpoint on outer edge (Fig. 5N); male penultimate ventrite shallowly depressed, venter otherwise lacking secondary sexual modifications. Aedeagus (Fig. 7C, D) with basal bulb low, broadly open above and below; distal processes arising from lobe on right side of bulb, comprising a strongly sclerotized dorsal hook, a narrow, apicoventrally directed rod, and a weakly sclerotized process between them.

Etymology. The species name refers to its body's general smoothness.

Distribution. This species is known only from cloud forests east of Cuenca, in Morona-Santiago Province, Ecuador.

Remarks. This species almost totally lacks sexual dimorphisms, with only small mesotrochanteral denticles and slightly modified mesotibial spurs. An unknown specimen from the region, if a male, will likely be identifiable by those characters alone. It also has quite smooth, almost impunctate pronotal and elytral surfaces. The aedeagus is quite similar to that of *A. awki*, from Tungurahua Province, differing only slightly in shapes of apical processes.

Arthmius smithae **sp. nov.**
Figs 3L, 5P–R, 7E–F

Type material. Holotype ♂ (ZSFQ-i23365): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m. Window traps, S. Smith" / "Caterino DNA voucher, Ext. MSC-12661, Morphosp. ElP.A.060"; deposited in ZSFQ. **Paratypes** (2♀): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" (ZSFQ-i23365–i23367). **Other material:** "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, misc. hand collecting" / "Caterino DNA voucher, Ext. MSC-12838, Morphosp. Ot.A.003" (MECN-EN 40939).

Diagnosis. (TL: 2.2mm) Body darker orange, with sparse, subrecumbent setae; male vertex unmodified; frons convex, projecting slightly over clypeo-labral region, weakly dentate on either side; antennae elongate, antennomere V longer than IV or VI; male pro- and meso-trochanters with elongate spines, the former longer; mesofemur weakly dentate near base (Fig. 5Q); male mesotibial spur enlarged, curved mesad (Fig. 5R); 1st visible male abdominal ventrite with narrow digitiform process produced between metacoxae, metaventrite with several elongate posteriorly bent setae over this process. Aedeagus (Fig. 7E, F) with bifurcate median lobe, dorsal lobe strongly bent, apex acute, strongly sclerotized, ventral lobe straight, apically truncate, weakly sclerotized lobe extending distad between them.

Etymology. The species is named to recognize the efforts of Dr. Sarah Smith, specialist in scolytine Curculionidae, in collecting the type of this species, during a joint field trip in 2011.

Distribution. This species is known from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador, and from Bosque Integral Otonga, located about 60km southwest, also on the Pacfic side of the Andean crest.

Remarks. The two localities inhabited by this species are not too far apart (~60km), but differences are evident in the main sclerotized process of the aedeagus, with that of the Otonga male more smoothly arched dorsally. Until more material is available, potentially from intervening localities, and barcodes can be produced for both populations, a hypothesis that this represents intraspecific variation seems most appropriate.

Arthmius atillo **sp. nov.**
Figs 3M, 6A–F, 7G–H

Type material. Holotype ♂ (QCAZ-I-280260): "ECUADOR: Chimborazo, -2.18775˚, -78.5210˚, Atillo, 3501m, 3JUL2016, S. Muñoz, & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13039, Morphosp. Atillo4"; deposited in QCAZ. **Paratypes** (8♂, 7♀): same data as type (QCAZ-I-280261–280275).

Diagnosis. (TL: 2.2mm) Body uniformly orange, sparsely recumbently setose, with only a few longer erect setae on sides of pronotum and elytra; head subquadrate, smooth, unmodified in male; antennae slightly elongate, antennomeres II–VII slightly longer than wide, VI and VII slightly longer than others, VIII no longer than wide, IX–XI forming loose club; pronotum with arcuate subbasal sulcus connecting shallow lateral foveae; elytra broadly rounded, each with three dorsobasal foveae; 1st abdominal segment with two lateral carinae, others with one; male mesotibia with truncate apical spur; male last ventrite broadly flattened and setose; legs and venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 7G, H) strongly sclerotized, narrow, elongate, with low basal bulb broadly open ventrally and dorsally, basal rim slightly elevated; tegmen with common base extended distad, right side with thick, ascending process topped with bird-head like apex, knobbed at proximal base, 'beak' distal, thin and curving ventrad; base of right side process with weakly sclerotized process curving distad, only its apex acutely sclerotized; left ventral apex of tegmen produced into narrower distal arm, divided near apex into median, in-bent paddle and apicolateral blade. Females (Fig. 6D–F): last tergite (pygidium) with short median longitudinal ridge.

Etymology. This species is named for the lake (Lagunas Atillo) near the type locality.

Distribution. This species is known only from páramo vegetation in the eastern highlands northeast of Cuenca, Ecuador.

Remarks. This species is distinguished by its almost complete lack of secondary sexual characters. The depression of the last abdominal ventrite in the male is more exaggerated and setose, however, than is typical of *Arthmius* males. The association of several females with this species is based on comparable abundance, and no other candidate species in the sample. However, the female is unique in showing a carinate pygidium (Fig. 6D). Secondary sexual characters in female Pselaphinae are very uncommon. A similar case may be seen in *A. condor*, where a putative female has an acute point at the pygidial apex, but that association is not as clear.

Arthmius igneus **sp. nov.**
Figs 3N, 6G–I, 7I–J

Type material. Holotype ♂ (MECN-EN 40728): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13073, Morphosp. VS.012"; deposited in MECN. **Paratypes** (10): (1♂ 4♀): same data as type (MECN-EN 40652, 40658, 40659, 40623, 40632); (3♂ 2♀): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" (MECN-EN 42049, 41995–41998).

Diagnosis. (TL: 2.3mm) Body conspicuously setose (Fig. 6G), mostly recumbent but with few longer erect setae, uniformly reddish-orange; head subquadrate, antennal insertions elevated; male vertex (Fig. 3N) depressed around distinct vertexal foveae, weakly carinate between, carina short; epistoma flat, rugosely punctate, with sides weakly margined; eyes large, coarsely faceted; antennae elongate, antennomeres II–VIII almost twice as long as wide, V and VII slightly longer than others, IX–XI forming loose club, apical antennomere acuminate; pronotum widest anteriorly, rather strongly constrcted at base, lateral foveae shallow, basal transverse sulcus weak; elytra strongly rounded, each with three dorsobasal foveae; 1st abdominal segment with two lateral carinae, others with one; male protibia with thin, curved apical protibial spur; male basal protarsomere very short, slightly flattened, with long modified seta at inner apex; male mesotrochanter with very small tooth; male metaventrite with weakly elevated, flat, setose plateaus in front of metacoxae. Aedeagus (Fig. 7I, J) with basal bulb low, broadly open dorsally and ventrally, dorsobasal ridge slightly elevated; tegmen extended as common thick base, dividing into two sclerotized distal processes, a dorsal inverted 'L'-shaped hook, with a downturned apex, and a narrowing, downturned ventral process, also hooklike; a weakly sclerotized median process arises from base of ventral hook, curving leftward apically, with subtly complex apical sclerotizations. Female last tergite and sternite with unique paired depressions on either apical corner.

Etymology. This species' volcanic geographical origin is referenced by its name.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is more conspicuously setose than many *Arthmius*, and its males' setose metaventral plateau is subtle but distinctive. The remaining suite of male secondary characters, especially those involving the anterior legs, is unique. And the females are unusual in showing modifications of the last sternite and tergite.

Arthmius aculeus **sp. nov.**
Figs 3O, 6J–L, 7K–L

Type material. Holotype ♂ (QCAZ-I-280276): "ECUADOR: Imbabura, 0.14517˚, -78.27922˚, Mojanda, 3715m, 12JUL2016, S.Muñoz, A.Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13061, Morphosp. Mojanda3"; deposited in QCAZ. **Paratypes** (3♂, 2♀): same data as type (QCAZ-I-280277–280281).

Diagnosis. (TL: 2.3mm) Body mostly dark, elytra and legs slightly lighter, sparsely setose, most setae

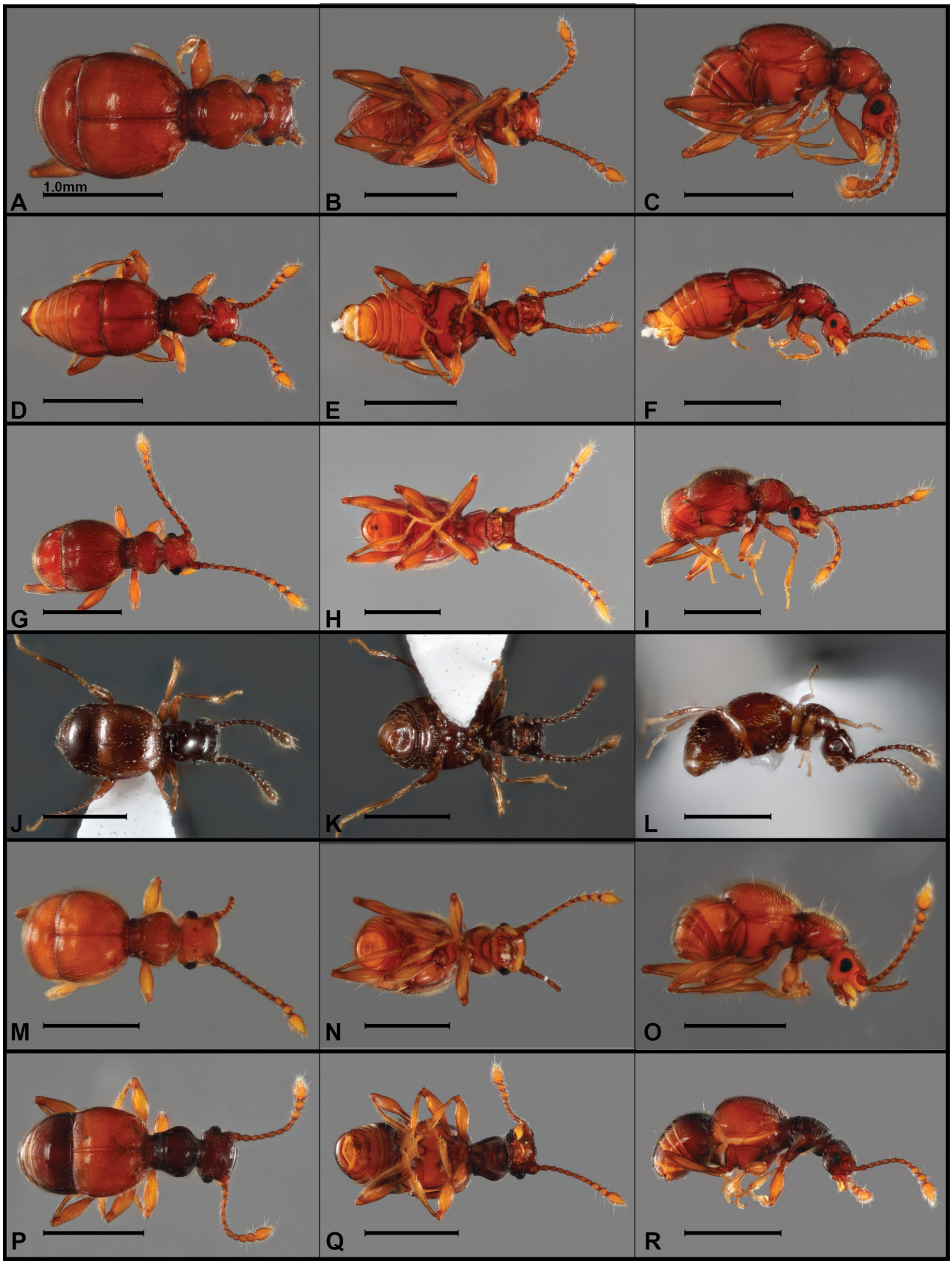

FIGURE 6. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. atillo* (male) **D–F** *A. atillo* (female) **G–I** *A. igneus* **J–L** *A. aculeus* **M–O** *A. turgidus* **P–R** *A. festivus.* Scale bars = 1.0mm.

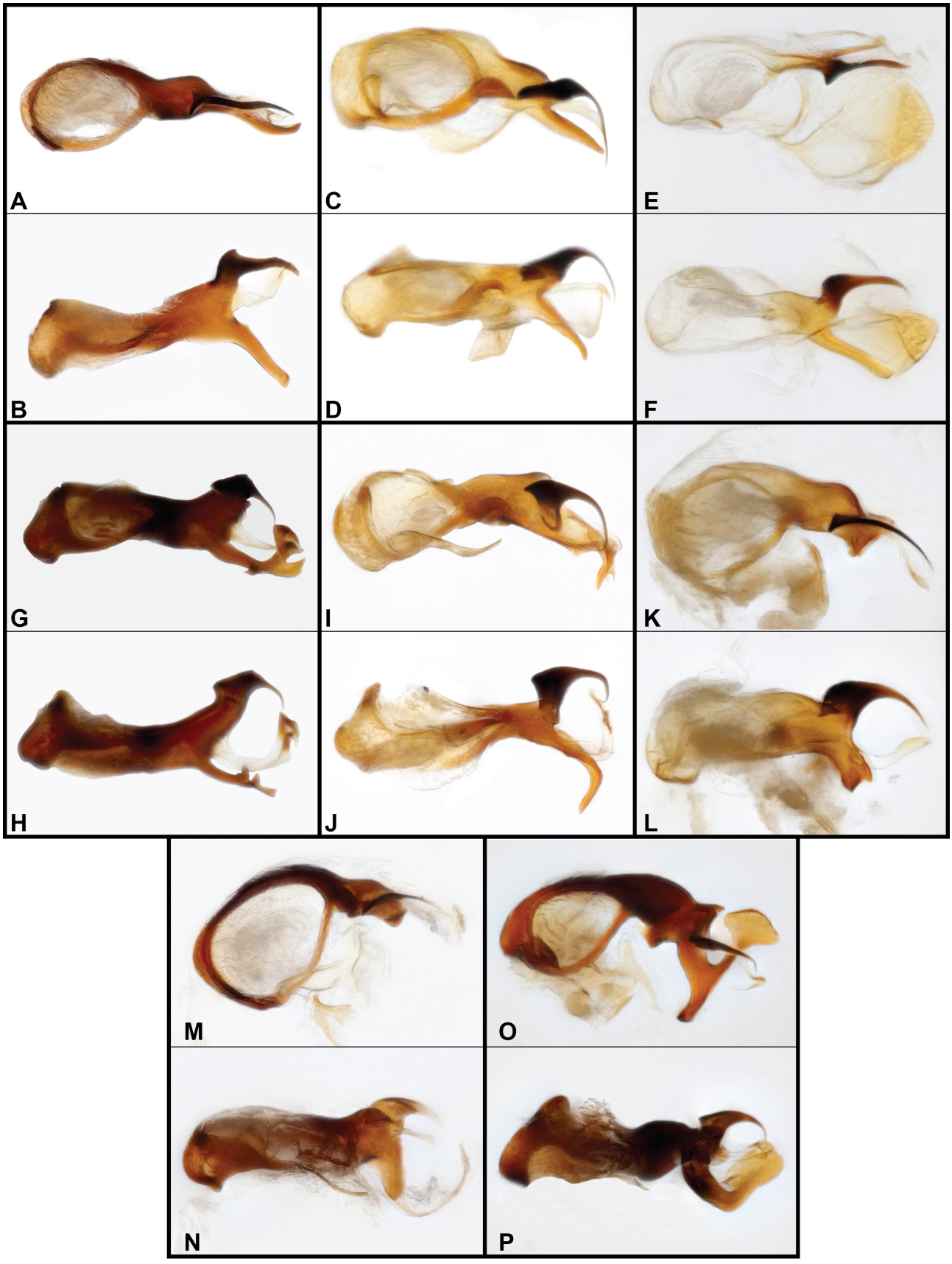

FIGURE 7. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. penicillus* **C, D** *A. politus* **E, F** *A. smithae* **G, H** *A. atillo* **I, J** *A. igneus* **K, L** *A. aculeus* **M, N** *A. turgidus* **O, P** *A. festivus*.

subrecumbent; head subquadrate, vertex strongly convex, that of male without obvious modifications; eyes protruding, coarsely faceted; antennae moderately elongate, those of male unmodified; pronotum widest before middle, smooth; lateral foveae weakly impressed, connected by well-impressed, arcuate transverse basal sulcus; elytra with sides rounded, each with three small dorsobasal foveae; flight wings present; male pro- and mesotrochanters with strong, curved spurs (Fig. 6K, L); apex of male metatibia with non-articulated spur perpendicular to tibial axis; male last two ventrites granulate, the ultimate depressed in apical two-thirds. Aedeagus (Fig. 7K, L) not too strongly sclerotized, with low basal bulb slightly elongate, broadly open ventrally and dorsally, basal rim weakly elevated; tegmen with common base extended distad, curving leftward; right edge slightly humped near midpoint, its surface bearing a discretely more strongly sclerotized hooked process; apical tegmenal process descends beneath hook to terminate in subquadrate, weakly emarginate apex; a weakly sclerotized median process extends from base of ventral process, its apex bluntly rounded, weakly sclerotized.

Etymology. This species is named for the long, acute mesotrochanteral spur of the male. It is used as a noun in apposition.

Distribution. This species is known only from páramo vegetation on Volcán Mojanda, northeast of Quito, Ecuador.

Remarks. This species is distinguished by its uniqely spurred mesotibia, a distinct, slightly curved tooth nearly perpendicular to the tibial axis, along with a long, thin spur on the mesotrochanter. The granulate texture of the last male ventrites is also unusual.

Arthmius turgidus **sp. nov.**
Figs 3P, 6M–O, 7M–N

Type material. Holotype ♂ (MECN-EN 40951): "ECUADOR: Pichincha, 0.0915˚, -78.5165˚, Res. Geobot. Pululahua, Cascada de la Peña, 1708m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12913, Morphosp. Pul.A.007"; deposited in MECN. **Paratypes** (7♂**,** 10♀), same general locality and date as type, 2: identical data to type; 15: 0.0914˚, -78.5164˚, 1715m (MECN-EN 40952–40968). **Other material:** 1♂ : "ECUADOR: Cotopaxi, -0.4194˚, -79.0033˚, Bosque Integral Otonga, 13.VIII.2024, 1963m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12849, Morphosp. Ot.A.014". (MECN-EN 40950)

Diagnosis. (TL: 2.1mm) Body orange, densely covered with moderately long semi-recumbent setae with longer erect setae interspersed; head broad, widened slightly to front, with vertexal foveae shallowly impressed; male epistoma (Fig. 3P) distinctly swollen, projecting over labrum, with receding shelf beneath, sides with distinct transverse notches from antennal cavities nearly to middle; eyes hemispherical; antennae moderately elongate, scape short, expanded apically, antennomere II slightly shorter and narrower, III–IV, VI, and VIII similar in size, slightly longer than wide, widened to apex, V and VII longer than the others, IX–XI progressively expanded, forming a loose club; pronotum smooth, convex, widest anterad midpoint, narrowed to base and apex; lateral basal foveae present, connected by shallow, straight transverse sulcus; each elytron with three dorsobasal foveae, sides rounded; subhumeral elytral fovea high on humerus; abdomen weakly margined, 1st abdominal segment much longer than others; male protibia widened, slightly swollen subapically; male basal protarsomeres flattened, expanded and setose beneath, notched at outer base; male mesotrochanter with tiny, setose denticle on posterior surface. Aedeagus (Fig. 7M, N) with basal bulb moderately flattened, broadly, irregularly rounded, with wide dorsal diaphragm, broadly open ventral foramen; right side of aedeagus bearing short tegmenal extension bearing sclerotized, strongly curved dorsal hook, immediately beneath which is a narrower, weakly sclerotized, digitiform process extending ventrodistad; apex of tegmen also with bluntly triangular ventral extension; at base of tegmen on medioapical margin of basal bulb is short, curved sclerotized hook.

Etymology. This species is named to recognize the swollen epistoma of the males (Fig. 3P).

Distribution. This species known from Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador, as well as Volcán Pululahua, just north of Quito.

Remarks. The aedeagus from the two known localities differs slightly, with that of the Otonga population exhibiting a narrowing ventral tegmenal process, and a dorsoapical process that is more strongly curved. This species is rather distinct in its large body size, rather dense body setation, distinctly flattened male basal protarsomere, and the male's distinctly swollen epistoma.

Arthmius festivus **sp. nov.**
Figs 3Q, 6P–R, 7O–P

Type material. Holotype ♂ (QCAZ-I-280282): "ECUADOR: Chimborazo, -1.6400˚, -78.5071˚, Releche, 3124m, 22JUL2017, S. Muñoz & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13053, Morphosp. Releche1"; deposited in QCAZ. **Paratypes** (1♀): same data as type (QCAZ-I-280283).

Diagnosis. (TL: 2.2mm) Body appearing bi- or tricolored (Fig. 6P), pronotum, head, and abdomen dark, almost castaneous, elytra lighter, orange, legs lighter still; body setae quite sparse, individual setae long, suberect; head subquadrate, slightly widened to front; eyes protuberant, coarsely faceted; male vertex not notably modified, weakly tuberculate at middle (Fig. 3Q); vertexal foveae present, widely separated; setae of vertex convergent to midline; frons weakly elevated, punctate over antennal bases, glabrous at middle; male antennae unmodified, moderately elongate, with loose three-segmented club; pronotum widest anterad middle,

posteriorly with lateral subbasal foveae present, connected by well-impressed, arcuate transverse sulcus; elytra rounded laterally; flight wings present; each elytron with three distinct basal foveae; (male only?) protrochanters with single long seta; male 2nd protarsomere with enlarged setae along anterior edge; last male ventrite weakly depressed, markedly punctate at middle; venter and legs otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 7O, P) strongly sclerotized, elongate, with low basal bulb broadly open ventrally and dorsally, basal rim distinctly elevated; tegmen with common base extended distad, curving leftward; widened at midpoint into dorsally arcuate plate, its surface bearing a dorsal hooked process; descending to right the tegmen continues before terminating in 'T'-like apex, the left end short, truncate, the right expanding into broad spade-shaped paddle; between the dorsal hook and ventral paddle a weakly sclerotized median process extends from tegmen base, terminating in weakly sclerotized recurved hook.

Etymology. This species is named for its somewhat 'festive' coloration.

Distribution. This species is known only from páramo vegetation on the west slope of Volcán El Altar, eastern Chimborazo Province, Ecuador.

Remarks. This species is distinguished by its coloration and modified male protarsi, in addition to genitalic characters.

***Arthmius* Group 2b:**

Arthmius canandensis **sp. nov.**
Figs 3R, 8A–C, 9A–B

Type material. Holotype ♂ (MECN-EN 40981): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13023, Morphosp. Can.A.009"; deposited in MECN. **Paratypes** (1♂, 3♀): same data as type (MECN-EN 40982–40985).

Diagnosis. (TL: 2.5mm) Body sparsely setose, with short recumbent setae interspersed with longer, erect setae; head broadly subquadrate, front corners roundly elevated; male frons with elevated median carina (Figs 3R, 8A); eyes prominent, hemispherical, coarsely faceted; antennae moderately elongate, antennomeres II, V, and VII distinctly longer than wide, III, IV, VI, and VIII only barely longer than wide, IX–XI forming loose club; pronotum widest at front, with distinct lateral fovae connected by arcuate subbasal sulcus; pronotal disk sparsely but distinctly punctate; elytra rounded, each with three dorsobasal foveae; 1st abdominal segment with two lateral marginal carinae, others with one; male with small tooth on mesotrochanter and enlarged mesotibial spur. Aedeagus (Fig. 9A, B) with small basal bulb, tegmen with three processes: a weakly sclerotized ventral one that bends up apically into weakly sclerotized, curved flange; at its base a strong tooth projects perpendicularly leftward and curves dorsad; dorsally is a more strongly sclerotized, laterally compressed blade, dentate at dorsal base, prolonged ventrad at squared apex into acute ventral tooth.

Etymology. This species is named for the reserve hosting the type locality.

Distribution. This species is known only from coastal forests of Esmeraldas, Ecuador, in the Reserva Biológica Canandé.

Remarks. This species is distinguished by its unique combination of secondary sexual characters, including a carinate male frons, alternating long and short antennomeres (V and VII being longer than IV, VI or VIII; Figs 8 B–C), mesotrochanteral tooth, and enlarged mesotibial spur.

Arthmius villamarini **sp. nov.**
Figs 3S, 8D–F, 9C–D

Type material. Holotype ♂ (MECN-EN 40898): "ECUADOR: Carchi, 0.8060˚, -78.1723˚, El Goaltal, 1420m, 07.II.2025, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13317, Morphosp. Goal.001"; deposited in MECN. **Paratypes** (3♂): same general locality and date as type; 2: 0.8050˚, -78.1711˚, 1317m; 1: 0.8050˚, -78.1712˚, 1322m (MECN-EN 42061–42063).

Diagnosis. (TL: 2.6mm) Body, especially head and prothorax, darkly orange, legs elytra, abdomen, and legs lighter, head and pronotum distinctly punctate (Fig. 8A), all surfaces sparsely covered with long, suberect setae, with longer fully erect setae interspersed; head quadrate; eyes large, protuberant; anterior corners of frons slightly elevated above antennal bases; male with prominent vertexal swelling between and anterad vertexal foveae, narrowing to median carina which extends to prominent frontal tubercle (Fig. 3S), slightly more densely setose on either side of carina; antennae not too elongate, scape thick, cylindrical, antennomeres II–VIII subconical, slightly longer than wide, V and VII a little longer and with longer setae, IX–XI forming loose club, XI about twice as long as X, apex rounded; pronotum rather short, slightly wider than long, widest near front, sides rounded, basolateral foveae shallow, connected by anteriorly arcuate, finely raised carina; elytra convex, with sides rounded, slightly wider to rear, each with three large dorsobasal foveae; flight wings present; male with pro- and mesotrochanters weakly dentate; male mesotibia with short, almost perpendicular inner apical spur; male last ventrite wide, depressed at middle. Aedeagus (Fig. 9C, D) with reduced basal bulb, broadly open above and below, with distinct, rounded ridge at left, upper, basal corner; apex of basal bulb extended as dorsoventrally flattened plate, expanding apically, then truncate, right side with major apical extension, a wide, laterally compressed blade, slightly notched at upper basal corner, curving downward at apex; narrow, weakly sclerotized process extending from beneath major sclerotized process, with digitiform ventral process, sinuate to broader apex; left middle edge of basal bulb also with complex, weakly sclerotized process arched with distal, dorsally directed acute tip.

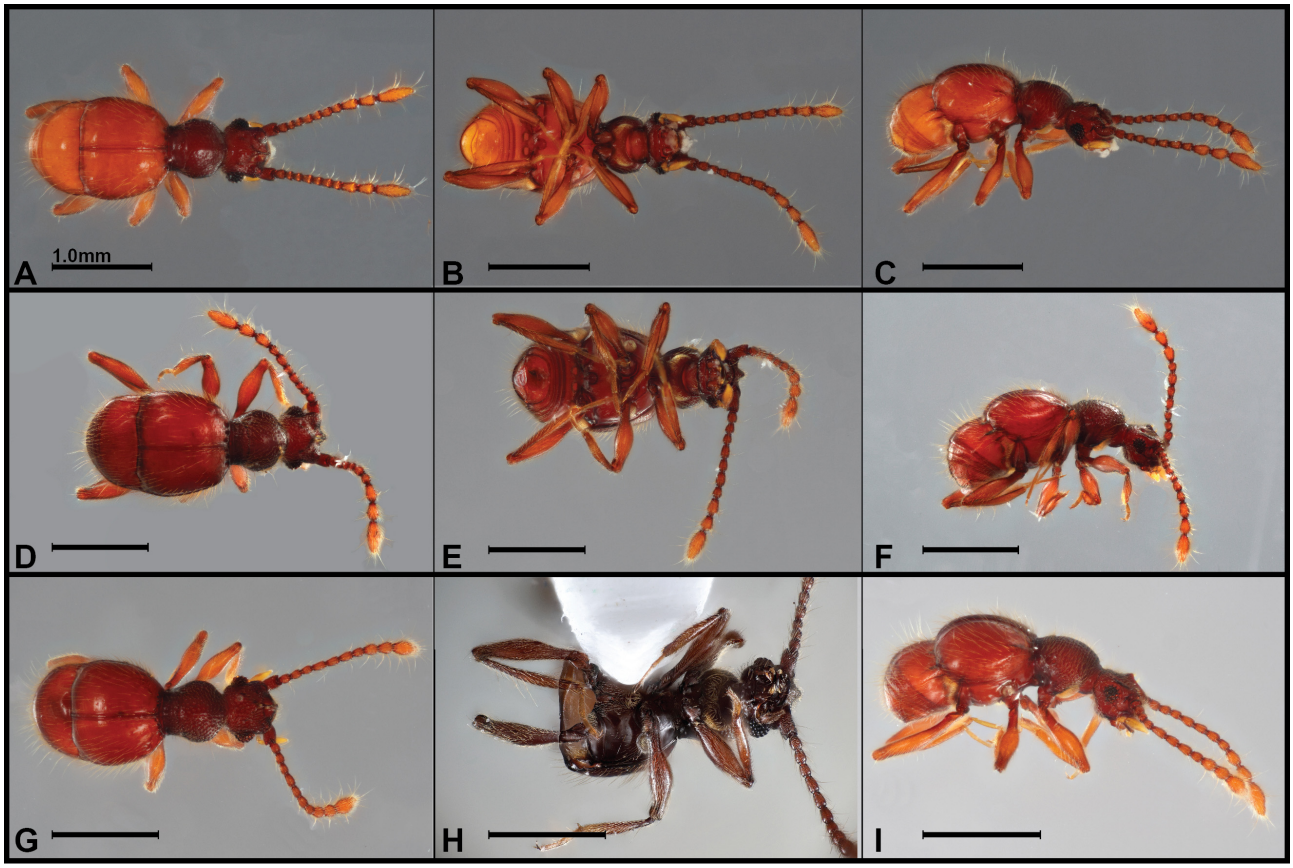

FIGURE 8. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. canandensis* **D–F** *A. villamarini* **G–I** *A. mindoensis*. Scale bars = 1.0mm.

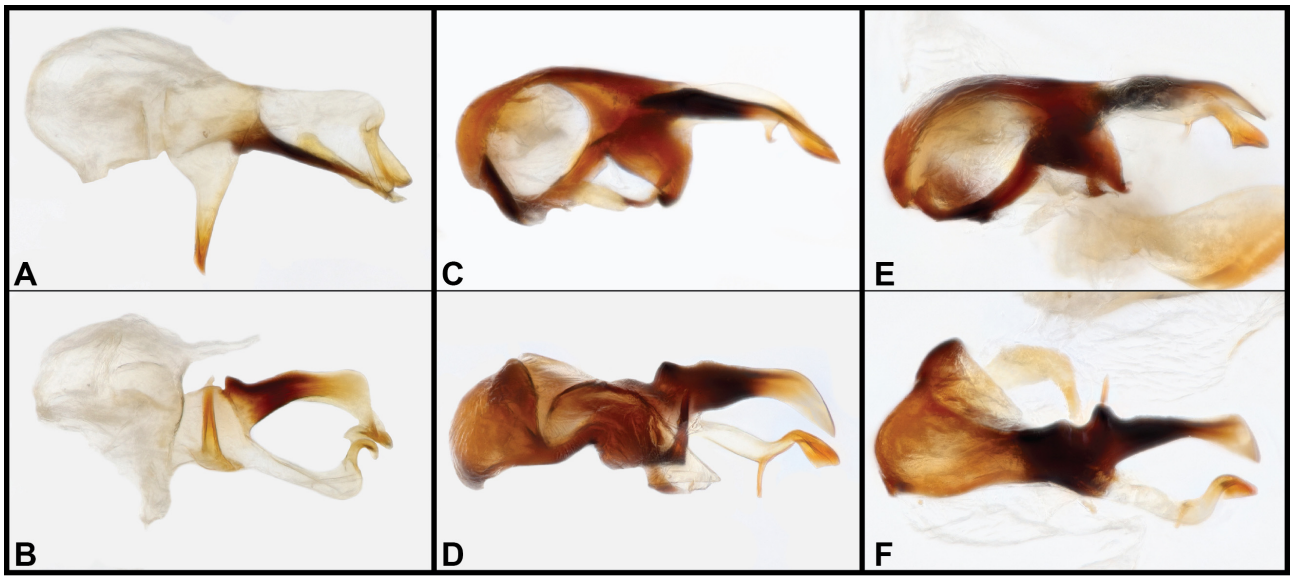

FIGURE 9. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. canandensis* **C, D** *A. villamarini* **E, F** *A. mindoensis*.

Etymology. The species is named for Dr. Santiago Villamarín, of la Universidad Central del Ecuador, whose family property in Carchi is the only known home of this species.

Distribution. This species is known from lower cloud forests of Carchi Province, in far northern Ecuador.

Remarks. This species has a moderately distinctive median frontal carina, elevated to a posterior vertexal swelling. Its punctate head and pronotum, while not unique, are unusual and can assist in identification. The aedeagus has several unique features, including the flat basal plate from the apex of the basal bulb, and a weakly sclerotized process on the left side (not just below the major sclerotized apical blade).

Arthmius mindoensis **sp. nov.**
Figs 3T, 8G–I, 9E–F

Type material. Holotype ♂ (MECN-EN 40940)**: "ECUADOR:** Pichincha, 0.0473˚S, 78.7619˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12780, Morphosp. Min.A.002"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Head and pronotum densely punctate and darker (Fig. 8G), with setae shorter and denser than those of elytra and abdomen; head broad, subquadrate, vertex with foveae weak; male vertex (Fig. 3T) with subacute median tubercle, continued anterad to frons by thin, upright vertical lamina, anteriorly with smooth, glabrous depression on each side; eyes hemispherical, coarsely faceted; antennae elongate with poorly defined, loose 3-segmented club, basal antennomere thick, its outer corner very slightly produced, antennomeres II–VIII slightly longer than wide (V–VII slightly moreso), IX and X distinctly widened to apex, XI almost twice as long as preceding, swollen medially; pronotum narrowed to base, rounded and widest in front of middle, basal transverse impression well developed, connecting shallow lateral foveae; elytra smooth, shining, each with four basal foveae, widening from humeri, sides broadly rounded, subhumeral fovea absent; elytra and abdominal tergites with two types of setae, shorter slightly recumbent setae (~45° posterad) interspersed with fewer longer, erect setae that curve anterad; first abdominal tergite with two lateral carinae setting off basal two-thirds of laterotergite, succeeding segments with single weak lateral carina. Aedeagus (Fig. 9E, F) with basal bulb low, broadly open dorsally and ventrally; tegmen with two process extending distad from left edge of basal bulb; a more strongly sclerotized ventral process, with a short spike projecting ventrally from a tubercle at its midpoint widens and curves mediad slightly, forming a palmate apical paddle; a more weakly sclerotized dorsal process extends dorsad slightly, with a sinuous subapical bend, also expanded in a slightly smaller palmate distal process bearing a similar spike on a weakly sclerotized lobe near its base; right side of tegmen with only very short subtriangular process.

Etymology. This species is named for the popular and enchanting tourist town near which it lives.

Distribution. This species is known only from the cloud forests near Mindo, Pichincha, Ecuador.

Remarks. This species, while closely related and rather similar to the preceding, is distinctive externally, with its strongly punctate head and pronotum contrasting with the smooth elytra.

***Arthmius* Group 2c:**

Arthmius tungurahua **sp. nov.**
Figs 10A–C, 11A, 12A–B

Type material. Holotype ♂ (MECN-EN 40866): "ECUADOR: Tungurahua, -1.4327˚, -78.3120˚, NaturetrekCandelariaRes, 2145m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13219, Morphosp. Cnd.035"; deposited in MECN.

Diagnosis. (TL: 2.9mm) Body large, head and pronotum (Fig. 10A) slightly darker rufescent than elytra, legs lighter; pronotum with sparse shallow punctures; setae of pronotum short, semi-erect, while those of elytra and abdomen are longer and subrecumbent, both with longer erect setae interspersed; eyes large, protuberant; vertexal foveae distinct but not strongly impressed; male head (Fig. 11A) with strong, transverse depression in middle of vertex, margined posteriorly, the anterior opening partially margined by broad, truncate median blade; lateral corners of depression dentate, with rounded lateral vertexal lobes between these teeth and eyes; frons transversely impressed immediately beneath vertexal shelf, but then strongly swollen and setose between antennal bases; antennae not too elongate, scape cylindrical, about twice as long as wide, II–IV similar, barely longer than wide, weakly expanded to apex, V–VII about 1.25× longer than wide, VIII similar to IV, IX–XI forming loose club; pronotum widest in front, sides rounded; lateral subbasal foveae distinct but shallow, connected by weakly sinuate transverse sulcus; elytra with sides rounded, each with three dorsobasal foveae; flight wings present; male protrochanter with small apical tooth; male penultimate abdominal ventrite simply transversly depressed, smooth. Aedeagus (Fig. 12A, B) with basal edge of basal bulb convex, broadly open ventrally, less so dorsally; right edge of basal bulb with prominent knob; tegmen with two curving subapical processes along dorsal edge basal to major, hooked apical process; a thin, acute, ventrally curved process below apical hook; and an elongate, weakly sclerotized process extending distad next to ventral one, weakly sclerotized and hooked at apex.

Etymology. The species name refers to the nearby volcano that gives the province its name, also the subject of myths which personify Mama Tungurahua as the object of several masculine volcanoes' ardor.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. The vertexal modifications of this species are unique, with a strongly margined median depression in combination with a swollen and setose frons. The shallowly and sparsely punctate pronotum is also unusual.

Arthmius pachamama **sp. nov.**
Figs 10D–F, 11B, 12C–D

Type material. Holotype ♂ (MECN-EN 40795): "ECUADOR: Tungurahua, -1.3812˚, -78.2895˚, Río Machay Reserve, 2416m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13148, Morphosp. Mch.011"; deposited in MECN. **Paratypes** (1♂, 1♀, same general locality as type): 1: -1.3821˚, -78.2902˚, 2402m; 1: -1.3895˚, -78.2929˚, 2239m (MECN-

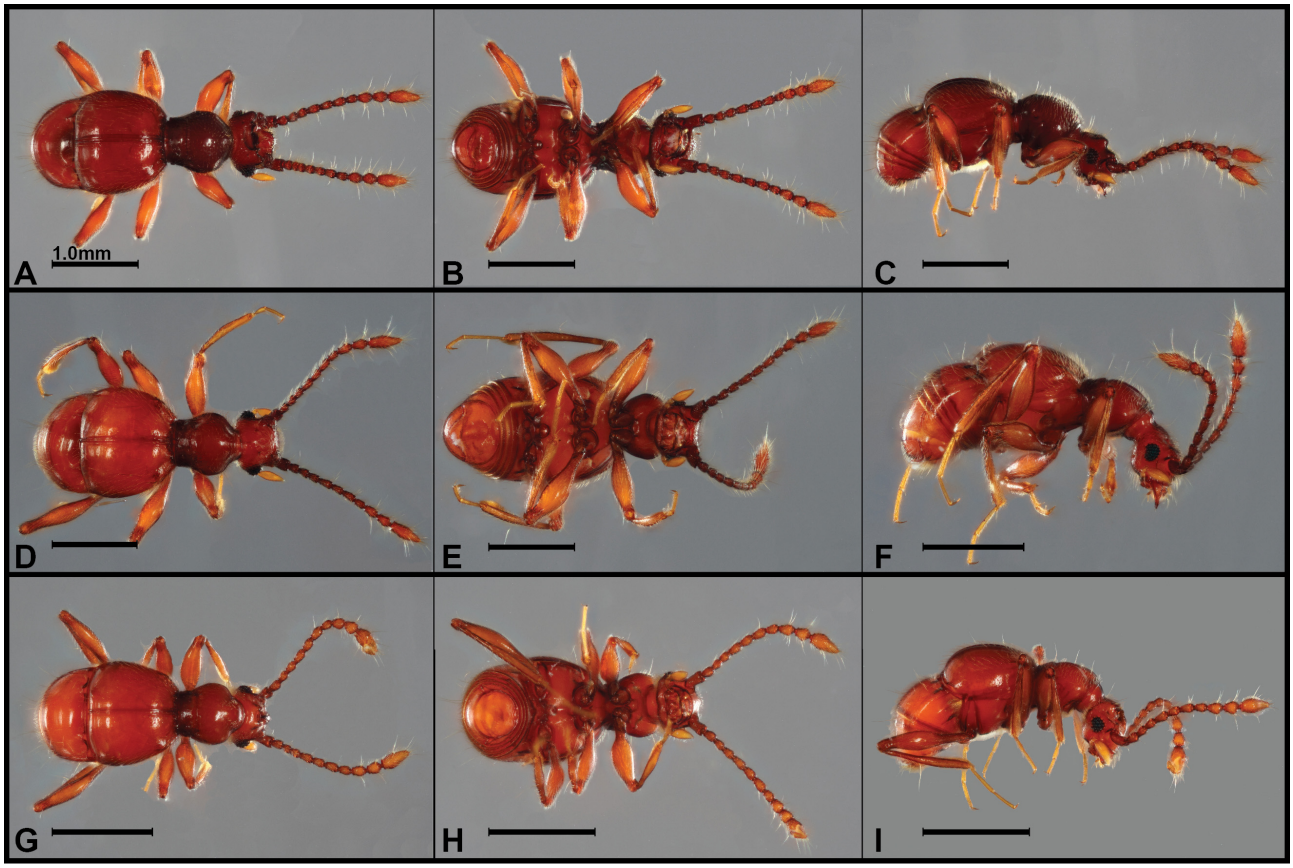

FIGURE 10. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. tungurahua* **D–F** *A. pachamama* **G–I** *A. francoi.* Scale bars = 1.0mm.

EN 40214, 40288). **Other material:** 2♂, 5♀: Ecuador: Tungurahua: Naturetrek Candelaria Reserve, 13.XI.2024, -1.43˚, -78.31˚, ~2200m (MECN-EN 40357, 40377, 40378, 40382, 40383, 40387, 40840).

Diagnosis. (TL: 2.9mm) Body reddish-orange, head and pronotum slightly darker; dorsum uniformly setose, most setae suberect with longer, erect setae interspersed; head subquadrate; vertexal foveae rather dorsal; male vertex (Fig. 11B) mostly unmodified, with shallow median dimple; antennal bases slightly elevated and more punctate; eyes medium-sized, protuberant, occupying most of genal surface; antennae elongate (Fig. 10D), scape thick, cylindrical, less than twice as long as wide, antennomeres II–IV narrower, cylindrical, slightly longer than wide, V–VIII, especially V and VII, longer, IX–XI forming elongate club, IX and X slightly bulbous apically, XI about 2.5× as long as X; pronotum widest near front, sides rounded, narrowed to neck and base; basolateral foveae shallow, connected by arcuate, transverse sulcus; pronotal base with series of shallow impressions; elytra convex with sides rounded, each with three distinct dorsobasal foveae; flight wings present; male metaventrite deeply impressed along median line, setose on either side; male penultimate ventrite (Fig. 10E) deeply, longitudinally sulcate medially, anterior margin of depression weakly ridged; female last tergite bilobed, with long converging setae above and below lobes. Aedeagus (Fig. 12C, D) highly complex; basal bulb low, slightly bulbous basally, with low basal ridge, broadly open dorsally and ventrally; tegmen borne on narrowed base, widening with right side shelf bearing four large, curved, serrate ventral hooks, the basal one smaller than the apical three; left side of tegmen raised into laterally compressed plate bearing dark, strongly sclerotized, downturned hook along its distal edge, and a long, curving, weakly sclerotized process with discretely sclerotized and bifid process beneath.

Etymology. This species' name recognizes the Andean 'mother Earth', the provider of all that lives. In particular, I wish to recognize the honor extended to Pachamama in Ecuador's constitution, the first to recognize that her embodied nature possesses inherent rights to life.

Distribution. This species is known only from cloud forests both north and south of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. While the minimal male secondary characters make this species a little difficult to characterize, its aedeagus presents novel ventral features that make it unmistakeable. The deeply sulcate penultimate male ventrite is fairly distinctive, and that combined with the lack of modifications elsewhere on the body will probably distinguish it sufficiently. The females of this species are also identifiable, with the bilobed pygidium and long, incurved, surrounding setae.

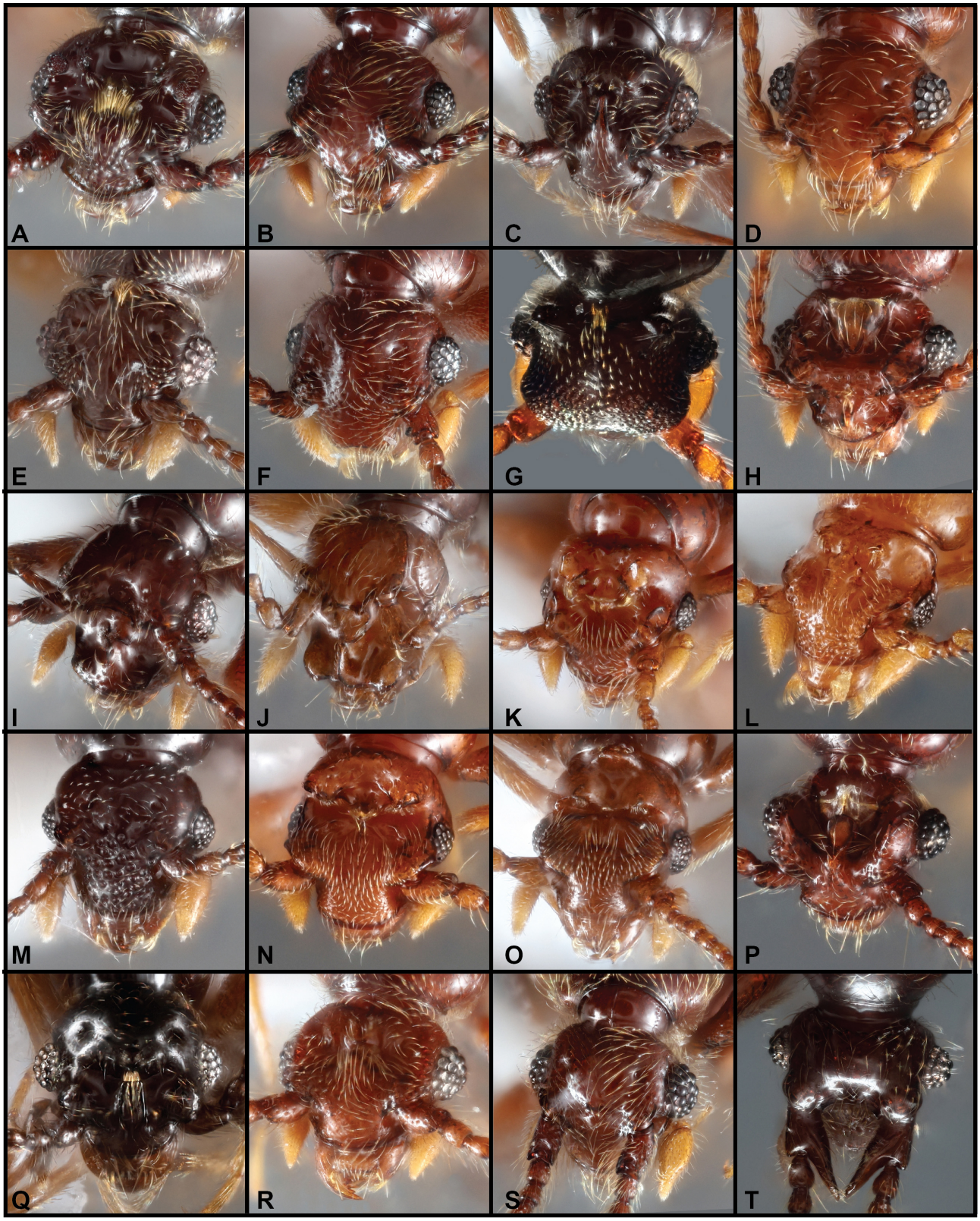

FIGURE 11. Frontal photos, male *Arthmius* spp. **A** *A. tungurahua* **B** *A. pachamama* **C** *A. francoi* **D** *A. minor* **E** *A. dolens* **F** *A. condor* **G** *A. montanus* **H** *A. papyrus* **I** *A. cuyabeno* **J** *A. orbis* **K** *A. aries* **L** *A. anzus* **M** *A. sumak* **N** *A. pazminoi* **O** *A. rex* **P** *A. intricatus* **Q** *A. insectus* **R** *A. tigrillo* **S** *A. discors* **T** *A. cervoides.*

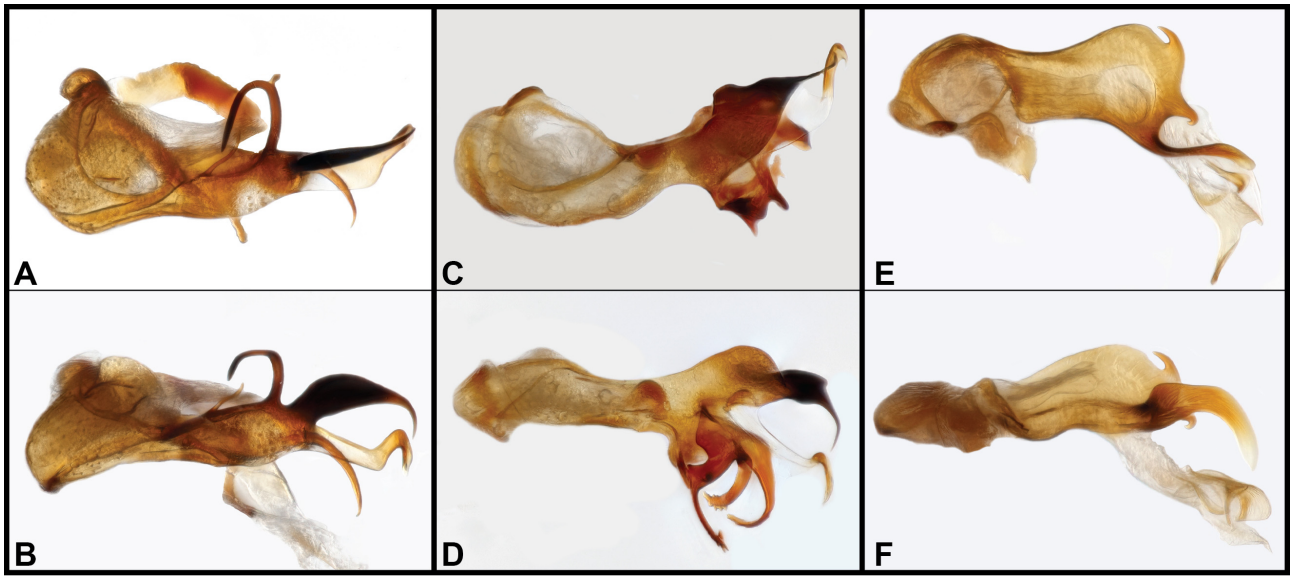

FIGURE 12. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. tungurahua* **C, D** *A. pachamama* **E, F** *A. francoi*.

Arthmius francoi **sp. nov.**
Figs 10G–I, 11C, 12E–F

Type material. Holotype ♂ (MECN-EN 39467): "Ecuador: Sta. Elena, Manglaralto, Barcelona, -1,8339573, -80,6449529, 262m, Hand collecting, 14-ago-2024. J. Franco" / "Caterino DNA voucher, Ext. MSC-13254, Morphosp. Bar.C.012"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Body large, orange, smooth, with sparse, subrecumbent setae, with few longer erect setae intermingled; male vertex (Figs 10I, 11C) with bidentate transverse ridge across middle half, depressed beneath, with median, backward-directed, thumb-like process extending up from frons to nearly meet it; eyes moderately large, coarsely faceted; antennae elongate, scape cylindrical, antennomere II almost as wide, subconical, III–VIII, especially V and VII longer than wide, subconical, IX–XI forming loose club, XI about 2.5× as long as X; pronotum widest in front, with weak oblique impressions from either side of neck to middle; lateral subbasal foveae shallowly impressed, a transverse subbasal sulcus straight between them; elytra widest toward posterior corners, each with three dorsobasal foveae; subhumeral fovea absent; 1st abdominal tergite near as long as others combined; male protrochanter with small apical tooth; male mesotrochanter setose (Fig. 10H); male penultimate ventrite large, nearly circular, depressed, basally weakly emarginate. Aedeagus (Fig. 12E, F) with basal bulb small, round, flat, broadly open above and below; tegmen dorsoventrally flat, right side higher than left, widened toward apex, main body then abruptly narrowed, with divergent, acute apical horns at either corner; left side of tegmen with long, thin, laterally compressed, sinuous subapical process, curving downward; beneath tegmen a large process extends distad, membraneous basally, with small, slightly sclerotized apical plates.

Etymology. The species is named in appreciation of the contributions of Mr. Josué Franco to this study, having collected and provided many useful specimens, including the type of this one.

Distribution. This species is known from the seasonal coastal forests of Santa Elena Province, about 100km NW of Guayaquil.

Remarks. The male frontal complex, with a bidentate ridge across the vertex and a short thumb-like process on the frons is unique to this species.

***Arthmius* Group 2d:**

Arthmius minor **sp. nov.**
Figs 11D, 13A–C, 14A–B

Type material. Holotype ♂ (MECN-EN 40969): "ECUADOR: Cotopaxi, -0.4192˚, -79.0031˚, Bosque Integral Otonga, 13.VIII.2024, 1966m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12856, Morphosp. Ot.A.021"; deposited in MECN. **Paratypes** (1♂,4♀), same date and general locality as type, but 1: -0.4167, -79.0047, 2102m, 2: -0.4157, -79.0046, 2132m, and 2: -0.4169, -79.0042, 2086m (MECN-EN 40970–40974). **Other material:** 1♂: -0.4167, -79.0047, 2102m (MECN-EN-42045).

Diagnosis. (TL: 1.7mm) This species appears very similar to *A. turgidus* (group 2A), differing primarily in the following characters: body smaller, lighter in color (Fig. 13A); setae, particularly of the head less dense, finer, and more recumbent; male epistoma (Fig. 11D) barely swollen, with very short lateral notches; male protibia slender to slightly bent tip; male protarsi only very weakly swollen; male protrochanters with small tooth; male mesotrochanter with conspicuous, narrow tooth at base; male mesotibia (Fig. 13B) with strong, curved apical spur (appearing to articulate with the mesotrochanteral tooth); male penultimate ventrite simply depressed at middle. Aedeagus (Fig. 14A, B) with broad, low, dorsally and

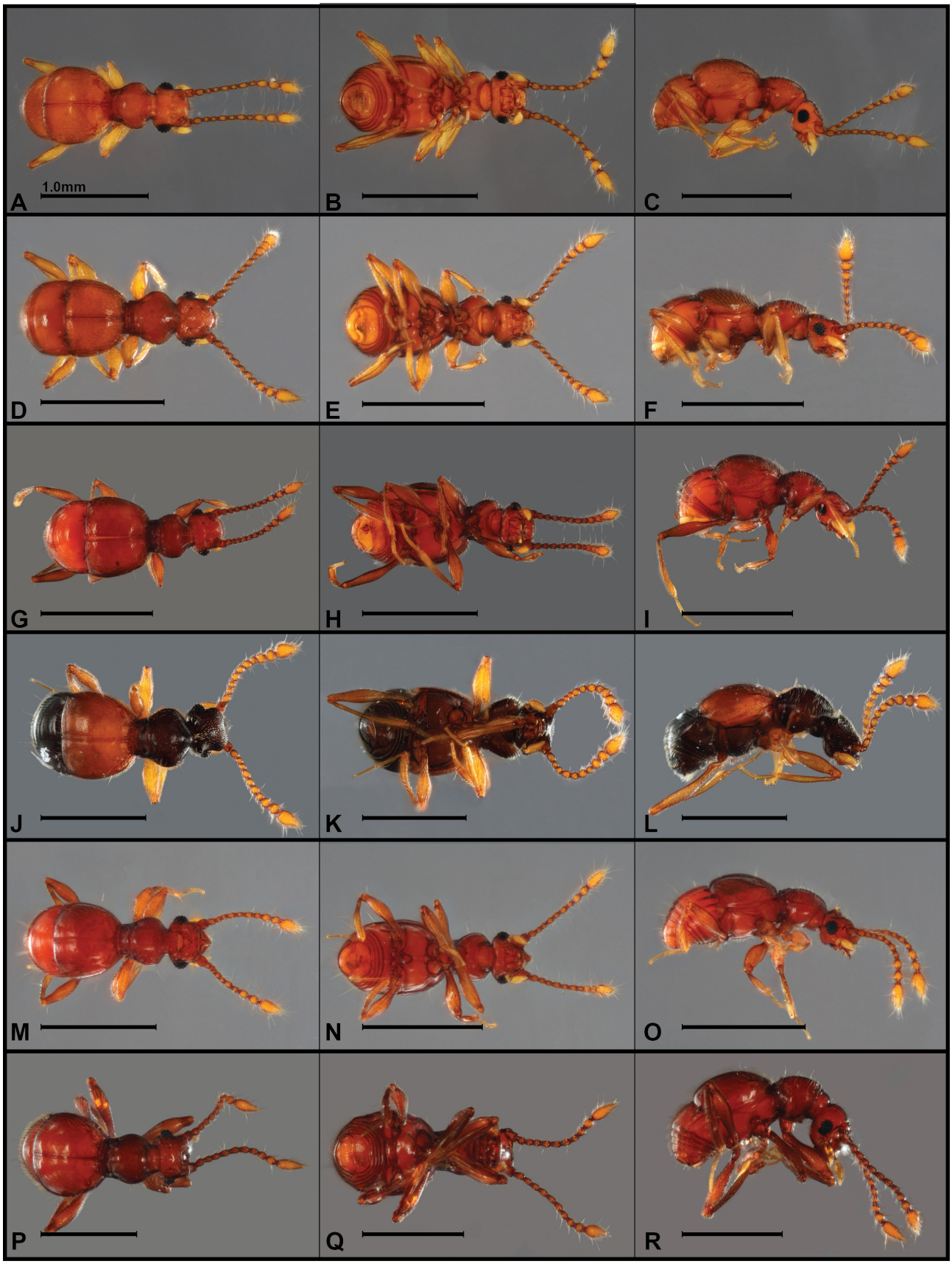

FIGURE 13. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. minor* **D–F** *A. dolens* **G–I** *A. condor* **J–L** *A. montanus* **M–O** *A. papyrus* **P–R** *A. cuyabeno.* Scale bars = 1.0mm.

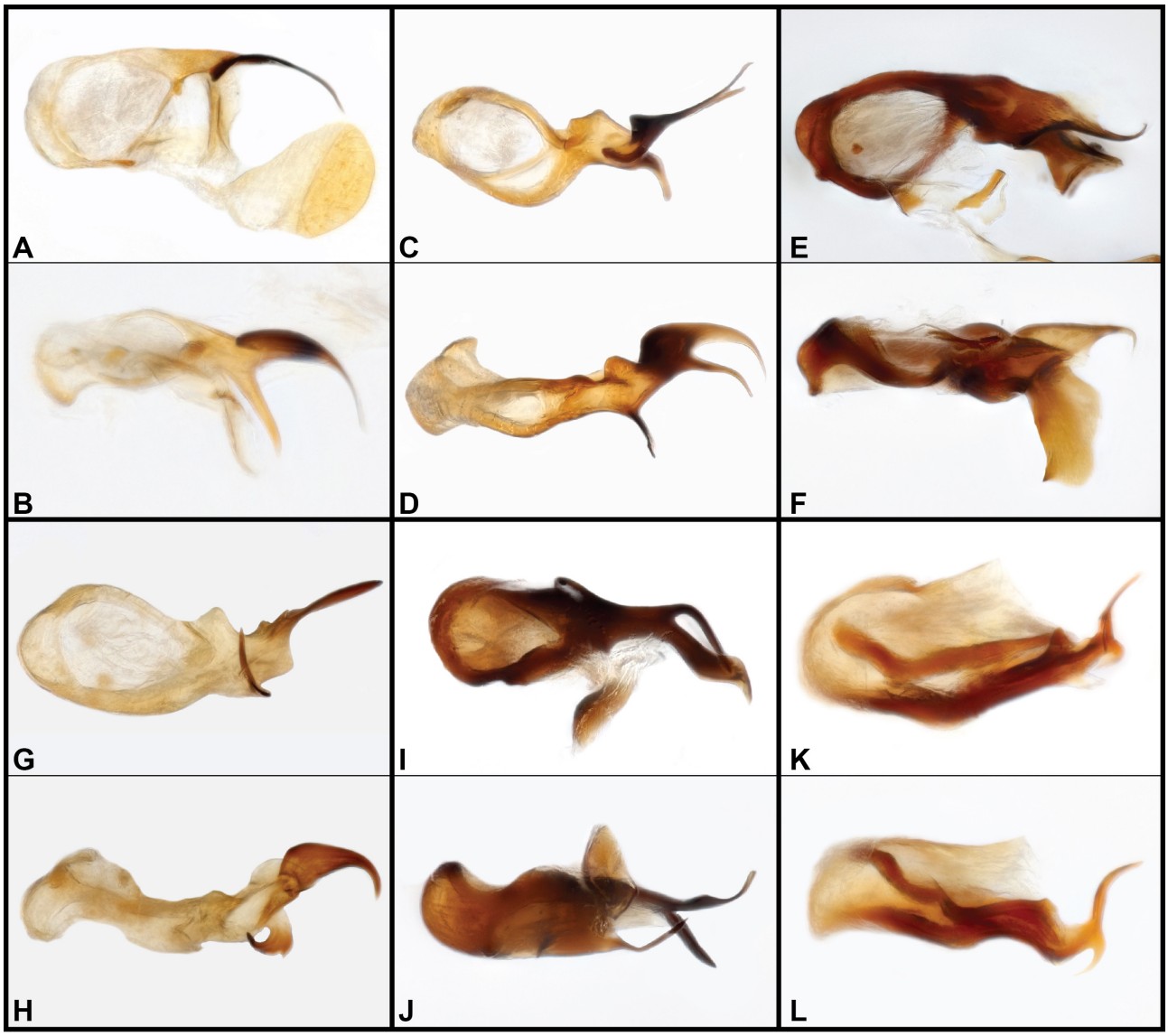

FIGURE 14. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. minor* **C, D** *A. dolens* **E, F** *A. condor* **G, H** *A. montanus* **I, J** *A. papyrus* **K, L** *A. cuyabeno*.

ventrally open basal bulb; tegmen extending from right side with long, strongly sclerotized curved dorsal style and apicoventrally directed, weakly curved, subacute, ventral process.

Etymology. This species' name refers to the fact that I had considered them merely small individuals of *A. turgidus* in initial sorting.

Distribution. This species is known only from the higher elevations of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is partly sympatric *Arthmius turgidus*, with similar, but much more subtle secondary modifications of the male head. However, the body size of the two is quite different, with this species smaller, and males of *A. turgidus* have the epistoma much more conspicuously swollen, with more conspicuous modifications of the male protibia and protarsus as well. The aedeagi of the two are quite distinct, with the ventral process (Fig. 7N) in *A. turgidus* broader and non-acute.

Arthmius dolens **sp. nov.**
Figs 11E, 13D–F, 14C–D

Type material. Holotype ♂ (MECN-EN 40843): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13196, Morphosp. Cnd.012"; deposited in MECN.

Diagnosis. (TL: 1.7mm) Body small, orange, impunctate, rather sparsely setose (Fig. 13D), short recumbent hairs interspersed with longer, erect, recurved setae; head quadrate; male vertex (Fig. 11E) swollen along midline, with mediobasal tuft of setae; eyes large, protuberant; anterior corners of frons punctate, more densely setose, elevated above antennal bases; clypeus setose; antennae not too elongate, scape thick, cylindrical, less than twice as long as wide, antennomere II elongate ovoid, III–VII narrow at base, slightly longer than wide, V and VII larger than IV or VI, VIII short, transverse,

IX–XI forming loose club, IX and X weakly transverse, XI almost 3× as long as X, apex slightly acuminate; pronotum widest near front, sides rounded, narrowed to neck and base; basolateral foveae shallow, connected by arcuate, transverse sulcus; pronotal base with weak series of shallow impressions; elytra convex, rather short, with sides rounded, each with three distinct dorsobasal foveae; flight wings absent; male mesotibia with oblique, acute apical spur at inner corner; penultimate male ventrite transversely depressed, punctate, setose. Aedeagus (Fig. 14C, D) simple, with basal bulb low, slightly bulbous basally, broadly open dorsally and ventrally, slightly raised along dorsal base; tegmen extending from apex of basal bulb, with blunt dorsal tooth at base elevated strongly bifid, sclerotized dorsal hooks; ventrally, a blunt, sclerotized proces curves strongly leftward.

Etymology. This species name, meaning 'painful,' records the knee injury suffered by the author during its collection.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. External characters that may help to recognize this species include the small body size, relatively short antennae and the punctate and setose penultimate male abdominal ventrite. The deeply bifid tegmenal process is unusual. It may be suggested that the typically weakly sclerotized median apical process has become sclerotized and incorporated into the dorsal hook of this species.

Arthmius condor **sp. nov.**
Figs 11F, 13G–I, 14E–F

Type material. Holotype ♂ (QCAZ-I-280259): "ECUADOR: Azuay, -3.2132˚, -79.0376˚, Siña, 3328m, 17JUN2017, S. Muñoz, A. Romero,Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13033, Morphosp. Siña4"; deposited in QCAZ. **Other material:** 5 specimens (in QCAZ), including one dissected male, were seen from Cajanuma, Loja Province that appear to be the same as this species.

Diagnosis. (TL: 1.7mm) Body uniformly orange (Fig. 13G), sparsely recumbently setose, with few longer erect setae; head subquadrate, vertexal foveae impressed; male frons unmodified; eyes prominent; antennae rather compact, antennomeres II–VIII subquadrate, V and VII very slightly larger; IX–XI forming loose club; pronotum with arcuate subbasal sulcus connecting shallow lateral foveae; elytra broadly rounded, each with three dorsobasal foveae; 1st abdominal segment with two lateral carinae, others with one; male protrochanter dentate and male profemur with small tooth near base of inner margin (Fig. 13I); venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 14E, F) with low basal bulb broadly open ventrally and dorsally; tegmen with broad, weakly sclerotized lobe expanded obliquely leftward to broadly truncate apex, a more strongly sclerotized apical tooth at its lateralmost corner; more strongly sclerotized, laterally compressed, bladelike process arising from its base, strongly narrowed and hooked in apical third.

Etymology. This species is named for a more famous flying denizen of the high Andean peaks.

Distribution. This species is known from páramo vegetation at two highlands localities in southern Ecuador, one just south of Cuenca, another about 100km further south, close to Loja.

Remarks. This species is distinguished by the subtle teeth on the male protrochanter and profemur. The male genitalia of specimens from the two known localities are extremely similar, and without longer series from each, conceivably within the range of interindividual variation. Specimens from both localities appear fully winged, so may cover much of the region where suitable (higher elevation) habitat occurs.

Arthmius montanus **sp. nov.**
Figs 11G, 13J–L, 14G–H

Type material. Holotype ♂ (QCAZ-I-280258): "ECUADOR: Cotopaxi, -0.6184˚, -78.4755˚, P.N.Cotopaxi, 3951m, 21JUN2016, S. Muñoz & S. Myers, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13028, Morphosp. Cotopaxi1"; deposited in QCAZ.

Diagnosis. (TL: 2.0mm) Body bicolored (Fig. 13J), with dark head, pronotum and abdomen with lighter elytra, legs and antennae, very sparsely setose, with short recumbent setae interspersed with few, longer erect setae; head broadly subquadrate; male vertex (Fig. 11G) drawing to elevated, setose posterior marginal corners, a distinct cluster of setae also at middle of of posterior vertexal margin; frons densely setose and rather coarsely punctate, especially anteriorly; eyes protuberant and coarsely faceted; antennae rather compact, antennomeres II, V, and VII distinctly bulbous, III–IV, VI, and VIII smaller, beadlike, IX–XI forming loose club, but IX and X not much larger than VII; pronotum widest anterad, strongly narrowed to base, basolateral foveae small, connected by finely impressed transverse sulcus; elytra strongly rounded, each with three very small basal foveae; 1st abdominal segment with two lateral carinae, others with one; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 14 G, H) with low basal bulb broadly open ventrally and dorsally; tegmen with strongly hooked basal process, arising from right side, curving under main process; main tegmenal process a longer, laterally compressed blade extending slightly dorsad, with curved apical hook.

Etymology. This species is named in recognition of its higher elevation habits than typical for *Arthmius* species (though it is not entirely alone in this).

Distribution. This species is known only from páramo vegetation on the upper slopes of Mt. Cotopaxi, Ecuador.

Remarks. This species is distinguished by its unique, posterolaterally acute vertex and densely punctate/setose frons.

Arthmius papyrus **sp. nov.**
Figs 11H, 13M–O, 14I–J

Type material. Holotype ♂ (MECN-EN 42052): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13347, Morphosp. PS.B.012"; deposited in MECN. **Paratypes** (10♂, 16♀): same data as type (MECN-EN 42011–42019 & MECN-EN 42021–42037).

Diagnosis. (TL: 1.7mm) Body (Fig. 13M) reddish orange, impunctate, with very sparse, long, suberect setae, with longer, fully erect setae interspersed; sides of head with strong longitudinal ridge over each eye; male vertex (Fig. 11H) with elevated triangular process, rising to the occiput, excavate beneath with thin lamina projecting over, anterior surface of elevation with smooth, elongate-oval plateau, head broadly depressed in a U-shape around elevation; epistoma with strong, setose, dorsally acute tooth; male left mandible with acute, subapical external tooth; eyes large, hemispherical, coarsely faceted; antennae elongate, scape short and cylindrical, antennomere II narrower, shorter, barrel-shaped; III–IV, VI, and VIII weakly conical, slightly longer than wide, V and VII longer, bearing elongate setae, IX–XI forming elongate, loose club; pronotum widest in anterior half, evenly rounded across front, strongly narrowed to base; lateral foveae well-impressed, connected by arcuate subbasal sulcus; elytra convex, sides rounded, each with sutural and two lateral basal foveae; 1st abdominal tergite about 4× as long as 2nd or 3rd, with short basolateral carinae; male mesotrochanter (Fig. 13N) with strong tooth, mesotibia with weakly modifed spur; male penultimate ventrite shallowly depressed, venter otherwise lacking secondary sexual modifications. Aedeagus (Fig. 14I, J) narrowly elongate, with basal bulb low, broadly open above and below, with dorsobasal ridge elevated; distal process flat, narrowing almost evenly from apex of basal bulb, with small basal tubercle on right side, sinuate, subdivided near middle, with thin and descending right-side rod below wider, sinuate lobe that bends upward at apex.

Etymology. This species is named for the translucent appearance of the thin, laminate plate that arises from the male vertex. It is used as a noun in apposition.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. The male head morphology of this species, with a broad, arcuate depression around an almost triangular vertexal process (Fig. 11H) is unique, and the external tooth of the male mandible has not been noticed in any other *Arthmius* species.

Arthmius cuyabeno **sp. nov.**
DNA barcode: GenBank PX930226
Figs 11I, 13P–R, 14K–L

Type material. Holotype ♂ (MECN-EN 40752): "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13097, Morphosp. Cu.014"; deposited in MECN. **Paratypes** (6♀): same data as type (MECN-EN 40451, 40467, 40483, 40486, 40489, 40508).

Diagnosis. (TL: 2.0mm) Body (Fig. 13P) dark orange, with sparse subrecumbent setae, denser and shorter on abdomen; head subquadrate; vertexal foveae small, widely separated near posterior margin, vertex convex; eyes prominent, hemispherical, diameter almost 2× postocular genal length, coarsely faceted; male frons (Fig. 11I) deeply depressed at middle, weakly carinate between antennal bases, with small tubercle at anterior epistomal margin; antennae inserted beneath frontal shelf, elongate, antennomere I curving anterad, III–VIII weakly conical, longer than wide, IX–XI forming indistinct club, antennomere XI 2.5× length of X; pronotum widest anteriorly, sides rounded, disk impunctate; basolateral foveae well impressed, connected by arcuate basal sulcus; elytra with sides rounded, with three basal foveae; 1st visible abdominal tergite as long as next three together; metaventrite (of both sexes; Fig. 13Q) with oblique carinae; male last sternite depressed and finely punctate, setose in discrete medioventral patch. Aedeagus (Fig. 14K, L) with basal bulb low, broadly open dorsally and ventrally; tegmen extended as common thick base, sinuate and dividing into two sclerotized distal processes, a thin, dorsal, inverted 'L'-shaped hook, and a slightly thinner, more strongly bent ventral hook.

Etymology. The name of this species recognizes the Cuyabeno Wildlife Reserve where it was found.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. The setose, oblique metaventral ridges (Fig. 13Q) possessed by both sexes of this species are unusual; in combination with the deep frontal depression that does not extend dorsad onto vertex, these will diagnose this species.

***Arthmius* Group 3**

Arthmius orbis **sp. nov.**
DNA barcode: GenBank PX930232
Figs 11J, 15A–C, 16A–B

Type material. Holotype ♂ (MECN-EN 40760): "ECUADOR: Sucumbíos, -0.2077˚, -75.9272˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 2.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13105, Morphosp. Cu.022"; deposited in MECN.

Diagnosis. (TL: 1.3mm) Body (Fig. 15A) globose, largely impunctate and glabrous, with sparse, long, semirecumbent setae; male head (Fig. 11J) with arcuate carina extending from outer corner of each antennal base dorsad to posterior margin of vertex, vertex shallowly depressed within; vertexal foveae shallow, widely separated, near upper edge of depression; frons with

prominent median carina below and between antennal bases; epistoma with round lobes on either side and longer, acute, median tooth immediately above small, rounded labrum; eyes small, only about 4 ommatidia, situated behind postantennal depression; antennae moderately elongate, antennomere I short, cylindrical, II globose, about two-thirds length of I, III–VII subconical, longer than wide, III, V, and VII slightly longer than IV, VI, and VIII; IX–XI forming indistinct loose club; pronotum convex, smooth, widest well anterad middle, with only very weak lateral foveae; transverse basal sulcus; elytra convex, basal foveae weak; basal marginal carina absent; subhumeral foveae absent; 1st visible abdominal segment elongate, longer than all others combined, somewhat globose, lacking lateral marginal carinae; male legs unmodified; metaventrite with longitudinal carinae extending from mesocoxae nearly to metacoxae; last male abdominal ventrite depressed. Aedeagus (Fig. 16A, B) rather flat, broad, elongate, with wide basal bulb broadly open above, deeply concave and open and below, lacking diaphragmatic sclerite; tegmen extending as broad flat lobe from upper edge of basal bulb, apparently split into left-side flange, curving inward toward apex, with broader flat lobe extending to obliqely subtruncate apex; weakly articulated lateromedian rod curving out from basal bulb along left tegmenal flange, ending free.

Etymology. This species' name refers to its disk-like depression on the male head.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is the most straightforwardly *Arthmius*-like in this group, with long antennae, slightly enlarged antennomeres V and VII that have longer setae (like the club), and a fairly distinct transverse basal pronotal sulcus. It is also distinctly setose (while the species below are mostly glabrous), has small but distinct basal elytral foveae, and a readily homologizable aedeagus. The modifications of the male head are unusual, with a large arched carina surrounding most of the vertexal and frontal area. The small eyes with large, flat genal surface above them is unique among neotropical Batrisini.

Arthmius aries **sp. nov.**
Figs 11K, 15D–F, 16C–D

Type material. Holotype ♂ (MECN-EN 42050): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13345, Morphosp. PS.B.010"; deposited in MECN. **Paratypes** (2♂, 2♀): same data as type (MECN-EN 41099–42002).

Diagnosis. (TL: 1.3mm) Body (Fig. 15D) largely impunctate and glabrous, with only very indistinct, short appressed setae; male vertex (Fig 11K) elevated, with pair of wide, apically subacute and setose projections, separated by about the width of one of them; frons below deeply and transversely depressed, with low, setose median tubercle; eyes moderately convex; antennae fairly short, antennomere I short, cylindrical, II elongate oval, III short, conical, IV–VIII subquadrate, weakly transverse, IX–XI gradually enlarged, IX and X transverse, each wider apically, XI about 5× as long as X, apex narrowly rounded; pronotum convex, smooth widest in apical half, sides rounded, posterior margin weakly reflexed; lateral foveae shallowly impressed; transverse basal impression absent, elytra convex, dorsobasal and subhumeral foveae lacking; humeri slightly carinate; 1st visible abdominal tergite elongate, longer than all others combined, globose, lacking lateral marginal carinae; male legs unmodified; male metaventrite (Fig. 15E) with median setose shelf between postmesocoxal carinae; last male abdominal ventrite impressed at middle. Aedeagus (Fig. 16C, D) compact with basal bulb largely reduced to a basal ring, tapered at base, with couple short spines at base of median lobe; median lobe extending from right side of basal ring, broad and dorsoventrally flat, inner edge rounded, thin apical process abruptly bent leftward from distal edge of lobe.

Etymology. This species' name is based on the 'ram-like' vertexal processes.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species is fairly closely related to both *A. anzus* and moreso *A. pazminoi*, sharing with both of them the setose male metaventrite. The head modifications are particularly similar to those of *A. pazminoi*, but those in *A. aries* are more narrowly separated, and the frons/epistoma is less distinctly setose. *Arthmius anzus* has much more compact antennae than either of the others.

Arthmius anzus **sp. nov.**
Figs 11L, 15G–I, 16E–F

Type material. Holotype ♂ (MECN-EN 40784): "ECUADOR: Pastaza, -1.4267˚, -78.0439˚, Río Anzu Reserve, 1342m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13137, Morphosp. RAn.020"; deposited in MECN. **Paratypes** (3): 1♂, 1♀: same data as type (MECN-EN 40182, 40185); 1♂: "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12757, Morphosp. SK.A.018" (MECN-EN 40980).

Diagnosis. (TL: 1.3mm) Body (Fig. 15G) largely impunctate and glabrous, with only very indistinct, short appressed setae; male vertex (Fig. 11L) slightly elevated, with pair of short, acute, anteriorly projecting horns, frons below delimited laterally by oblique carinae, somewhat depressed between but with low longitudinal convex ridge; eyes weakly convex; antennae short, antennomere I short, cylindrical, II globular, III–IV and VI–VIII smaller, rounded, male antennomere V distinctly enlarged, especially on upper axis, antennomeres IX–XI gradually enlarged, IX and X transverse, XI much larger, apically subacute; pronotum convex, smooth; lateral foveae deeply impressed, interrupting lateral pronotal outline, transverse

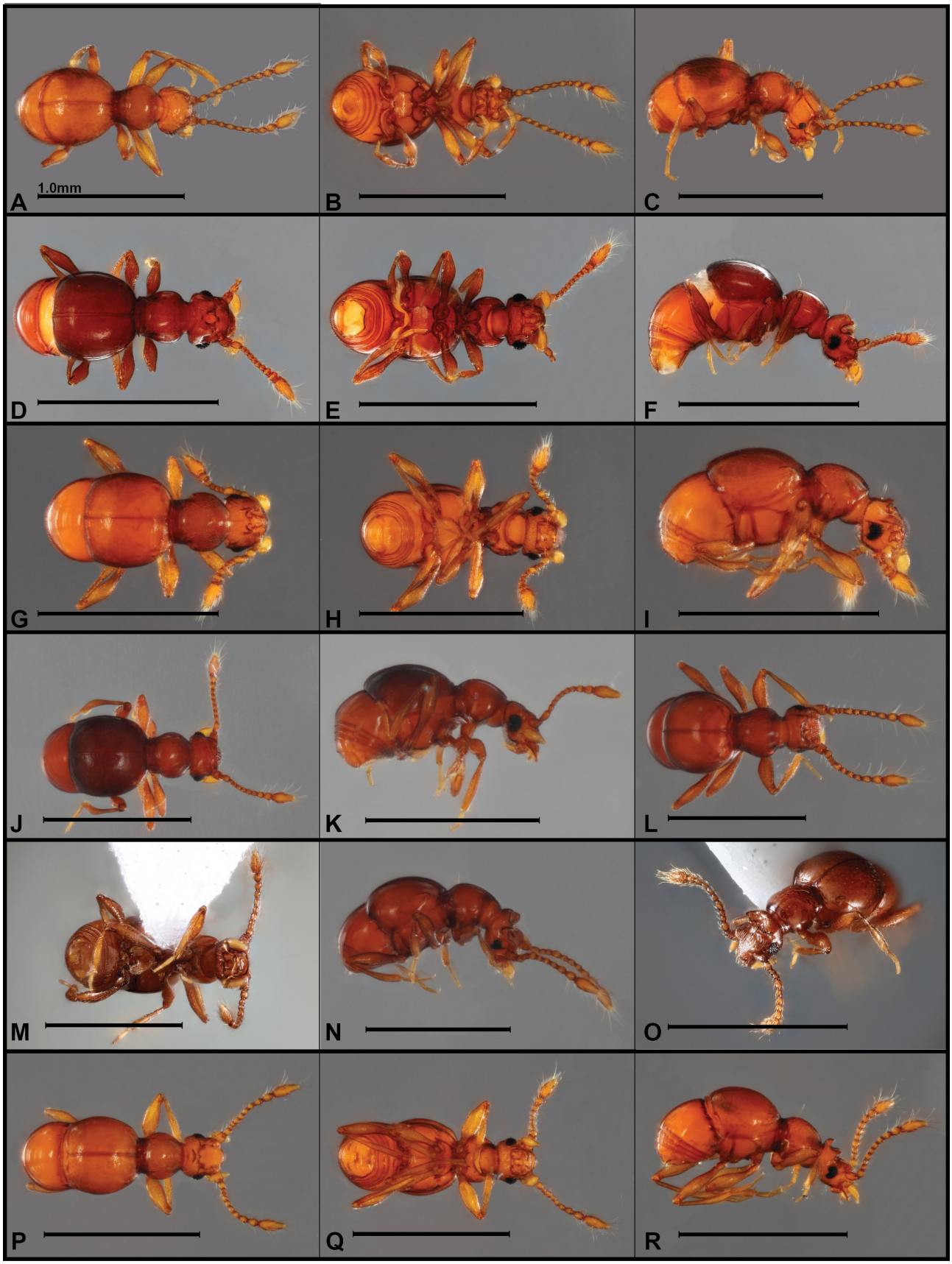

FIGURE 15. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral **A–C** *A. orbis* **D–F** *A. aries* **G–I** *A. anzus* **J, K** *A. sumak* (dorsal & lateral only) **L–O** *A. pazminoi* (dorsal, ventral, lateral, anterolateral) **P–R** *A. rex.* Scale bars = 1.0mm.

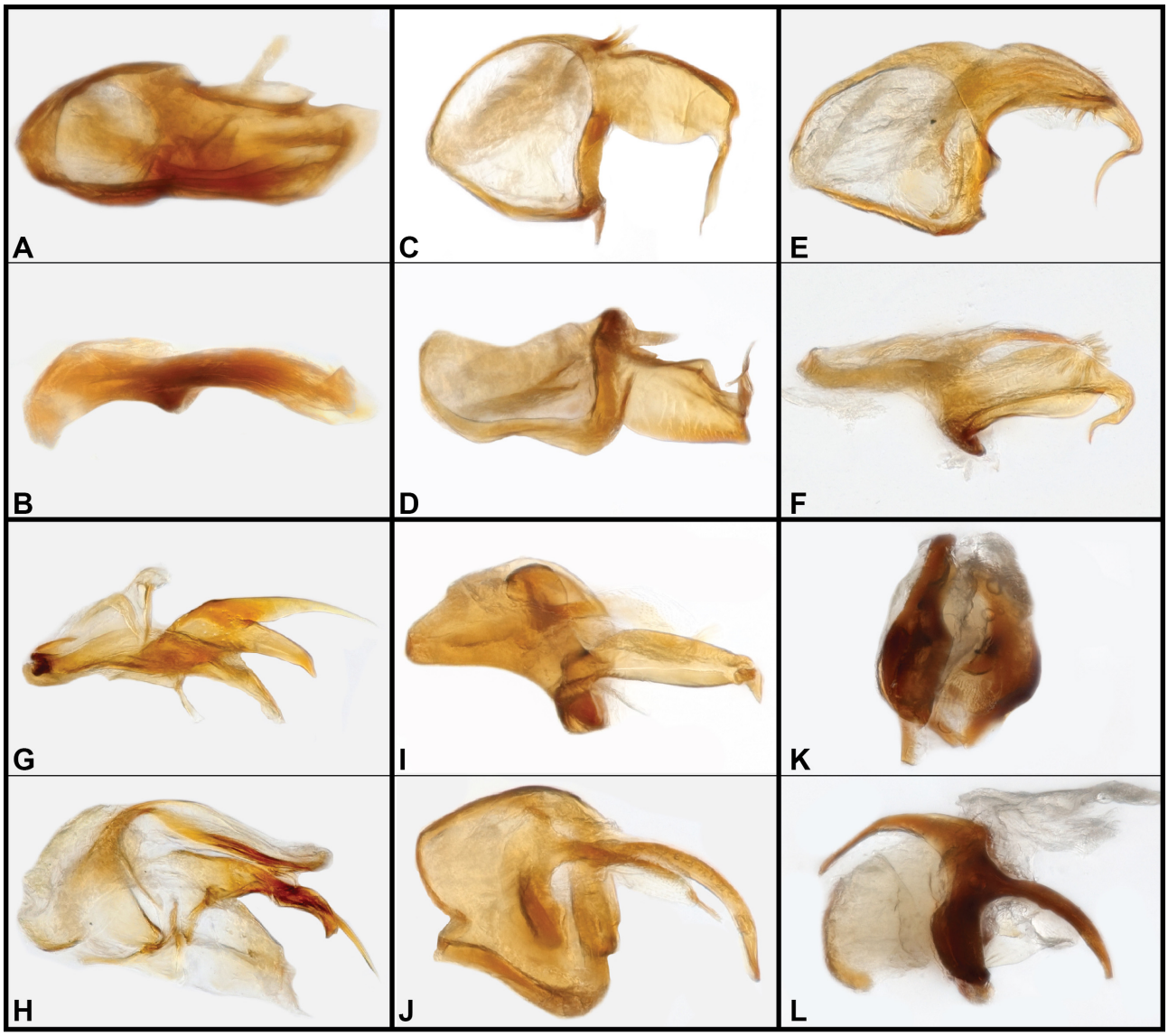

FIGURE 16. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. orbis* **C, D** *A. aries* **E, F** *A. anzus* **G, H** *A. sumak* **I, J** *A. pazminoi* **K, L** *A. rex*.

basal impression absent, elytra convex, dorsobasal and subhumeral foveae lacking, male legs unmodified; male metaventrite (Fig. 15H) with median setose shelf; 1st visible abdominal segment elongate, longer than all others combined, globose, lacking lateral marginal carinae; last male abdominal ventrite strongly impressed at middle. Aedeagus (Fig. 16E, F) compact with broadly open basal 'bulb', entire thing sort of cornucopia shaped, tapering distad; distal process on right side (behind major process in lateral view) shorter, rather thin, tapering then expanded apically into multispinose club; left-side process broader basally, tapering and tortously curving to downward pointing acute apex.

Etymology. The species name is a latinized adjective derived from the Río Anzu region where it was collected.

Distribution. This species is known from two localities along the Río Anzu watershed (Pastaza Province, Ecuador), both of them in a transition zone between Amazonian rain forest and lower elevation cloud forest.

Remarks. This species may be the most significant outlier in these barely-*Arthmius* species, mainly with respect to the very compact antennae, but also in light of the basally constricted pronotum. These differences seemed the strongest to potentially justify a new genus. On the other hand the aedeagus of this species bears significant resemblance to that of *A. aries,* suggesting that the external differences are autapomorphic. In both, the basal bulb is strongly reduced, broadly open on above and below, and the major process of the tegmen is a right-side based, strongly leftwardly bent acute process. This species has a distinct second process that is barely evident in *A. aries*. As to the homologies of these with any of the other species in this group, they are too different to be able to say with any confidence. In any case, this species is very easy to recognize by its short antennae and frontal modifications.

Arthmius sumak **sp. nov.**
Figs 11M, 15J–K, 16G–H

Type material. Holotype ♂ (MECN-EN 40975)**: "**ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12749, Morphosp. SK.A.010"; deposited in MECN.

Diagnosis. (TL: 1.4mm) Body (Fig. 15J) largely impunctate and glabrous, with only very indistinct, short appressed setae; male vertex (Fig. 11M) unmodified; (male?) frons with rather dense field of short setae; eyes convex; antennae rather short, antennomere I short, cylindrical, II narrower, slightly elongate, III–VIII smaller, rounded, very slightly longer than wide, IX–XI gradually enlarged to form an indistinct, loose club, XI considerably wider and about 3× as long as X; pronotum convex, smooth, sides broadly rounded, lateral foveae weakly impressed, lacking transverse basal impression; elytra convex, sides rounded, dorsobasal and subhumeral foveae lacking; male metaventrite concave and densely setose medially; 1st visible abdominal segment elongate, longer than other segments combined, globose, lacking lateral marginal carinae; last male abdominal ventrite deeply but discretely impressed at middle, densely setose. Aedeagus (Fig. 16G, H) laterally compressed, basal bulb indistinct; aedeagus mostly comprising two sclerotized distal processes, a dorsal one slightly less sclerotized, arched dorsad then distad, narrowing to weakly acute apex directed slightly toward left; inner more strongly sclerotized process strongly bifid, with two acute distal lobes, the lateral-most the longest.

Etymology. This species name means 'beautiful' in the native Kichwa of the region, and also acknowledges the Sumak Kawsay In Situ reserve where this species was found.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. Beyond the distinctive external features of the larger group, this species is not especially distinctive. This species shares with most of the others in this group the lack of basal elytral foveae. The lack of male frontal modifications, however, is atypical, and there are no evident antennal modifications either. The only distinctive secondary character is the setose male metaventrite (shared to varying degrees by other species in the group), so the overall suite of male characters in the species is distinctive. The male genitalia are less similar to other *Arthmius* species, appearing to be rotated 90°, with the remnants of basal bulb open on either side, rather than above and below (though what's dorsal and what's lateral is less than 100% clear). The strongly dentate apical process seems to be dissociated from the basal ring, and may correspond to exaggerated internal articulated processes rather than typical arthmioid distal tegmenal hooks.

Arthmius pazminoi **sp. nov.**
Figs 11N, 15L–O, 16I–J

Type material. Holotype ♂ (MECN-EN 40976): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12748, Morphosp. SK.A.009"; deposited in MECN. **Paratypes** (1♂, 2♀): same data as type (MECN-EN 40977–40979).

Diagnosis. (TL: 1.5mm) Body (Fig. 15L) largely impunctate and glabrous, with only very indistinct, short appressed setae; male head (Fig. 11N) with posterior edge of vertex elevated, somewhat cup-shaped, lateral arms of elevation weakly serrate; base of elevation with small tubercle with fringe of horizontally directed setae; frons simply and weakly convex, with appressed setae; eyes weakly convex, rather small, moderately coarsely faceted; antennae somewhat elongate, antennomere I short, cylindrical, II–IV globose, V slightly enlarged with shallow concave depression on anterior surface, VI–VIII slightly elongate, gradually enlarging toward weakly three-segmented club; pronotum convex, smooth, with only very weak lateral foveae, transverse impression absent, but pair of elongate setae present on either side of subbasal midline; elytra convex, basal foveae lacking, but weak, crenulate basal marginal carina present; subhumeral foveae absent; male legs unmodified; male metaventrite (Fig. 15M) with pair of slightly elevated densely setose patches in front of metacoxae; base of abdomen slightly constricted; 1st visible abdominal segment elongate, longer than all others combined, somewhat globose, lacking lateral marginal carinae; last male abdominal ventrite strongly impressed, elevated margins somewhat carinate, apical margin deeply emarginate to receive narrow 'tab' of last tergite/pygidium. Aedeagus (Fig 16I, J) very short, compact, comprising broadly basally open 'bulb', bearing two distal processes, each with sclerotized vertical basal portion embedded in apical surface of more weakly sclerotized portion of basal bulb; shorter, inner process bent more or less distad, bearing moderately long fringe at its apex; longer upper process extending distad then curving ventrad, ending in subacute point.

Etymology. This species is named in recognition of the collaboration, friendship, and support of Mr. Alex Pazmiño-Palomino, an entomologist formerly with INABIO who helped the author in the field and in the lab throughout a productive year, and whose extensive, mostly ant-focused collections turned up many of the species described in this paper.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. This species and the following (*A. rex*) are a similar pair, at least in external characters. Aside from the glabrous body, unmargined abdomen, and lack of basal pronotal sulcus that all the species in this group share, and the lack of basal elytral foveae of the last four, these two share a distinctively notched last male ventrite (Fig. 15M), into which a distinct tab of the last tergite inserts.

They both also have prominent vertexal modifications in the males, as well as an enlarged 5th antennomere. The specific shape of the posterior-most elevation of the vertex of the male differs significantly between the two, with that of *A. pazminoi* more transverse and slightly bilobed, while that in *A. rex* has a median peak. This species has two distinct setal elevations on the male metaventrite, while the following has nothing comparable. The male genitalia are so different between these two, however, as to cast some doubt on the significance of this list of other similarities. *Arthmius pazminoi* retains a recognizable basal bulb (more substantial than that of most *Arthmius*, in fact), broadly open on one surface, with a pair of simply curving distal processes. It bears some similarities to the aedeagus of *Syrbatus* (as might be said of *A. sumak*, as well). In *A. rex*, on the other hand, the basal bulb hardly exists as such, the surrounding rings having become more strongly sclerotized but detached along the basal margin, with much of the intervening surface apparently lost. More detailed study and hopefully intermediate genitalic forms will be needed to shed light on these potential relationships.

Arthmius rex **sp. nov.**
DNA barcode: GenBank PX930233
Figs 11O, 15P–R, 16K–L

Type material. Holotype ♂ (MECN-EN 40761): "ECUADOR: Sucumbíos, -0.2077˚, -75.9272˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 2.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13106, Morphosp. Cu.023" / "MECN-EN 40761"; deposited in MECN. **Paratypes** (5♀): same data as type (MECN-EN 40504–40505, 40507, 40509, 40511).

Diagnosis. (TL: 1.4mm) Body (Fig. 15P) globose, antlike, smooth, largely glabrous, with only very fine inconspicuous setae; male vertex (Fig. 11O) with strong dorsomedial process flanked by pair of anteriorly directed horns, head strongly depressed between and anterad, epistoma setose; eyes convex, posteriorly emarginate, each comprising about 30 ommatidia; antennae moderately elongate, antennomere I cylindrical, about 2× as long as globose antennomere II, II–IV short, slightly transverse, male antennomere V slightly enlarged, angulate medially, VI–VIII conical, slightly longer than wide, IX–XI forming indistinct club, XI about 3× as long as X; pronotum with sides rounded, widest near middle, narrowed to front, constricted behind; basolateral foveae inconspicuous, transverse sulcus absent, though posterior portion of disk depressed, with pair of erect setae at anterior edge of depression; elytra strongly convex with sides rounded, dorsobasal foveae absent; base of abdomen slightly constricted; 1st visible segment longer than others combined; anterior male ventrites shallowly depressed at middle, last male ventrite (Fig. 15Q) deeply depressed, deeply emarginate apically to receive apex of last tergite; legs and venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 16K, L) with basal bulb large but largely membraneous, with just a thin basal ring connected by membrane to more strongly sclerotized tegmen; tegmen with continuous basal bridge separated dorsally into two halves, each comprising thinner basal ridge and broader apical plate, apical plate or left half dominant, forming curving, narrowly but bluntly rounded distal lobe, apical plate of right half with inner process continued by multidenticulate sac-like apical extension, broadening into ventral lobe; extrusible inner sac evident, but ill-defined and difficult to resolve.

Etymology. This species' name refers to the king-like crown on the male's head.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. Most of the significant comments with regard to recognizing this species, and with respect to its unusual characters, are included in the preceding species' 'remarks' sections. The modifications of the head are sufficient for recognition, and more work is needed to interpret the radical modifications of the aedeagus among this group of Batrisini.

***Arthmius* Group 4**

Arthmius intricatus **sp. nov.**
Figs 11P, 17A–C, 18A–B

Type material. Holotype ♂ (MECN-EN 40938)**:** **"**ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12746, Morphosp. SK.A.007"; deposited in MECN. **Paratypes** (10): (4♂, 5♀): same data as type (MECN-EN 40929–40937); 1♂**:** "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" (MECN-EN 42051).

Diagnosis. (TL: 1.8mm) Body (Fig. 17A) largely impunctate, with uniform, short appressed setae and sparser, longer erect setae on most dorsal surfaces; male head (Fig. 11P) with complex sulciform depressions, posteriormost depression with thin, laminate anterior border; anterad this lamina is a median, subtriangular, dorsally flat tubercle in the middle of a deep, curved sulcus from one posterior corner of head to the other; sides of vertex anterad this sulcus strongly and vertically elevated above eyes; frons with setose, round-topped median tubercle immediately anterad flat-topped one; eyes prominent, hemispherical, coarsely faceted; antennae moderately elongate with antennomere V slightly longer than IV or VI, VII slightly longer than VI or VIII, antennomeres IX–XI forming slightly enlarged loose club; pronotum subcordate, widest in front of middle, rounded anterad and tapered posteriorly; lateral foveae present, bare, connected by shallow transverse slightly crenulate impression; elytra convex; each elytron with sutural and two lateral basal foveae; subhumeral fovea absent; 1st abdominal segment strongly carinate laterally (Fig. 17C), laterotergite rather wide, delimited medially by distinct

but weaker carina; subsequent abdominal segments with weak lateral carinae but otherwise rounded; last abdominal ventrite weakly and simply depressed; legs rather short, femora slightly clavate, meso- and metatibia slightly curved; male venter and legs with few secondary modifications, male mesotrochanter (Fig. 17B) weakly dentate with tuft of apical setae; male mesotibia with enlarged apical spur. Aedeagus (Fig. 18A, B) with short, separate basal collar, articulated dorsally and ventrally with expanded tegmen; tegmen arched dorsad, bearing four thin, terminally acute distal styles, three of these very long and incurved to across main axis of aedeagus, the fourth shorter and extending more or less straight distad.

Etymology. This species' name refers to its remarkably complex aedeagus.

Distribution. This species is known only from the Centro de Investigación Sumak Kawsay In Situ in the eastern foothills of the Andes in western Pastaza Province, Ecuador.

Remarks. This species is distinguishable by its 'intricate' vertexal sculpture, with lateral and median ridges with bilateral setose depressions (Fig. 11P). Apart from these characters, the general morphology doesn't depart radically from that of other *Arthmius* species, so its membership in the genus is not in question, only its relationships within.

Arthmius insectus **sp. nov.**
Figs 11Q, 17D–F, 18C–D

Type material. Holotype ♂ (ZSFQ-i23368): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12637, Morphosp. ElP.A.036"; deposited in ZSFQ.

Diagnosis. (TL: 2.1mm) Body (Fig. 17D) rather slender, elongate, light (legs, antennae, elytra), to dark (abdomen, head, pronotum) brown, with sparse semirecumbent setae; male vertex (Fig. 11Q) with pair of distinct dorsal foveae, swollen above and between, transversely incised beneath between antennal bases, with narrow anterior shelf of dorsal swelling narrow, flat, with dense setal fringe reaching posterior edge of fissure; frons medially longitudinally carinate beneath transverse incision; eyes protuberant; antennae elongate, all antennomeres distinctly longer than wide, last three antennomeres forming very weak loose club; pronotum widest in front of middle, with strong, weakly arcuate transverse basal sulcus; elytra widened from base to near apex, humeri sloped, each with three small basal foveae; mesotrochanter with narrow spine near base; mesotibial spur (Fig. 17F) enlarged, but not sinuate; metatibia long, curved; metatarsi long. Aedeagus (Fig. 18C, D) strongly asymmetrical, with one sinuous, elongate lateral lobe tipped with abruptly inturned apical tooth.

Etymology. This species name means 'notched' referring to the distinctively notched frons, most evident in lateral view (Fig. 17F).

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. *Arthmius insectus* is a bit of an outlier in both genitalic and external morphology. Its body (pronotum especially) and antennae (Fig. 17D) are both more elongate than usual. And the strong tegmen with bidentate apical scoop is dissimilar from any others seen, although still identifiable without question as *Arthmius*.

Arthmius tigrillo **sp. nov.**
Figs 11R, 17G–I, 18E–F

Type material. Holotype ♂ (MECN-EN 42053): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13348, Morphosp. PS.B.013"; deposited in MECN. **Paratypes** (5♂): same data as type (MECN-EN 42040–42044).

Diagnosis. (TL: 1.8mm) Body (Fig. 17G) orange, smooth, with sparse, subrecumbent setae on elytra and abdomen, semierect setae on pronotum, longer, erect setae interspersed; head subquadrate, produced slightly above antennal insertions; vertexal foveae distinct, widely separated, in male (Fig. 11R) connected by transverse crease that interrupts a low median ridge, vertex slightly tuberculate above crease; eyes protuberant, large; antennae elongate, most intermediate antennomeres about twice as long as wide, V and VII almost 3× as long as wide, bearing elongate setae like antennomeres of club, IX–XI progressively larger, forming narrow, loose club; pronotum widest near front, sides rounded, constricted basally; lateral foveae shallow, with weakly arcuate transverse sulcus between them; elytra convex, sides rounded, each with sutural and two lateral basal foveae; 1st abdominal tergite about 3× as long as 2nd or 3rd, with short basolateral carinae; first four abdominal segments with complete lateral carinae; male mesotibia with strong apical spur; male penultimate ventrite shallowly depressed. Aedeagus (Fig. 18E, F) robust and strongly sclerotized; basal bulb low, basally convex, basal foramen rather small, dorsal diaphragm round; dorsal apex of basal bulb with distally directed thumb-like process on left side, a shorter, narrow one directed ventrad beneath it; main body of tegmen extending from right side of basal bulb, thick, with laminar ventral keel, apical half becoming abruptly laterally compressed, curving leftward, apex thin and rounded, with a thin, secondary apical process extending beneath it from apex of ventral keel.

Etymology. This species' name refers both to a small, spotted cat native to the region, as well as to a popular Ecuadorian breakfast combining green plantains and eggs.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species is rather unremarkable externally, though the transverse crease above a low median longitudinal frontal ridge is more or less unique. But the aedeagus is unusual. It fits the general structure

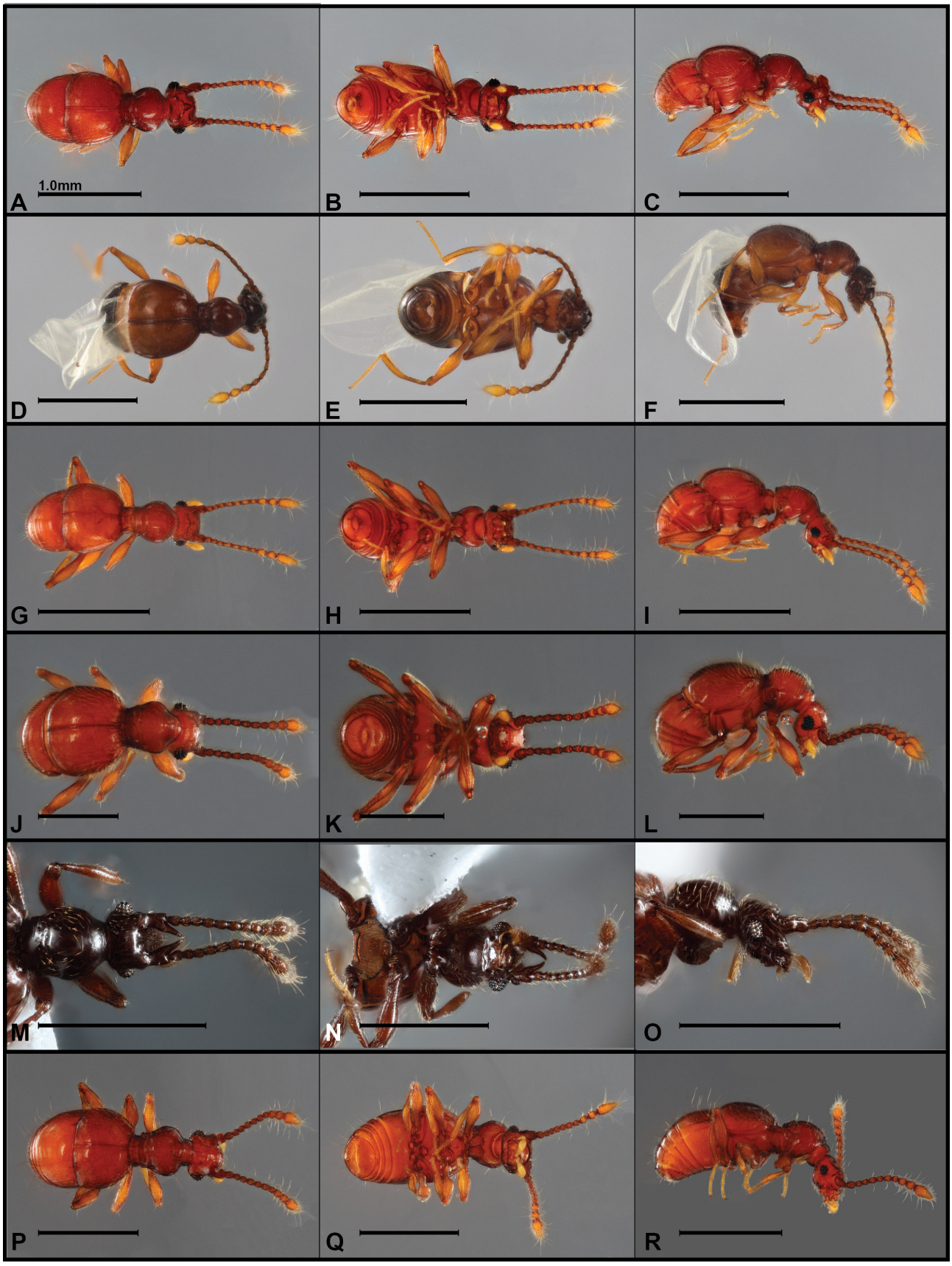

FIGURE 17. Habitus photos, *Arthmius* spp., dorsal, ventral, lateral views **A–C** *A. intricatus* **D–F** *A. insectus* **G–I** *A. tigrillo* **J–L** *A. discors* **M–O** *A. cervoides* **P–R** *A. amazonus.* Scale bars = 1.0mm.

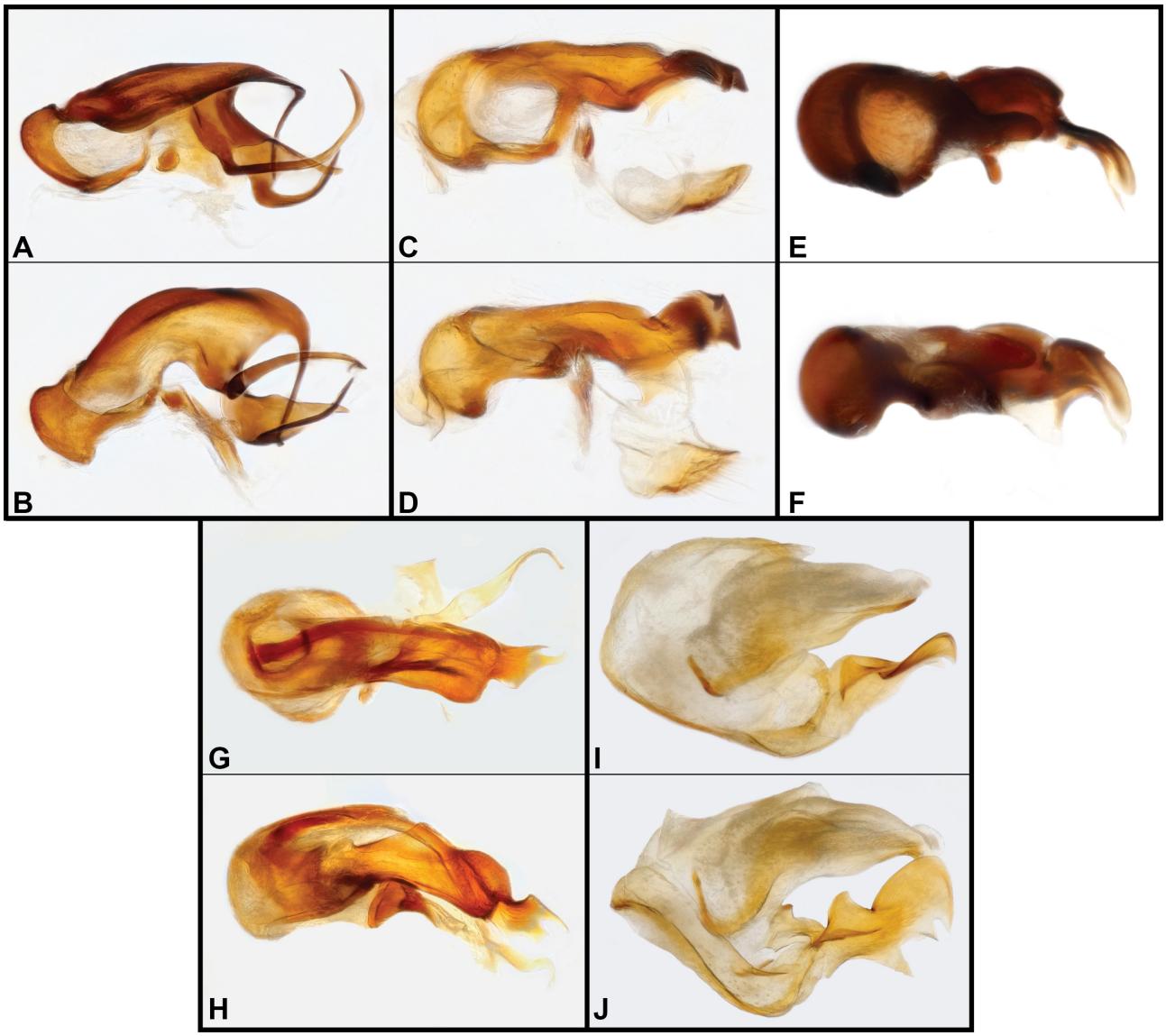

FIGURE 18. Aedeagus photos, *Arthmius* spp., dorsal, lateral views **A, B** *A. intricatus* **C, D** *A. insectus* **E, F** *A. tigrillo* **G, H** *A. discors* **I, J** *A. cervoides*.

for *Arthmius*, but is much more strongly sclerotized, with a more substantial basal bulb that one might be inclined to consider plesiomorphic.

Arthmius discors **sp. nov.**
Figs 11S, 17J–L, 18G–H

Type material. Holotype ♂ (MECN-EN 40766): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13111, Morphosp. RAn.002"; deposited in MECN.

Diagnosis. (TL: 2.5mm) Body (Fig 17J) orange, smooth, with fairly long suberect setae with longer, erect setae interspersed along sides of pronotum, elytra, and abdominal tergites; male head (Fig. 11S) simple, with small frontal tubercle; eyes large, protuberant, very coarsely faceted, with about 27 facets; antennae moderately elongate, antennomeres I & II cylindrical, III–VIII all slightly elongate, V and VII longer, bearing whorls of long setae (like club segments), IX–XI forming elongate, loose club; pronotum widened to front, sides rounded, base weakly constricted; lateral pronotal foveae weakly impressed, with shallowly 'V'-shaped sulcus between, weakly transversely carinate behind; elytra with sides rounded, each with weak basal carina and sutural plus two lateral basal foveae; abdomen with sides weakly margined; 1st tergite with short lateral longitudinal striae connected by basal arch; male last ventrite simply depressed, bearing short, stiff setae; male legs and venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 18G, H) unusual, with well developed basal bulb, open only ventrally, with broad dorsal plate lying over rod-like, elongate median process, the latter articulated within the basal bulb and exiting through small dorsal foramen; lower portion of tegmen with expansive median plate extending upward and over apex of dorsobasal rod,

with obliquely subquadrate pseudoapex, extending along lower distal margin into narrower, obliquely bidentate distal blade; separately, a lower (articulated?) right-side extension from basal bulb narrows into long, weakly sclerotized, sinuous hook, apparently able to chelate with apical teeth of median process.

Etymology. This species' name refers to this seeming discordance of external and genitalic morphology.

Distribution. This species is known only from lower part of the Río Pastaza Watershed, in the foothills of Pastaza Province, Ecuador.

Remarks. This species is also quite unremarkable externally, lacking conspicuous sexual dimorphisms. This, in conjunction with relatively elongate and erect dorsal setation may help distinguish it. However, its male genitalia are remarkable and unparalled among those described for the genus, with an elaborate basal bulb and an asymmetrical pair of apparently articulating distal processes, resembling in these respects some species of the closely related *Syrbatus.*

Arthmius cervoides **sp. nov.**
Figs 11T, 17M–O, 18I–J

Type material. Holotype ♂ (ZSFQ-i23369): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 7.vi.2011, flowerfall sifting, AT1348, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12727, Morphosp. TBS.A.030"; deposited in ZSFQ. **Paratype** (1♀): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" (ZSFQ- i23370).

Diagnosis. (TL: 2.4mm) Body dark reddish, smooth, sparsely setose; male vertex (Fig. 11T) deeply depressed between swollen antennal bases, with sinuate and laterally dentate carinae between them, slightly excavate beneath; epistoma prolonged, with broad setose tubercle near base, apical margin flattened, produced; male antennae (Fig. 17M) gradually enlarged toward apex, antennomere I thickened, strongly prolonged, acute on inner margin beyond apex of antennomere II; pronotum strongly convex, with weak antebasal carina complete between poorly developed lateral foveae; median fovea absent; elytra convex, each with sutural and two lateral foveae; profemur with small anterobasal tooth; trochanters unmodified; metaventrite (Fig. 17N) with circular, elevated, flattened plaques densely covered with spatulate setae on each side of weakly setose median area; abdominal ventrites 2–5 flattened medially, 2 and 3 with inwardly angled spatulate setae; pygidium medially densely setose with short median setae surrounded by longer incurved setae. Female with lateral metaventrite simply carinate between meso- and metacoxae. Aedeagus (Fig. 18I, J) with extremely large basal foramen, entire ventrobasal half of aedeagus open, margin sinuate; right side prolonged distally, twisting and flattened into an internally dentate and apically hooked laminate plate; left side of aedeagus developed into similarly long but more weakly sclerotized and bluntly rounded apical process.

Etymology. The antler-like male scape gives this species its name.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador

Remarks. The modified, prolonged male scape in this species is very similar to that shown by a number of *Syrmocerus* species, including at least one also found at Tiputini. The two genera are distinguishable by the lateral longitudinal pronotal sulci seen in the latter, and differ in various other external characters. At the same time, the aedeagus of *A. cervoides* is quite unlike that of most *Arthmius*, with a sinuous basal rim and unhomologizable, disjunct dorsal (internal?) process, so its position in the genus is uncertain. It shows no significant similarity to known genitalia of *Syrmocerus,* either.

Arthmius amazonus **sp. nov.**
Figs 17P–R

Type material. Holotype ♀ (MECN-EN 40732): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13077, Morphosp. VS.016"; deposited in MECN. **Paratypes** (24♀): same locality as type (MECN-EN 40606, 40607, 40609, 40612, 40616–40622, 40624, 40625, 40628–40630, 40634, 40635, 40638, 40643, 40645, 40653, 40654, 40656).

Diagnosis. (TL: 2.1mm) Body (Fig. 17P) smooth, sparsely setose, lower setae subrecumbent and sparse, with few longer erect setae rather conspicuous, uniformly reddish-orange; head subquadrate, antennal insertions elevated; vertex weakly depressed around distinct vertexal foveae; frons weakly convex; eyes large, coarsely faceted; antennae rather compact, antennomeres III–VIII roundly subquadrate, V and VII slightly wider than others, IX–XI forming loose club, apical antennomere abruptly narrowed at middle; pronotum widest anteriorly, narrowed to base, lateral foveae conspicuous, basal transverse sulcus arcuate, well-impressed; elytra strongly rounded, each with three small dorsobasal foveae; 1st abdominal tergite with two lateral carinae, others with one; last ventrite shallowly depressed.

Etymology. Known only but numerously from females, in an isolated rise from the Amazon basin, the name '*amazonus*' seems particularly apt.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. In contrast with the preceding species, with which this one shares a type locality, this species is unusually glabrous for *Arthmius*; the recumbent setae are very sparse (though longer erect setae are somewhat more conspicuous), and the integument is very smooth and shining.

Iteticus Raffray, 1904
Fig. 19

Ten species are included in this genus from Central and South America (Asenjo *et al.* 2019). Most have been described from Brazil (6 spp.) and Bolivia (2). Chile and Panama are each also known to host one species. One new species is described below.

Diagnosis. The elongate body shape of *Iteticus* along with a distinct elytral stria distinguishes it from most other Batrisini. In addition, only one other genus of Batrisini possesses both dorsobasal elytral foveae and subhumeral foveae, *Batoctenus* Sharp, which Chandler (unpub.) has suggested might be synonymous. The latter is said to have more clearly defined abdominal paratergites on the first three or four segments. The most recent species to have been described was *I. punctaticollis* Jeannel (1962), which is also the only available illustration of male genitalia, described simply as 'in the form of an oval, sclerotized capsule, with three distal lobes, one dorsal, the other two lateral and unequal.'

Iteticus oculatus **sp. nov.**
DNA barcodes: GenBank PX930252, PX930253
Figs 19A–D

Type material. Holotype ♂ (ZSFQ-i23353): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12633, Morphosp. ElP.A.032"; deposited in ZSFQ. **Paratypes** (2♂, 5♀): 5, same data as type; 2, "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m. Window traps, S. Smith" (ZSFQ-i23354–i23360).

Diagnosis. (TL: 2.2mm) Body elongate, dark orange, densely covered with subrecumbent setae; vertex (Fig. 19A) with three shallow foveae in a transverse series, lacking carinae; antennal bases swollen, narrowly depressed between; eyes very large and coarsely faceted; antennae thick, elongate, without obvious dimorphisms; pronotum elongate, smooth anteriorly, with fine denser punctures in posterolateral corners; pronotum with lateral foveae, no antebasal sulcus; elytra each with sutural and three lateral basal foveae, with complete medial and humeral striae; subhumeral fovea and carina present; pro- and mesotibiae with small tooth on inner margin at apical third; metaventrite swollen, but broadly depressed and setose, with deeper median impression along entire midline; abdominal tergites and sternites with several deep basal foveae on each side, those laterad metacoxae especially deep; lateral margins of tergite six with short spiracular tubes. Aedeagus (Fig. 19C, D) relatively simple, with large basal bulb and nearly as large dorsal diaphragm, the apex narrowed and flattened, expanding slightly into a irregular fin-like plate with a single digitiform process subapically on the left side.

Etymology. This species is named for its large and coarsely faceted eyes.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is straightforward to identify, being the only *Iteticus* known from the higher parts of the central Andes. Most of the known species are defined by particular modifications of the male meso- and metatrochanters, none of which are evident in this species. For comparisons, I also include habitus photos (Figs. 19E, F) of another *Iteticus* species, believed to be *I. semipunctatus* Raffray, or very near (specimen ZSFQ-i23352).

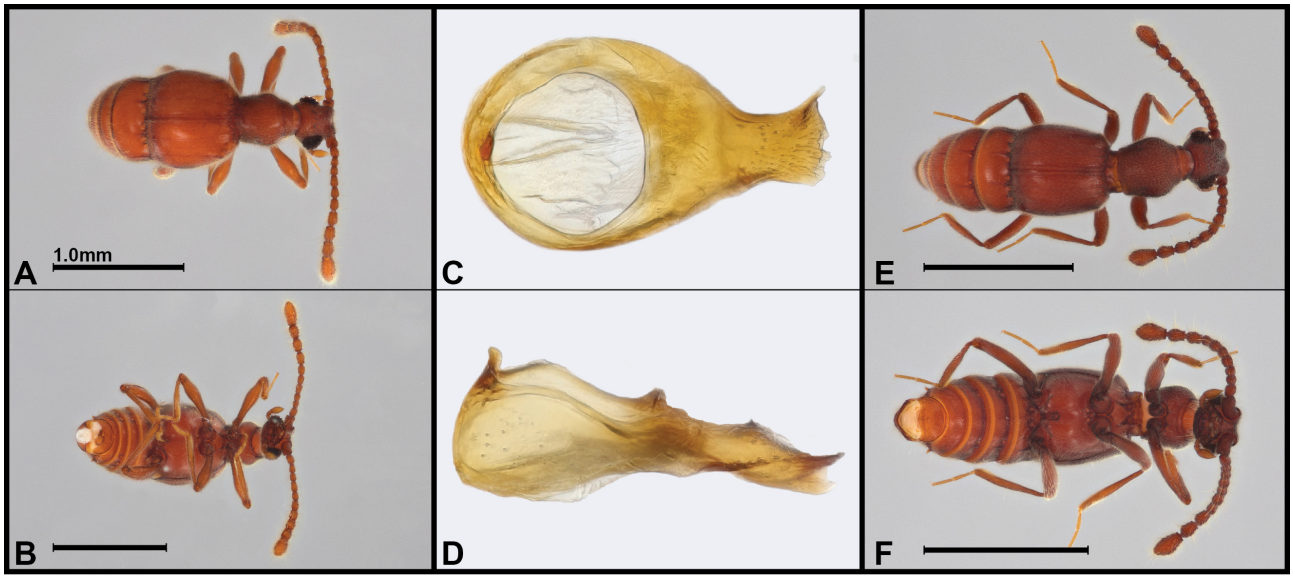

FIGURE 19. Photographs, *Iteticus* spp. **A–D** *I. oculatus* (body: dorsal, lateral; aedeagus: dorsal, lateral) **E, F** *I.* nr. *semipunctatus* Raffray. Scale bars = 1.0mm.

Oxarthrius Reitter, 1883
Fig. 20

Oxarthrius currently includes thirteen species, ranging across the Neotropical region from Mexico to Argentina (Asenjo *et al.* 2018, 2019a; Gouvea *et al.* 2023). Gouvea *et al.* (2023) recently published a key to those species known from Brazil.

Diagnosis. (TL: 2.5–2.6mm, Avg. 2.5mm) Among neotropical Batrisini, *Oxarthrius* is distinguished by the presence of a pair of basal pronotal spines/tubercles and a lack of a transverse basal pronotal sulcus. Most species have only a single pair of dorsobasal elytral foveae (though even those can be absent) and lack a subhumeral fovea. Male secondary characters are diverse, frequently occurring on the mesothoracic trochanters, femora, and tibiae, but also including processes of the metaventrite, antennae, and metatrochanters. Two new species are described below.

Male genitalia have previously been illustrated only for *O. aurora* Asenjo, *O. inexpectatus* Asenjo (both in Asenjo *et al.* 2018), and *O. spiculatus* Gouvea *et al.* (2023). These illustrate two very distinct types of aedeagi: the first two species have a small basal bulb and two or three strongly asymmetric apical processes, one of those processes bearing a small number of thick setae; the aedeagus of *O. spiculatus* is much more similar to those described below, consisting of a relatively simple flat, subquadrate plate with a single, short, broad apical tooth, reminiscent of the aedeagus of *Batrisodes* Reitter. Which form more closely resembles the genitalia of the type species, *O. bispinosus* (Reitter), remains to be seen; although its lectotype specimen is a male, it has never been dissected.

Oxarthrius formicatus **sp. nov.**
DNA barcode: GenBank PX930337
Figs 20A–E

Type material. Holotype ♂ (MECN-EN 40734): "ECUADOR: Cotopaxi, -0.4205˚, -79.0027˚, Bosque Integral Otonga, 14.VIII.2024, 1884m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12837, Morphosp. Ot.A.002"; deposited in MECN.

Diagnosis. (TL: 2.6mm) Body (Fig. 20A) antlike, with distinctive constrictions behind the prothorax and metathorax, densely and uniformly covered with short, stiff, slightly recumbent setae; antennae robust, with antennomeres II–VIII similar in width, mostly subquadrate though V and VI are more elongate, IX–XI widening, forming indistinct club; pronotum widest near front, with sides rounded, disk with pair of acute posterodorsal teeth, lateral foveae shallow and broad; elytra strongly convex, with sides rounded, lacking basal foveae; abdominal segments completely lacking lateral carinae or laterotergites, the basal segment longer than the others combined; (male?) profemur with setose basal depression on anterior surface; male mesofemur (Fig. 20B) with thick tooth at base of inner margin; male metatibia slightly curved at base; terminal abdominal ventrite slightly depressed. Aedeagus (Fig. 20D, E) comprised mainly of flat, subquadrate basal bulb, broadly unsclerotized dorsally and ventrally; apex with short, broadly rounded, slightly off-centered ventral shelf and a narrower, thumblike dorsal process directed slightly obliquely to the opposite side.

Etymology. This species is named for its 'ant-like' habitus.

Distribution. This species is known only from the Bosque Integral Otonga in Cotopaxi Province, Ecuador, along the western Andean cordillera.

Remarks. This species has a distinctive habitus, with the strong constriction at the base of the abdomen unique among those species for which illustrations are available (7 of the 13). While male modifications of the inner margin of the mesofemur are common to several species, those of this species are unique in shape, being somewhat hatchet-shaped (Fig. 20B), while others at the base of the mesofemur are spinelike, or accompanied by other femoral and tibial modifications.

Oxarthrius tiputinus **sp. nov.**
DNA barcode: GenBank PX930372
Figs 20F–J

Type material. Holotype ♂ (ZSFQ-i23363): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, small scale fogging, AT1347, M. Caterino, A. Tishechkin" "Caterino DNA voucher, Ext. MSC-12694, Morphosp. TBS.A.014"; deposited in ZSFQ. **Paratypes** (1♂): same locality as type, small scale fogging (ZSFQ-i23364).

Diagnosis. (TL: 2.5mm) Body (Fig. 20F) dark orange, with short stiff setae, those of pronotum erect, those of elytra and abdomen subrecumbent; frons transversely elevated between antennal bases, small densely setose depression just posterad; vertex with paired lateral foveae, short median longitudinal carina between; antennae moderately moniliform, basal antennomere cylindrical, less than twice as long as wide, antennomeres II–VIII rounded, as long as wide; antennomeres IX–XI enlarged, forming loose club; pronotum with two small basolateral foveae and two larger lateral foveae, disk with pair of acute tubercles behind middle; basal elytral margin with only sutural fovea; subhumeral fovea absent; prothoracic legs unmodified; mesofemur with short flange on posterior edge of inner margin; metaventrite with narrow, longitudinal, densely setose patch along midline; 1st abdominal ventrite narrowly elevated between metacoxae, with deep setose depression laterad metacoxae. Aedeagus (Fig. 20I, J) flattened, broad, subquadrate, basal bulb wide, broadly open above and below; tegmen with rounded, laminate, asymmetrical ventral median lobe below a wider dorsal shelf, densely setose at sides, with obliquely truncate median tooth.

Etymology. This species is named to recognize the importance of the Tiputini Biodiversity Station, run by the

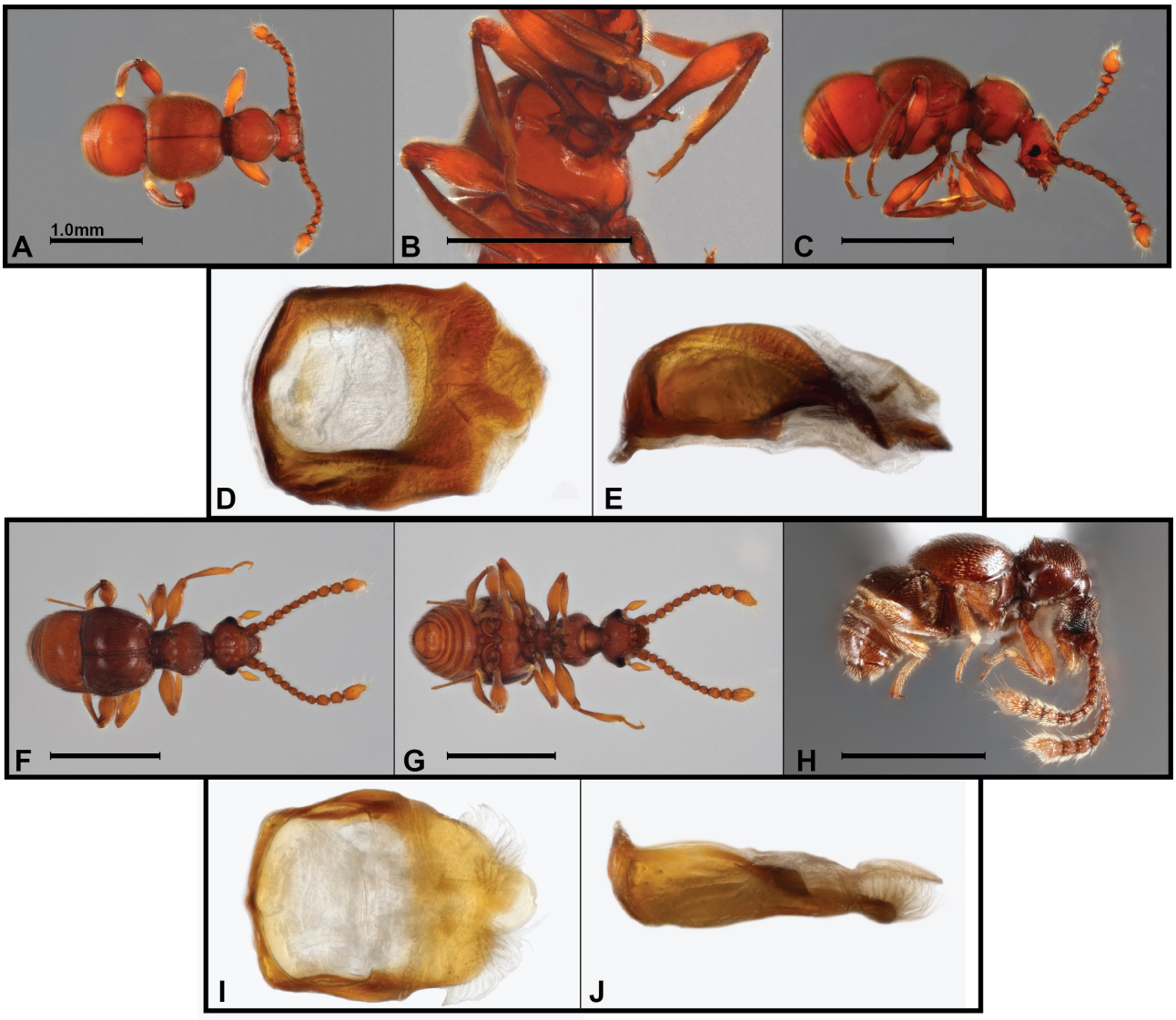

FIGURE 20. Photographs, *Oxarthrius* spp. **A–E** *O. formicatus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **F–J** *O. tiputinus* Raffray (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

Universidad San Francisco de Quito, who hosted a visit by the author in 2011 that led to the discovery of this species.

Distribution. This species is known only from the Tiputini Biodiversity Station in the Ecuadorian Amazon.

Remarks. The species keys to *O. bispinosus* in Gouvea *et al.*'s (2023) key is generally similar. It completely lacks, however, the strong tooth on the inner margin of the mesotibia that males of *O. bispinosus* possess. The only apparent secondary sexual character the male possesses is a rather small laminate flange just basad the midpoint of the inner margin of the mesofemur. Without female specimens, it is impossible to determine if other characters, such as the setose longitudinal crease on the metaventrite, are sexually dimorphic.

Syrbatus Reitter, 1882
Figs 21A–O, 22A–J

Thirty-three species of *Syrbatus* have been described from South America (Asenjo *et al.* 2019a, 2024b). Most are from Brazil (28), with a few from Paraguay (3) and Argentina (2). Five new species are described below.

Diagnosis. (TL: 2.3–3.1mm, Avg. 2.5mm) *Syrbatus* is similar to (and perhaps synonymous with) *Arthmius* (Chandler, unpub. data) in possessing dorsobasal elytral foveae and dorsally located lateral pronotal foveae while lacking a subhumeral fovea, dorsal pronotal spines or tubercles. It is distinguished by the possession of longitudinal pronotal sulci extending anterad from the lateral pronotal foveae. Most species exhibit distinctive male secondary sexual characters on the head and/or antennae (as do many *Arthmius*). A misleadingly similar, although certainly convergent, longitudinal pronotal crease may also be seen in some Iniocyphini and Baradini (*Euphalepsus*), either of which may also exhibit male secondary characters on the head.

Until recently, no genitalia had been illustrated for any species of *Syrbatus*. However, Asenjo *et al.* (2024), in describing three new Brazilian species, described the

aedeagus and female genital complex in some detail. The generally reduced, low, and broadly open basal bulb with asymmetrical distal proceses is consistent with the species described below, and also exhibits strong similarities with those of many *Arthmius* species.

Syrbatus cununero **sp. nov.**
Figs 21A–C, 22A–B

Type material. Holotype ♂ (MECN-EN 40907): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13022, Morphosp. Can.A.008"; deposited in MECN. **Paratypes** (7♂, 9♀): same data as type (MECN-EN 40909–40923).

Diagnosis. (TL: 2.2mm) Body (Fig. 21A) sparsely setose; head with posterolateral margins rounded; vertex with cruciate setae; male with vertex depressed below transverse posterior ridge; frons with weak longitudinal carina between antennal bases with setose comb and a modified 'Y'-shaped carina beneath, with small median tubercle behind; epistoma strongly arcuate, produced over labrum, with setose ridge between deep subantennal depressions; antennae rather short, antennomeres II–VIII beadlike, male antennomere IV enlarged and with dimple on inner surface, antennomeres IX–XI slightly enlarged into loose, weak club; pronotum widest anteriorly, with median longitudinal ridge and lateral longitudinal sulci; subbasal sulcus strongly impressed, posteriorly dentate (as seen in lateral view; Fig. 21C); elytra strongly rounded, each with 3 dorsobasal foveae; 1st abdominal tergite as long as others together; metaventrite with setose lateral depression posterad mesocoxae; legs and venter otherwise without obvious secondary sexual characters. Aedeagus (Figs. 22A, B) with large basal bulb, with large, broadly open basal foramen, lacking dorsal diaphragm; tegmen with weakly sclerotized ventral process, main extension of tegmen comprising long, bent process on left side with mitten-shaped apex with large triangular process on right edge that bears a long, thin, right-pointing process; median armature within aedeagus comprising single long, sclerotized (extrudible) rod projecting over tegmen.

Etymology. This species' name means 'player of the cununo', a type of percussion instrument particular to music of the Afro-Ecuadorian culture in Esmeraldas Province.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species is distinguishable based on the relatively weakly developed lateral longitudinal pronotal sulci, the male's low transverse vertexal ridge, strongly anteriorly produced epistoma, and enlarged, medially dimpled male antennomere IV.

Syrbatus chelatus **sp. nov.**
Figs 21D–F, 22C–D

Type material. Holotype ♂ (MECN-EN-40905): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12744, Morphosp. SK.A.005"; deposited in MECN.

Other material: 1♂: "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, window traps, S. Smith" / "Caterino DNA voucher, Ext. MSC-12728, Morphosp. TBS.A.031" (ZFSQ-i23351). 1♂: "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13089, Morphosp. Cu.006" (MECN-EN 40744).

Diagnosis. (TL: 2.4mm) Male head (Fig. 21D) with sides elevated, carinate, subparallel; vertex carinate at base, deep median depression below transversely projecting vertex, mostly glabrous within, though with small, discrete clusters of long, inwardly directed setae on sides near front; epistoma with strong, bifid, median tooth in front of depression, bluntly triangular processes on either side; eyes large, protuberant, coarsely faceted; anterior margin of epistoma rounded, projecting anterad over labrum, convex and setose; labrum narrow, setose, with particularly long, convergent setae on sides, and median setose tubercle beneath clypeal projection; antennal scape slightly elongate, curving inward, with longitudinal setose carina on inner apical half; antennomeres II–III very short, IV as long as both together, with inner basal carina (chelating weakly with scape?), antennomeres V–VIII slightly progressively shorter, IX–X slightly larger than VIII, similar in size, antennomere XI about twice as long as X; pronotum with strong, median longitudinal ridge, with medially bent, transverse antebasal stria complete; sides of pronotum with setose longitudinal impressions in basal half, possibly representing elongated lateral foveae; each elytron with sutural and 2 equally spaced dorsobasal foveae; humerus slightly convex; subhumeral fovea and striae absent; male mesotrochanters with dense brush of flattened apical setae; male legs otherwise unmodified; first visible abdominal tergite with two lateral carinae, the inner sinuate and nearly meeting outer apically; last abdominal ventrite (male) large, flat, semicircular, with irregular but not emarginate apical margin. Aedeagus (Fig. 22C, D) with large basal foramen, basal bulb weakly defined, with basal edge raised and curving distally covering inner bulb; a thin articulated process spirals out of basal bulb, through distal opening on right side, prolonged as thin, apically bent, whip-like process; main body of tegmen deeply emarginate on left side, with sclerotized knobs on either side of opening, tegmen beyond narrows into outwardly angled, then apically inwardly bent, pick-like process; right side of tegmen rising from base as broad, laterally compressed plate that twists over and inward, flattening then abruptly expanded into T-shaped, obliquely truncate distal plate.

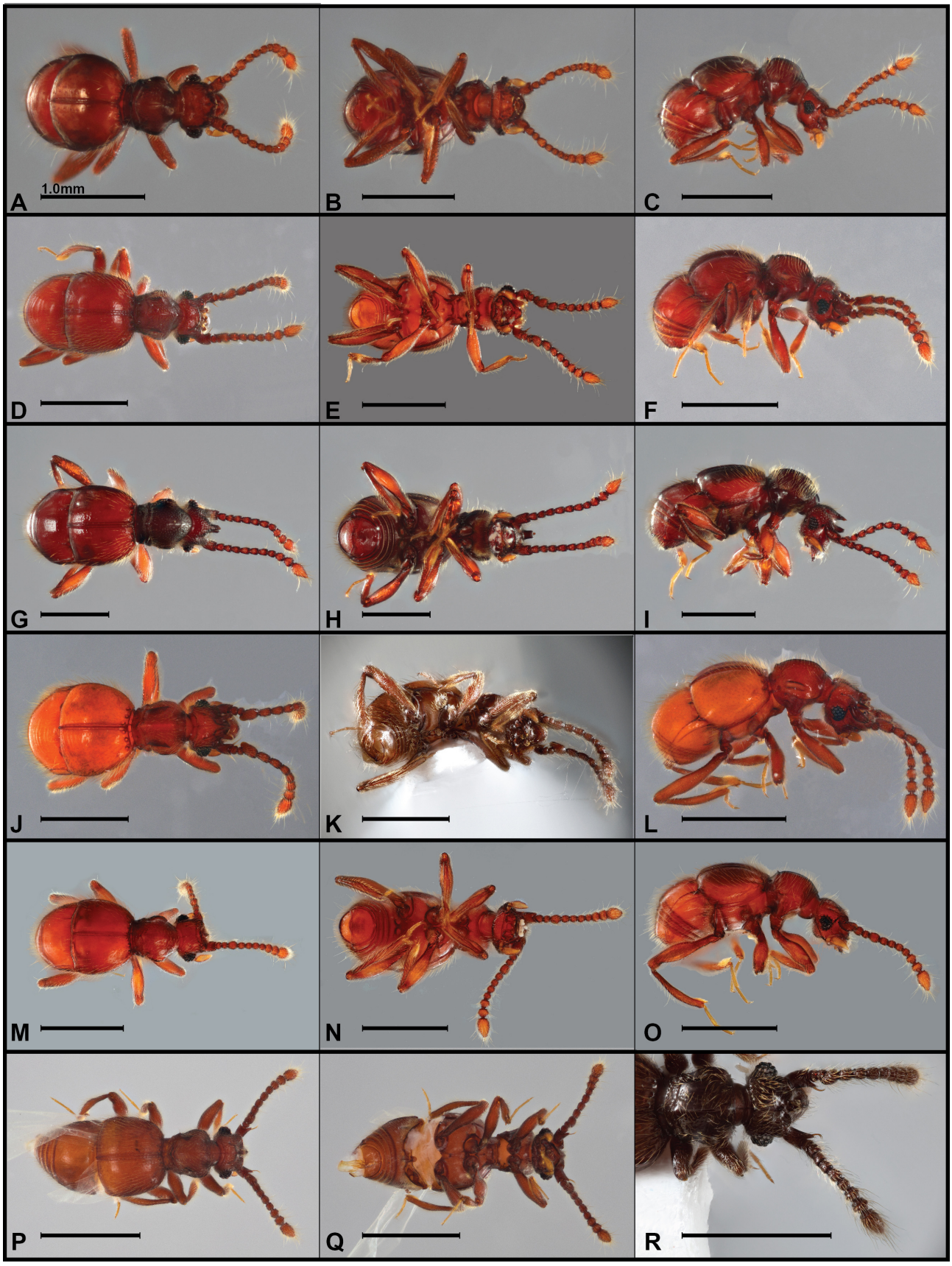

FIGURE 21. Habitus photos, Batrisini, dorsal, ventral, lateral views **A–O** *Syrbatus* spp. **A–C** *S. cununero* **D–F** *S. chelatus* **G–I** *S. spicatus* **J–L** *S. triceratops* **M–O** *S. yarinae* **P–R** *Syrmocerus swingi.* Scale bars = 1.0mm.

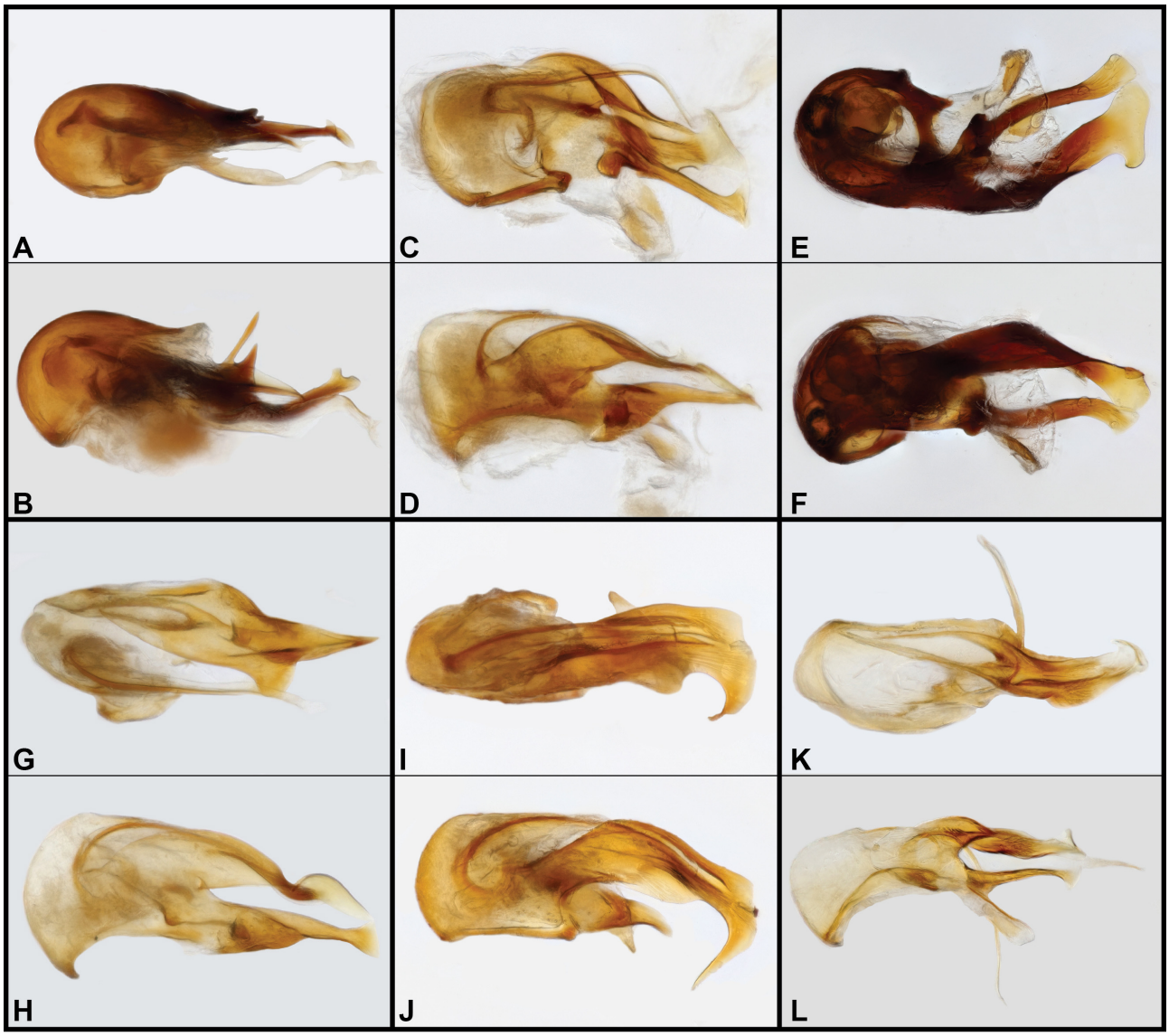

FIGURE 22. Aedeagus photos, dorsal, lateral views **A–J** *Syrbatus* spp. **A, B** *S. cununero* **C, D** *S. chelatus* **E, F** *S. spicatus* **G, H** *S. triceratops* **I, J** *S. yarinae* **K, L** *Syrmocerus swingi*.

Etymology. This species is named for its seemingly 'chelating' male antennal structures.

Distribution. This species is known from three localities, two of them in fully Amazonian lowland forest (Orellana and Sucumbíos Provinces, Ecuador), one considerably higher in the lower cloud forests of the eastern Andes, Pastaza Province.

Remarks. The male head modifications of this species are unique, comprising a vertexal shelf over a median depression, with a narrowly bifid epistomal process flanked by secondary setose processes of similar length to the median one. The prolonged inner basal corners of antennomere IV and the subcarinate, median longitudinal pronotal ridge will also help distinguish it.

The aedeagus of this species shows clear similarity in general structure to those of *S. spicatus* and *S. triceratops*, both sympatric, yet with equally clear diagnostic characters. The lateral channel at the base of the tegmen would appear closeable, suggesting a grasping structure in use during copulation.

Syrbatus spicatus **sp. nov.**
DNA barcode: GenBank PX930369
Figs 21G–I, 22E–F

Type material. Holotype ♂ (MECN-EN 40924): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12742, Morphosp. SK.A.003"; deposited in MECN. **Paratypes** (3♂, 3♀): 4: same data as type; 2: "ECUADOR: Pastaza, -1.4267˚, -78.0439˚, Río Anzu Reserve, 1342m, 11.XI.2024, M.Caterino" (MECN-EN 40925–40928, MECN-EN 40772, MECN-EN 40183).

Diagnosis. (TL: 3.1mm) Body (Fig. 21G) clothed

with moderately dense long setae; vertex rather evenly convex, prolonged anteriorly into an acute median tooth; frons with erect, laminate median plate, weakly bifid apically, subparallel with vertexal tooth; epistoma with lower blunt median tubercle; male antennae not modified, antennomeres II–VII subquadrate, IX–X slightly enlarged, apically widened, XI about twice as long as X, apically narrowed; pronotum with lateral basal foveae connected by discretely impressed transverse basal impression, impression slightly widened at middle, but no median fovea present; longitudinal midline of pronotum elevated, very weakly carinate; lateral pronotal foveae weakly prolonged anterad into longitudinal sulcus; each elytron with three basal foveae; male legs with dense brush of setae on mesotrochanters, not otherwise modified; tibiae rather short, cylindrical, densely setose. Aedeagus (Figs. 22E, F) with large basal bulb, convex at base, open ventrally, with thin laminar plate over dorsal opening; tegmen with two main distal processes, the dorsal-most thicker, flat, twisting slightly and abruptly expanded to T-shaped apex; ventral process narrower, slightly shorter and weakly sinuous, with simply obliquely truncate apex.

Etymology. This species' name refers to its vertexal horns.

Distribution. This species is known only from the foothills of the Andes in western Pastaza Province, Ecuador. The type locality is the Sumak-Kawsay In Situ preserve, and the species has also been collected at EcoMinga's Río Anzu preserve, 3km to the southeast.

Remarks. This species can be recognized by its simple median vertexal horn in combination with a longer, bifid frontal one in the males.

Syrbatus triceratops **sp. nov.**
Figs 21J–L, 22G–H

Type material. Holotype ♂ (MECN-EN 40906): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12745, Morphosp. SK.A.006"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Body (Fig. 21J) densely setose; head with posterolateral margins sharp; male with vertex flat, prolonged into short acute point, frons depressed beneath, anteriorly with tripartite process, median part broad, short, truncate, lateral ones longer, subacute; epistoma strongly convex, produced over labrum; antennal scape with apicolateral corners slightly prolonged, bearing long, dense tufts of setae, inner basal corner of antennomere IV broadly prolonged as small rounded flange; pronotum similar to that of *Syrbatus chelatus*, but with median longitudinal carina more distinctly developed, posteriorly dentate (as seen in lateral view; Fig. 21L); lateral pronotal sulci longer, more deeply incised, and distinctly setose; tibiae simple, densely setose, male legs (Fig. 21K) with dense brush of short setae on bluntly produced mesotrochanter but no other modifications. Aedeagus (Fig. 22G, H) with basal bulb open ventrally and distally, with basal surface curved over dorsum; internal thin process strongly arched from base, but not coiled; right side plate of tegmen flat, broad, twisted inward, and expanded apically, with broad, raised lobe on inner edge, outer apical corner strongly lobate, inner corner finely acute; left-side basal emargination large, with knobs of outer corners weakly defined, apical process of left tegmenal edge short, narrowing slightly, then expanded into a flat, inverted triangular apex.

Etymology. This species' name refers to the males' generally three-pointed frontal processes.

Distribution. This species is known only from the foothills of the Andes, at the Sumak-Kawsay In Situ preserve, in western Pastaza Province, Ecuador.

Remarks. The complex modifications of the male frons and vertex are distinctive of this species, as is the flange-like projection of the inner basal corner of the 4th male antennomere.

Syrbatus yarinae **sp. nov.**
Figs 21M–O, 22I–J

Type material. Holotype ♂ (MECN-EN 40895): "ECUADOR: Napo, -0.88973˚, -77.26821˚, Chontapunta, Bosque Minga. 370m. 14-oct-2025. Winkler., D Diaz | Y. Tapuy" / "Caterino DNA voucher, Ext. MSC-13314, Morphosp. Ming.002"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Body (Fig. 21M) dark orange, sparsely setose; male head broadly quadrate, with vertex mostly flat, becoming slightly depressed anterad, sides of frons weakly elevated over antennal bases; male frons with weak transverse carina above and between antennal bases, with setose median tooth below; eyes protuberant, coarsely faceted, occupying entirety of genae; gula distinctly swollen and setose below; antennae rather short, scape arcuate on lower surface, deeply emarginate at dorsal apex, antennomere II transversely oval, III short, beadlike, IV enlarged, with setose dimple on median surface, V–VIII beadlike, IX–XI larger, forming loose club, IX–X slightly wider than long, widest at middles, XI about 2.5× as long as X; pronotum widest anteriorly, slightly elevated along midline, laterally longitudinally depressed along margin; lateral foveae indistinct, but margin weakly dentate, setose behind their position, with biarcuate transverse sulcus between, medially subdentate behind; posterolateral corners of pronotum with round setose depressions; elytra convex, sides rounded, each with 3 dorsobasal foveae; 1st abdominal tergite as long as others together, with short basal carinae on each side; male mesotrochanters densely setose behind; male last abdominal ventrite broadly depressed, setose. Aedeagus (Fig. 22I, J) with large basal bulb, with large, broadly open basal foramen, lacking dorsal diaphragm, posterior edge of basal bulb curving distad over dorsum to form part of apical armature; main extension of tegmen comprising longitudinally divided, long, closely parallel, sclerotized processes, left one bent strongly downward to acute apex, right shorter, obliquely truncate; lower distal edge of basal bulb with short median lobe and to its right a weakly sclerotized, diverging process.

Etymology. The species is named to acknowledge the collaboration and friendship of Ms. Yarina Tapuy-Avilés, 'Investigadora Asociada' with INABIO, and coauthor on several species of Metopiasini being described elsewhere (Tapuy-Avilés *et al.* 2025, 2026), also co-collector of this species.

Distribution. This species is known only from western Amazonia, in the region of Chontapunta in eastern Napo Province, Ecuador.

Remarks. Compared to other species of *Syrbatus*, this species has relatively modest male modifications, with mainly just a median frontal tooth and slightly enlarged 4th antennomere (which may become more extremely modified in many species). The aedeagus is clearly similar in basic form to most other species, but differs markedly in the shapes of the apical processes.

Syrmocerus Raffray, 1898

Figs 21P–R, 22K–L

This genus includes 6 South American species (Asenjo *et al.* 2019), all reported only from Brazil. One new species is described below.

Diagnosis. Among neotropical Batrisini, *Syrmocerus* is distinguished by its 'heavily pubescent sulcoid fovea' (Park 1942) that incises the lateral pronotal margin. No male genitalia have been described previously for any member of the genus.

Syrmocerus swingi **sp. nov.**

Figs 21P–R, 22K–L

Type material. Holotype ♂ (ZFSQ-i23361): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" "Caterino DNA voucher, Ext. MSC-12701, Morphosp. TBS.A.021"; deposited in ZSFQ. **Paratypes** (1♀): same locality as type, flowerfall sifting, vi.7.2011 (ZFSQ-i23362).

Diagnosis. (TL: 2.4mm) Body (Fig. 21P) dark orange, with sparse but rather long subrecumbent setae; head with sides parallel, posterior corners quadrate; eyes (Fig. 21R) strongly produced, beyond hemispherical, very coarsely faceted; male vertex punctate, setose, slightly elevated as a quadrate platform, anterior median point slightly prolonged, with weak median carina, carina continued more prominently anterad onto depressed, smooth frons; frons lacking obvious foveae, anteriorly margined near antennal bases, densely setose at lateral corners, protuberant at middle; dorsal margin of epistoma transversely depressed and smooth, anteromedially elevated into strongly setose carina; anterior margin of epistoma broadly rounded, slightly produced; labrum short, setose, elevated at base; maxillary palpi with terminal segment bulbous at base, tapered apically, setose; antennomere I (Fig. 21R) large, cylindrical at base, emarginate at apex, prolonged subacutely with cluster of elongate setae at inner apex, antennomeres II–III very short, transverse, IV larger, rounded and expanded on inner margin, V–VIII slightly longer than wide, IX–XI forming weak club, IX and X wider but short, transverse, with long whorls of setae, XI about 3× as long as X, densely setose; pronotum elevated along median axis, ending at weakly defined basal groove (disrupted by increased punctation); basal groove finely curving anterad, expanded into longitudinal densely setose depression; elytra with three distinct basal foveae evenly spaced from suture to humerus; subhumerus lacking fovea, with only fine marginal stria; legs slender, setose, only secondary sexual modification appearing as subtruncate and densely setose mesotrochanters. Aedeagus (Fig. 22K, L) slightly flattened, basal bulb convex above, open below; tegmen with elongate, sinuate blade crossing from right side of base across to middle, terminating in obliquely truncate, slightly upturned edge; beneath, arising from same side is a thinner, apically expanded, hammer-like process; a basally coiled, thin, sclerotized rod emerges from basal bulb ventrad below major tegmenal lobe.

Etymology. This species is named to honor Dr. Kelly Swing, a founder of the Tiputini station, and facilitator of the author's only trip there in 2011 that discovered this species.

Distribution. This species is known only from the Tiputini Biodiversity Station in the Ecuadorian Amazon.

Remarks. Most of the described species of *Syrmocerus* are keyed in Park (1942), and separated by modifications of male antennomere I. This new species is distinct from all of these in having this antennomere only modestly prolonged at the inner corner, but also adorned with elongate, curved setae.

Clavigeritae: Clavigerini

Fustiger LeConte, 1866

Figs 23–24

This genus includes 44 species, 32 of which are known from the Neotropical region (Hava 2023), while others extend into the southern Nearctic or Palaearctic. None have previously been reported from Ecuador. Four new species are described below.

Diagnosis. (TL: 1.2–2.0mm, Avg. 1.6mm) Among neotropical Pselaphinae, Clavigeritae are easily recognized by the enlarged terminal (3rd) antennomere, usually in combination with a compact body form and the presence of trichomes on some part of the body, typically the abdominal base. The monotypic genus *Neofustiger* Bruch is separated from *Fustiger* by the presence of an apparent suture across the main antennomere. While the neotropical fauna of *Fustiger* is undoubtedly diverse, the group has been very neglected, with only a single species (*F. lenoiri* Hava) described in the past 50 years. Few have been described or illustrated in any detail, and only the most recent has included an illustration of the male genitalia.

All members of the genus are undoubtedly associated with ants, although none of the new species were collected in direct association with any particular ant species.

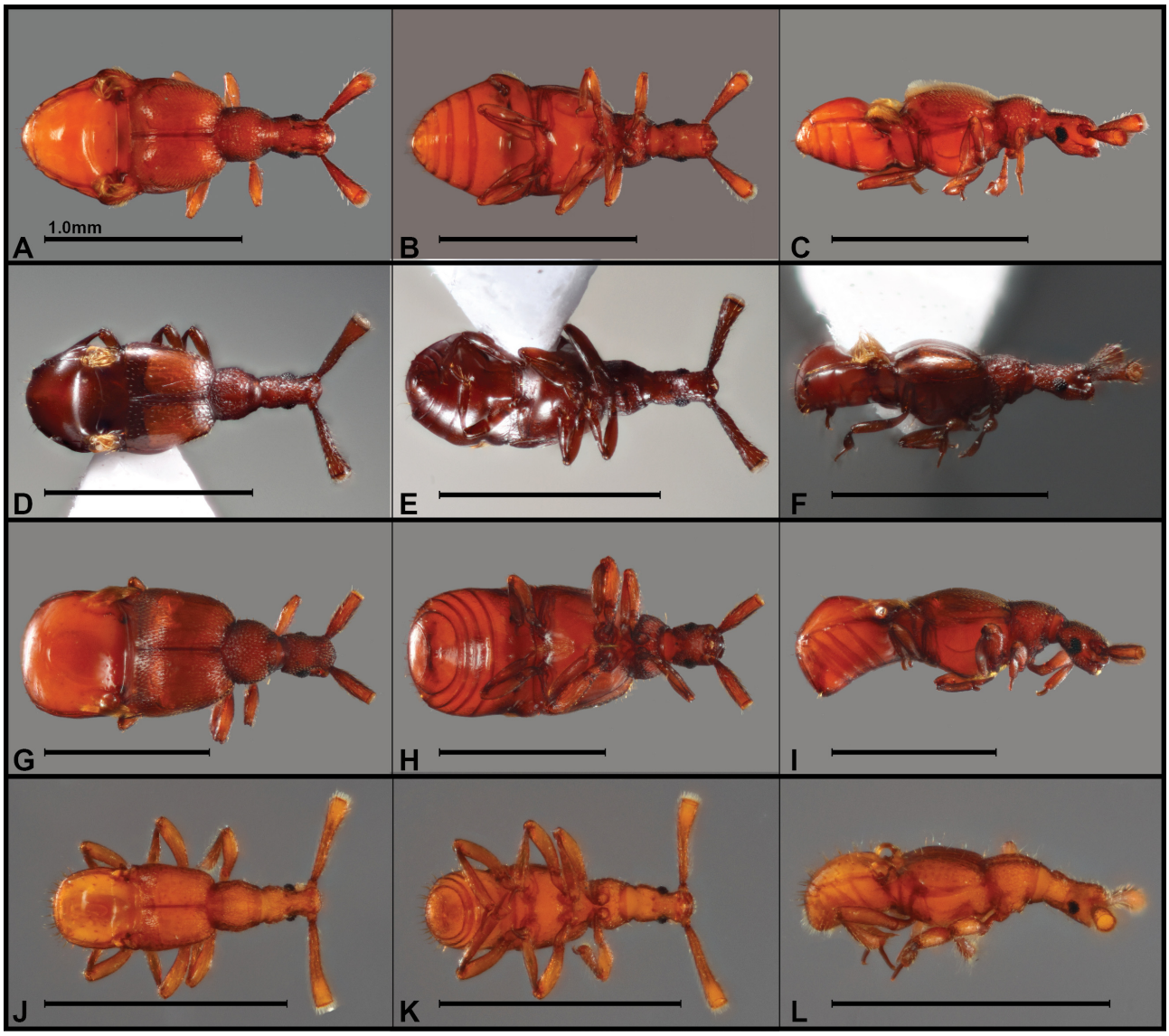

FIGURE 23. Habitus photos, *Fustiger* spp., dorsal, ventral, lateral views **A–C** *F. bucina* **D–F** *F. canistrum* **G–I** *F. chuku* **J–L** *F. tullu.* Scale bars = 1.0mm.

Fustiger bucina **sp. nov.**
DNA barcodes: GenBank PX930231, PX930375
Figs 23A–C, 24A–B

Type material. Holotype ♂ (ZSFQ-i16785): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12698, Morphosp. TBS.A.018" / "ZSFQ-i16785"; deposited in ZSFQ. **Other material:** 1♀: "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFauna Cuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13104, Morphosp. Cu.021" (MECN-EN 40759).

Diagnosis. (TL: 1.7mm) Body (Fig. 23A) robust, orange, widest at abdominal base, tapering anterad and posterad; head and pronotum shallowly but coarsely punctate, with short, curved setae, elytra less punctate with longer setae, abdomen smoother still, largely glabrous; head elongate, widest at eyes, narrowing slightly posterad, widening slightly to epistoma; dorsum of head coarsely, shallowly reticulopunctate; vertexal foveae evident near posterior margins of eyes; eyes comprising about 22 facets; antennae inserted subapically on frons, third antennomere about five times as long as apical diameter, sides evenly widening from base to apex, apex pyramidal; pronotum about as long as wide, lacking sulci or foveae, sides rounded, evenly narrowing to anterior margin; elytra widening slightly from base to apex, obliquely truncate at apical corners, setose, with setal bases weakly elevated, setae longer, more erect, and converging toward posterolateral corner; elytra lacking basal foveae, with only finely crenulate basal carina; sutural stria distinct; basal abdominal tergite (apparently three fused tergites) with conspicuous trichomes at basal corners, paratergites produced laterally and dorsally, with inner whorl of long golden setae, base of tergite weakly depressed between trichomes, otherwise convex, very glabrous; legs slender,

smooth, trochanters elongate; tibiae widening slightly from base to apex, none toothed; tarsi slender, largely comprising apical tarsomere; metaventrite strongly convex, with weak, setose median depression; male abdominal ventrites unmodified. Aedeagus (Fig. 24A, B) elongate, with large basal bulb flattening distad, dorsal diaphragm elongate oval, with distinct diaphragmatic sclerite; tegmen flat, narrowing, hooked at apex, dorsally open for extrusion of internal sac.

Etymology. This species is named for its distinctive 'hornlike' antennomere, which helps distinguish it from some other *Fustiger* spp. It is used as a noun in apposition.

Distribution. While the type locality of this species is the Tiputini Biodiversity Station in eastern Orellana Province, Ecuador, a very similar series of females was found in the Cuyabeno Reserve, approximately 50 kilometers to the northeast. Given the lack of male, we do not assign these individuals to the type series.

Remarks. Barcoded individuals each from the two localities differ in only a single base pair over the barcoding region.

Fustiger canistrum **sp. nov.**
Figs 23D–F, 24C–D

Type material. Holotype ♂ (MECN-EN 42059): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13354, Morphosp. PS.B.019"; deposited in MECN. **Paratypes** (3♀): same data as type (MECN-EN 42006–42008).

Diagnosis. (TL: 1.5mm) Body (Fig. 23D) elongate, slender anteriorly, elytra and abdomen wider, sparsely setose; head about 2.5× as long as wide, rugosely punctate, eyes round, situated at middle of genae, comprising about 15 ommatidia; frons slightly elevated above antennal bases; antennal insertions broadly excavate, smooth; antennae with short cylindrical scape, main antennomere slightly longer than head, sparsely setose on sides, expanding evenly to circular apex bearing a distinct, incurved fringe of golden setae; venter of head mostly smooth along midline, with pair of gular foveae; pronotum about as long as wide, rugosely punctate, parallel-sided in basal half, narrowing evenly to apex, disk with shallow median longitudinal depression; elytra widening evenly to apices, bases with low, uneven basal carina; sutural stria complete, unevenly converging to apex of suture; second elytral stria arises at middle of base, curving inward halfway toward sutural stria, ending free one-third from elytral apex; combined first tergite strongly depressed across middle of base, smooth, with just a few setae on disk; trichomes present at each side of basal third, comprising a deep transverse incision with long golden setae around entire circumference; venter mostly impunctate, glabrous; legs rather slender and smooth, tibiae widening slightly to apices; tarsi slender; male first abdominal ventrite broadly depressed across base. Aedeagus (Fig. 24-C, D) simple, slender, with ventrobasal knob; basal bulb with elongate oval dorsal diaphragm, with distinct diaphragmatic sclerite; tegmen tapering evenly from basal bulb to subacute, slightly descending apex; tegmen with mid-dorsal channel revealing internal sac bearing a bifid tip, one side acute, the other side shorter and narrowly rounded.

Etymology. The name of the species is Latin for 'basket', referring to the appearance of the apical setae of the antennal club. It is used as a noun in apposition.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. Among *Fustiger* species, this species is relatively slender, with the strongly expanded antennal club somewhat unusual.

Fustiger chuku **sp. nov.**
DNA barcode: GenBank PX930230
Figs 23G–I, 24E–F

Type material. Holotype ♂ (MECN-EN 40758): "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13103, Morphosp. Cu.020"; deposited in MECN. **Paratypes** (1♂, 1♀): same data as type (MECN-EN 40501, 40503).

Diagnosis. (TL: 2.0mm) Body (Fig. 23G) robust, dark reddish orange; head, pronotum, and elytra densely punctate, with dense, recumbent, golden setae, abdomen largely smooth and shining; head elongate, subrectangular, gular area widening slightly to front; eyes moderately large, occupying about one-fourth the side of head, frons sulcate between eye and antennal base; vertexal foveae not evident, dorsum convex; epistoma weakly produced anteriorly between antennal bases; third antennomere about four times as long as apical diameter, sides parallel, apically truncate; pronotum wider than long, lacking sulci or foveae, sides rounded, narrowing to weakly distinct anterior collar; elytra widening slightly from base to apex, emarginate at apical corners around abdominal trichomes, punctures somewhat elongate, aciculate, lacking basal foveae, sutural stria distinct; basal abdominal tergite (apparently three fused tergites) with conspicuous trichomes at basal corners, an erect fringe of dense setae projecting dorsad and posterad, base of tergite widely depressed between and behind these, otherwise strongly convex, very glabrous; legs with femora setose, tibiae smooth, none toothed; male mesotibia and mesofemur slightly enlarged, parallel-sided, flattened; tarsi short, laterally compressed, largely comprising apical tarsomere; metaventrite with setose line along midline; male 1st ventrites strongly depressed such that metaventrite and abdominal ventrites form smoothly concave surface; female 1st ventrite only depressed transverse immediately behind metacoxae. Aedeagus (Fig. 24E, F) very robust, only about 1.3× as long as wide, basal bulb very large, comprising two-thirds of aedeagus, flat dorsally, with large, irregularly circular dorsal diaphragm entirely filled

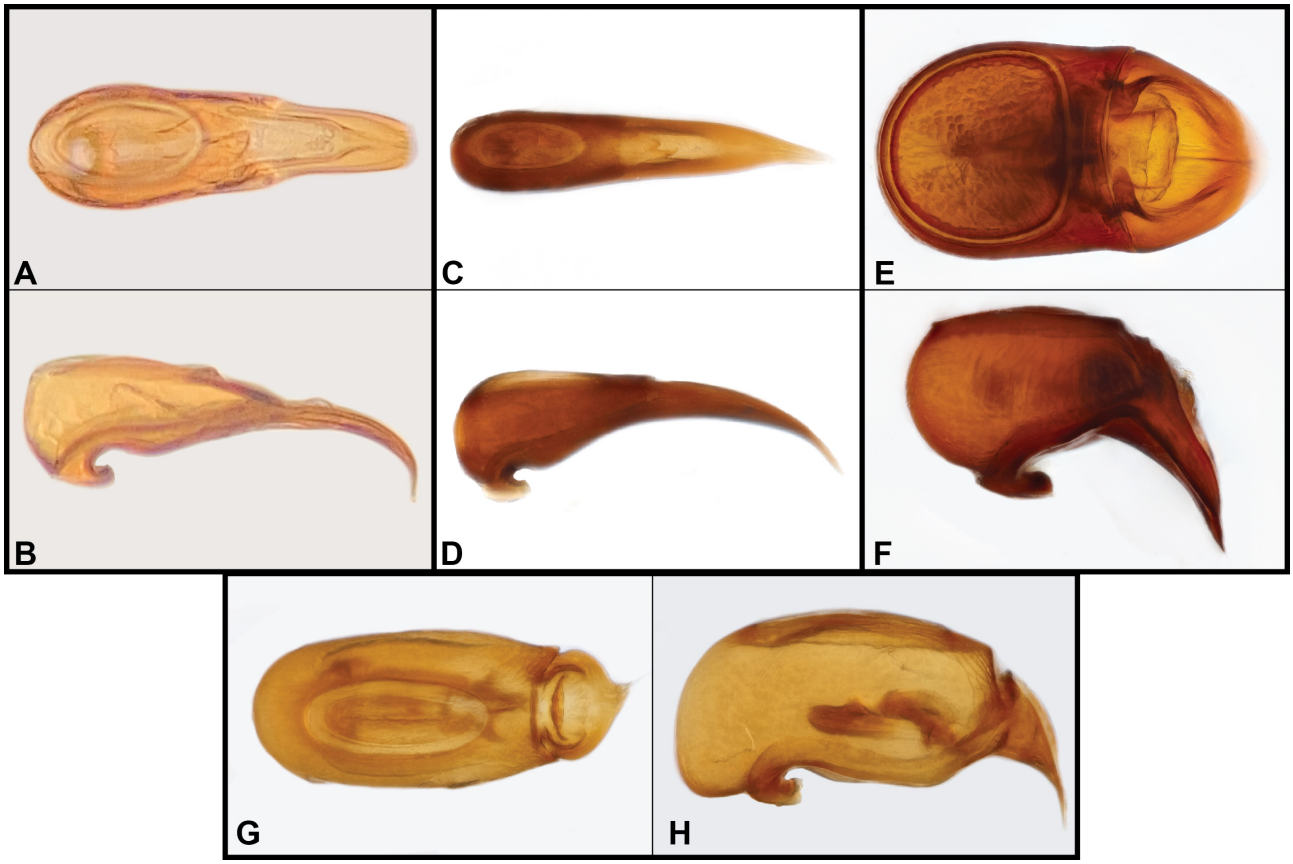

FIGURE 24. Aedeagus photos, *Fustiger* spp., dorsal, lateral views **A, B** *F. bucina* **C, D** *F. canistrum* **E, F** *F. chuku* **G, H** *F. tullu*.

with diaphragmatic sclerite; tegmen short, flat, narrowing to apex, directed ventrad, open dorso/distad for extrusion of complex, hidden internal sac.

Etymology. This species' name is a Kichwa word for 'stranger', owing to its certain existence within a colony of some type of ant.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is distinguished by its densely punctate elytra, head, and pronotum, contrasting with its very smooth abdomen and venter, and its subquadrate body shape.

Fustiger tullu **sp. nov.**
Figs 23J–L, 24G–H

Type material. Holotype ♂ (MECN-EN 41957): "ECUADOR: Napo, 0.89008˚S, 77.84771˚W, Archidona, Huambula Alto, VIII–IX.2024, 1041m, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13012, Morphosp. Ach.A.007" / "MECN-EN 41957"; deposited in MECN. **Paratypes** (1♂, 1♀): 1: same data as type; 1: same general locality, Santa Rita, -0.86833˚, -77.83778˚, 946m (MECN-EN 41958–41959).

Diagnosis. (TL: 1.2mm) Body (Fig. 23J) elongate, narrow, orange, rather coarsely punctate on the head and pronotum, less so on the elytra, and less so yet on the abdomen; head and antennae with short curved setae, pronotum and elytra with sparser, elongate setae, abdominal dorsum with thick, erect, scale-like setae; head about twice as long as wide, somewhat bulbous basally, narrowed in front of eyes, swollen at antennal bases; eyes at middle of head, with about 22 facets; vertexal foveae weak but evident near posterior margins of eyes; antennae extremely elongate, longer than head and pronotum combined, widening from base to apex, slightly curved beyond middle, apex truncate; pronotum coarsely rugose, slightly longer than wide, widest at middle, depressed along midline; elytra parallel-sided, apical corners slightly emarginate; basal corners of 1st (composite) abdominal tergite with small, knobbed trichomes bearing erect, curving, dense bundle of golden setae, arching over basal abdominal depression, tergum otherwise convex; legs somewhat elongate, setose, femora and tibiae weakly expanded toward apices; male meso- and metatarsi elongate, bent at base; male metatibiae with strong inner apical spurs. Aedeagus (Fig. 24G, H) very large (filling most of abdomen), elongate, largely comprising very large basal bulb, weakly convex dorsally, with narrowly elongate dorsal diaphragm, diaphragmatic sclerite present, smaller; tegmen very short, flat, narrowed, curving ventrad, open dorsally for extrusion of inner armature/sac, visible through body of basal bulb.

Etymology. The name of this species, a Kichwa word meaning 'thin', recognizes its elongate antennomeres and slender body.

Distribution. This species is known only from the eastern Andean foothills in the Napo region, Ecuador.

Remarks. The slender body and very elongate distal antennomeres help distinguish this distinctive species.

Euplectitae: Bythinoplectini

Besucheteidos Comellini, 1985

Figs 25–27

There are 13 described species in this neotropical genus (Comellini 1985). They range north to Mexico, with the southernmost known species previously described from Ecuador, *B. inca* Comellini, from high on Cotopaxi volcano. Ten new species are described below.

Diagnosis. (TL: 0.9–1.6mm, Avg. 1.2mm) Bythinoplectini are among the easiest neotropical tribes to recognize, being elongate in body form (like many other Euplectitae), having the pronotum narrowed basally, and having unique depressions on the dorsolateral portion of the epistoma for reception of the bulbous maxillary palpi. Among Bythinoplectini, *Besucheteidos* are defined by having 11 antennomeres, the last two of which form a tight club, separated only by a fine suture. The terminal maxillary palpomere is described as 'calabash-shaped', which apparently refers to a necked gourd, and the aedeagus is 'tubular, more or less irregular' (Comellini 1985). Considering Comellini's figures and the material available, the aedeagus can be described as having a strong basal constriction, with one or two basal apodemes directed distad, and a slightly expanded tegmen usually bearing a non-articulated distal spike that doubles back onto the tegmen, sometimes closely appressed, sometimes free.

Remarks. Most of the species are small-bodied and extremely similar. Most are sexually dimorphic in eye size, with those of the female smaller. It also appears that some species may have both winged (and large-eyed) and wingless forms of males (e.g. *B. alternans*, below), with accompanying eye size reduction. There is some intraspecific variation in the degree of punctation on various parts of the body, pronotal shape, and antennal segment widths. A couple of high elevation species exhibit some minor secondary sexual characters on the basal abdominal ventrites. But in general, identification is impossible without reference to the aedeagus.

Besucheteidos alternans **sp. nov.**

DNA barcodes: GenBank PX930362, PX930363

Figs 25A–F, 26A

Type material. Holotype ♂ (MECN-EN 40780): "ECUADOR: Pastaza, -1.4267˚, -78.0439˚, Río Anzu Reserve, 1342m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13133, Morphosp. RAn.016"; deposited in MECN. **Other material:** 3♂,1♀: same data as type, 1: "Caterino DNA voucher, Ext. MSC-13134, Morphosp. RAn.017" (MECN-EN 40781, 40189, 40186, 40188).

Diagnosis. (TL: 1.0mm) Head and pronotum (Fig. 25A–F) relatively coarsely punctate; eyes of macrophthalmous male large, protuberant, comprising ~40 ommatidia; vertexal foveae rather close together and situated just behind antennal bases; antennal insertion relatively short; pronotum broad, widest near front, abruptly narrowed to distinct anterior collar, narrowed, nearly constricted near base; lateral pronotal foveae well impressed at sides just behind middle; subbasal smooth depressions distinct, with median carina between; elytra long or short (in winged and wingless forms, respectively), with sides rounded, with alternating puncture rows on elytra, smooth in post-foveal depressions; 1st tergite short; prosternum depressed in front of oblique ridges; metaventrite smooth. Aedeagus (Fig. 26A) strongly constricted near base, with distinct, oblique basal collar & short basal apodeme; tegmen rather short, strongly widened from base, narrowed subapically, apical lobe narrow, rounded, 'dolphin-head' shaped in lateral view; tegmenal process arising at widest part, strongly curved basad then ventrad alongside tegmen, acutely projecting below ventral margin.

Etymology. This species is named for the alternating punctate and impunctate elytral rows.

Distribution. This species is known only from lower part of the Río Pastaza Watershed, in the foothills of Pastaza Province, Ecuador.

Remarks. The type specimen of this species is a large-eyed, winged male. The alternating punctate/impunctate rows on the elytra are more distinct than in most other species, and the aedeagus is very distinctive. The extracted specimen listed under 'other material' (MECN-EN 40781; Fig. 25D–F) is flightless and small eyed, appearing to be an alternate morph of the same species. Its aedeagus has been examined, and is generally similar, though slightly shorter.

Besucheteidos ecominga **sp. nov.**

Figs 25G–I, 26B

Type material. Holotype ♂ (MECN-EN 40828): "ECUADOR:Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13181, Morphosp. Mch.044"; deposited in MECN. **Paratypes** (2♂, 3♀, same general locality and same date as type): 4: -1.3868˚, -78.2929˚, 2304m (MECN-EN, 40270, 40303, 40310, 40318, 40321. **Other material:** 1♂, 1♀: "ECUADOR: Tungurahua, -1.4343˚, -78.3114˚, NaturetrekCandelariaRes,2145m,13.XI.2024,M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13209, Morphosp. Cnd.025" (MECN-EN 40856, 40417).

Diagnosis. (TL: 1.2mm) The species of this genus are all extremely similar externally, and are diagnosed from the first species only to the extent that they differ. This species principally differs from the norm in the following characters: head and prothorax (Fig. 25G) relatively densely punctate; vertexal foveae distinct, slightly oblique, placed further forward and closer together than most, situated about midpoint between eye and antennal insertion;

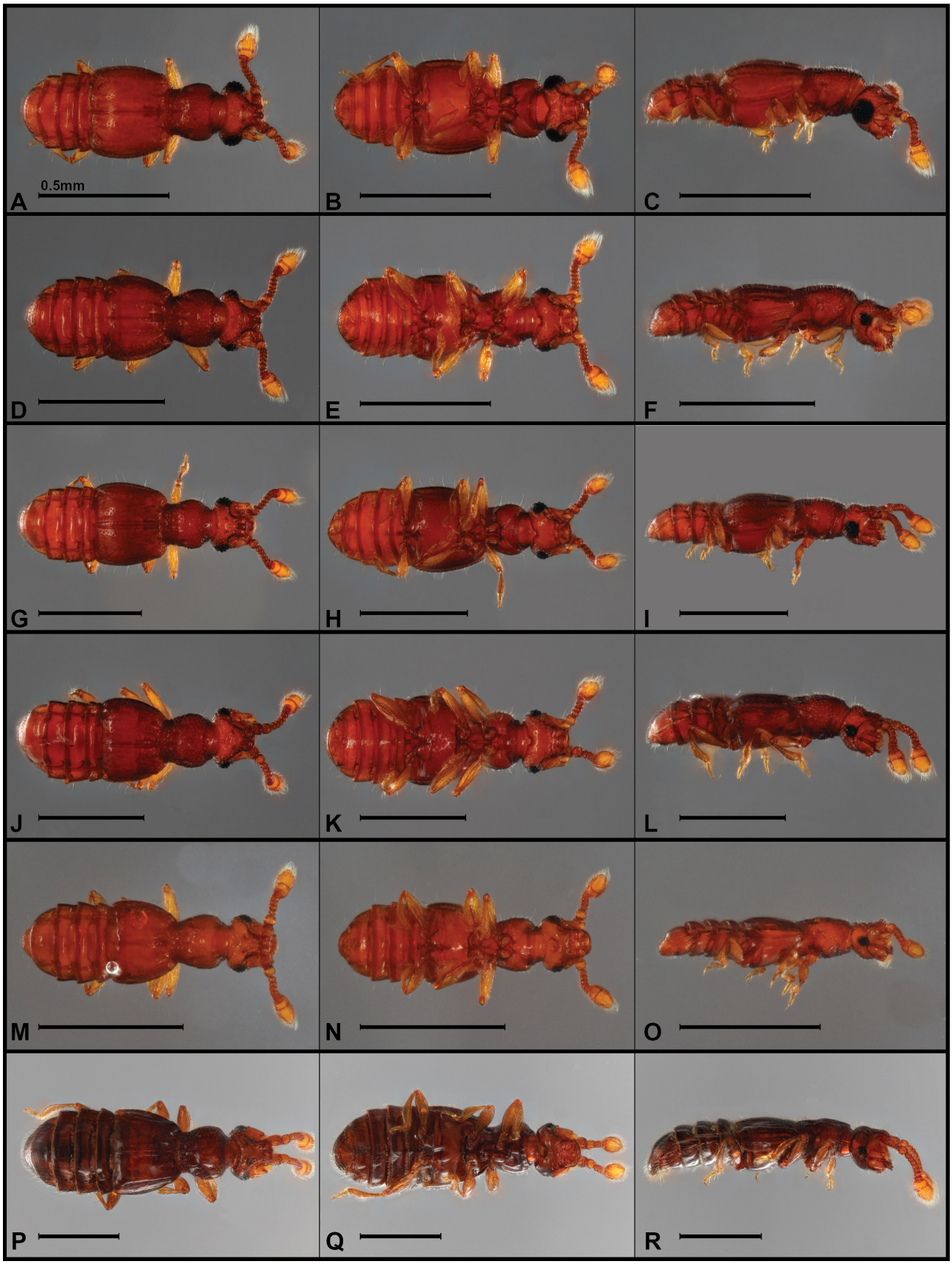

FIGURE 25. Habitus photos, *Besucheteidos* spp., dorsal, ventral, lateral views **A–C** *B. alternans* (macropterous form) **D–F** *B. alternans* (micropterous form) **G–I** *B. ecominga* (macropterous form) **J–L** *B. ecominga* (micropterous form) **M–O** *B. egens* **P–R** *B. perpolita.* Scale bars = 0.5mm.

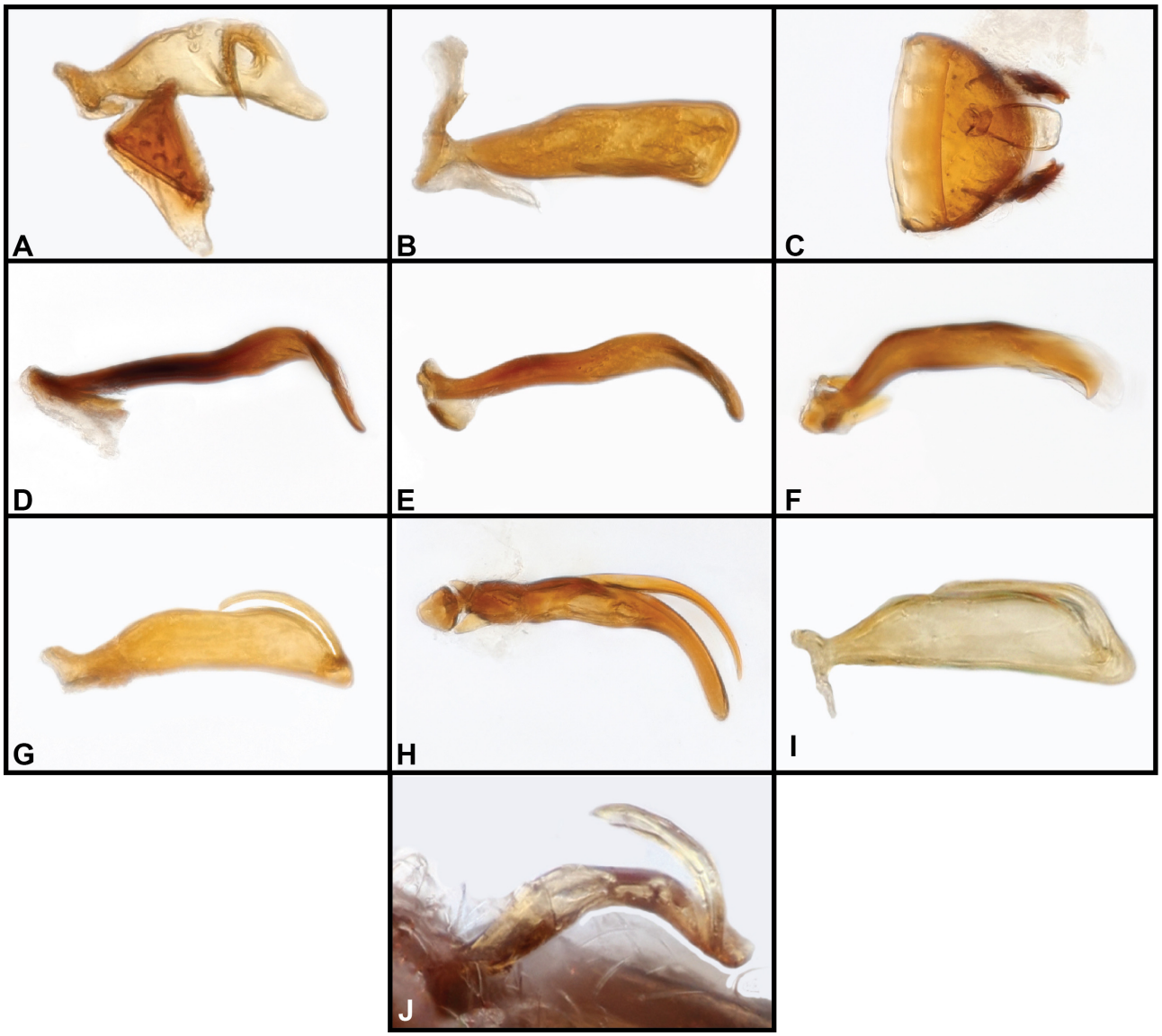

FIGURE 26. Aedeagus photos, *Besucheteidos* spp., lateral view **A** *B. alternans* **B** *B. ecominga* **C** *B. egens* **D** *B. perpolita* **E** *B. sofiae* **F** *B. kapya* **G** *B. otonga* **H** *B. shina* **I** *B. simbanai* **J** *B. dilatata*.

antennal process slightly constricted behind insertions; eyes variable in size, with from ~14–36 ommatidia; pronotal punctation denser toward base, subbasal smooth depressions present, but rather small; elytral length varied (males may be winged or wingless), slightly less punctate in postfoveal depressions; 1st abdominal tergite quite short, about 2/3 length of 2nd & 3rd, with slightly transverse basolateral depressions; prosternum depressed anteriorly, with weak, oblique ridges from precoxal foveae to near anterior corners; metaventrite distinctly punctate. Aedeagus (Fig. 26B) strongly constricted at base, with short basal collar bearing a short, thick basal apodeme; tegmen cylindrical, widened from base to middle, remaining similar in thickness to apical fourth, then flattening to apex that is narrowly rounded in lateral view, slightly obliquely subquadrate in dorsal view, with subapical process that bends back alongside tegmen, slightly bladelike, thickened along leading and trailing edges, thinner between.

Etymology. The species name recognizes the efforts of La Fundación EcoMinga, which established and manages both of the sites known to host this species. ‘Minga’ refers to a local practice of collective work, cooperation to improve a community.

Distribution. This species is known from cloud forests both north and south of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. Two males from the two different populations exhibit distinctly different eye sizes as well as different elytral lengths (the larger eyed individual is fully winged). However, they are very similar in all other characters, and this is most likely indicative of interindividual variability. They share the punctate metaventrite, which is slightly unusual in the genus. The aedeagus is similar to that of the preceding species, but slightly narrower, without a median constriction, and with the distal process arising subapically.

Besucheteidos egens **sp. nov.**
DNA barcode: GenBank PX930346
Figs 25M–O, 26C

Type material. Holotype ♂ (MECN-EN 41938): "ECUADOR: Cotopaxi, -0.4168˚, -79.0044˚, Bosque Integral Otonga, 14.VIII.2024, 2093m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12890, Morphosp. Ot.A.055" / "MECN-EN 41938"; deposited in MECN. **Paratypes** (1♂, 3♀, same general locality and date as type): 2: same data as type; 1: -0.4165˚, -79.0047˚, 14.VIII.2024, 2107m; 1: -0.4167˚, -79.0043˚, 14.VIII.2024, 2097m (MECN-EN 41939–41942).

Diagnosis. (TL: 0.9mm) Body (Fig. 25M) reddish-orange, mostly smooth, with fine semirecumbent setae; head with vertexal foveae separated by about width of antennal bases, vertex smooth behind and at sides; antennae 10-segmented, scape short and thick, cylindrical, antennomere II as wide, globular, III–IX similar in width, increasingly transverse (shorter), X–XI forming tight club, XI about 1.5× as long as X; gula with deep basal fovea; pronotum widest near front, narrowed to slightly constricted anterior collar, evenly narrowed to base; lateral foveae distinctly impressed, base of disk with shallow, smooth depressions on either side of weak basomedian carina; elytra short (flightless), each with sutural and one lateral fovea, shallow depressions extending posterad from each; 1st three abdominal tergites with rather deep, broad depression across middle ¾ of base; prosternum and legs lacking secondary sexual characters. Aedeagus (Fig. 26C) simple with narrow subbasal constriction and short basal collar, with short, incurved parameres appearing fused distad basal collar; tegmen flat, widening toward apex, sides thickened, narrowed slightly to truncate apex.

Etymology. This species name means 'wanting', in this case wanting one antennomere.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is an awkward fit here, mainly because it has only 10 segmented antennae. The only neotropical Bythinoplectine genus supposedly with 10 segmented antennae is *Pyxidion* Comellini, but several other characters seem incompatible with that possibility, in particular the clearly and closely associated 2 segmented antennal club, and the last maxillary palpomere which does not have a strong median constriction. In general appearance it is largely indistinguishable from members of *Besucheteidos*, aside from the number of funicular antennomeres.

Besucheteidos perpolita **sp. nov.**
Figs 25P–R, 26D

Type material. Holotype ♂ (QCAZ-I-280284): "ECUADOR: Pichincha, -0.30795˚, -78.23255˚, La Virgen, 3694m, 28JUL2016, S. Muñoz & R.Tobar, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13043, Morphosp. Virgen1"; deposited in QCAZ. **Paratypes** (2♀): same data as type (QCAZ-I-280285–280286).

Diagnosis. (TL: 1.6mm) Body (Fig. 25P) medium-sized, dark reddish, mostly smooth and sparsely setose; head punctate around base and on dorsal sides of antennal elevation; vertexal foveae deep, located at edges of antennal excavations; eyes rather small, comprising ~18 ommatidia; antennae short, antennomere I cylindrical, about 2.5× as long as wide, II globose, III subconical, IV–IX transverse, progressively shorter and wider, X–XI enlarged, setose; pronotum with sides rounded, widest behind front, anterior part of disk smooth, posteriorly subrugose; lateral foveae deeply impressed, behind middle; middle of base of disk with pair of deep, smooth impressions, with a weak carina separating them; elytra short, sides weakly rounded, each with two dorsobasal foveae, weakly depressed behind; subhumeral fovea not distinct, but subhumeral stria deeply sulciform, forming lateral epipleural carina; abdomen with 1st tergite shorter than 2nd and 3rd, with transverse, setose depressions along base of each; paratergites wide, posterior corners projecting; anterior prosternal margin only very weakly serrate; male 1st and second ventrite with weak, setose median carina. Aedeagus (Fig. 26D) constricted at base, with paired, short basal apodemes; tegmen narrow at base, widening slightly and weakly sinuate, flattened, abruptly bent, widened one-fourth from tip; apex slightly sinuate on both sides, almost disklike.

Etymology. This species name refers to its 'smooth' integument.

Distribution. This species is only known from páramo habitats southeast of Quito, Pichincha Province, Ecuador.

Remarks. This species and the following appear closely related, and are both known only from páramo sites, suggesting a high elevation radiation of *Besucheteidos*, comparable to that in *Panabachia* (Muñoz-Tobar & Caterino 2019, 2025), previously undetected.

Besucheteidos sofiae **sp. nov.**
Figs 26E, 27A–C

Type material. Holotype ♂ (QCAZ-I-280287): "ECUADOR: Imbabura, 0.14517˚, -78.27922˚, Mojanda, 3715m, 28DEC2016, S.Muñoz, A.Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13059, Morphosp. Mojanda1"; deposited in QCAZ.

Diagnosis. (TL: 1.5mm) This species is closely related to and very similar to the preceding, differing principally in the following characters: head (Fig. 27A) with punctures along base and sides of antennal projection rather fine and sparse; eyes (of male) slightly larger; pronotum less strongly constricted at base; male with carina of 2nd visible abdominal ventrite more conspicuous, setose along its entire length. Aedeagus (Fig. 26E) with base of tegmen more distinctly sinuate, widened and flattening just beyond midpoint, curved (rather than bent) to broadly rounded, spoon-shaped apex, the tip notched, with one side curving over other.

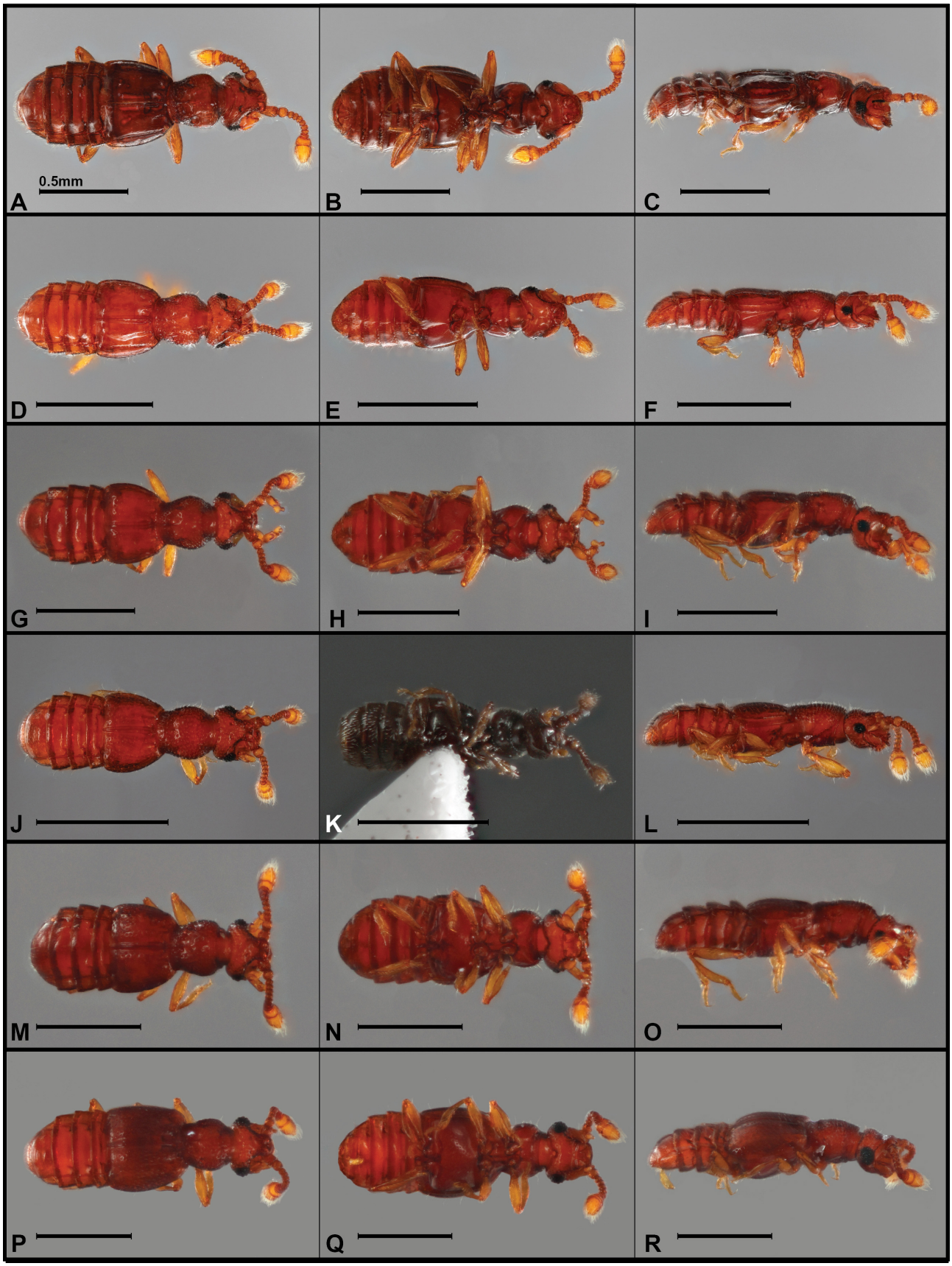

FIGURE 27. Habitus photos, *Besucheteidos* spp., dorsal, ventral, lateral views **A–C** *B. sofiae* **D–F** *B. kapya* **G–I** *B. otonga* **J–L** *B. shina* **M–O** *B. simbanai* **P–R** *B. dilatata.* Scale bars = 0.5mm.

Etymology. I am pleased to name this species for Dr. Sofia I. Muñoz-Tobar, the author's former doctoral student of high Andean beetles, now a researcher with INABIO, and collector of this species.

Distribution. This species is only known from páramo habitats of northern Ecuador, in Imbabura Province.

Remarks. The aedeagal shape is the most distinctive character separating this species from the preceding. However, it is likely that each is locally endemic to its respective peak, and can be identified based on geography as much as morphology.

Besucheteidos kapya **sp. nov.**
Figs 26F, 27D–F

Type material. Holotype ♂ (MECN-EN 40904): "ECUADOR: Napo, -0.5983˚, -77.8954˚, Est. Biol. Yanayacu, Stream Tr., 2192m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13323, Morphosp. Yn.A.041b"; deposited in MECN. **Paratypes** (4♂, same general locality as type): 2: -0.5986˚, -77.8949˚, Stream Tr., 2185m; 2: -0.5974˚, -77.8934˚, Ridge Tr., 2222m (MECN-EN 41928–41931).

Diagnosis. (TL: 1.1mm) Body (Fig. 27D) small, orange, only sparsely setose, pronotum and head distinctly punctate, elytra much less so; head with deep vertexal foveae equidistant from each other and to eyes; eyes medium sized, ~16 ommatidia; antennae very compressed, antennomere I cylindrical, about twice as long as wide, II wider but shorter than long, III–VIII transverse, closely appressed, IX–X forming weakly divided club, X glabrous; pronotum widest near front, narrowed to short apical collar; lateral foveae distinct, near midpoint; basally pronotum with small, smooth depression on each side; elytra short, sides weakly rounded, each with two dorsobasal foveae, weakly depressed behind; subhumeral fovea not distinct, but subhumeral stria deeply sulciform, forming lateral epipleural carina; abdomen with 1st tergite shorter than 2nd and 3rd; paratergites wide, posterior corners projecting; male venter not exhibiting obvious secondary sexual characters. Aedeagus (Fig. 26F) constricted at base, with paired short basal apodemes; tegmen bent laterad then distad, widening slightly, apex with incurved hook and separate, slightly longer, rounded membraneous lobe.

Etymology. The species name 'kapya' means 'smooth' in Kichwa.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. Compared to the other species of *Besucheteidos*, particularly those with which it is sympatric, this species can be recognized by its mostly impunctate elytra.

Besucheteidos otonga **sp. nov.**
Figs 26G, 27G–I

Type material. Holotype ♂ (MECN-EN 41932): "ECUADOR: Cotopaxi, -0.4176˚, -79.0040˚, Bosque Integral Otonga, 13.VIII.2024, 2063m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12862, Morphosp. Ot.A.027"; deposited in MECN. **Paratypes** (2♂, 3♀, same general locality and same date as type): 1: same data as type; 1: -0.4181˚, -79.0039˚, 2054m; 1: -0.4167˚, -79.0043˚, 2097m; 1: -0.4176˚, -79.0041˚, 2062m; 1: -0.4168˚, -79.0044˚, 2093m; 1: -0.4164˚, -79.0046˚, 2109m (MECN-EN 41933–41937).

Diagnosis. (TL: 1.3mm) Body (Fig. 27G) small, orange, only sparsely setose, pronotum and head lightly punctate, elytra less so; head with vertexal foveae separated by about eye diameter; eyes medium sized, comprising ~26 ommatidia; antennae very compressed, antennomere I cylindrical, about 1.25× as long as wide, II similar in width, shorter, rounded, III weakly conical, IX–VIII transverse, closely appressed, IX very short, cupuliform, X–XI forming weakly divided club; pronotum widest about one-third from front, sides rounded, weakly constricted at base; lateral foveae distinct, just behind middle; basally pronotum with small, smooth depression on each side, separated by a distinct carina; elytra short, sides weakly rounded, each with two dorsobasal foveae, weakly depressed behind; subhumeral fovea not distinct, but subhumeral stria sulciform, forming lateral epipleural carina; abdomen with 1st tergite shorter than 2nd and 3rd, each with depression in anterolateral corner, with short carina along its inner edge; paratergites wide, posterior corners projecting; male venter not exhibiting obvious secondary sexual characters. Aedeagus (Fig. 26G) constricted at base, with basal collar slightly expanded, basal apodemes small; tegmen widened near base, width constant to near apex, slightly constricted near middle, narrowed to narrowly rounded apex, with narrow, strongly recurved process laying back along tegmen's apicodorsal half.

Etymology. This species is named for the Otonga reserve where the species was discovered. That name in turn was based on a Tsachila word 'oto', meaning 'of the Earth.' It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of the Bosque Integral Otonga, in northwestern Cotopaxi Province.

Besucheteidos shina **sp. nov.**
Figs 26H, 27J–L

Type material. Holotype ♂ (MECN-EN 40827): "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13180, Morphosp. Mch.043" / "MECN-EN 40827"; deposited in MECN.

Diagnosis. (TL: 0.9mm) This species is very similar to the preceding, with which it is sympatric. It differs from it

and others in the genus mainly by the following characters; head and pronotum (Fig. 27J) densely punctate; head with vertexal foveae rather close together, separated by less than one eye diameter; eyes medium-small, comprising about 12 ommatidia; pronotum rather elongate, widened toward front, but not as strongly as in many, narrowed almost evenly to base; subbasal depressions small, with a few punctures within; elytra short, broad, slightly less densely punctate in post-foveal depressions, apparently flightless; metaventrite only sparsely punctate. Aedeagus (Fig. 26H) strongly constricted at base, with distinct subbasal collar and weakly attached, paired basal apodemes; tegmen subcylindrical from base to apical third, weakly constricted about one-fourth from base, narrowing and strongly curving apically to narrowly rounded tip; a strongly curved, narrow tegmenal process emerges from just basad midpoint, diverging from tegmenal axis, curving back to near tegmenal apex.

Etymology. This species name comes from a Kichwa term meaning 'similar', referring to the difficulty of distinguishing this species from others in this genus.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species exhibits a relatively small body size, and has weakly differentiated pronotal impressions. Its aedeagus is, however, markedly distinct. It is likely that a winged form of the species could be found in the region.

Besucheteidos simbanai **sp. nov.**
Figs 26I, 27M–O

Type material. Holotype ♂ (MECN-EN 41924): "ECUADOR: Napo, -0.5939˚, -77.8980˚, Est. Biol. Yanayacu, Ridge Tr., 2368m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12972, Morphosp. Yn.A.041"; deposited in MECN. **Paratypes** (1♂, 2♀): same data as type (MECN-EN 41925–41927).

Diagnosis. (TL: 1.2mm) This species is disinguished principally by the following characters: head punctate mainly dorsally near sides; vertexal foveae small, closer together than either is to eye; pronotum (Fig. 27M) coarsely and irregularly puncate, wider than long, widest just behind front, narrowed anteriorly to distinct anterior collar; lateral pronotal foveae located at basal third, deep; basomedial depressions present but weakly defined, with a few punctures; elytra short, punctate but less coarsely so than pronotum; 1st abdominal tergite short. Aedeagus (Fig. 26I) strongly constricted at base, with short basal collar bearing a short, basal apodeme; tegmen cylindrical, widened markedly to basal third, then widening more weakly to apical fourth, narrowing to apex that is narrowly rounded in lateral view; apical process thick at base, bent directly back and following contours of tegmen back to basal third.

Etymology. This species name honors Mr. Jose Simbaña, resident manager of Yanayacu Biological Station, who assisted with the author's visit there.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the western Napo Province of Ecuador.

Remarks. The somewhat irregularly coarsely punctate pronotum (Fig. 27M) is distinctive in this species, and the also punctate elytra will help distinguish it from the sympatric species that follows, in which the elytra are very smooth. The aedeagal shape is similar to that of *B. otonga*, and the two may be closely related, but the basal thickness, length, and close appression of the apical process to the tegmen are unique to this species.

Besucheteidos dilatata **sp. nov.**
Figs 26J, 27P–R

Type material. Holotype ♂ (MECN-EN 41943): "ECUADOR: Napo, -0.5958˚, -77.8927˚, Est. Biol. Yanayacu, Aburrian Tr., 2283m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13323, Morphosp. Yn.A.042"; deposited in MECN. **Paratypes** (2♂, same general locality as type): 1: same data as type; 1: -0.5939˚, -77.8980˚, Piha Tr., 2368m (MECN-EN 41944–41945).

Diagnosis. (TL: 1.4mm) Body (Fig. 27P) relatively large, reddish orange; head and pronotum moderately punctate, elytra less so, abdomen smooth, body setae sparse, recumbent; head with vertex transversely convex behind shallow arcuate depression connecting vertexal foveae; antennal base slightly elevated, depressed along midline; penultimate maxillary palpomere short, subtriangular, with small sensory plaque near basal angle; terminal maxillary palpomere pill-shaped, apical margin straight dorsal tip with discrete rounded disk as wide as palpomere; eyes moderately large, finely faceted; antenna compact, scape short, wide, antennomere II globose, antennomeres III–VIII short, transverse, IX widened slightly at apex, X setose but shining, distinctly asymmetrical, longer along lower/inner edge than upper/outer; apical antennomere about 2× as long as X; pronotum widest near front, evenly narrowed to base, disk sparsely punctate anterad, more densely along base, lateral foveae just behind midline; pair of glabrous subbasal depressions separated by short, weak median ridge; elytral widening toward apex, sides slightly rounded (winged), each elytron with sutural and one lateral basal fovea, with very shallow, indistinct, impunctate depressions posterad. Aedeagus (Fig. 26J) narrow, constricted at base; tegmen slightly flattened, bent at middle, apex rounded; accessory process large, inserted subapically on left side, curving backwards above the tegmen approximately half its length.

Etymology. This species' name refers to the enlarged ('dilated') 10th antennomere.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the western part of Napo Province, Ecuador.

Remarks. While initially considered potentially a winged form of one of the other species at this locality, this species is actually distinctive in a number of characters, even compared to most others in the genus. The maxillary

palp, with its short penultimate and elongate oval terminal palpomeres suggests a possibly distinct genus. Yet the asymmetrical, tightly conjoined 10th antennomere is similar to others within *Besucheteidos*.

Hendecameros Comellini, 1985

Figs 28–29

10 described species are known in this segregate of the former *Bythinoplectus* Reitter, from Costa Rica through Brazil (Asenjo *et al.* 2019a; Comellini 1985). Five new species are described below.

Diagnosis. (TL: 1.1–2.2mm, Avg. 1.6mm) *Hendecameros* is distinguished from other Bythinoplectini by having 11 antennomeres (the plesiomorphic condition), with the last two antennomeres forming a loose club, and the terminal maxillary palpomere subtriangular and larger than the penultimate. Many species are quite large (for the tribe), and these, especially, have the lower surface of the head distinctively broad and convex, with a deep basal fovea but no other indication of a gula. Comellini (1985) describes the male genitalia as having the 'aedeagus formed of two superimposed blades, of different sizes, whose ends diverge'. The shorter of the two blades (or 'lame' in the original French) appears to correspond to the basal apodeme of other Bythinoplectini and even other Euplectitae such as Dimerini (where it has been alleged to be a modifed paramere; Chandler 2001).

Remarks. This genus encompasses rather remarkable variation in body size, shape, and sculpturing.

Hendecameros cabezon **sp. nov.**

DNA barcode: GenBank PX930385

Figs 28A–C, 29A

Type material. Holotype ♂ (MECN-EN 40893): "ECUADOR: Morona-Santiago, -3.0234˚, -78.5893˚, Limón Indanza, Área Ecológica de Conservación Municipal Tinajillas – Río Gualaceño, 2311m, 31.I.2025, M.Barreno | M. Basantes" / "Caterino DNA voucher, Ext. MSC-13312, Morphosp. Tin.005" / "MECN-EN 40893"; deposited in MECN.

Diagnosis. (TL: 2.2mm) Body (Fig. 28A) large, reddish, sparsely but uniformly setose; head with broad posterior portion narrow, with shortly produced antennal pedestal; median vertexal fovea deep, lateral foveae small, located just along sides of base of antennal insertion; eyes large, comprising about 40 ommatidia; genae moderately convex, with sparse but distinct punctures; antennae elongate, scape about 3× as long as maximum (apical) width, antennomere II slightly narrower, just longer than wide, III subconical, IV–IX progressively shorter and more transverse, X–XI forming loose setose club, XI about twice as long as X; pronotum coarsely punctate, slightly more densely so basally, widened from base to apical third, weakly dentate at widest point, slightly concave anterad, narrowed to very short anterior collar; lateral pronotal foveae small but deep; elytra long, with only sparse fine punctures, sides weakly rounded, each with deep sutural and one smaller lateral dorsobasal foveae, humeri weakly dentate; subhumeral fovea and stria present; 1st–3rd abdominal tergites deeply sulcate along basal margins. Aedeagus (Fig. 29A) constricted at base, with small basal apodeme in addition to wide, secondary basal flange, which runs along basal half of tegmen; tegmen abruptly widened at base, curving 90 degrees to slightly expanded, flat, rounded apex.

Etymology. The species name translates roughly from the Spanish as 'big head'.

Distribution. This species is known only from cloud forests east of Cuenca, in Morona-Santiago Province, Ecuador.

Remarks. This species is among the larger species of *Hendecameros*, among which it is somewhat distinguished by having relatively impunctate elytra, being fully winged, and having the sides of the pronotum slightly uneven.

Hendecameros ceiba **sp. nov.**

Figs 28D–F, 29B

Type material. Holotype ♂ (ZSFQ-i23248): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12641, Morphosp. ElP.A.040"; deposited in ZSFQ.

Diagnosis. (TL: 1.5mm) Body (Fig. 28D) elongate, parallel-sided, reddish orange, head between eyes and apical half of elytra darker; antennae with two-segmented club, no secondary sexual modifications to intermediate antennomeres; pronotum with sides narrowed to base; lateral foveae present, connected by weak transverse impression; elytron with one sutural and one humeral dorsal fovea, subhumeral fovea present but very fine. Aedeagus (Fig. 29B) with main lobe of tegmen bent at 90° two-thirds from base, apical portion convex on distal edge, subacute at tip; basal lobe of tegmen weakly 'S'-shaped, slightly expanded at tip.

Etymology. This species' name reocgnizes the Ceiba Foundation, manager of El Pahuma, among other reserves, and facilitator of my fieldwork there in 2011.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is relatively small, while also being unusually narrowly elongate. The median fovea of the pronotum is quite deeply impressed, while the posterior margin becomes distinctly rugose.

Hendecameros grandis **sp. nov.**

Figs 28G–I, 29C

Type material. Holotype ♂ (MECN-EN 41946): "ECUADOR: Cotopaxi, -0.4181˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 2054m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12876, Morphosp. Ot.A.0241" / "MECN-EN



FIGURE 28. Habitus photos, *Hendecameros* spp., dorsal, ventral, lateral views **A–C** *H. cabezon* **D–F** *H. ceiba* **G–I** *H. grandis* **J–L** *H. tenuis* **M–O** *H. tumes.* Scale bars = 1.0mm.

41946"; deposited in MECN. **Paratype** (1♂): same data as type (MECN-EN 41947).

Diagnosis. (TL: 2.2mm) Body (Fig. 28G) large, dark reddish, conspicuously punctate; head broad, with posterior portion and antennal pedestal short, smooth, with median fovea immediately behind antennal bases; lateral foveae small and almost hidden beneath them; eyes medium-small, comprising about 15 ommatidia; genae strongly convex beneath, weakly but uniformly punctured, with covering of very short setae; dorsal palpal depressions large, delimited by carinae; antennae moderately long, scape widening from base to apex, about 3× as long as apical width, antennomere II narrower and cylindrical, about 1.5× as long as wide; III–VIII subquadrate, slightly wider than long, IX transverse, X–XI forming loose, setose club, XI only about 1.5× as long as X; pronotum uniformly punctate except in small, smooth mediobasal depression; sides strongly widened from base to middle, parallel in anterior half; lateral foveae conspicuous, located along narrowing sides of base; elytral more finely

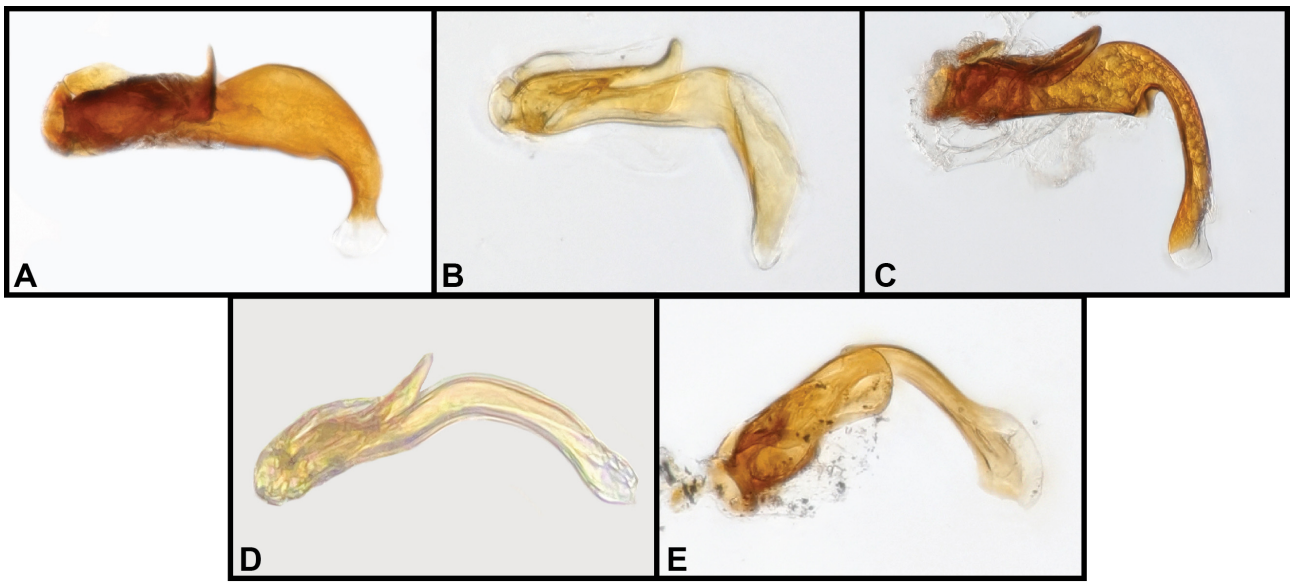

FIGURE 29. Aedeagus photos, *Hendecameros* spp., lateral views **A** *H. cabezon* **B** *H. ceiba* **C** *H. grandis* **D** *H. tenuis* **E** *H. tumes*.

but also uniformly punctate, each with deep sutural and one lateral dorsobasal fovea, humeri weakly dentate at subhumeral fovea, subhumeral stria deeply impressed, creating elevated epipleural margin; abdomen depressed along base of each tergite; paratergites wide, roundly projecting at posterolateral corners. Aedeagus (Fig. 29C) finely and weakly constricted at base, with short basal collar; basal apodeme thick, sinuous, narrowing slightly to subacute apex near bend of tegmen; tegmen cylindrical in basal half, then abruptly narrowed and bent almost perpendicularly to long, narrow, curving apex.

Etymology. This species name recognizes it as among the largest members of its genus.

Distribution. This species is known only from the cloud forests of the Bosque Integral Otonga, in northwestern Cotopaxi Province.

Remarks. This is among the larger species of *Hendecameros*, recognizable by its broad head, somewhat elongate antennae, punctate pronotum depressed at base, deep sutural foveae, and remarkably distinctive aedeagus, with a notch at the median bend of the tegmen.

Hendecameros tenuis **sp. nov.**
Figs 28J–L, 29D

Type material. Holotype ♂ (ZSFQ-i23249): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12685, Morphosp. LL.A.021"; deposited in ZSFQ.

Diagnosis. (TL: 1.1mm) Body (Fig. 28J) elongate, parallel-sided, reddish orange; antennae with two-segmented club, antennomeres VI–VII slightly larger than those that proceed and follow, antennomere VII with narrow expansion along inner apex; pronotum with sides subparallel in anterior half, posterior corners obliquely narrowed behind; disk with broad, shallow transverse subbasal impression, not extending to weak lateral foveae; elytra elongate, parallel-sided (flight wings present). Aedeagus (Fig. 29D) with main lobe of tegmen weakly sinuate at base, parallel-sided and curved laterad toward apex, incised along inner edge of apical half at 90° two-thirds from base, apical portion convex on distal edge; basal lobe of tegmen weakly 'S'-shaped, apex narrowed, subacute, pointing distad opposite main lobe.

Etymology. This species' name refers to its elongate, slender body.

Distribution. This species is known only from lowland, seasonally dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. This species is a small and elongate representative of the genus. However, its male exhibits a modifed antennomere VII, a dimorphism that appears rarely in *Hendecameros*, though it is also present in the following species.

Hendecameros tumes **sp. nov.**
DNA barcode: GenBank PX930361
Figs 28M–O, 29E

Type material. Holotype ♂ (MECN-EN 40779): "ECUADOR: Pastaza, -1.4267˚, -78.0439˚, Río Anzu Reserve, 1342m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13132, Morphosp. RAn.015"; deposited in MECN. **Paratype** (1♀): same data as type (MECN-EN 40187).

Diagnosis. (TL: 1.3mm) Body (Fig. 28M) smaller, elongate, parallel-sided, orange, finely setose; head rather narrow, with vertex strongly margined posteriorly; median vertexal fovea large, lateral ones inconspicuous; eyes large, occupying entire genae; genae convex below; antennae compact, antennomere I cylindrical, barely twice as long as wide, II roundly subquadrate, III

conical, IV–VI transverse with margins rounded, male antennomere VII enlarged, projecting on inner margin, VIII–IX very short, transverse, X short, XI about 3× as long as X, setose; pronotum widened from base to middle, anteriorly sides parallel, depressed in 'V'-shaped anterior area to neck; lateral subbasal foveae deeply impressed; posteromedial portion of pronotal disk broadly depressed; elytra long, sides weakly rounded, each with sutural and one lateral dorsobasal fovea; subhumeral fovea and stria present. Aedeagus (Fig. 29E) weakly constricted at base, with narrow basal collar, widened briefly, then narrowed and cylindrical, strongly bent almost perpendicularly at middle, widened beyond into flattened, rounded apical paddle; basal apodeme wide, mostly following basal half of tegmen, then with abruptly, thickly bent apex across axis, opposite in direction to bend of tegmen.

Etymology. This species name refers to the males' 'tumid' antennomere VII.

Distribution. This species is known only from the lower part of the Río Pastaza Watershed, in the Andean foothills of Pastaza Province, Ecuador.

Remarks. This species shares dimorphism in the shape of antennomere VII (Fig. 28M) with *H. tenuis*. While they are best distinguished by aedeagal characters, *H. tumes* is also generally broader in body form.

Euplectitae: Dimerini

Barroeuplectoides Park, 1942

Figs 30, 31, 32A–C

Only two species of *Barroeuplectoides* have been described, from Panama and Mexico (Asenjo *et al.* 2019). Seven new species are described below.

Diagnosis. (TL: 0.9–1.4mm, Avg. 1.4mm) This genus, and the tribe Dimerini in general, are recognized partly by the presence of frontal foveae in addition to vertexal ones, as well as the two-segmented antennal club and two segmented tarsi, for which the tribe is named. Both *Barroeuplectoides* and *Tuberoplectus* Park also share a bluntly serrate anterior prosternal margin. In *Barroeuplectoides* the frontal foveae are distinctly separate, while in *Tuberoplectus* they are fused into a single opening. Although not mentioned in the generic description (because the type of the genus, *B. zeteki* Park is based on a single female specimen), most males have secondary modifications of the 3rd visible abdominal tergite. Male genitalia have not been illustrated for either described species, but judging by the species described below they are highly distinctive, with a strong constriction between the short basal bulb and the tegmen. Chandler (2001) mentioned this as a tribal and potentially shared character with Bythinoplectini as "a pair of small sclerites or a ring at the base of the aedeagus that are not considered to be remnants of the parameres". The species are otherwise largely indistinguishable based on external characters, although minor variation in the shape of the pronotum may be helpful.

Barroeuplectoides cujigualpai **sp. nov.**
DNA barcode: GenBank PX930221
Figs 30A–C, 31A–B

Type material. Holotype ♂ (MECN-EN 41749): "ECUADOR: Guayas, -2.173485, -79.979409, Bosque Protector Cerro Blanco, Antenas 507, 06.V.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12817, Morphosp. CrBl.A.015" / "MECN-EN 41749"; deposited in MECN.

Diagnosis. (TL: 1.2mm) Head (Fig. 30A) mostly smooth, finely punctate and setose; eyes moderately large, with small convex facets; pair of small vertexal foveae present, separated by width of epistomal shelf; frontal impressions converging from foveae to close pair of frontal foveae on elevated shelf between antennal bases; antennae with rather short scape and pedicel, antennomeres III–VIII shorter, similar in size, corners rounded, IX slightly more quadrate, X and XI forming a distinct club, XI three times as long as X; pronotum widened from base to apex, sides weakly convex, basal band of pronotal disk with series of short, longitudinal carinae; pronotal disk punctate, with pair of lateral foveae and weak, median discal fovea, not joined by impression, shallow anterior depression in front of median fovea also present; elytra very smooth, each with two deep dorsobasal foveae, at suture and midway to humerus; subhumeral fovea weakly developed, but a crease present at base of subhumeral stria; male 2nd visible tergite (Fig. 30C) weakly elevated at middle of posterior margin; base of male 3rd visible tergite weakly depressed with faint median swelling, a prominent, anteriorly directed seta inserted near each posterolateral corner. Aedeagus (Figs. 31A, B) constricted subbasally, with short basal collar, distally-directed apodeme short; tegmen cylindrical at base, widening and flattened slightly beyond midpoint, apex ventrally broad, concave below, trilobed, with downturned hooks at each lateral corner and short medioventral tooth.

Etymology. I dedicate this species to Mr. Cristian Cujigualpa, Investigador Asociado with INABIO, proprietor of Bio-Zero entomological traps, and collector of this species.

Distribution. This species is known only from Ecuador's coastal mountains just northwest of Guayaquil.

Remarks. The male abdominal modifications of this species are extremely subtle, although the enlarged setae near the posterior corners of the 3rd visible tergite seem to be unique.

Barroeuplectoides donaritae **sp. nov.**
DNA barcode: GenBank PX930224
Figs 30D–F, 31C

Type material. Holotype ♂ (MECN-EN 40749): "ECUADOR: Sucumbíos, -0.2049°, -75.9266°, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13094, Morphosp. Cu.011";

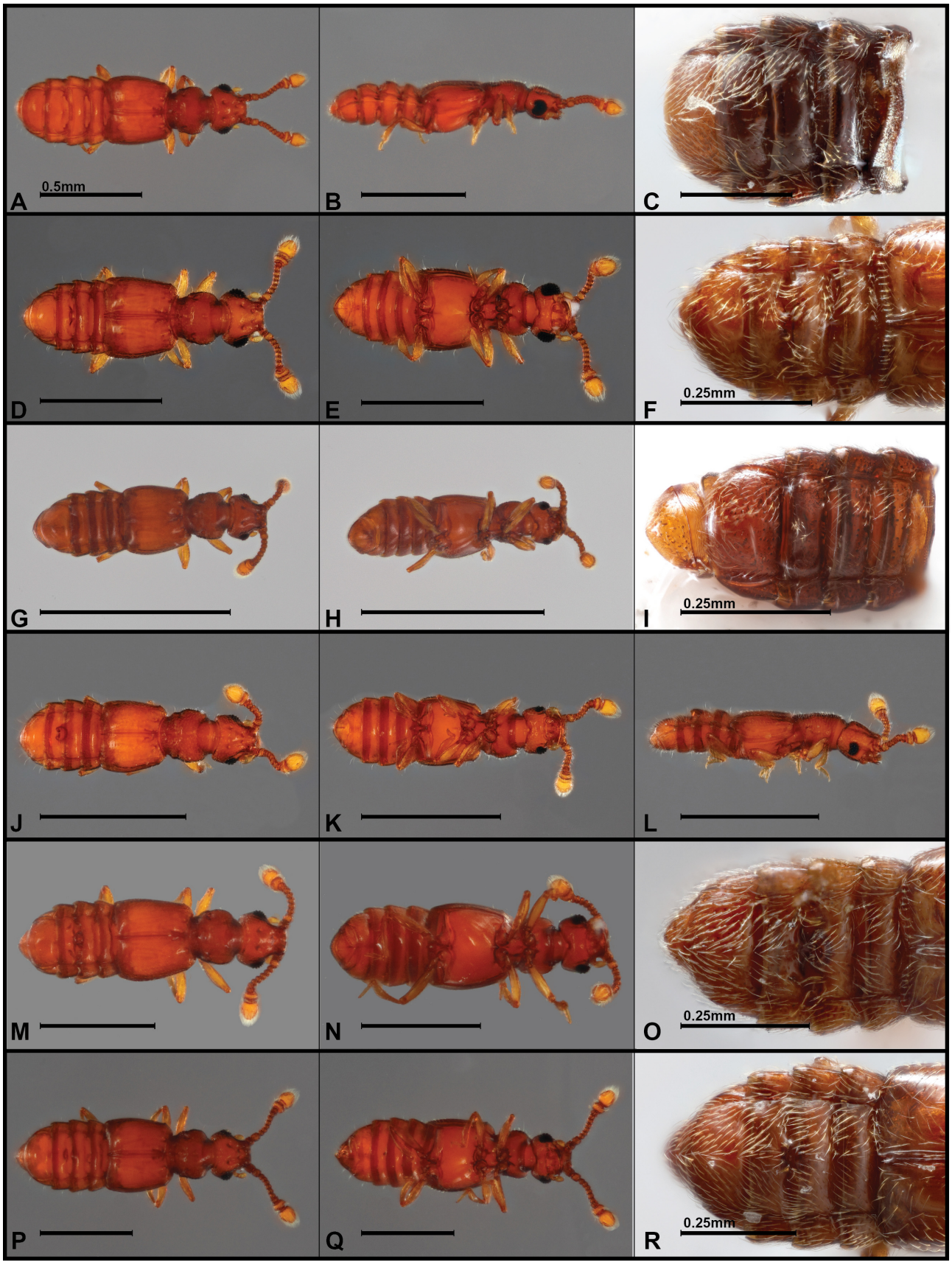

FIGURE 30. Habitus photos, *Barroeuplectoides* spp., dorsal, ventral, lateral views **A–C** *B. cujigualpai* **D–F** *B. donaritae* **G–I** *B. dracula* **J–L** *B. micros* **M–O** *B. obliquus* **P–R** *B. pululahuae.* Scale bars = 0.5mm unless otherwise indicated.

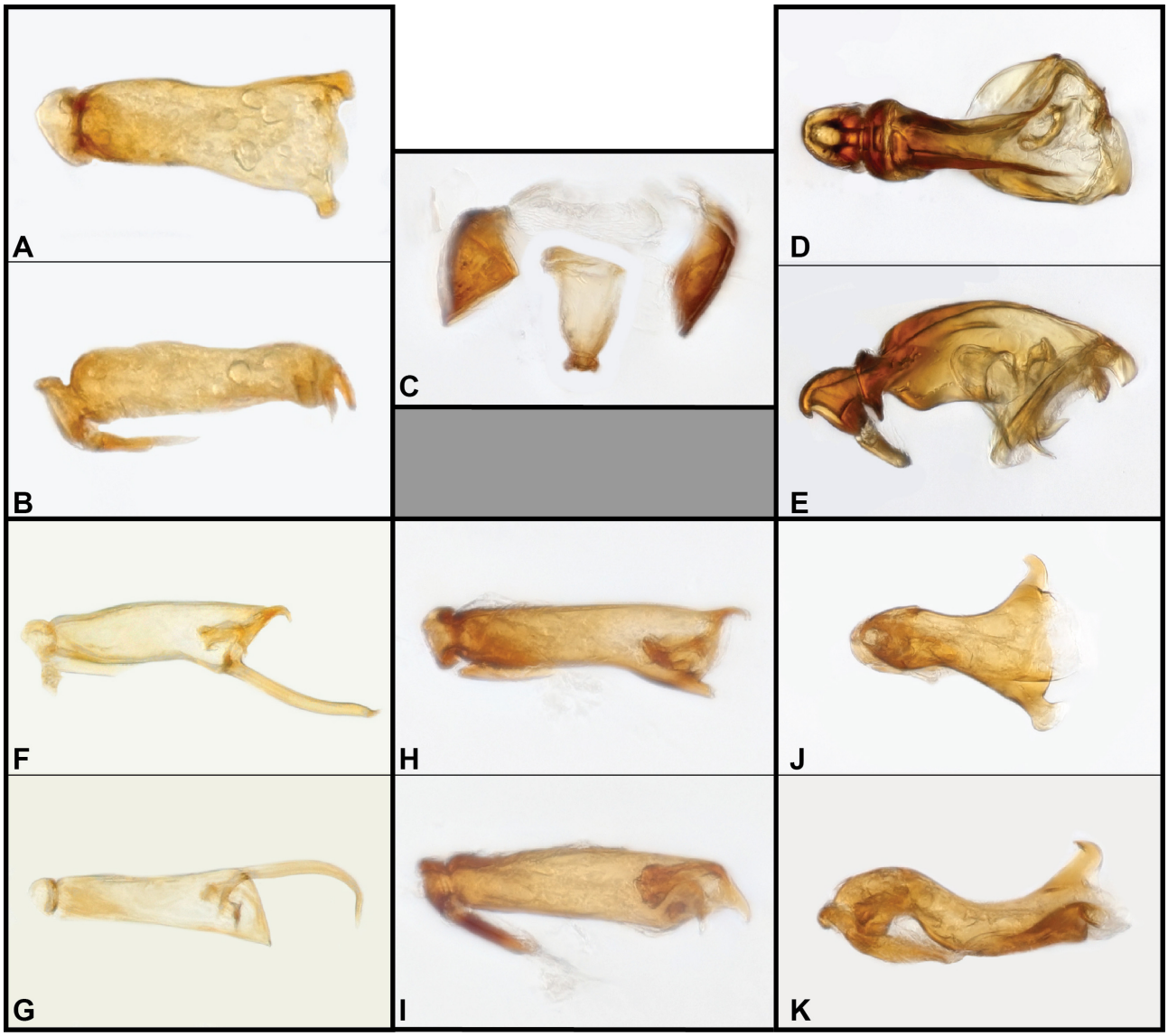

FIGURE 31. Aedeagus photos, *Barroeuplectoides* spp., dorsal, lateral views **A, B** *B. cujigualpai* **C** *B. donaritae* **D, E** *B. dracula* **F, G** *B. obliquus* **H, I** *B. pululahuae* **J, K** *B. pyramicus*.

deposited in MECN. **Paratypes** (1♂, 1♀): same data as type (MECN-EN 40444, 40461).

Diagnosis. (TL: 1.1mm) This species is identical in most external characters to the preceding, with the exception of the following: head broad (Fig. 30D), eyes very large; frontal foveae rather widely separated; frontal shelf between antennae rather wide; sides of pronotum with fine denticles laterad subbasal foveae, sides rounded anterad; pronotal disk behind lateral constriction with series of fine longitudinal carinae; male 2nd visible abdominal tergite (Fig. 30F) weakly emarginate on either side of a slightly elevated and apically produced median lobe; base of 3rd male visible tergite elevated into transverse median ridge, weakly bidentate, with each tip setose. Aedeagus (Fig. 31C) with rather strong subbasal constriction, basal apodeme small; tegmen rather short, expanded to apex, apex with enlarged rim along one edge.

Etymology. This species' name honors Doña Rita, a member of the Cuyabeno-based community that helps manage the Waita Lodge, and who shared her forest with my family during a 2024 visit.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species' male abdominal modifications resemble those of *B. pululahuae* (compare Figs 30F with 30R, respectively), with the posterior margin of visible tergite 2 overhanging a transverse ridge at the base of the 3rd. Their aedeagi are rather different in form, however, and easily distinguished on that basis.

Barroeuplectoides dracula **sp. nov.**
DNA barcode: GenBank PX930262
Figs 30G–I, 31D–E

Type material. Holotype ♂ (ZSFQ-i23332): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res.,

28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12644, Morphosp. ElP.A.043"; deposited in ZSFQ.

Diagnosis. (TL: 1.3mm) This species (Fig. 30G) is identical in most external characters to the preceding, with the exception of the following: epistoma below shelf with weak median carina; male metatrochanter with small apical tooth; male 3rd visible tergite (Fig. 30I) with broad shallow depression on each side of midline, finely punctate on raised outer surfaces, posterior portion of midline of tergite weakly raised and setose. Aedeagus (Fig. 31D, E) strongly constricted at base, basal node with laminate ventral flange, short middle collar between base and widely expanded and less strongly sclerotized tegmen, tegmen open apically, with apices of acute inner armature visible within.

Etymology. The name of this species is taken from an orchid genus known from the El Pahuma reserve.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species can only be recognized by its unique male modifications of the 3rd visible abdominal tergite. The deep subbasal constriction of the aedeagus is so far unique among known species.

Barroeuplectoides micros **sp. nov.**
Figs 30J–L

Type material. Holotype ♂ (MECN-EN 40750): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13095, Morphosp. Cu.012"; deposited in MECN. **Paratypes** (7♂, 7♀), 11: same data as type; 1: same general locality and date, -0.2066, -75.9262, 220m; 2: same general locality and date, -0.2044, -75.929267, 220m (MECN-EN 40440, 40441, 40445, 40447, 40449, 40450, 40453, 40454, 40456, 40463, 40465, 40490, 40493, 40499).

Diagnosis. (TL: 0.9mm) This species is identical in most external characters to the preceding, with the exception of the following: head and pronotum (Fig. 30J) notably punctate; pronotal sides slightly emarginate laterad subbasal foveae, margins converging, nearly straight anterad; male 2nd visible abdominal tergite weakly emarginate on either side of distinctly produced median apical hood (Fig. 30L); base of 3rd male visible tergite elevated beneath into transversely acute median ridge, depressed at sides and anterad ridge. Aedeagus extremely small; constricted subbasally; tegmen widened and flattened to apex, corners weakly prolonged, ventrally with medan apical keel.

Etymology. This species' name refers to its small body size, small eyes (relative to other members of the genus), and vanishingly small genitalia.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. The aedeagus of this species was too small to effectively photograph, and is not figured.

Barroeuplectoides obliquus **sp. nov.**
Figs 30M–O, 31F–G

Type material. Holotype ♂ (MECN-EN 41734): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Piha Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12950, Morphosp. Yn.A.019"; deposited in MECN. **Paratypes** (2♂, 2♀, all same general locality): 1♀: same data as type; 1♂, 1♀: -0.5935, -77.8982, 2356m; 1♂, 1♀: -0.5939, -77.8980, 2368m (MECN-EN 41735–41738).

Diagnosis. (TL: 1.2mm) This species is identical in most external characters to the preceding, with the exception of modifications of the male abdominal dorsum: male 2nd visible tergite (Fig. 30O) with discrete swelling in middle of apical margin, distinctly emarginate on either side, the swelling setose on apical margin; male 3rd visible tergite depressed in front of and on either side of transverse median ridge, with oblique carinae along posterolateral margins of basal depression. Aedeagus (Fig. 31F, G) subbasally constricted, with globular basal collar, a single distally directed apodeme projecting from it ventrally; tegmen gradually expanded toward apex, more or less cylindrical in cross section, apex obliquely truncate; right dorsal edge of apex with short medially directed hook; opposite edge of apex prolonged into long, apically curved rod.

Etymology. The name of this species refers to the short carinae on the male abdomen.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. The swollen medioapical portion of the 2nd visible tergite along with oblique carinae behind the basal depression of the 3rd sufficiently distinguish this species. The long apicoventral process of the aedeagus (Fig. 31G) is unique, although it would appear to be an extreme modification of the short ventral process seen in the following species (*B. pululahuae*).

Barroeuplectoides pululahuae **sp. nov.**
DNA barcode: GenBank PX930356
Figs 30P–R, 31H–I

Type material. Holotype ♂ (MECN-EN 41739): "ECUADOR: Pichincha, 0.0915˚, -78.5165˚, Res. Geobot. Pululahua, Cascada de la Peña, 1708m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12916, Morphosp. Pul.A.010"; deposited in MECN. **Paratypes** (5♂, 2♀) same data as type (MECN-EN 41740–41746).

Diagnosis. (TL: 1.3mm) Body (Fig. 30P) dark orange, very sparsely setose; similar to preceding in all respects except: male with posterior margin of 2nd visible abdominal tergite (Fig. 30R) slightly elevated, in some

individuals slightly emarginate on either side of short median projection; base of 3rd visible tergite slightly depressed, but with pair of median setose tubercles below projection of 2nd tergite. Aedeagus (Fig. 31H, I) constricted at base with short basal collar, basal node with short, laminate, deflected ventral flange, tegmen weakly expanded toward apex, right edge abruptly narrowing to short; left dorsal edge of apex with weak tooth; internal armature comprising a short, sclerotized hook, basally globose, about one-fourth length of tegmen.

Etymology. This species is named for the type locality.

Distribution. This species is known only from riparian habitats in the cloud forests northwest of Volcán Pululahua in Pichincha, Ecuador.

Remarks. The modifications of the 2nd and 3rd male abdominal tergites distinguish this species from other *Barroeuplectoides.* There is a surprising amount of variation in the posterior margin of the 2nd tergite, from almost unmodified to deeply emarginate on each side of a distinct median process.

Barroeuplectoides pyramicus **sp. nov.**
DNA barcode: GenBank PX930210
Figs 31J–K, 32A–C

Type material. Holotype ♂ (MECN-EN 40849): "ECUADOR: Tungurahua, -1.4357˚, -78.3111˚, NaturetrekCandelariaRes, 2218, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13202, Morphosp. Cnd.018"; deposited in MECN.

Diagnosis. (TL: 1.4mm) This species is identical in most external characters to the preceding, with the exception of the following: eyes small (Fig. 32C), comprising only about 8 ommatidia; frontal foveae rather narrowly separated; elytra small, narrower than widest point of abdomen; flight wings apparently absent; male 3rd visible abdominal tergite (Fig. 32A) transversely depressed along base, with elevated, subtriangular plateau immediately behind, tergite medially depressed behind. Aedeagus (Fig. 31J, K) narrow at base, with relatively inconspicuous basal constriction, and very short basal collar; basal collar with distally directed ventral apodeme; tegmen bent upwards briefly before flattening and widening into broad, triangular apex with slightly asymmetrical hooks at each lateral corner.

Etymology. This species' name refers to the subpyramidal abdominal modification of the male.

Distribution. This species is only known from the cloud forests of EcoMinga's Naturetrek Candelaria Reserve, south of the Río Pastaza in Tungurahua Province, Ecuador.

Remarks. The triangular elevated median plateau of the male abdominal tergite of this species is unique among known *Barroeuplectoides*. Its small eyes and flightlessness are also unusual. The apically expanded, fanlike aedeagus indicates a relationship to *B. cujigualpai*, where it is less extreme.

Tuberoplectus Park, 1952b
Figs 32D–K

This genus presently contains only *T. plaumanni* (Park 1952b), although Park initially included an additional species since moved to *Barroeuplectoides*. This confusion emphasizes the closeness of their relationship, which will have to be revised in the light of more species level diversity in the two. Two new species are described below.

Diagnosis. (TL: 0.9–1.1mm, Avg. 1.0mm) In addition to the tribal level characters of possessing a two segmented antennal club and two segmented tarsi, *Tuberoplectus* is distinguished from *Barroeuplectoides*, the only other genus in the tribe, by having only a single large median frontal fovea. Both genera have a serrate prosternal margin, which hasn't been noted previously (and which is shared with various Proterini and other Euplectite tribes, perhaps meaningfully). The species described here, like *Barroeuplectoides*, do exhibit secondary sexual modifications of the male abdominal dorsum, although they are much more subtle and not yet of clear use for distinguishing species. Although male genitalia have not previously been described, they appear very similar to those of *Barroeuplectoides*, having a strong subbasal constriction, a long basal apodeme (paramere?), and an expanded and apically ornate tegmen.

Tuberoplectus conjugator **sp. nov.**
Figs 32D–F, J

Type material. Holotype ♂ (MECN-EN 41722): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Ridge Tr., 2356m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12967, Morphosp. Yn.A.036" / "MECN-EN 41722"; deposited in MECN. **Paratypes** (2♂, 6♀, all same general locality): 2♀: same data as type; 1♂, 3♀: -0.5958˚, -77.8927, 2233m; 1♀: -0.5935, -77.8982, 2356m; 1♂: -0.5952, -77.8994, 2386m; 1♀: -0.5974, -77.8934, 2222m (MECN-EN 41723–41730).

Diagnosis. (TL: 1.0mm) This species (Fig. 32D) is slightly larger and apparently darker in color than the following species (assuming the latter [Fig. 32G] is not teneral), but other significant external differences from it are not evident. The male 2nd visible tergite has a similar, but somewhat more crescent-shaped shallow impression along the posterior margin. Aedeagus (Fig. 32J) strongly subbasally constricted, with globular basal collar; basal apodeme reduced; tegmen strongly expanded, bulbous in basal half, with large ventral laminate process, bent dorsad at apex; dorsum of tegmen with elaborate dorsoapical swelling, with curved, ventrally directed rod extending from its lower apical corner.

Etymology. This species is named for 'coupler-like' aedeagal processes.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

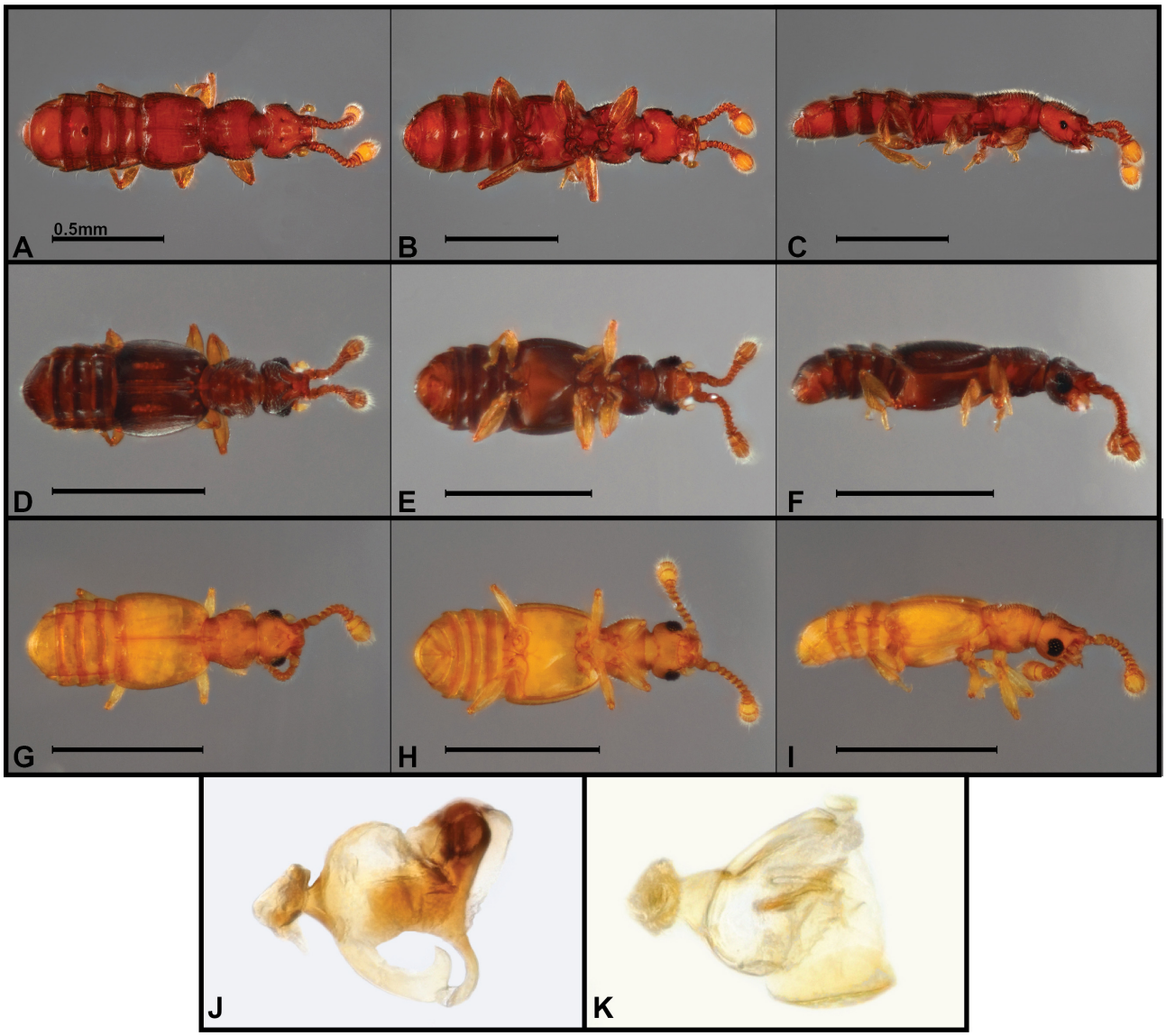

FIGURE 32. Photos dorsal, ventral, lateral views of **A–C** *Barroeuplectoides pyramicus* **D–L** *Tuberoplectus* spp. **D–F** *T. conjugator* **G–I** *T. licens* **J, K** Aedeagus of *Tuberoplectus* spp. **J** *T. conjugator* **K** *T. licens.* Scale bars = 0.5mm.

Remarks. This species and the following are microsympatric, and only differentiatable by genitalic characters, the apex of this species' aedeagus having opposing hooks lacking in the other.

Tuberoplectus licens **sp. nov.**
Figs 32G–I, K

Type material. Holotype ♂ (MECN-EN 41731): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Ridge Tr., 2356m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12962, Morphosp. Yn.A.031" / "MECN-EN 41731"; deposited in MECN. **Paratype** (1♂, same general locality): -0.5974, -77.8934, 2222m (MECN-EN 41732).

Diagnosis. (TL: 0.9mm) Body (Fig. 32G) elongate, orange, dorsal setae uniform but not prominent; head narrowed anteriorly, with prominent antennal base, posterior corners quadrately rounded; eyes moderate, occupying a little over half of genal area; vertexal fovea small but conspicuous, with oblique sulci anterad leading to single deep median frontal fovea; antennae compact, antennomeres I and II thick, cylindrical, only slightly longer than wide, III–VIII short, increasingly transverse, IX cupuliform, X–XI forming fairly compact, setose, two-segmented club; pronotum widened from base to middle, sides subparallel anterad; lateral and median foveae present, inconspicuous; transverse subbasal sulcus absent; elytra long widening slightly from base to apex, each with sutural and one conspicuous dorsobasal fovea; subhumeral fovea and stria present; first three visible abdominal tergites similar in length, 4th longer, convex; male 2nd visible abdominal tergite with transverse, ovoid median depression along middle one-fifth of posterior disk; venter smooth, lacking obvious secondary sexual characters; male last ventrite subdivided along midline into two hemiventrites (as in Metopiasini). Aedeagus

(Fig. 32K) subbasally constricted, with globular basal collar, tegmen strongly expanded from base.

Etymology. This species' name is Latin for 'free'.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. The species is distinguished principally on male genitalic characters, its aedeagus lacking some of the apical ornamentation of the preceding. The two were collected in the same samples.

Euplectitae: Euplectini

Euplectamecia Park, 1952

Fig. 33

This genus has only previously been known from a single species, *Euplectamecia hidalgensis* Park, described from Mexico (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. The published diagnosis of *Euplectamecia* (Park 1952b) emphasizes the 3 segmented antennal club, short face, pubescent vertexal foveae connected by an arcuate sulcus, convex pronotal disk (lacking a median longitudinal sulcus in the one described species), trifoveate elytra, distinct subhumeral fovea, having the first three visible abdominal tergites of the same length, all coxae contiguous, and the prosternum lacking a median carina. As Euplectina it is purported to have the last male ventrite medianly divided, and the original generic diagnosis states so (Park 1952). However, a few lines later, Park describes the terminal sternites as 'peculiar', and that these are withdrawn into the abdominal apex. The male genitalia were not described in the original publication, but Grigarick and Schuster (1980) illustrated it to have a large basal bulb with membraneous dorsal diaphragm, one short, setose paramere, and the tegmen to be comprised of a short median and long lateral lobe.

Euplectamecia suffusa **sp. nov.**

DNA barcodes: GenBank PX930355, PX930359

Fig. 33

Type material. Holotype ♂ (MECN-EN 41781): "ECUADOR: Pichincha, 0.0915˚, -78.5165˚, Res. Geobot. Pululahua, Cascada de la Peña, 1708m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12915, Morphosp. Pul.A.009"; deposited in MECN. **Paratypes** (3♂, 7♀): same data as type (MECN-EN 41782–41791).

Diagnosis. (TL: 1.0mm) Body (Fig. 33A) with light legs and antennae, darker elytra (lightening toward base), abdomen and head, lighter pronotum; dorsum inconspicuously setose, with few longer, erect setae intermingled; head narrowed to front, smooth; vertexal foveae deeply impressed, with sulci extending anterad to shallow frontal depression; eyes medium-large, diameter about twice post-ocular genal length, comprising ~40 ommatidia; antennae moderately short, scape cylindrical, little longer than wide, antennomere II globular, III–VIII short, transverse, increasing slightly in width, IX–XI forming loose club, IX about ¾ width and length of X, sides rounded, X with base and apex truncate, widening, XI about 3× as long as X, apex narrowly rounded, with denser sensory patches; pronotum widest just beyond middle, sides rounded, narrowed evenly to near base, then constricted slightly; lateral foveae distinct, median fovea very shallow, transverse sulcus weak; elytra subparallel-sided (winged), each elytra with sutural and two lateral basal foveae, evenly spaced; humeri slightly dentate; subhumeral fovea present, subhumeral stria complete; 1st abdominal tergite slightly longer than 2nd, male tergites unmodified; legs and venter lacking obvious secondary sexual characters; last male ventrite forming an elongate lobe extending into a deep emargination of the last tergite. Aedeagus (Fig. 33D, E) with basal bulb large but short, round dorsal diaphragm present with distinct diaphragmatic sclerite; basal foramen small, left paramere

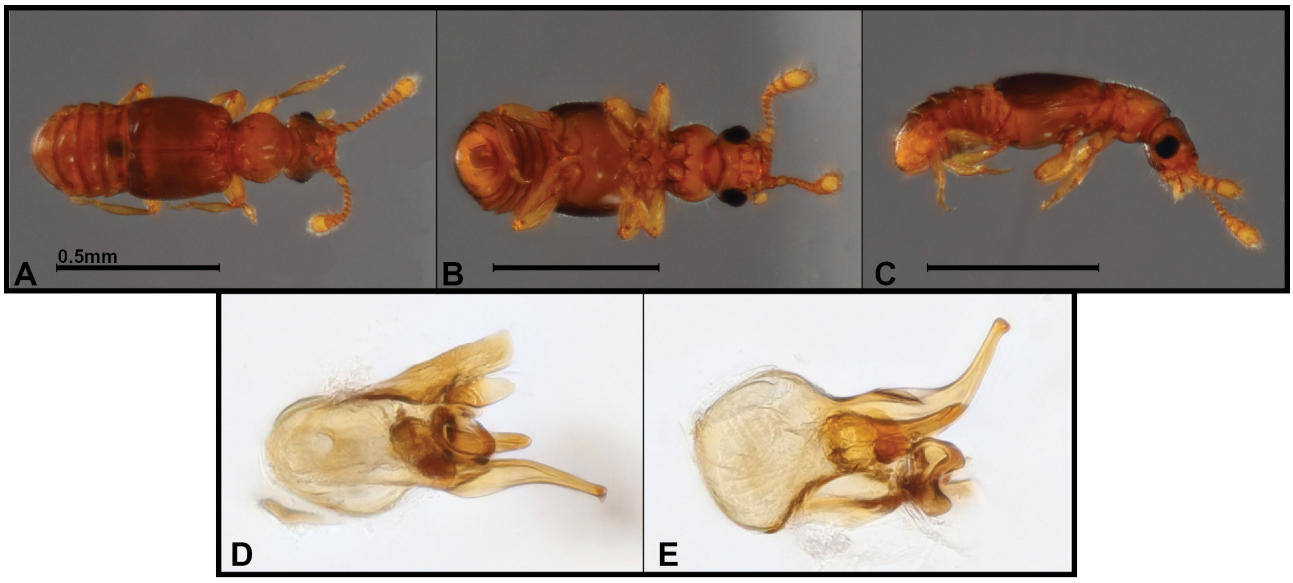

FIGURE 33. Photographs, *Euplectamecia suffusa* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 0.5mm.

large, expanded from base into broad bifid process, outer lobe roundly quadrate at apex, inner lobe more narrowly rounded, a prominent seta between them; right paramere reduced, indistinct; median lobe with prominent, apically narrowed and curved process, slightly knobbed at tip; complex articulated armature includes a shorter, straight, narrowly rounded median process, and convoluted secondary sclerotized process beneath it.

Etymology. The name of this species refers to the gradually light to dark elytra.

Distribution. This species is known only from the Río Blanco Canyon, just northwest of Volcán Pululahua, Pichincha, Ecuador.

Remarks. This species mostly conforms to the generic diagnosis given above, with the caveat of the state of the male genital plate(s) of *E. hidalgoensis* being unclear. In this new species, there is a single plate that lies within an emargination of the last tergite. This may suggest the species is misplaced, but an unpublished key provided by Don Chandler suggests that some other as yet undescribed species of *Euplectamecia* are also not a perfect match with the type in other respects. So a larger scale revision will be necessary to determine what characters best and most consistently define the genus.

Euplectitae: Jubini

Arctophysis Reitter, 1882

Figs 34–35

Only one species of *Arctophysis* is presently known, *A. gigantea* Reitter, described from Colombia (Asenjo *et al.* 2019). Six new species are described below.

Diagnosis. (TL: 2.1–4.0mm, Avg. 3.78mm) Compared to other Jubini, this previously monotypic genus has been characterized by a lack of dorsobasal elytral foveae, a lack of vertexal foveae or sulci, and the dorsum of the pronotum being smoothly convex laterally, lacking the longitudinal sulci of *Pselaphomorphus* and others, as well as having the lateral margin untoothed (Park 1942). Males lack the conspicuously modified pronotal tubercles found in *Sebaga* Raffray and *Barrojuba* Park. Male genitalia have not been previously illustrated for *Arctophysis*; most, but not all, of the species described here have a large, strongly sclerotized, seed-like basal bulb, with a short, relatively simple distal tegmen. In one fortuitous specimen (*A. sumaco*), a complex inner armature emerged from the bulb during observation in viscous fluid (see Figs 35K, L). It is very likely that most species possess something similar that cannot typically be observed. Despite their large size and distinctive habitus, the species cannot easily be distinguished, except by subtle variation in texture, setation, and aedeagal characters.

Arctophysis lanigera **sp. nov.**
DNA barcode: GenBank PX930267
Figs 34A–C, 35A–B

Type material. Holotype ♂ (ZSFQ-i23280): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, AT1324, 1900–2100m, Misc. hand collecting, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12651, Morphosp. ElP.A.050"; deposited in ZSFQ. **Paratype** (1♂, ZSFQ-i23281): same data as type.

Diagnosis. (TL: 3.8mm) Body (Fig. 34A) conspicuously setose; head and pronotum very densely punctate; head only slightly narrowed to antennal insertions, narrowly and sharply emarginate at posterodorsal margin, posterior and genal margins otherwise forming continuous subcarinate ridge; eyes large and coarsely faceted, occupying posterior 3/4 of genae; antennae somewhat compact, club indistinct, antennomeres III–X weakly transverse, increasingly but gradually larger; antennomere XI about twice as long as X, narrowed apically; epistoma recessed, labrum very short, arcuate; maxillary palpomere 3 bulbous, widest beyond middle, pubescent, with small sensory depression along outer apical surface; pronotum strongly transverse, abruptly narrowed at base, anterior portions of margins converging arcuately anterad; distinct, unmodified transverse antebasal impression complete, originating just beneath lateral margin, no distinct pronotal foveae present; elytron with sutural, basal, and subhumeral striae continuous, no elytral foveae present; legs and thoracic venter unmodified; last abdominal ventrite of male depressed, raised and setose at side, apically emarginate, the emargination surrounded by dense incurved setae. Aedeagus (35A, B) dominated by bulbous, seed-like basal bulb, basal foramen small; entire dorsal edge of basal bulb with raised pair of carinae converging anteriorly to form narrow, parallel-sided, obliquely truncate apical blade.

Etymology. The species name refers to its smooth and dense, 'woolly' coat of setae.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. In addition to its relatively setose appearance, this species' densely rugose pronotum, and only slightly less rugose head are somewhat distinctive. Fig. 34C depicts an individual with extruded secretions from the enlarged maxillary cardines. The ability to produce these secretions, apparently common to most Jubini, is alleged to serve as a prey capture or immobilization mechanism (Parker 2014).

Arctophysis marginata **sp. nov.**
DNA barcode: GenBank PX930338
Figs 34D–F

Type material. Holotype ♀ (MECN-EN 41669): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher,

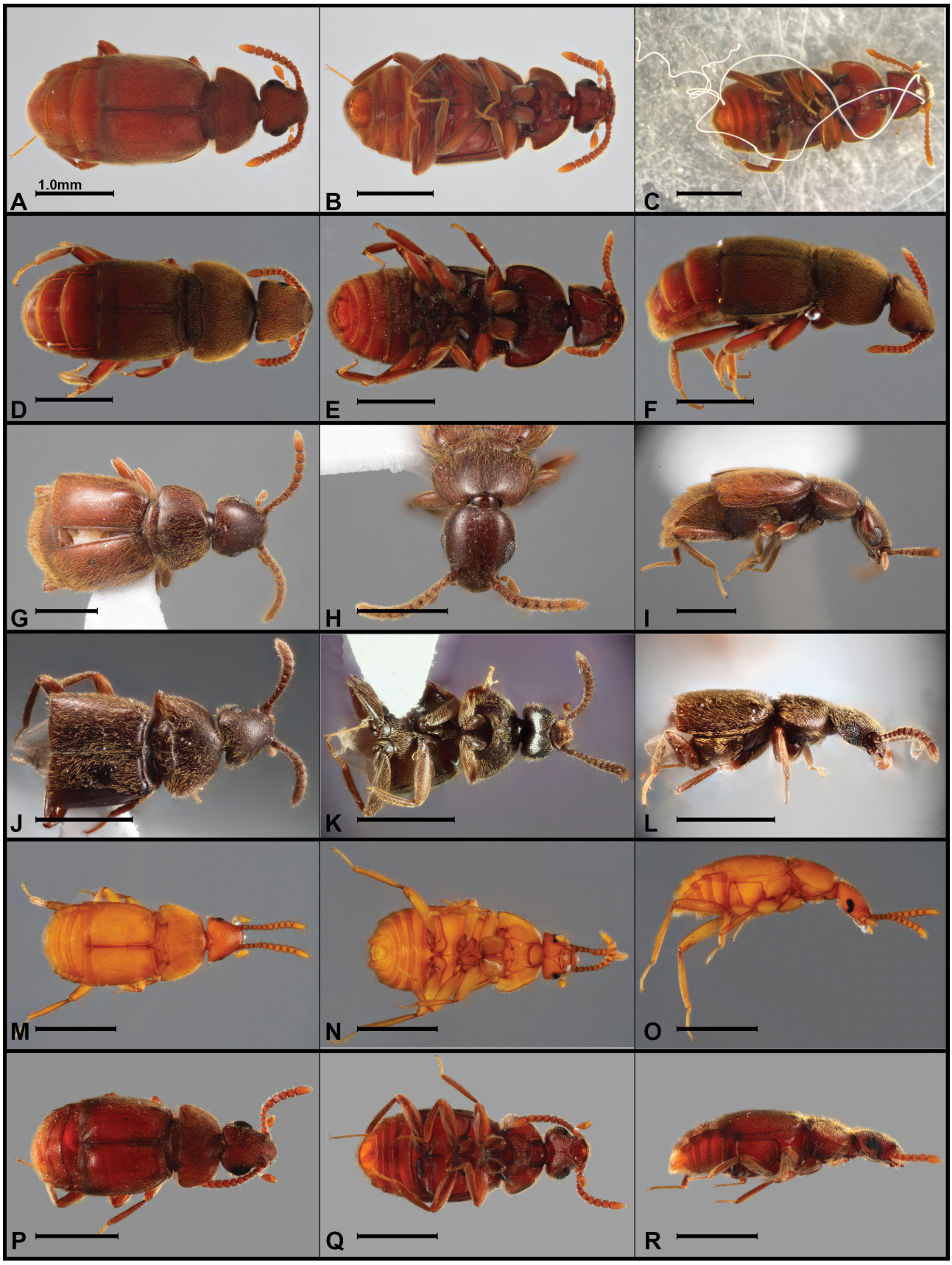

FIGURE 34. Habitus photos, *Arctophysis* spp., dorsal, ventral, lateral views **A–C** *A. lanigera* **D–F** *A. marginata* **G–I** *A. nebulosa* **J–L** *A. orellanae* **M–O** *A. rara* **P–R** *A. sumaco.* Scale bars = 1.0mm.

Ext. MSC-12839, Morphosp. Ot.A.004"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 38561).

Diagnosis. (TL: 3.7mm) Body (Fig. 34D) large, brownish-orange, densely punctate, punctures small and closely-set such that entire body appears matte, densely setose; head roundly triangular, with sharply rounded posterior corners, a fine incision at basal one-fourth of vertex; eyes small, elongate, comprising about 20 ommatidia; ventral margin of gena (Fig. 34E) with strong marginal carina continuous across posterior margin of vertex; gular carinae weak, stem short, with anterior portion of gula exposed behind mentum; antennae compact, III–V subquadrate, VI–X similar sized, weakly transverse, XI about 2.5× length of X, apically rounded; pronotum very broad, lateral and anterior margins continuously rounded; strongly constricted in basal 1/6, subbasal foveae not evident; transverse sulcus deeply impressed, bisinuate; elytral long, parallel-sided, margined along suture, base, and epipleuron by continuous stria, basal and subhumeral foveae absent; flight wings absent; hypopleura of prothorax less densely punctate, weakly shining; mesepipleuron and mesepimeron entirely smooth and shining, glabrous; venter otherwise densely setose; procoxae large, globular, and prominent; tibiae with smooth, setose rounded edges.

Etymology. The name of the species refers to the margined genae.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. Although this species is only known from two females, it is sufficiently distinct to justify description. It is the largest *Arctophysis* known (3.7mm), and the genal carinae are unique (although hints of such structures are visible in a few other species). The male might be expected to have larger eyes, be fully winged, and to have a depressed and emarginate last ventrite, but otherwise to appear similar.

Arctophysis nebulosa **sp. nov.**
DNA barcode: GenBank PX930283
Figs 34G–I, 35C–D

Type material. Holotype ♂ (ZSFQ-i23279): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res. 31.v.2011, 2550m, Understory fogging, M.Caterino, A.Tishechkin, AT1335" / "Caterino DNA voucher, Ext. MSC-12730, Morphosp. ElP.A.091"; deposited in ZSFQ.

Diagnosis. (TL: 4.6mm) As for preceding, but head and pronotum (Fig. 34G, H) only sparsely punctate, less densely setose; eyes smaller and more finely faceted, closer to antennal bases than to posterior margin of head; posterior margin of head more rounded; epistoma not recessed; pronotum not as wide; basal constriction very short, close to base; antebasal pronotal impression more arcuate, barely continued ventrad lateral margin. Aedeagus (Fig. 35 C, D) with large basal bulb, with dorsal and right edges produced to form convex lateral shield, tapering to dorsoventrally flattened apical process, sinuate in lateral view, blade-like on inner edge with apical hook.

Etymology. This species' name refers to both the cloud forest in which it occurs and to the method (fogging of understory vine tangles) by which it was collected.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is distinguished by its relatively smooth and shining head and pronotal surfaces. Both are finely punctate but the punctures are separated by 1–2× their diameters.

Arctophysis orellanae **sp. nov.**
Figs 34J–L, 35E–F

Type material. Holotype ♂ (ZSFQ-i23282): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, S. Smith, window traps" / "Caterino DNA voucher, Ext. MSC-12731, Morphosp. TBS.A.034"; deposited in ZSFQ.

Diagnosis. (TL: 3.6mm) Head and pronotum (Fig. 34J) intermediate in puncture density; eyes similar to preceding, smaller and less coarsely faceted; antennae slightly shorter and more compact; pronotum strongly transverse anteriorly, very narrow basally. Aedeagus (35E, F) with very large, convex, strongly sclerotized basal bulb, with distinct basal collar; apicodorsal carina on right side flattening out into distal process with small, subacute apical lobe, deflexed ventrad; left distal side of basal bulb with broad, low acute tooth.

Etymology. This species' name refers to the province in Amazonian Ecuador in which it occurs.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador

Remarks. This larger species is difficult to distinguish from several others here, except on the basis of aedeagal shape. It has relatively densely punctate head and pronotum, though the integument between remains shining.

Arctophysis rara **sp. nov.**
Figs 34M–O, 35G–H

Type material. Holotype ♂ (MECN-EN 40829): "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13182, Morphosp. Mch.045"; deposited in MECN.

Diagnosis. (TL: 2.9mm) Body (Fig. 34M) medium-sized, orange (though type may be slightly teneral), rather densely punctate, weakly shining, moderately densely setose; head elongate triangular, emarginate at base of vertex, with weak posterior marginal vertexal carina; eye moderately large, emarginate near bottom of posterior margin, comprising about 32 ommatidia; gular carinae well-developed, common stem short with anterior portion

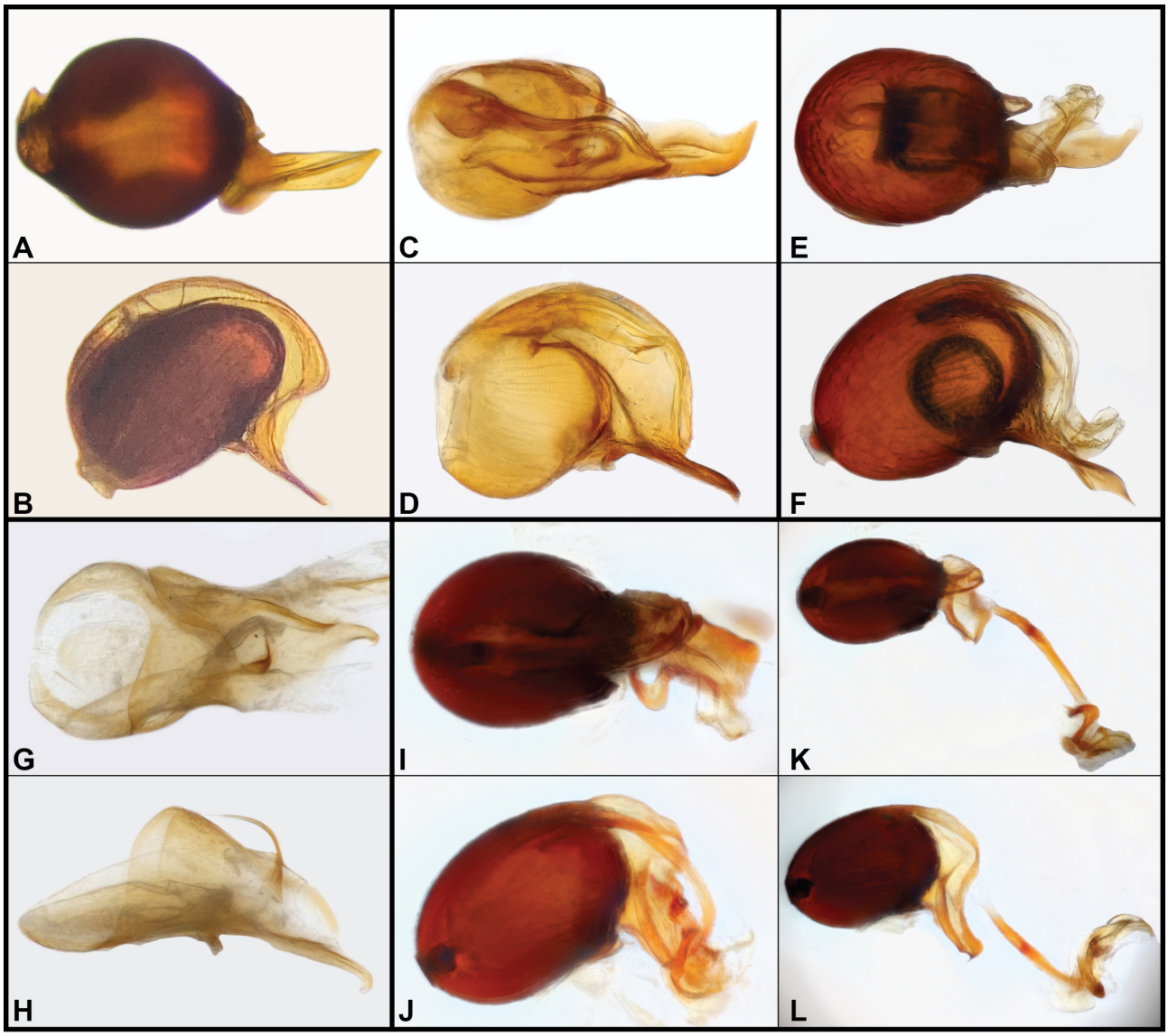

FIGURE 35. Aedeagus photos, *Arctophysis* spp., dorsal, lateral views **A, B** *A. lanigera* **C, D** *A. nebulosa* **E, F** *A. orellanae* **G, H** *A. rara* **I–L** *A. sumaco* **(K, L** with internal armature 'deployed').

of gula exposed; antennae compact, with weakly distinct 6-segmented club, most antennomeres wider than long, XI about 2× length of X; pronotum broad, sides rounded; basal pronotal constriction very short, acutely angulate within; transverse basal pronotal sulcus deep, straight across middle, bent posterolaterad at sides; elytral long, parallel-sided, margined along suture, base, and epipleuron by continuous stria, basal and subhumeral foveae absent; flight wings present; mesepipleuron, mesepimeron, and small area of metaventrite in front of metacoxae smooth and shining, glabrous; venter otherwise densely setose; penultimate male ventrite (Fig. 34N) deeply emarginate, bilobed; male secondary sexual characters otherwise not evident. Aedeagus (Fig. 35G, H) unusual for genus, with broadly dorsobasally desclerotized basal bulb; distal part of basal bulb enclosing median dorsal space; tegmen extended as a flat, narrowing ventral plate, with short apical hook; inner armature comprises one long, curved hook, articulating dorsad, and a thicker sinuate acute process along right side.

Etymology. The name of this species refers to its atypical status in the genus. 'Que raro!' was also a commonly heard term around the INABIO lab, whenever a weird bug was observed, which was often.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. While sharing the essential external characters of *Arctophysis*, this species differs in a number of respects. Externally, it is smaller than many, and the deeply emarginate male penultimate ventrite (Fig. 34N) has no counterpart in any other known species. The aedeagus is also atypical, lacking the large seed-like basal bulb, and as such may represent a more plesiomorphic form within the genus.

Arctophysis sumaco **sp. nov.**
Figs 34P–R, 35I–L

Type material. Holotype ♂ (MECN-EN 40729): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13074, Morphosp. VS.013"; deposited in MECN.

Diagnosis. (TL: 3.2mm) In external characters, this species is in most respects extremely similar to *A. orellanae*. Differences include: dorsal punctures of head (Fig. 34P) and pronotum slightly less dense; dorsal setae much less dense; eye larger and almost divided (Fig. 34R) by posteroventral emargination; stem of gular suture shorter, triangular portion of gula exposed behind postmentum; antennae short, approximately equal in length to maximum pronotal width; posterior corners of pronotum slightly less angulate, rounder; male last ventrite depressed, truncate but only weakly emarginate along apical margin. Aedeagus (Fig. 35I–L) with very large, convex, strongly sclerotized basal bulb, basal collar inconspicuous; low carina along dorsum of basal bulb joining right side flange, together continuous with deflexed apicoventral, subquadrate lobe; apex of articulated, sclerotized median process visible at rest, strongly sinuate, apex widened, more weakly sclerotized, setose; when extruded (Fig. 35K, L) median lobe comprises long, weakly curved, sclerotized rod, slightly longer than basal bulb, tipped with this sinuate apical complex.

Etymology. This species' name refers to the volcano that hosts the type locality.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is best distinguished by its large eyes, compact antennae, and densely punctate yet shining integument.

Barrojuba Park, 1942
Fig. 36

Fourteen described species have been included in this genus, all from Central and South America (Asenjo *et al.* 2019). Most are from Panama (5) and Brazil (6), with one known from Colombia (Chandler 1983, 1989a). Three new species are described below.

Diagnosis. (TL: 3.1–5.2mm, Avg. 4.2mm) *Barrojuba* shares the general facies of Jubini, with a tapered head, rounded pronotum, carinate gular sutures, and laterally projecting maxillary cardines. It is distinguished from other members of the tribe by its relatively large size, lack of frontal sulci (shared only with *Arctophysis* and *Morphogenia* Parker), and lack of longitudinal pronotal sulci (present in *Pselaphomorphus* Motschulsky, *Jubomorphus* Raffray, and *Phamisus* Aubé). *Morphogenia* is very similar, but does not have a carinate median gular suture (though its postmental sutures are carinate). Males of all known species have distinctive modifications of the antebasal pronotal impression. While male genitalia have been illustrated previously (Chandler 1983, 1989a), they have not been described in much detail. Most are rather similar, with a well-developed basal bulb, an elongate, lobe-like ventral process, and an articulated median rod that terminates in a multi-lobed flower-like process. Specific differences are evident, but hard to characterize. Those described below expand on these known forms considerably.

Barrojuba penicillata **sp. nov.**
Figs 36A–C, J–K

Type material. Holotype ♂ (MECN-EN 40735): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13080, Morphosp. VS.018"; deposited in MECN.

Diagnosis. (TL: 3.1mm) Body (Fig. 36A) orange, with short, dark recumbent setae, lateral body outline more or less evenly rounded; head moderately elongate, with interantennal 'rostrum' slightly widened apically; head lacking dorsal sulci or foveae, posterior corners rounded; eyes (Fig. 36C) large, diameter about 1.5× postocular genal length, coarsely faceted; deep, inconspicuously setose fovea present along anterodorsal margin of eye; antennae elongate, slender, most intermediate antennomeres slightly longer than wide, antennomeres VIII–XI forming distinctly elongate club, each subequal in length, about 3× as long as wide; pronotum with subbasal lateral marginal teeth in front of weak, setose basal constriction, sides weakly rounded, evenly narrowed anterad; posterior portion of male pronotal disk bilaterally depressed, posterior margin of depression with subacute tubercle bearing several elongate, erect setae (Fig. 36C); elytra with sides weakly rounded, each with basal carina arched over two large but shallowly impressed basal foveae; subhumeral fovea weak, but subhumeral stria cariniform; abdomen with sides rounded, narrowed to apex, 1st visible tergite only slightly longer than 2nd; legs and venter largely lacking secondary sexual characters, though male last ventrite is weakly depressed. Aedeagus (Fig. 36J, K) with large basal bulb, bulb narrowly open dorsad; apicoventral process with upright flange along right side of median rod, expanded apically into broad, apically rounded tongue-like lobe; median process arising within basal bulb, curving ventrally, then dorsally, terminating in expanded iris-like apex, with truncate median lobe and ~5 lateral lobes.

Etymology. The penicillate processes behind the male pronotal impression gives this species its name.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species would key to *B. albertae* Park in Chandler (1988), and it is similar in having a setose tubercle along the posterior margin of the male pronotal impression. However, it is quite distinct from any described species in the notably elongate apical antennomeres.

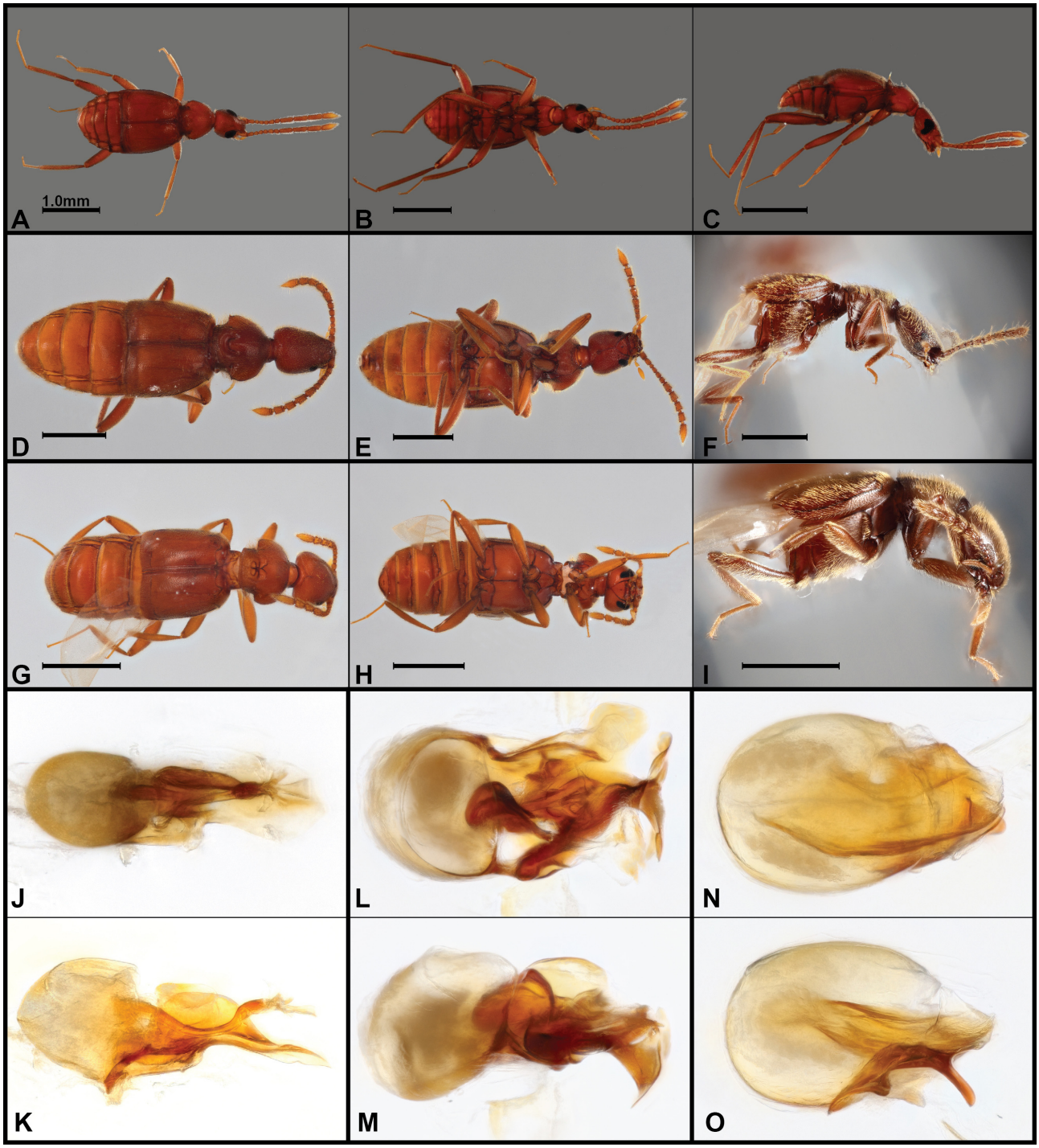

FIGURE 36. Photographs, *Barrojuba* spp. **A–C, J, K** *B. pencillatus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *B. solea* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *B. tetricum* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

Barrojuba solea **sp. nov.**
DNA barcode: GenBank PX930271
Figs 36D–F, L–M

Type material. Holotype ♂ (ZSFQ-i23299): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 31.v.2011, 2500m, understory fogging, AT1335, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12655, Morphosp. ElP.A.054"; deposited in ZSFQ.

Diagnosis. (TL: 5.2mm) Head (Fig. 36D) elongate, narrowed anteriorly, moderately densely punctate; eye moderate-sized, finely faceted, immediately behind antennal bases, with genae (Fig. 36F) about 3× eye width behind; vertex with short, fine, shallow, divergent impressions, ending in inconspicuous foveae; antennal

bases rather close together anteriorly, frontal strip about half width of scape diameter; labrum small, emarginate; antennae with short antennomere III, quadrate antennomeres IV–VI, antennomeres VII–XI forming loose, elongate club, the terminal antennomere not quite twice length of penultimate; maxillary cardines very elongate, about as long as basal two palpomeres, projecting laterad; pronotum constricted basally, with small marginal tooth immediately anterad constriction, anterior margins evenly rounded to neck; antebasal pronotal impression indistinct, base of pronotum with deep 'U'-shaped impression near base (Fig. 36D), smooth and glabrous within; basal elytral carina slightly disrupted by slightly deeper depressions, but distinct foveae absent; subhumeral fovea also poorly developed, subhumeral stria complete and distinct; apical abdominal ventrite depressed, apically emarginate. Aedeagus (Fig. 36L, M) with large basal bulb, bulb open dorsally, venter produced into complex distal process, with left lateral flange, a median process with a broad lateral lobe, and an apically expanded plate; an apparently separate thick median process that spirals to the right back to center ending above apicoventral flange, bearing a membraneous, distally multidenticulate lobe; a third short process nestled above base of ventral plate, short, apically widened bearing pair of apicolateral teeth.

Etymology. The name of this species refers to the 'horseshoe'-shaped pronotal impression.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. Among described species of *Barrojuba*, this species is similar to *B. simpliciventris* Chandler in lacking a modified setal patch on the last male abdominal ventrite, having that segment instead simply transversely depressed. The elongate five-segmented male antennal club of *B. solea*, however, distinguishes it easily, as does its flanged distal plate of the aedeagus. It keys to *B. simplicinota* Chandler in his 1988 revision, but the elongate head and deep, 'U'-shaped pronotal impression are very different from that species.

Barrojuba tetricum **sp. nov.**
DNA barcode: GenBank PX930248
Figs 36G–I, N–O

Type material. Holotype ♂ (ZSFQ-i23300): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12628, Morphosp. ElP.A.027"; deposited in ZSFQ.

Diagnosis. (TL: 4.3mm) Body (Fig. 36G) rather narrowly elongate, distinctly setose; male head conspicuously but not densely punctate; posterior margin of head rounded, emarginate medially; vertexal foveae located immediately adjacent to antennal bases, visible as a distinct setose emargination between antenna and anterior margin of eye, these connected across the middle by fine impression; eyes kidney shaped (emarginate posteriorly), finely faceted; genae behind eyes as long as dorso-ventral eye height; maxillary palpi rather small, gracile; antenna rather stout, antennomeres III–VII subquadrate, slightly transverse, VIII–XI forming an elongate club, VIII slightly longer than either IX or X, XI more than twice as long as VIII; pronotum abruptly narrowed in basal one-third, angulate but not dentate anterad constriction, anterior portion of lateral margin roundly narrowed anterad; antebasal pronotal impression (Fig. 36G) fine at sides, interrupted at middle by pair of very deep, ovate impressions, deeper along line of impression, separated along posterior half of midline by fine median lamina; lateral pronotal foveae not evident; basal marginal elytral carina deeply displaced around sutural and deeper humeral foveae, continuous to subhumeral fovea, subhumeral stria complete; sternite 5 with short median tooth on posterior margin; sternite 6 with short, simple, transverse row of modified setae. Aedeagus (Fig. 36N, O) entirely bulbous, cleft dorsally, with oblique inner plate, apicoventrally with short digitiform distal process.

Etymology. The name of this species refers to the four medial pronotal depressions.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species' aedeagus is unique in the genus in being generally capsule shaped, with minimal apical processes. On that basis, it is perhaps most similar to *B. prolongicornis* Chandler, from Brazil, whose basal bulb constitutes a larger proportion of the aedeagus, but it is not closely related to any described species. The two part pronotal modification, with larger anterior and smaller posterior depressions is unique, as is the lack of teeth on the lateral margin of the pronotum.

Endytocera Sharp, 1887
Fig. 37

Only two species of *Endytocera* are known, both from Panama (Park 1942). Three new species are described below.

Diagnosis. (TL: 3.1–5.6mm, Avg. 4.4mm) The species of *Endytocera* are easily distinguished from other Jubini by having densely tomentose frontal sulci forming an arc from the lower antennal base posterad to the front of the eye then ascending to converge on the middle of the frons (though these are not shown clearly in Sharp's [1887] figure of one of the two known species). The antennae are rather thick, densely setose, and have the apical 5 or 6 antennomeres enlarged to form an indistinct club. In addition they are large-bodied and exhibit distinctive sexual dimorphisms in male elaborations of the antebasal pronotal impression (much like those of *Sebaga* spp.) The male genitalia (Fig. 37J-O) are rather simple, with a small basal bulb and dorsoventrally flattened blade-like apical extensions, though they have not been described for either known species.

Endytocera conjectrix **sp. nov.**
DNA barcode: GenBank PX930384
Figs 37A–C, J–K

Type material. Holotype ♂ (ZSFQ-i23296): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, S. Smith, window traps" / "Caterino DNA voucher, Ext. MSC-12722, Morphosp. TBS.A.033"; deposited in ZSFQ.

Diagnosis. (TL: 4.4mm) Body (Fig. 37A) dark orangish-brown, densely setose; head rounded, emarginate at dorsal base, constricted in front of eyes; eyes (Fig. 37C) very large, emarginate posteroventrally, occupying most of sides of head; vertex convex, rougly textured but only indistinctly and finely punctate; vertexal foveae densely setose, connected by deep, 'V'-shaped anterior sulci, continued ventrad to antennal insertions; pronotum constricted basally, densely setose in basal emargination, lacking marginal teeth, antebasal transverse impression deep laterally, weak between lateral and medial depressions, middle with glabrous transverse impression and two fine, glabrous rings around pair of submedial tubercles, tubercles punctate on top; each elytron with three small basal foveae, basal carina indistinct, two lateral foveae continued posterad not by striae but by shallow depressions nearly to apex; subhumeral fovea large and distinct, continued to elytral apex by subhumeral stria; abdominal ventrites weakly flattened at middle, last ventrite only shallowly depressed, not apically emarginate. Aedeagus (Fig. 37J, K) with basal bulb almost half as long as apical portion; tegmenal processes strongly flattened dorsoventrally, one (right side) broader, with sparsely setose field, narrowing to rounded medioapical tip, the other slightly shorter and acute at inner edge, outer edge bluntly hooked.

Etymology. The species name comes from a Latin term for 'seer', a reference to its large eyes.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador

Remarks. This species is generally similar to *E. cognata* Sharp, described from Panama, particularly in the form of the male pronotal modifications, with a well-defined pair of elevated, circular median tumuli. The eyes of *E. conjectrix*, however, are considerably larger (as compared with a photograph of Sharp's type shared by C. Carlton).

Endytocera rostrata **sp. nov.**
DNA barcode: GenBank PX930247
Figs 37D–F, L–M

Type material. Holotype ♂ (ZSFQ-i23295): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v-1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12627, Morphosp. ElP.A.026"; deposited in ZSFQ.

Diagnosis. (TL: 5.6mm) Body (Fig. 37D) large, rufescent, finely but densely setose; head elongate, strongly constricted anterad eyes, coarsely rugopunctate, sparsely setose; vertexal foveae located immediately anterodorsad eyes, setose, continuous anteroventrally with antennal insertion, setose within, dorsally foveae connected by deep 'V'-shaped, glabrous sulci; eyes large, emarginate posteriorly, small-faceted, genae behind almost twice length of longitudinal eye width; antennae thick, segmental joints short, partly obscured by setae, antennomeres II–V subquadrate, antennomeres VI–XI longer, forming indistinct club; pronotum coarsely rugose, strongly constricted in basal one-third, setose within basal emargination, deeply depressed along course of antebasal impression at sides and at middle, middle depression impunctate, containing pair of glabrous, ovate domes with elevated median mushroom-like pedestal that is finely punctate dorsad; each elytron with 3 dorsobasal foveae along strongly elevated basal carina, dorsal carina disconnected from subhumeral, which begins in deep subhumeral fovea and extends to posterior elytral margin; all visible abdominal ventrites flattened at middle, last ventrite depressed and apically emarginate; metatibia long and slender but with elongate, setose gash along inner margin in apical fourth. Aedeagus (Fig. 37L, M) bulbous at base, dorsoventrally flattened distally, with two asymmetric apical blades, left one (upper side in dorsal view with apex to the right) slightly widened subapically, then narrowed to rounded apex, the other more central, slightly shorter, tapered evenly to narrowly rounded apex.

Etymology. The name of this species refers to its elongated head.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is very distinct from either of the known species, having a markedly elongate, nearly rostrate head, having the dorsal surfaces of the head and pronotum strongly granulate, and having the male pronotal impression largely smooth and glabrous, with two small, obliquely ovoid median tumuli.

Endytocera serrata **sp. nov.**
Figs 37G–I, N–O

Type material. Holotype ♂ (MECN-EN 38555): "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12767, Morphosp. Bar.A.001"; deposited in MECN. **Paratype** (1♂): ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler. A Pazmiño | D Diaz" / "Caterino DNA voucher, Ext. MSC-13016, Morphosp. Can.A.002" (MECN-EN 41670). **Other material:** 1♂: ECUADOR: Pichincha: Otongachi (-0.3212°, -78.9509°), 850m, 2-Apr-2021 (QCAZ-I-280372); 1♂: ECUADOR: Cotopaxi: Otonga (-0.4194°, -79.0033°), 1888m, 31 Jul-2005 (QCAZ-I-280375).

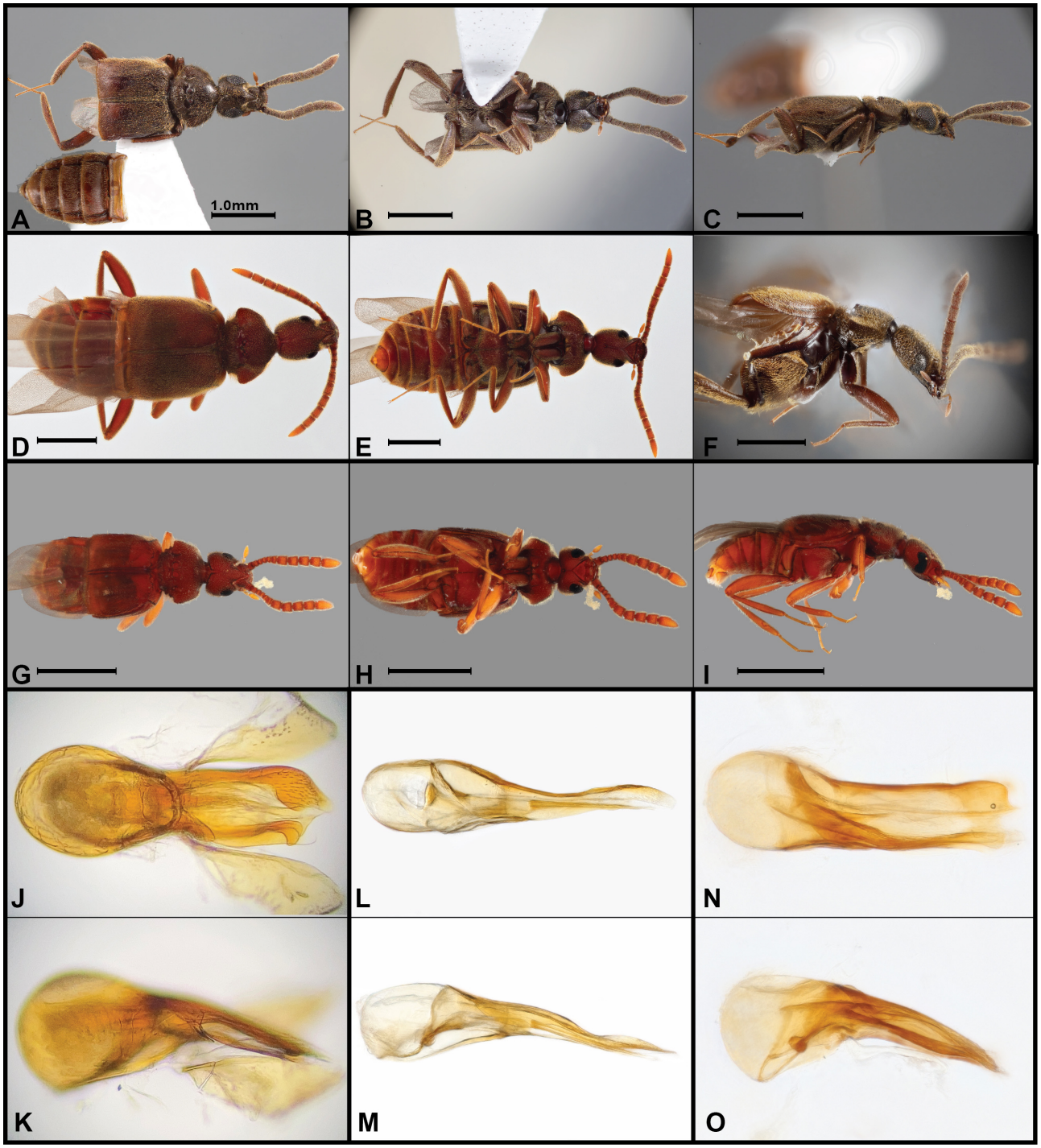

FIGURE 37. Photographs, *Endytocera* spp. **A–C, J, K** *E. conjectrix* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *E. rostrata* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *E. serrata* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

Diagnosis. (TL: 3.1mm) Body (Fig. 37G) large, rufescent, finely but densely setose; generally as for preceding except: male eyes smaller, about equal in diameter to post-ocular genal length, with wider separation between front of eye and lateral portion of frontal sulcus; pronotum quite short, with slightly denticulate lateral margins, bearing two distinct denticles on each side within basal constriction, finely denticulate anterad; male pronotal tubercles slightly larger and closer together, with more conspicuous glabrous sulci surrounding them anteriorly and medially; elytra with basal carinae more distinct, angulate over sutural and dorsolateral foveae. Aedeagus (Fig. 37N, O) with shorter, narrower basal bulb; right half of tegmen narrowed very abruptly at apex, with acute median tooth (rather than narrowly rounded medioapical lobe); left (narrower) half of tegmen weakly expanded at apex, end truncate, not at all hooked on outer margin.

Etymology. This species' name refers to its denticulate pronotal margins.

Distribution. This species is known from two different localities along the Ecuadorian coast, in Esmeraldas and Santa Elena Provinces, as well as two montane localities, one at about 850m at Otongachi in southwestern Pichincha Province, and one in the higher forests of Otonga, northern Cotopaxi Province.

Remarks. This species is smaller than others I am familiar with. The morphology is otherwise quite similar to, for example *E. conjectrix,* although the male eyes are quite a bit smaller than those. It also has the pronotal tubercles lower and slightly greater in diameter, while the stria of the elytra are finer, subcarinate.

Jubus Schaufuss, 1872
Figs 38–65

This large neotropical genus contains 55 described species, from Mexico to Argentina (Asenjo *et al.* 2019). Brazil has the most described species, with 25, while Colombia has 8 (Newton *et al.* 2005). None have previously been recorded from Ecuador. Seventy-two new species are described below.

Diagnosis. (TL: 0.9–2.9mm, Avg. 1.5mm) Species of *Jubus* are generally small, and the males lack distinctive antebasal pronotal modifications. The pronotum in both sexes is typically constricted at the base, lacks a median longitudinal impression (present in *Balega* Reitter), and may or may not have a tooth at the basal corner of the anterior portion of the pronotal margin. The species share various generally plesiomorphic states of Jubini, with gular carinae complete, elytra with basal foveae, and vertexal foveae present and usually connected by elongate frontal sulci. Males usually have the last four (occasionally more) antennomeres enlarged into a club, but only rarely distinctly lengthened as they typically are in *Sebaga.* Males are typically macrophthalmus and macropterous (with a few exceptions), while females seem universally to lack wings and have strongly reduced eyes. Other secondary sexual characters are few and subtle. Park (1952a) mentions spines of the legs of some males (such as in *J. stipulatus*, sp. nov, described below), metaventral depressions, and at least one antennal modification. However, in most of the species described here, obvious secondary characters such as these are not evident.

The male genitalia of *Jubus* are varied and, in the majority, quite distinctive. The aedeagus most commonly lacks an enlarged basal bulb, is moderately to strongly flattened laterally, and generally comprises two or more basally hinged valves, or styli, of various lengths and shapes. There are a number of exceptions to this, however, where a distinct basal bulb is 'retained' (that is, putatively plesiomorphically), and similarities to *Sebaga* and other Jubine genera are more evident. Their great variety among otherwise very similar Ecuadorian species indicates that aedeagal morphology will be critical for species identification across the genus. Many species of Jeannel's (1962) south temperate *Auxenocerus* are very similar to the more modified, two-style type in *Jubus*, and Jeannel's genus seems likely to be derivative. At the same time, at least one species of nominal *Jubus* (*J. marcuzzi* Park 1952) has been described to exhibit secondary sexual characters of the male abdominal tergites that characterize *Auxenocerus.*

Remarks. Park (1952a) provided a key to known species based on external characters, and illustrated male genitalia for a few species. He gives relatively little credence to Raffray's (1904b) previously established species groups. Those seven groups were based mainly on combinations of a) relative length of the first abdominal tergite; b) distinctness of the vertexal foveae from the coincident anterior sulci (with a single species lacking sulci entirely assigned to its own group); and c) distinctness of either a 4- or 5-segmented antennal club. While some of these characters may have some phylogenetic value, they mainly provide coarse groupings to facilitate identification. Here, I employ similar, but not identical groups based on a few additional external characters, also including presence or absence of a subbasal pronotal marginal tooth, the relative lengths of the antennomeres, and flightlessness, in some, of the male. While these don't all correspond obviously to groups as might be delimited by distinctive genitalic form, they bring similar species close together in the paper to facilitate comparisons and diagnoses. Raffray's groups VI and VII are both described to have frontal sulci that are narrower than the vertexal foveae that they extend forward from, a seemingly distinctive configuration based on photos of the types so assigned. I have only seen one such species yet from Ecuador, *J. vipereus* **sp. nov.**, but in general, my groups 6 and 7 do not correspond to his.

Key to modified species groups of *Jubus*

1. Pronotum lacking subbasal marginal tooth 2
- Pronotum with basal marginal tooth..... 3

2. First abdominal tergite more than 1.5× as long as than 2nd; antennae nearly all distinctly clubbed ..... **group 1**
- First abdominal tergite only slightly longer than 2nd; antennae unclubbed ..... **group 4**

3. First abdominal tergite more than 1.5× as long as than 2nd . ..... **group 2**
- First abdominal tergite only slightly longer, usually similar in length to 2nd..... 4

4. Male elytra short, flight wings abbreviated or absent .... **group X**
- Male elytra long, flight wings present..... 5

5. Antennae not distinctly clubbed; vertexal sulci varied..... 6
- Antennal club distinct; most also with long, thin, subparallel vertexal sulci meeting in median frontal impression..... 7

6. Vertexal foveae large, sulci deeply impressed; head short

and broad, body somewhat flattened ..... **group 7**

- Vertexal foveae not unusually large, sulci not too deeply impressed; head typically longer than wide; body flattened or not..... **group 3**

7. Antennomeres of club elongate, more than twice as long as wide ..... **group 6**

- Antennomeres of club shorter ..... **group 5**

Group 1. Species in this group (Figs 38–45) are all quite small, have an untoothed pronotum (e.g., Figs 38A, D), have the 1st tergite moderately elongate, although somewhat varied, and most have the frontal sulci distinctly 'Y'-shaped and at least somewhat (to strongly) depressed. Most also have 2 basal elytral foveae, with the basal carina narrowly arched conspicuously over each, a long submarginal carina on the sides of the first ventrite enclosing the spiracle in front, and a median prosternal carina. The antennae are typically compact and have a distinct four-segmented club, the last antennomere pointed apically. The male genitalia, however, are at least a little more variable than the external morphology would suggest. Most have lost any distinct basal bulb, having the outer valve free at the base (e.g., Figs 39D, F, H). The inner valve either forms a distinct dorsal channel for the outer valve, or a lamina along its right side.

Species placed here include: *J. placero, J. cribratus, J. digitatus, J. tishechkini, J. dentiventer, J. acuminatus, J. pseudacuminatus, J. telus, J. katsu, J. basantesi, J. pichinchae, J. fuscus, J. mashi, J. pinzai, J. intrepidus, J. paku, J. indiscretus, J. pusillus,* and *J. perplexus.* Of previously described species, the only one that I would place in this group with even a modest degree of confidence is *Jubus turneri* Park.

Group 2. This group (Figs 46–49) corresponds in significant part to Raffray's group II, characterized primarily by having a 1st visible tergite that is much longer than the 2nd, presence of vertexal sulci, and a distinct antennal club. I would augment those characters primarily by the presence of a distinct subbasal marginal pronotal tooth (the ignoring of which would have had some of my group 1 species in Raffray's group II, and an apical antennomere that is somewhat acuminate. In most the vertexal sulci are moderately deeply impressed, meeting at a stem (and therefore "Y'-shaped') or meeting in a distinct mediofrontal depression (~a widened, setose stem). The group is interesting in having a relatively high incidence of apparently flightless, and at least one wing-polymorphic species (in the males of *J. mutabilis* **sp. nov.**, not just between the sexes). In one of the flightless species (*J. effeminatus* **sp. nov.**), the male exhibits a fully female morphology, with minute eyes and an only barely distinct antennal club. A group so-characterized also seems to have some reality when considering male genitalic characters, in that most of these retain a distinct basal bulb (e.g., Figs 47B, D, F), and have the outer valve less its own structure and instead simply a dorsoapical extension of the basal bulb.

The following newly described species are included in this group: *J. effertus, J. gyrus, J. excavatus, J. diazi, J. mutabilis, J. cavus, J. piscator, J. stipulatus, J. reptans, J. pectineus, J. effeminatus, J. tetrad, J. clavus, J. vortex,* and *J. cochleatus.* The described species *Jubus spinicollis* Raffray, *J. decipiens*, and *J. boneti* Park may belong here, based on type photos.

Group 3. This small group of species (Figs 50–52) are rather large-bodied, large-eyed, and have antennae without very distinct clubs (some could perhaps be said to have weak 5- or 6-segmented clubs, but none are unambiguously clubbed). The 1st visible abdominal tergite is only slightly longer than the 2nd, all the males are fully winged, and most have long, sub-parallel frontal sulci. Aedeagus morphology is fairly consistent among the species, having a long, basally looped outer valve that is free for about half its basal length (e.g., Figs 51B, D), and a generally limited inner valve that serves as a guide for the outer. A similar form is seen in some species placed in group 5 (e.g. *J. cusicayo*), whose antennae are more distinctly clubbed. This latter character should be reassessed for value in higher level grouping. The major outlier in aedeagal morphology is *J. triticius*, with a trio of apical processes, one of which is brushy (Fig. 51I, J). Otherwise, the species here may well be closely related.

This group includes the newly described species: *J. arquus, J. sextus, J. parallelus, J. kiru, J. triticius,* and *J. humboldti.* Previously described members *may* include *J. lativentris* Raffray and *J. insularis* Raffray.

Group 4. This group (Fig. 53) is most briefly characterized as large in body size, with small eyes, unclubbed antennae, and an untoothed pronotum. I put just two species here, quite distinctive in their external morphology, with a broad triangular head having relatively small eyes, and a pronotum that has a longer than usual basal constriction, such that the wide portion of the pronotum is quite short. The aedeagus in both species (Fig. 53G-J) has a large, convex basal bulb, with several tegmenal processes, one of which is articulated within the basal bulb.

Only *J. monilicornis* and *J. triangularis* are assigned to this group. No previously described species appear to be closely related to these.

Group 5. This is a fairly generic grouping of species (Figs 54–61) that have a toothed pronotal margin, with not overly large eyes, and distinctly clubbed (usually 4-segmented) antennae, and they are probably not all that closely related. One subgroup within includes larger, fairly slender species with long, fine, and subparallel vertexal sulci, and these may be more closely related than the rest. Aedeagus morphology is highly varied, some similar to species in group 3, with a basally arched and free outer valve. A number of the larger species just mentioned (such as *J. risus* and *J. denticulatus*) have the outer valve rather short, and to degrees independent of the more dominant inner valve (e.g., Figs 61C–F).

The newly described species included here are: *J. marissae, J. chongon, J. depressus, J. lunaris, J. limaorum, J. pendulus, J. tibiodentatus, J. spiralis, J.*

iactus, J. amplexus, J. sulcatus, J. culebrillas, J. cusicayo, J. ataorupagui, J. fraternus, J. denticulatus, J. risus, J. vulgus, J. pradoi, and *J. specus.*

Group 6. This group (Fig. 62) is characterized mainly by the elongated antennal club antennomeres in combination with the presence of a subbasal pronotal tooth, the presence of fully developed flight wings in the male, and similar-length basal abdominal segments. The male genitalia of the three included species do not share any obviously unique characters.

The newly described species placed here include*: J. kutsi, J. ruku*, and *J. superbus*. Previously described species possibly related to these include: *J. longicornis* Raffray, *J. longipennis* Raffray, and *J. tetratomus* Reitter (in the last of which the club antennomeres are only moderately elongate).

Group 7. This small group of species (Figs 63–64) is characterized by a wide head with the vertexal sulci deeply impressed, and antennae that are not distinctly clubbed. All have a toothed pronotal margin and short first abdominal tergite. Aedeagal similarities are difficult to identify, although both the first two listed below have a slightly enlarged basal bulb without a hinge at the junction of the inner valve and the outer.

The newly described species placed here include: *J. sebagoides, J. lyriformis, J. compactus,* and *J. vipereus*. I can't place any previously described species here from available photographs and descriptions.

Group X. These species (Fig. 65) are not obviously closely related to any of the groups defined above, nor to each other: *J. cinctus, J. tamizado,* and *J. tumidus*. They are isolated and deserve closer scrutiny.

Jubus Group 1

Jubus placero **sp. nov.**
Figs 38A–C, 39A–B

Type material. Holotype ♂ (MECN-EN 40853): "ECUADOR: Tungurahua, -1.4349˚, -78.3113˚, NaturetrekCandelariaRes, 2178m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13206, Morphosp. Cnd.022"; deposited in MECN.

Diagnosis. (TL: 1.1mm) Body (Fig. 38A) small, orange, with moderately dense, recumbent setae with slightly longer, suberect setae interspersed; head slightly elongate, posterior corners narrowly rounded; eyes medium-sized, diameter about equal to post-ocular genal length; vertexal foveae small; vertexal sulci 'Y'-shaped, converging to common stem; antennae moderately compact, antennomere I cylindrical, short, II elongate oval, III–VI beadlike, VII transverse, VIII–XI forming distinct club, VIII–X slightly wider than long, XI about 3× length of X, narrowly subacute; pronotum lacking subbasal tooth, sides evenly narrowed anterad, then abruptly to front; basal constriction strong; subbasal lateral foveae inconspicuous, connected by arcuate transverse sulcus; elytra long, parallel-sided (male winged), with sutural and one lateral dorsobasal foveae; basal marginal carina present, arched over foveae; subhumeral fovea and stria present; 1st visible abdominal tergite about 1.5× length of second; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 39A, B) moderately laterally compressed; basal bulb absent; outer valve free for basal one-fourth, entering channel formed by inner, bent left and extending nearly to apex of tegmen, truncate; inner valve with both sides elevated from base, forming complete dorsal channel in basal half, apex widening, bifid, right side short and rounded, left side longer, bent downward and inward, acute at apex; venter of tegmen with distinct tooth at midpoint.

Etymology. This species' name refers to the community of El Placer, where the Río Chinchín empties into Río Pastaza, the jumping off point for the trip that discovered this species, and home to some of the stewards of the reserve.

Distribution. This species is known only from cloud forests of the Naturetrek Candelaria Reserve, just south of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species is among the smaller, lacking pronotal marginal teeth, and with distinctly 'Y'-shaped vertexal sulci. It cannot be separated from other such species except by its distinctive aedeagal morphology, especially the bifid and widening tegmen with its ventral tooth (Fig. 39B).

Jubus cribratus **sp. nov.**
Figs 38D–F, 39C–D

Type material. Holotype ♂ (MECN-EN 38510): "ECUADOR: Guayas, -2.173485, -79.979409, Bosque Protector Cerro Blanco, Antenas 507, 06.V.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12818, Morphosp. CrBl.A.016"; deposited in MECN. **Paratypes** (3♂): same general locality as type: "ECUADOR: Guayas, -2.159579, -80.02109, Bosque Protector Cerro Blanco, Q. Cusumbo, 25.IV.2022, Winkler, C. Cujigualpa" (MECN-EN 38511–38513).

Diagnosis. (TL: 0.9mm) Body (Fig. 38D) light orange, male winged; head about as long as wide, posterior margin weakly emarginate; eye diameter slightly greater than postocular genal length, coarsely faceted; frontal sulci deep, short, 'V'-shaped, meeting between antennal bases; antennae short, antennomeres III–VII transverse, 3× as wide as long, each slightly wider than preceding, VIII–X about twice as wide as long, terminal antennomere about 2.5 times as long as penultimate; pronotal margin lacking subbasal tooth, widest at basal third, arcuately narrowing to front; basal pronotal constriction rather short, less abrupt; lateral pronotal foveae small, joined by curved basal sulcus; each elytron with small sutural and one lateral basal foveae, basal carina distinct but weak; subhumeral fovea present, with short very vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete, distant from margin;

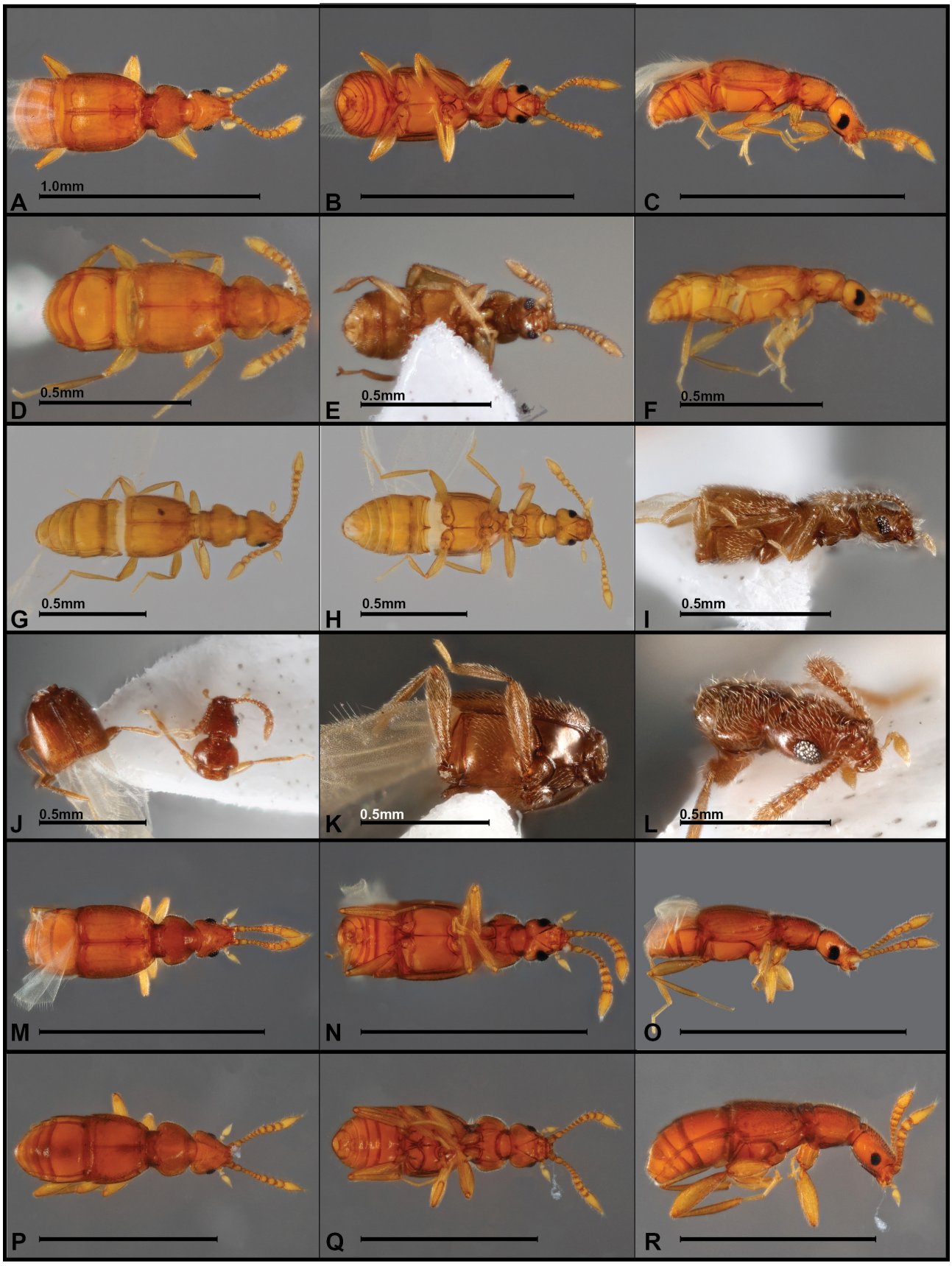

FIGURE 38. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. placero* **D–F** *J. cribratus* **G–I** *J. digitatus* **J–L** *J. tishechkini* (**K** lateral view of head **L** ventral view of meso- & metathorax) **M–O** *J. dentiventer* **P–R** *J. acuminatus.* Scale bars = 1.0mm unless otherwise indicated.

1st abdominal segment fully twice length of 2nd. Aedeagus (Fig. 39 C, D) with basal/dorsal valve arched basad, then dorsad to rest within deep trough of inner valve, elongate, extended distad to curve right ending in acute tip; inner valve emarginate at base (in lateral view), right flange extending over dorsal valve, left side bifid (in lateral view), upper portion ending bluntly, ventral portion extended mediad as thin, descending, apical plate.

Etymology. This species' name comes from the Latin 'sifted' or 'seived', from leaf litter.

Distribution. This species is known only from Ecuador's coastal mountains just northwest of Guayaquil

Remarks. As with most in this group, identification must rely primarily on the male genitalia, which has an unusually expansive flange on the right side of the inner valve, and a long outer valve that is free at the base.

Jubus digitatus **sp. nov.**
Figs 38G–I, 39E–F

Type material. Holotype ♂ (ZSFQ-i23273): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12632, Morphosp. ElP.A.031"; deposited in ZSFQ.

Diagnosis. (TL: 1.3mm) Body (Fig. 38G) small, light orange-yellow, finely punctate and uniformly setose; head only slightly longer than wide, basal corners rounded; eyes small, diameter slightly less than post-ocular genal length, coarsely faceted; vertexal foveae distinct, fine; vertexal sulci short, deeply impressed, 'Y'-shaped, converging to short stem behind antennal elevation; antennae moderately elongate, antennomeres I–II cylindrical, III–VII beadlike, progressively shorter and more transverse, but not wider, VIII–XI forming loose club, VIII–X slightly wider than long, XI about 3× as long as X; pronotum lacking basal marginal tooth, sides weakly convergent anterad, then abruptly narrowed to short basal collar; posterior constriction strong, basolateral foveae obscured by constriction; transverse basal sulcus deep, weakly arcuate; elytra subparallel-sided (winged), each elytron with sutural and one lateral basal foveae; subhumeral fovea and carina present; 1st abdominal tergite about twice as long as 2nd; male legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 39E, F) with dorsal style strongly arched basad, narrow and cylindrical to midpoint, then thickened slightly, extending sinuously, apex bifid, upper tooth longer; ventral valve forming continuous trough enclosing dorsal style ventrally and laterally, flattening out to tongue-shaped apex, with small subapical tooth on inner margin.

Etymology. The name of this species refers to the 'finger-like' apical processes of the aedeagus.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. Among many very similar species (including one sympatric one) that lack a pronotal tooth and have a long 1st abdominal tergite, this species appears somewhat lighter in color and with more elongate antennae. But it is only definitely identifiable by the aedeagus, which has a uniquely bidentate apex of the dorsal/outer style (Fig. 39F).

Jubus tishechkini **sp. nov.**
Figs 38J–L, 39G–H

Type material. Holotype ♂ (ZSFQ-i23274): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v-2011, 2000–2100m, Mid canopy FIT, AT1339, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12726, Jubus (ElPahuma)"; deposited in ZSFQ.

Diagnosis. (TL: 1.2mm) Body (Fig. 38A) orange, smooth, only very finely punctate, sparsely setose; head slightly elongate, subtriangular, posterior corners subangulate; eyes moderately large, diameter slightly greater than post-ocular genal width; vertexal foveae fine, distinct, at apices of sulci; vertexal sulci fine, slightly arcuate, converging to short stem behind antennal elevation; antennae rather short, antennomeres I and II cylindrical, only slightly longer than wide, III–VII short, increasingly transverse, VIII–XI forming loose club, VIII–X slightly wider than long, XI about 3× length of X; pronotum lacking basal marginal tooth, converging arcuately to front; basolateral pronotal foveae indistinct, close to edge of basal constriction; transverse basal pronotal sulcus deep; elytra subparallel-sided (winged), each elytron with sutural and one basal foveae; subhumeral fovea present and subhumeral stria complete; 1st abdominal tergite about twice as long as 2nd; male venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 39G, H) with dorsal style weakly arched at base, long, thin, acute at apex; ventral valve broad, forming complete trough surrounding dorsal style ventrally and laterally, extending distad slightly beyond it.

Etymology. I am pleased to name this species for my long-time (histerid) collaborator, Dr. Alexey Tishechkin, who also accompanied me on the 2011 trip that resulted in this species' discovery.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. As with the preceding, this species can only be identified by reference to the male genitalia, which is relatively simple, with a gradually widened inner valve cradling a simply tapered outer style.

Jubus dentiventer **sp. nov.**
Figs 38M–O, 39I–J

Type material. Holotype ♂ (MECN-EN 40791): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13144, Morphosp. Mch.007"; deposited in MECN.

Diagnosis. (TL: 1.0mm) Body small, reddish-orange, with moderately dense, short recumbent setae

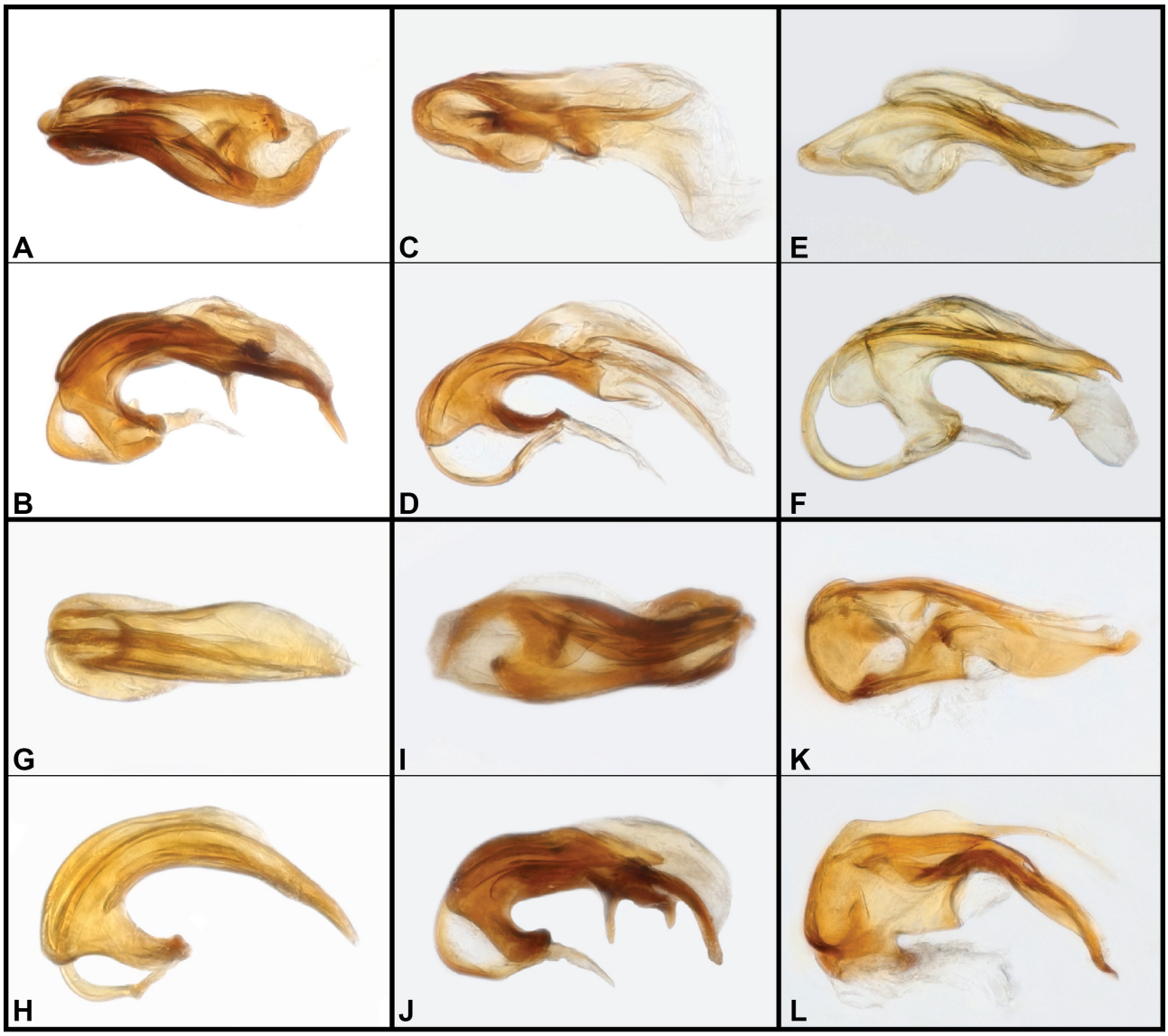

FIGURE 39. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. placero* **C, D** *J. cribratus* **E, F** *J. digitatus* **G, H** *J. tishechkini* **I, J** *J. dentiventer* **K, L** *J. acuminatus*.

with longer suberect setae interspersed; head elongate triangular, with narrowly rounded posterior corners; eyes large, protuberant, diameter about equal to post-ocular genal length; vertexal foveae fine, situated at ends of 'Y'-shaped vertexal sulci, long stem extended anterad onto shared antennal base; antennae compact, antennomere I cylindrical, slightly longer than wide, II elongate oval, III–VII small, increasingly transverse, VIII–XI forming distinct club, VIII–X slightly wider than long, XI about 2.5× as long as X; pronotum widest just anterad basal constriction, lacking basal marginal teeth, sides evenly converging, then more steeply narrowed anterad; basal constriction gradual; subbasal lateral foveae evident, connected by arcuate transverse sulcus; elytra long, parallel-sided (winged), each with sutural and one lateral basal fovea, with basal carina strongly arched over them; subhumeral fovea and stria present; 1st abdominal tergite about 1.5× length of second; male 4th abdominal sternite with pair of acute teeth near middle of apical margin; last male ventrite depressed at middle; legs lacking obvious secondary sexual characters. Aedeagus weakly laterally compressed; outer valve free at base, arched basad, then distad, running along right outer side of median channel nearly to apex; inner valve narrow at base, widening into dorsal channel, ventrally with median and subapical teeth, apex curving ventrad, blunt.

Etymology. This species is named for the distinctive processes of the male venter.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. The distinct teeth of the male 4th ventrite are unique among known *Jubus* species. The aedeagus, with its briefly free outer valve and ventrally toothed inner valve is similar to those of *J. placero* (Fig. 39B) and *J. intrepidus* (Fig. 43F).

Jubus acuminatus **sp. nov.**
Figs 38P–R, 39K–L

Type material. Holotype ♂ (MECN-EN 41026): "ECUADOR: Cotopaxi, -0.4191˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 1990m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12881, Morphosp. Ot.A.046"; deposited in MECN. **Paratypes** (2♂, same general locality): 1: -0.4167˚, -79.0047˚, 2102m (MECN-EN 41027); 1: -0.4157˚, -79.0046˚, 2132m (MECN-EN 38563).

Diagnosis. (TL: 1.4mm) Body (Fig. 38P) orange, uniformly, not too densely setose; head rather broad, only slightly longer than wide; male eyes rather small, diameter just less than postocular genal length, moderately coarsely faceted; vertexal foveae absent, sulci short, diverging in 'V' from deep interantennal fovea; antennae short, scape short, cylindrical, antennomere II globular, III–VI small, beadlike, slightly shorter than wide, VII slightly wider, VIII–XI forming distinct loose club, XI acuminate apically; pronotum rather large, broad, lacking subbasal tooth, sides widest near base, rounded, narrowing to front; lateral foveae weak, connected by shallowly angulate transverse sulcus; male elytra short, subparallel-sided (wingless), each elytron with basal carina, sutural fovea distinct, other dorsobasal foveae indistinct; subhumeral fovea distinct and subhumeral stria complete; first visible abdominal segment about 2.5× midline length of 2nd segment. Aedeagus (Fig. 39K, L) with small basal bulb, and constricted basal collar; tegmen ventrally keeled at base with laterally notched, broad, tongue-like apical lobe that deflects ventrad, narrows, and terminates in right-pointed, slightly knobbed apex; within tegmen are two sclerotized styles, median one parallels apicoventral lobe of tegmen, right one curves weakly mediad, and is bifid at apex, laterally with barbed tip, medially seeming to merge with median style; upper margin of right side of tegmen extended into thin, elongate, weakly sclerotized process that curves mediad and extends above median styles.

Etymology. This species name refers to its acuminate last antennomere.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is somewhat larger than typical for the group, and has relatively short elytra and is brachypterous. The frontal sulci are also shallower than most. Its aedeagus, as with that of the related species that follows, retain a distinct basal bulb, setting them apart from others treated as group 1. The similarity beyond that is not significant, and the aedeagus of *J. acuminatus* has a quadrate basal part, with long, dangling dorsal style over a bivalved, long internal armature.

Jubus pseudacuminatus **sp. nov.**
Figs 40A–C, 41A–B

Type material. Holotype ♂ (MECN-EN 38562): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13305, Morphosp. Ot.A.046b"; deposited in MECN.

Diagnosis. (TL: 1.2mm) Body (Fig. 40A) orange, uniformly but not too densely setose; head about one-third longer than wide; male eyes large, diameter about twice postocular genal length, coarsely faceted; vertexal foveae small, sulci short, fine, diverging in 'V' from deep interantennal fovea; antennae short, scape short, cylindrical, antennomere II about 1.5× as long as wide, III conical, IV-V small, beadlike, slightly shorter than wide, VI–VII increasingly transverse, VIII–XI forming distinct loose club, XI acuminate apically; pronotum rather large, broad, lacking subbasal tooth, sides widest near base, rounded, narrowing to front; lateral foveae weak, connected by shallowly arcuate transverse sulcus; male elytra long, subparallel-sided (flight wings present), each elytron with basal carina finely arched over small sutural and two, evenly spaced, lateral dorsobasal foveae; subhumeral fovea distinct and subhumeral stria complete; first visible abdominal segment about twice midline length of 2nd segment. Aedeagus (Fig. 41A, B) with small basal bulb, and distinct basal knob; dorsal style narrowing and extended from upper apex of basal bulb, curving slightly to left near subacute apex; ventral/inner valve, forming laterally compressed, elevated plate along right side of dorsal style, flattening to leaf-like apical lobe, with diminishing dorsal keel forming its midrib, curving downward toward apex.

Etymology. The name of this species comes from it strong similarity to the preceding.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is similar to the preceding (and mixed up with it in initial morphospecies sorting). They share an untoothed pronotum, small size, and a 4-segmented antennal club with an acuminate terminal antennomere. *Jubus pseudacuminatus* can be distinguished by its long elytra and wingedness (initially considered potential flight polymorphism, as seen in some other *Jubus* species), shorter 1st abdminal tergite, larger eyes, and slightly more elongate (or less transverse) basal antennomeres, particularly antennomere II. Their genitalia separate them unambiguously, this species having a somewhat unevenly tapered inner valve that curves strongly downward toward the apex (Fig. 41B).

Jubus telus **sp. nov.**
Figs 40D–F, 41C–D

Type material. Holotype ♂ (MECN-EN 42057): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13352, Morphosp. PS.B.017"; deposited in MECN. **Paratypes**: 3♀, same data as type (MECN-EN 42003–42005).

Diagnosis. (TL: 1.4mm) Body (Fig. 40D) small,



FIGURE 40. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. pseudacuminatus* **D–F** *J. telus* **G–I** *J. katsu* **J–L** *J. basantesi* **M–O** *J. pichinchae* **P–R** *J. fuscus* (**R** ventral view of male terminal ventrites). Scale bars = 1.0mm unless otherwise indicated.

elongate, parallel-sided, finely but distinctly punctate, densely covered with subrecumbent setae; head subtriangular, about 1.25× as long as wide, posterior corners narrowly rounded, base distinctly emarginate; vertexal foveae fine but distinctly impressed, vertexal sulci converging evenly to small, setose median fovea; eyes large, diameter about 1.5× postocular genal length; antennae short, scape thick, cylindrical, antennomere II elongate oval, III–VI beadlike, VII wider, VIII–XI forming loose club, VIII–X transverse, XI about 4× as long as X, apically acuminate; pronotum lacking subbasal tooth, widest just behind middle, sides rounded to neck; posterior constriction strong, sides straight within; lateral pronotal foveae deep, connected by weakly angulate transverse subbasal sulcus; elytra parallel-sided, each with sutural and two smaller lateral foveae, basal carina weakly arched over them, humeri not dentate; venter and legs lacking secondary sexual characters. Aedeagus (Fig. 41C, D) simple, basal bulb small, with distinct basal knob below subbasal constriction; basal bulb evenly narrowed to distal tegmen, which is dorsally slightly split, sinuate just beyond middle, and apically acute.

Etymology. The name of this species refers to its somewhat 'arrow-like' head shape. It is used as a noun in apposition.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species has a fairly distinctive head shape, quite triangular, with narrowly rounded basal corners. It can be separated from most others by this, in combination with its very simple aedeagus. A similar aedeagus is seen in *J. diazi* (compare Figs 41D and 45J), but external differences between these are numerous (pronotal teeth, deep median frontal fovea in *J. diazi*) enough to suggest parallel simplification of the aedeagus.

Jubus katsu **sp. nov.**
Figs 40G–I, 41E–F

Type material. Holotype ♂ (MECN-EN 40776): "ECUADOR: Pastaza, -1.4267˚, -78.0439˚, Río Anzu Reserve, 1342m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13121, Morphosp. RAn.012"; deposited in MECN.

Diagnosis. (TL: 0.9mm) Body (Fig. 40G) small, orange, moderately adorned with semirecumbent setae, with scattered longer, erect setae interspersed; head slightly longer than wide, weakly basally emarginate, posterior corners rounded; eyes moderately large, diameter about 1.5× post-ocular genal length, coarsely faceted; vertexal foveae small; vertexal sulci 'Y'-shaped, converging from foveae to short stem; antennae short, antennomere I cylindrical, II elongate globose, III–VI small, transverse, sides rounded, VII wider, VIII–XI forming distinct, loose club, VIII–X weakly transverse, apical antennomere about 3× length of X, apex narrowly subacute; pronotum rather narrow, lacking subbasal marginal tooth, sides weakly convergent toward front; basal constriction strong; lateral subbasal foveae weak, connected by arcuate sulcus; elytra subparallel-sided (winged), each with basal carina strongly arched over shallow sutural and one basolateral fovea; subhumeral fovea and carina present; 1st visible abdominal tergite about 2× length of 2nd; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 41E, F) slightly laterally compressed; basal bulb absent; outer valve free from base, thin and weakly sinuate toward apex; inner valve forming broad trough from near base to apex, cradling outer valve, broadening to spoon-shaped apex, bearing articulated, sickle-shaped, subapical hook.

Etymology. The name of this species is a Kichwa word for beetle.

Distribution. This species is known only from lower part of the Río Pastaza Watershed, in the foothills of Pastaza Province, Ecuador.

Remarks. This is a very small species, with an untoothed pronotum, distinctly clubbed (of four antennomeres) antennae, and a mid-length 1st abdominal tergite. It can only be definitely identified by its male genitalia, which has a unique, laterally projecting distal process (Fig. 41E).

Jubus basantesi **sp. nov.**
Figs 40J–L, 41G–H

Type material. Holotype ♂ (MECN-EN 40890): "ECUADOR: Morona-Santiago, -3.0212˚, -78.55895˚, Limón Indanza, Á[rea]E[cológica de]C[onservación]M [unicipal] Tinajillas – Río Gualaceño, 2344m, 31.I.2025, M. Barreno | M. Basantes" / "Caterino DNA voucher, Ext. MSC-13309, Morphosp. Tin.002"; deposited in MECN. **Paratypes** (1♂, 1♀): 1: same data as type; 1: same general locality, but -3.0234, -78.5893, 2311m (MECN-EN 41972–41973).

Diagnosis. (TL: 1.0mm) Body (Fig. 40J) small, orange, moderately adorned with recumbent setae, with scattered longer, erect setae interspersed; head slightly longer than wide, posterior corners narrowly rounded; eyes moderately large, diameter about equal to post-ocular genal length, coarsely faceted; vertexal foveae small, rather close; vertexal sulci 'Y'-shaped, converging from foveae to short stem; antennae short, antennomere I cylindrical, II elongate globose, III–VI small, transverse, sides rounded, VII wider, VIII–XI forming distinct, loose club, VIII–X transverse, apical antennomere about 3× length of X, apex bluntly subacute; pronotum rather narrow, lacking subbasal marginal tooth, sides weakly convergent toward front; basal constriction strong; lateral subbasal foveae weak, connected by arcuate sulcus; elytra subparallel-sided (winged), each with basal carina strongly arched over shallow sutural and one basolateral fovea; subhumeral fovea and carina present; 1st visible abdominal tergite about 2× length of 2nd; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 41G, H) laterally compressed; basal bulb absent; outer valve free from base, arching all the way over inner valve nearly to apex; inner valve forming right side

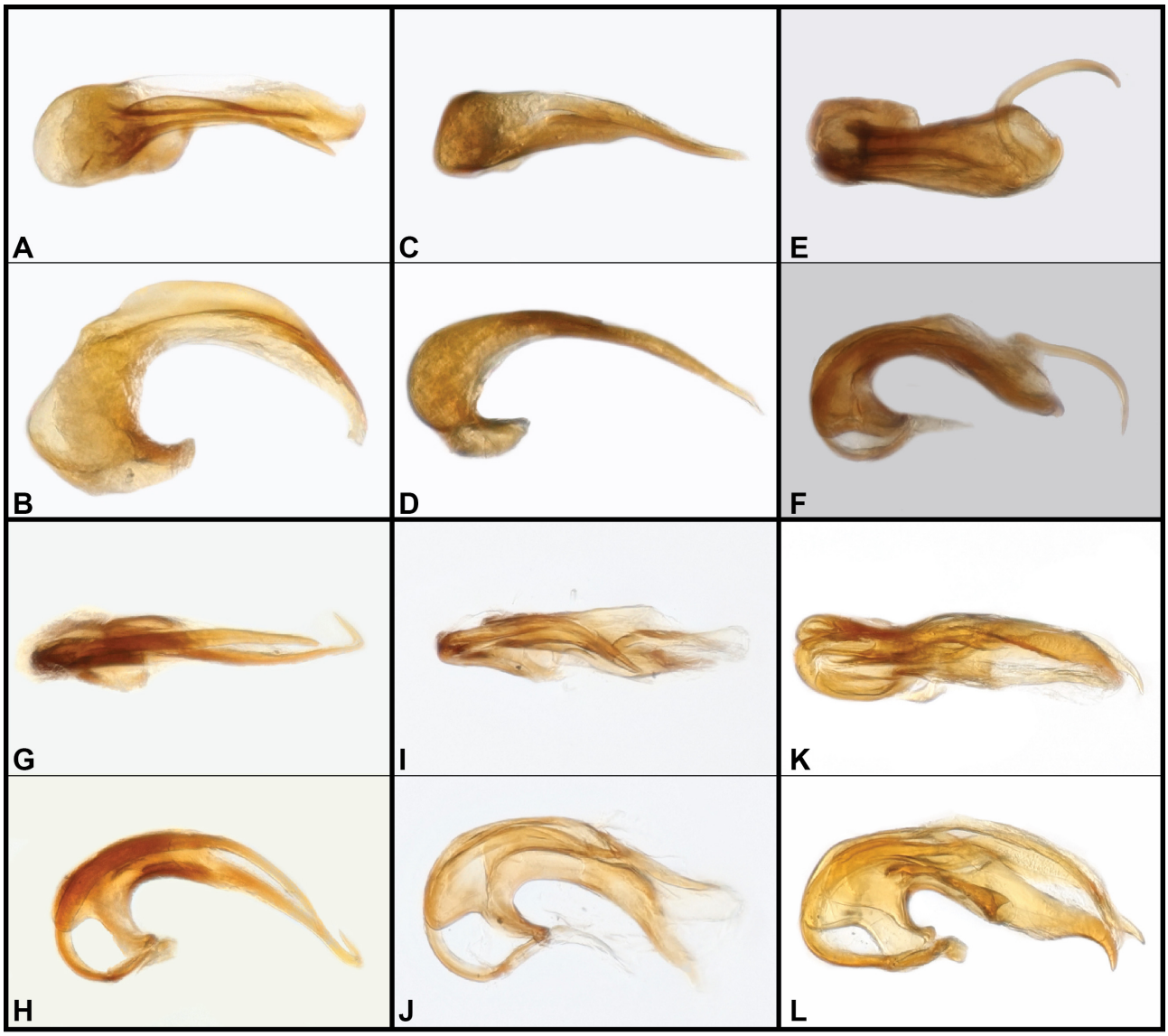

FIGURE 41. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. pseudacuminatus* **C, D** *J. telus* **E, F** *J. katsu* **G, H** *J. basantesi* **I, J** *J. pichinchae* **K, L** *J. fuscus*.

laminar plate, narrowing to long, thin, distal process that is strongly bent rightward and upward at tip.

Etymology. I am pleased to name this species for Mr. Michael Basantes, 'investigador' with INABIO, who assisted in the collection of many interesting samples that contributed to this study, including this, one of the last I was able to incorporate.

Distribution. This species is known only from cloud forests east of Cuenca, in Morona-Santiago Province, Ecuador.

Remarks. This species isn't externally distinguishable from many other small species with untoothed pronota. But its aedeagus, with a long, strongly apically bent inner valve is distinctive.

Jubus pichinchae **sp. nov.**
Figs 40M–O, 41I–J

Type material. Holotype ♂ (MECN-EN 38756): "ECUADOR: Pichincha, 0.0915˚, -78.5165˚, Res. Geobot. Pululahua, Cascada de la Peña, 1708m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12914, Morphosp. Pul.A.008"; deposited in MECN. **Paratypes (6)**: 3♂: same data as type (MECN-EN 38753–38755); 1♂: "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Reserve, 28.v–1.VI.2011, AT1328, 2500m, *Chusquea* leaf sheath, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12500, Pselaphinae" (ZSFQ-i13682). 1♂: "ECUADOR: Pichincha, 0.0472˚S, 78.7631˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12802, Morphosp. Min.A.024" (MECN-EN 13661); 1♀: "ECUADOR:

Pichincha, 0.0473˚S, 78.7632˚W Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" (MECN-EN 13660).

Diagnosis. (TL: 0.9mm) Male body (Fig. 40M) slightly bicolored, elytra brownish, darker than head, pronotum, abdomen, or legs; body finely punctate, uniformly setose; head about 1.25× as long as wide, widened posterad, shallowly emarginate at base; eye diameter approximately equal in length to post-ocular gena, rather coarsely faceted; vertexal foveae evident; vertexal sulci 'V'-shaped, weakly diverging from antennal bases, terminating in foveae; antennae rather short, with last 4 antennomeres forming loose club, antennomeres VIII–X transverse, XI about three times as long as X and distinctly acuminate; pronotum lacking subbasal tooth, sides weakly rounded and narrowed anterad; posterior third strongly constricted, with weakly angulate basal sulcus connecting large and conspicuous lateral foveae; elytra parallel-sided (winged), with basal carina arched over large sutural to single large lateral foveae; subhumeral fovea present, subhumeral stria extending straight posterad, rather distant from margin; first abdominal segment about twice as long as second. Aedeagus (Fig. 41I, J) with outer valve arched basad, then dorsad to rest within deep trough of inner valve, elongate, extended distad to curve abruptly left ending in acute tip; inner valve emarginate at base (in lateral view), dorsal trough expanded outward distad, narrowing to descending, tongue-like apex.

Etymology. This species is named for its rather wide distribution in the Province of Pichincha.

Distribution. This small species is known from three localities in the cloud forests of Pichincha, Ecuador.

Remarks. Very similar and probably closely related to *J. fuscus*, which is also very small and dark (see Fig. 40P). But *J. pichinchae* has longer and less widely impressed vertexal sulci. Also most specimens of *J. pichinchae* are fairly distinctly bicolored, with browner elytra against a yellowish-orange body, whereas *J. fuscus* are more uniformly dark.

Jubus fuscus **sp. nov.**
DNA barcodes: GenBank PX930278, PX930279, PX930280
Figs 40P–R, 41K–L

Type material. Holotype ♂ (ZSFQ-i23267): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v–2011, 2000–2100m, Mid canopy FIT, AT1339, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12667, Morphosp. ElP.A.066"; deposited in ZSFQ. **Paratypes** (4♂): 2: same locality as type, 0.0182˚N, 78.6372˚W, 2500m, litter sifting; 1: same locality as type, 0.0182˚N, 78.6372˚W, 2500m, FIT; 1: same locality as type, 0.0264˚N, 78.6344˚W, 1200–2100m, FIT (ZSFQ-i13676, i13676, i23268–i23269).

Diagnosis. (TL: 1.0mm) Male: body (Fig. 40P) brown, winged; head with posterior margin weakly carinate, crenulated; vertex convex; frons with 'Y'-shaped depression originating between antennal bases, splitting behind, terminating in lateral frontal fovae equidistant to antennal bases and to each other; eyes about equal in diameter to post-ocular genal length, coarsely faceted; labrum broad, weakly emarginate, multidenticulate; antennomeres I–II cylindrical, II about two-thirds length of I, antennomeres III–VI beadlike very gradually widening, antennomere VII shorter, wider than long, antennomeres VIII–XI forming loose, distinct club, each gradually larger than the preceding, antennomere XI about 2.5× as long as X, distally pointed; pronotum abruptly narrowed in basal one-third, distal portion of lateral margin converging slightly to apex, lacking subbasal teeth, interruption densely setose around lateral pronotal foveae; lateral pronotal foveae connected by deep, arcuate antebasal impression, median fovea absent; elytra with distinct sutural fovea and one lateral dorsal fovea near humeral swelling; sutural stria complete but no other dorsal striae; subhumeral fovea distinct, with subhumeral stria reaching just beyond epipleural midpoint; legs unmodified; first abdominal segment about 1.3× length of second. Aedeagus (Fig. 41K, L) with dorsal style arched strongly basad, then curved strongly distad, rod-like basally, then flattening and becoming thinner and flexible, twisting slightly to subacute apex; inner valve with two posterior flanges forming saddle for dorsal style, left flange extended distally as strongly sclerotized process about as long as dorsal style, sinuate to subacute apex, with strong basal tooth on inner margin; right side of inner valve extended as thin strongly arched process paralleling dorsal style.

Etymology. This species' name refers to its brownish coloration.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. As above, this species is similar and closely related to *J. pichinchae*, and both occur at El Pahuma, and probably other localities at the region. Generally the all-brown coloration of *J. fuscus* will serve to separate them, but the male genitalia should generally be consulted, the inner valve of *J. fuscus* forming a more substantial basal lamina encompassing the outer valve, and in being more strongly hooked at the apex (Fig. 41L).

Jubus mashi **sp. nov.**
Figs 42A–C, 43A–B

Type material. Holotype ♂ (MECN-EN 41033): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Ridge Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12955, Morphosp. Yn.A.024"; deposited in MECN. **Paratypes** (6♂15♀, same general locality as type): 1: same data as type; 4: -0.5958˚, -77.8927˚, 2386m; 1: -0.5974˚, -77.8934˚, 2222m (MECN-EN 38672, 38676–38678, 38683, & 41034, 38709, 38713–38717, 38719, 38720, 38724, 38726, 38727, 38729, 38730). **Other material—** 24♀, same general locality as type.

Diagnosis. (TL: 1.2mm) Body (Fig. 42A) orange, setae dense, short, appressed; head distinctly elongate, widened

to base, posterior corners narrowly rounded, weakly emarginate at base; vertexal foveae shallow, vertexal sulci converging to front, meeting in common depression behind antennal tubercles; antennal tubercles with short, oblique dorsal ridges; eyes large, diameter slightly greater than post-ocular genal length, coarsely faceted; antennae short, with antennomeres III–VI beadlike, VII–XI forming loose club, VII–X wider, transverse, terminal segment about 3.5× length of penultimate; pronotum lacking subbasal tooth, margins rounded, widest just anterad basal constriction, narrowing more or less evenly to front, basal fourth constricted; lateral discal foveae weak, basal transverse sulcus weakly arcuate between them; elytra subparallel-sided (winged), with complete basal carina weakly interrupted by sutural and two lateral basal foveae on each; subhumeral fovea present and subhumeral stria complete, straight; 1st visible abdominal tergite long about 2× midline length of second; male 4th visible tergite sulcate along basal margin on either side of rounded median tubercle; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 43A, B) moderately laterally compressed, basal bulb small; tegmen extended smoothly from basal bulb, dorsoventrally compressed, rather narrow and parallel-sided with small tooth on left edge, apex narrowly subtruncate; dorsal process arising from upper right edge of tegmen, short, curving mediad over top of middle of distal lobe of tegmen.

Etymology. The species name is a Kichwa term meaning 'companion' or 'sibling'.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is very similar to many other small species with an untoothed pronotum and relatively short antennal club with transverse basal segments. Its aedeagus, retaining a minimal basal bulb and not having a strongly differentiated outer valve, is unusual in the group and in the genus. It is most similar, however, to that of the following species (*J. pinzai*).

Jubus pinzai **sp. nov.**
DNA barcode: GenBank PX930339
Figs 42D–F, 43C–D

Type material. Holotype ♂ (MECN-EN 41024): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12840, Morphosp. Ot.A.005"; deposited in MECN. **Paratypes** (2♂): same general locality, but -0.4191˚, -79.0039˚, 1990 (MECN-EN 38564) & -0.4181˚, -79.0039˚, 2054m (MECN-EN 41025).

Diagnosis. (TL: 1.1mm) Body (Fig. 42D) light orange, uniformly not too densely setose; head a little longer than wide, eye diameter slightly greater than postocular genal length, coarsely faceted; vertexal foveae indistinct, sulci short, deeply impressed, 'U'-shaped behind strongly elevated antennal bases; antennae moderately elongate, antennomeres III–VII progressively wider and more transverse, VIII–XI forming distinct loose club, VIII–X similar in size, XI about three times as long as X; pronotum short and broad, margin lacking subbasal tooth, sides anterad weakly rounded and evenly narrowed, basal constriction about one-third total pronotal length, lateral foveae present just anterad constriction, connected by evenly curved basal transverse sulcus; male elytra subparallel-sided (winged), each elytron with sutural and two lateral foveae well impressed, basal carina between them weak; subhumeral fovea present and subhumeral stria complete; first visible abdominal segment long, tergite about twice midline length of 2nd segment. Aedeagus (Fig. 43C, D) simple, very narrow, base slightly widened, outer style dominant, arching strongly basad before curving to subacute apex, inner valve short, appressed closely to inner surface of outer.

Etymology. I name this species for Mr. Alejandro Sebastian Pinza Garcia, a student and collaborator from La Universidad Central del Ecuador (UCE), who assisted with this study, including helping to collect this species.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. While sharing most external features with the rest of this group, *J. pinzai* is somewhat distinctive in its shorter anterior pronotal constriction in addition to a stronger posterior one. It also has unusually deeply depressed frontal sulci (Fig. 42D).

Jubus intrepidus **sp. nov.**
Figs 42G–I, 43E–F

Type material. Holotype ♂ (MECN-EN 40719): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13064, Morphosp. VS.003"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN).

Diagnosis. (TL: 1.0mm) Body (Fig. 42G) orange with legs and antennae lighter yellow-orange, body setae very short, appressed; head slightly longer than wide, subtriangular, posterior corners rounded; vertexal foveae and sulci rather deep, converging evenly to front, 'Y'-shaped, with short stem behind antennal tubercles; eyes weakly protruding, coarsely faceted, diameter about equal to post-ocular genal length; antennae short, with antennomeres III–VII bead-like, increasingly transverse, VIII–XI enlarged, forming loose club, with squared basal and distal margins, terminal segment about 2.5× length of penultimate, apically acute; pronotum rather narrow, lacking subbasal tooth, margins narrowed evenly to front, basal fourth constricted; lateral discal foveae weak, basal transverse sulcus weakly arcuate between them; elytra subparallel-sided (winged), with complete basal carina weakly interrupted by sutural and one lateral basal fovea on each; subhumeral fovea present and subhumeral stria complete; 1st visible abdominal tergite long about twice midline length of second; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 43E, F)

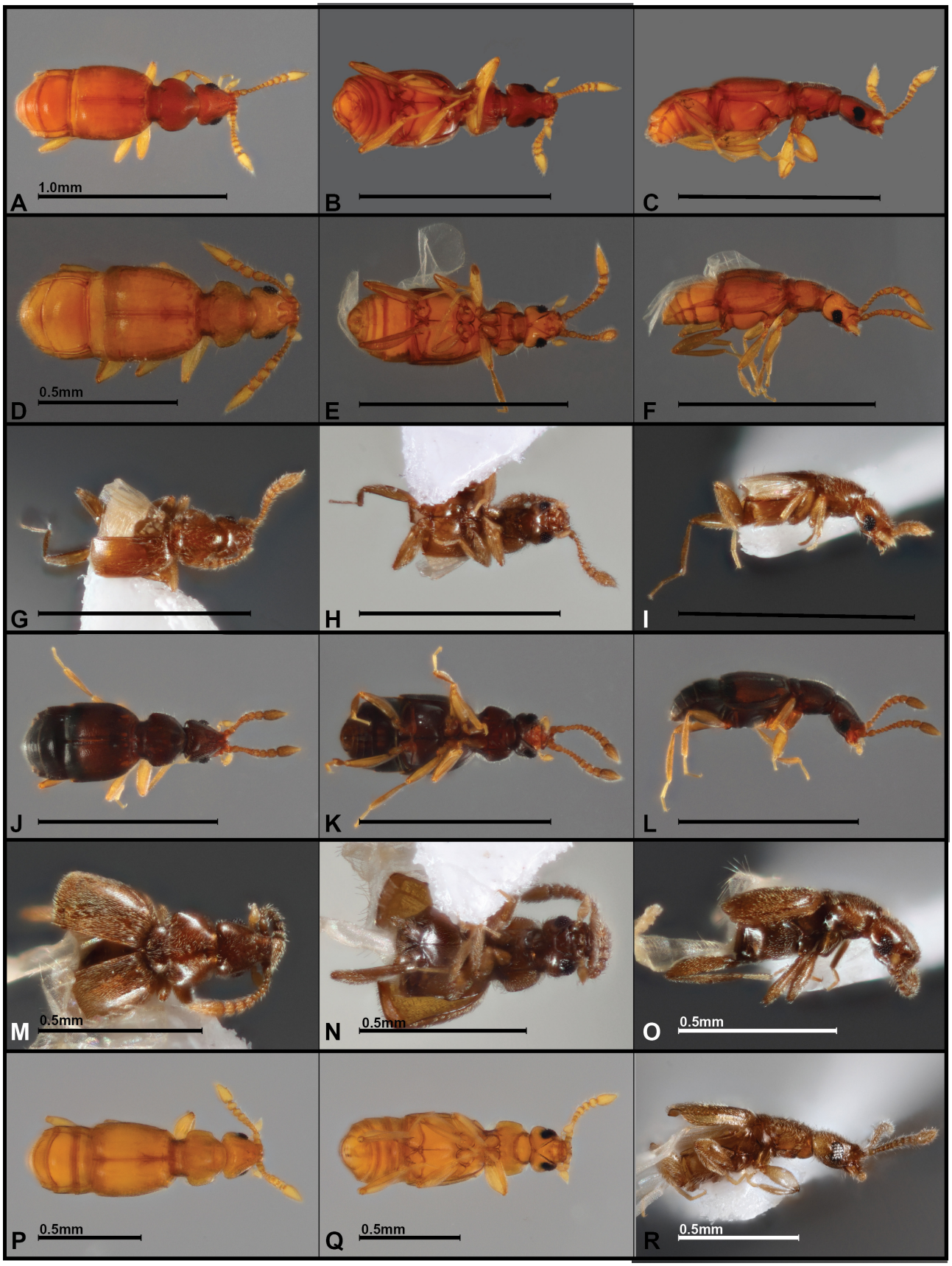

FIGURE 42. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. mashi* **D–F** *J. pinzai* **G–I** *J. intrepidus* **J–L** *J. paku* **M–O** *J. indiscretus* **P–R** *J. pusillus.* Scale bars = 1.0mm unless otherwise indicated.

lacking basal bulb; outer valve sinuate at extreme base, free for short distance basally, curving distad between elevated lateral ridges of inner valve, bifid at apex, with shorter and longer ventrally directed teeth; inner valve thick at base, with small basal emargination, distal portion laterally subdivided: left-side process rises then bends apicad, acute apex free, right-side lobe forming longer lateral lamina that widens to an enlarged, membranous, extrusible sac.

Etymology. This species name refers to its bravery in living on the side of a volcano.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is only definitely identifiable by characters of the male genitalia, in particular, having the outer valve dinstinctly sinuate at the very base, and only free briefly, and having a tridentate apex, formed by the apices of both the inner and outer valves. It is uncertain whether the exposed internal sac is an artifact of preservation (more likely) or a consistent character of the species.

Jubus paku **sp. nov.**
Figs 42J–L, 43G–H

Type material. Holotype ♂ (MECN-EN 41036): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Ridge Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12956, Morphosp. Yn.A.025"; deposited in MECN. **Paratypes** (15♂, 4♀, same general locality as type): 9: same data as type; 3: -0.5958˚, -77.8927˚, 2233m; 3: -0.5935˚, -77.8982˚, 2356m; 5: -0.5939˚, -77.8980˚, 2368m (MECN-EN 38679, 38684–38696, 41037–40138, 38718, 38722, 38707, 38706).

Diagnosis. (TL: 1.2mm) Male (Fig. 42J) brownish orange with legs and antennae lighter yellow-orange, body setae very short, appressed; head slightly longer than wide elongate, subtriangular, posterior corners rounded; vertexal foveae shallow, vertexal sulci converging evenly to front, 'Y'-shaped, with short stem behind antennal tubercles; eyes protruding, coarsely faceted, diameter about equal to post-ocular genal length; antennae short, with antennomeres III–V beadlike, VI–VII weakly transverse, VIII–X enlarged, slightly wider than long, with squared basal and distal margins, terminal segment about 2.5× length of penultimate; pronotum rather narrow, lacking subbasal tooth, margins narrowed evenly to front, basal fourth constricted; lateral discal foveae weak, basal transverse sulcus weakly arcuate between them; elytra subparallel-sided (winged), with complete basal carina weakly interrupted by sutural and one lateral basal foveae on each; subhumeral fovea present and subhumeral stria complete; 1st visible abdominal tergite long about 1.5× midline length of second; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 43G, H) somewhat but not strongly laterally compressed, basal bulb indistinct; outer/basal valve free at base, curved distad and reposed in broad trough formed by inner valve; inner valve with sides splayed out at base, narrowed slightly but remaining broadly open, sinuate and broadening toward curved, narrowly rounded apex.

Etymology. The name of this species is a kichwa word meaning 'dark brown' or 'café-colored' (in Spanish).

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This small species has unusually dark coloration, while its legs remain lighter. Its pronotum is slightly narrower than many of those that lack a marginal tooth.

Jubus indiscretus **sp. nov.**
Figs 42M–O, 43I–J

Type material. Holotype ♂ (MECN-EN 40730): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13075, Morphosp. VS.014"; deposited in MECN.

Diagnosis. (TL: 0.9mm) Body (Fig. 42M) small, light castaneous, densely setose; head slightly longer than wide, basal corners rounded; eyes protruding, diameter about equal to post-ocular genal length; vertexal foveae large, setose; vertexal sulci rather short, thin, converging anterad, meeting behind antennal elevation; antennae compact, antennomeres I & II short, cylindrical, III–VII beadlike, increasingly transverse, VIII–XI forming distinct, loose, setose club, VIII–X wider than long, XII about 3× length of X, apically bluntly acute; pronotum lacking basal tooth, margins evenly narrowed from widest basal point to near apex, abruptly narrowed to very short collar; posterior constriction very strong, pronotum slightly narrower at constriction than behind; lateral foveae lost in constriction, transverse sulcus present but only shallowly impressed; elytra subparallel-sided (winged), each with weak basal carina, arched weakly over sutural and one lateral basal foveae; 1st abdominal tergite about 2× as long as 2nd; all male abdominal ventrites depressed and setose, ultimate ventrite densely setose, with setae convergent to midline. Aedeagus (Fig. 43I, J) moderately laterally compressed, basal bulb absent; outer valve briefly free at base, curving dorsad and to the left, running obliquely through basal trough formed by inner valve, emerging at side and recurving mediad to acute apex, ending near midpoint of apical lobe of inner valve; inner valve divided from base, a short trough for passage of outer valve divided by ridge from main portion which widens from base into broad, flat apical lobe with left and right edges slightly elevated, apex weakly rounded, fringed.

Etymology. This species' name refers to its strong similarity to other small-bodied species *Jubus* species.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. While the basal pronotal constriction is somewhat stronger then many in this group, *J. indiscretus*



FIGURE 43. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. mashi* **C, D** *J. pinzai* **E, F** *J. intrepidus* **G, H** *J. paku* **I, J** *J. indiscretus* **K, L** *J. pusillus*.

is only definitely identifiable through characters of the male genitalia. In particular, the broadly expanded trough of the right side of the inner valve is unique, with the outer valve being rather short and confined to its left basal edge (Fig 43I).

Jubus pusillus **sp. nov.**
DNA barcode: GenBank PX930293
Figs 42P–R, 43K–L

Type material. Holotype ♂ (ZSFQ-i23270): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 22.v.2011, AT1312, M. Caterino, A. Tishechkin, Leaf/rotting stick litter" / "Caterino DNA voucher, Ext. MSC-12677, Morphosp. LL.A.013"; deposited in ZSFQ.

Diagnosis. (TL: 1.3mm) Body (Fig. 42P) small, narrow, orange, finely punctate and uniformly setose; head short, no longer than wide, basal corners rounded; eyes small, diameter about two-thirds post-ocular genal length; vertexal foveae distinct, fine; vertexal sulci short, deeply but narrowly impressed, 'Y'-shaped, converging to short stem behind prominent antennal elevation; antennae short, antennomeres I–II cylindrical, III–VI beadlike, progressively shorter and more transverse, VII–XI forming loose (5 segmented) club, VII smaller than VIII–X all slightly wider than long, XI about 2.5× as long as X, narrowly rounded apically; pronotum lacking basal marginal tooth, sides almost parallel, very weakly convergent anterad, then abruptly narrowed to short basal collar; posterior constriction strong, basolateral foveae obscured by constriction; transverse basal sulcus deep, weakly arcuate; elytra long, subparallel-sided (winged), each elytron with sutural and two lateral basal foveae; subhumeral fovea and carina present; 1st abdominal tergite about equal in length to 2nd; male legs and venter lacking obvious secondary sexual characters. Aedeagus

(Fig. 43K, L) with distinct dorsobasal and ventral valves, hinged at their bases, dorsal valve styliform, looped very strongly basad before curving distad to rest in dorsum of ventral valve, ending short of it; ventral valve with basal shelf-like lobe and more elongate, sloping dorsal lobe which receives the dorsal style.

Etymology. The name of this species refers to its very small body size.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. The phylogenetic relationships of this species may lie elsewhere, as it has a shorter 1st tergite than most other members of this group. Its very narrow, elongate form, and nearly parallel-sided pronotum, in combination with the lack of subbmarginal pronotal teeth should make it fairly readily identifiable. Its male genitalia, with a long, free, arched outer valve, resemble those of some otherwise very dissimilar *Jubus* species, like *J. fraternus* (larger and with a pronotal tooth) and *J. arquus* (larger still, and with unclubbed antennae). So the looped, free outer valve may, surprisingly, be convergent among at least a couple distinct lineages.

Jubus perplexus **sp. nov.**
DNA barcode: GenBank PX930378
Figs 44A–C, 45A–B

Type material. Holotype ♂ (ZSFQ-i23272): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12704, Morphosp. TBS.A.024"; deposited in ZSFQ.

Diagnosis. (TL: 1.8mm) Body (Fig. 44A) light orange; head smooth and shining, sparsely setose, posterodorsal and lateral margins rounded; eyes rather small, slightly shorter in diameter than postocular genal length, finely faceted; frontal sulci impressed on anterior third, becoming thinner and shallower posterad, meeting anteriorly in broad smooth median interantennal impression; antennae rather short, gradually expanded from antennomere I distad, club not distinct; gular carinae present; pronotal disk smooth, lacking subbasal teeth, sides weakly rounded anterad, basal third abruptly narrowed; antebasal transverse impression distinct, curved between distinct lateral foveae; elytra with weak basal carina, each with sutural and two small lateral foveae dorsally; subhumeral fovea and complete subhumeral stria present; legs simple, without secondary modifications; first abdominal segment about 1.5× length of second; Aedeagus (Fig. 45A, B) with distinct, large basal bulb with conspicuous internal musculature; four-part dorsal process extending distad from within upper part of basal bulb, a lateral pair of thick, incurved hooks, and an inner pair of thinner, intertwined acute rods; ventral valve curved upward from base, ventrad to narrowly rounded apex.

Etymology. The species name refers to the quandary faced in determining its proper taxonomic placement.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador

Remarks. Externally this species seems a good fit in *Jubus*, seeming only a little unusual in having elongate unclubbed antennae. Its place in this 1st group of species is more suspect, being relatively large-bodied and having three basal elytral foveae. The male genitalia are very strange in either regard, and potentially plesiomorphic, having a large basal bulb, and only short armature over a contiguous tegmenal lobe. Seen on its own the genitalia would tend to place the species in *Sebaga*.

***Jubus* Group 2**

Jubus effertus **sp. nov.**
Figs 44D–F, 45C–D

Type material. Holotype ♂ (MECN-EN 41042): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13018, Morphosp. Can.A.004"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 41043).

Diagnosis. (TL: 1.7mm) Body (Fig. 44D) medium sized, orange, conspicuously sparsely punctate, with recumbent setae throughout and sparsely scattered longer, erect setae interspersed, particularly along margins of nota, elytra, and abdomen; head slightly longer than wide, weakly emarginate at base, basal corners rounded; eyes moderately large, diameter about equal to postocular genal length; vertexal foveae evident; vertexal sulci 'V'-shaped, well impressed and meeting behind elevated antennal tubercles; antennae short, antennomeres III–V beadlike, VI–VII slightly transverse, VIII–XI forming loose club, terminal antennomere acuminate, about 3× longer than penultimate; pronotum with distinct subbasal tooth, widened slightly anterad, tapered evenly to near front; basal constriction emarginate at sides; lateral basal foveae distinct, transverse subbasal sulcus well impressed, arcuate between; elytra subparallel-sided (winged); basal carina present, slightly interrupted by sutural and two lateral foveae on each; humeri slightly dentate; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite slightly more than 2× midline length of 2nd; male 4th visible tergite sulcate along basal margin, last tergite slightly swollen, weakly pointed apically; venter and legs without obvious secondary sexual characters. Aedeagus (Fig. 45C, D) moderately laterally compressed, slightly broader at base; basal bulb present, upright, subquadrate in lateral view; basal/outer valve not differentiated at base, but extended distad, widened and curved strongly to right then back across midline, ending near apex as narrow style; ventral portion of tegmen extended as dorsoventrally flattened lobe, constricted at base, widened toward apex into roundly bifid spatulate apex, a more acute subapical tooth present along its inner (left) margin.



FIGURE 44. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. perplexus* (**C** detail view of head) **D–F** *J. effertus* **G–I** *J. gyrus* **J–L** *J. excavatus* **M–O** *J. diazi.* Scale bars = 1.0mm.

Etymology. This species' name refers to the 'swollen' condition of the last male tergite.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This small species is mainly distinguished by aedeagal characters, with a subquadrate (in lateral view; Fig. 45C) basal bulb, a widely arcuate dorsal valve, and apically tridentate inner valve/tegmen. Externally, the slightly tumid last tergite is somewhat unusual, more commonly seen among females of related species. The transverse sulcus along the base of the penultimate tergite is seen in other species, but often concealed by retraction within the preceding segment. The first visible tergite is approximately twice the length of the 2nd, whereas in many in this group the length ratio is closer to 3×.

Jubus gyrus **sp. nov.**
Figs 44G–I, 45E–F

Type material. Holotype ♂ (MECN-EN 40747): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13092, Morphosp. Cu.009"; deposited in MECN. **Paratype** (1♀): same general locality, -0.2077˚, -75.9272˚ (MECN-EN 40510).

Diagnosis. (TL: 1.2mm) Body (Fig. 44G) orange, with rather sparse recumbent pubescence and conspicuously longer erect setae; head roughly equilateral, emarginate posteriorly, posterior corners rounded; eye diameter about equal to postocular genal length; vertexal foveae small; vertexal sulci shallow, strongly convergent anterad ('V'-shaped), meeting in shallow trough behind antennal elevation; antennae short, compact, antennomeres I and II short, cylindrical, III–VII strongly transverse, VIII–XI forming loose club, VII–X half as long as width, XI 3.5× length of X, apically acuminate; pronotum with weak subbasal tooth, sides weakly rounded anterad, then narrowed to anterior margin, posterior constriction rather deep; basolateral foveae at inner corners of constriction, joined by somewhat deeply angulate transverse sulcus; elytra subparallel-sided (winged), each with low basal carina weakly arched over sutural and one lateral fovea; subhumeral fovea and stria present; 1st visible tergite almost 3× longer than 2nd; male last ventrite weakly depressed, venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 45E, F) somewhat laterally compressed; basal bulb present, rounded basally, tapered to tegmen distally; outer/basal valve arising from left basal upper edge of basal bulb, extending dorsad then loosely spiralling ventrad, ending pointing apicolaterad (leftward); tegmen (=inner valve of others) with right-side flange partly covering outer style, with basal plate bluntly, subapically dentate on left side, narrowing to short, bluntly digitiform apex.

Etymology. This species is named for its aedeagal 'coil'. It is used as a noun in apposition.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is very small, with a narrow and weakly toothed prontum (Fig. 44G). The antennae are short, with club antennomeres VIII–X distinctly transverse. The spiralled outer valve of the aedeagus (Fig. 45F) may be homologous with more radical ones like *J. vortex* (Fig. 49J), *J. sulcatus* (Fig. 57J), or *J. cochleatus* (Fig. 49L). The female paratype is associated on the basis of similar pronotal shape.

Jubus excavatus **sp. nov.**
Figs 44J–L, 45G–H

Type material. Holotype ♂ (MECN-EN 40757): "ECUADOR: Sucumbíos, -0.2066˚, -75.9262˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13102, Morphosp. Cu.019"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 40497).

Diagnosis. (TL: 1.3mm) Body (Fig. 44J) small, orange, moderately adorned with semirecumbent setae, with scattered longer, erect setae interspersed; head slightly longer than wide, weakly basally emarginate, posterior corners rounded; eyes moderately large, diameter slightly greater than post-ocular genal length, coarsely faceted; vertexal foveae small, rather narrowly separated; vertexal sulci converging from foveae to setose median post-antennal depression; antennae compressed, antennomere I short, cylindrical, II globular, III–IV small, weakly transverse, V–X increasingly transverse, club indistinct, apical antennomere a little over 3× length of X, apex narrowly subacute; gular carinae strong, projecting beneath head; pronotum with weak subbasal tooth, sides weakly converging to short apical collar; basal constriction narrow; lateral subbasal foveae weak, connected by arcuate sulcus; elytra subparallel-sided (winged), each with basal carina arched over small sutural and two basolateral foveae; subhumeral fovea and carina present; 1st visible abdominal tergite about 2.5× length of 2nd; male 4th tergite with deep, transverse, setose excavation along anterior margin (may be largely hidden under distal margin of 3rd); legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 45G, H) large, as long as abdomen (as seen when cleared), laterally compressed, small basal bulb present; outer valve not styliform, lying above and partly nested within main body of tegmen, subapically with a rounded dorsal carina and short apical hook; inner valve/tegmen wider, with basal plate produced around left side of outer valve, narrowing at midpoint and continued to descending, rodlike, weakly bobbed apical lobe.

Etymology. This species is named for the male's abdominal tergite sulcus.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This small species may be recognizable by the combination of its weak pronotal tooth, small median frontal depression, indistinct antennal club, and long 1st tergite. This species' males have a pronounced, setose sulcus along the anterior margin of the male 4th abdominal tergite (which is known and often inconspicuous in some other *Jubus* species). Its aedeagus has an unusually long and thin inner valve/tegmen.

Jubus diazi **sp. nov.**
Figs 44M–O, 45I–J

Type material. Holotype ♂ (MECN-EN 40894): "ECUADOR: Napo, -0.9128˚, -77.2862˚, Chontapunta, Finca Minga, 22.1.2025, 347m. Winkler., D Diaz | Y. Tapuy" / "Caterino DNA voucher, Ext. MSC-13313, Morphosp. Ming.001"; deposited in MECN. **Paratypes** (1♂, 4♀): same data as type (MECN-EN 41967–41971).

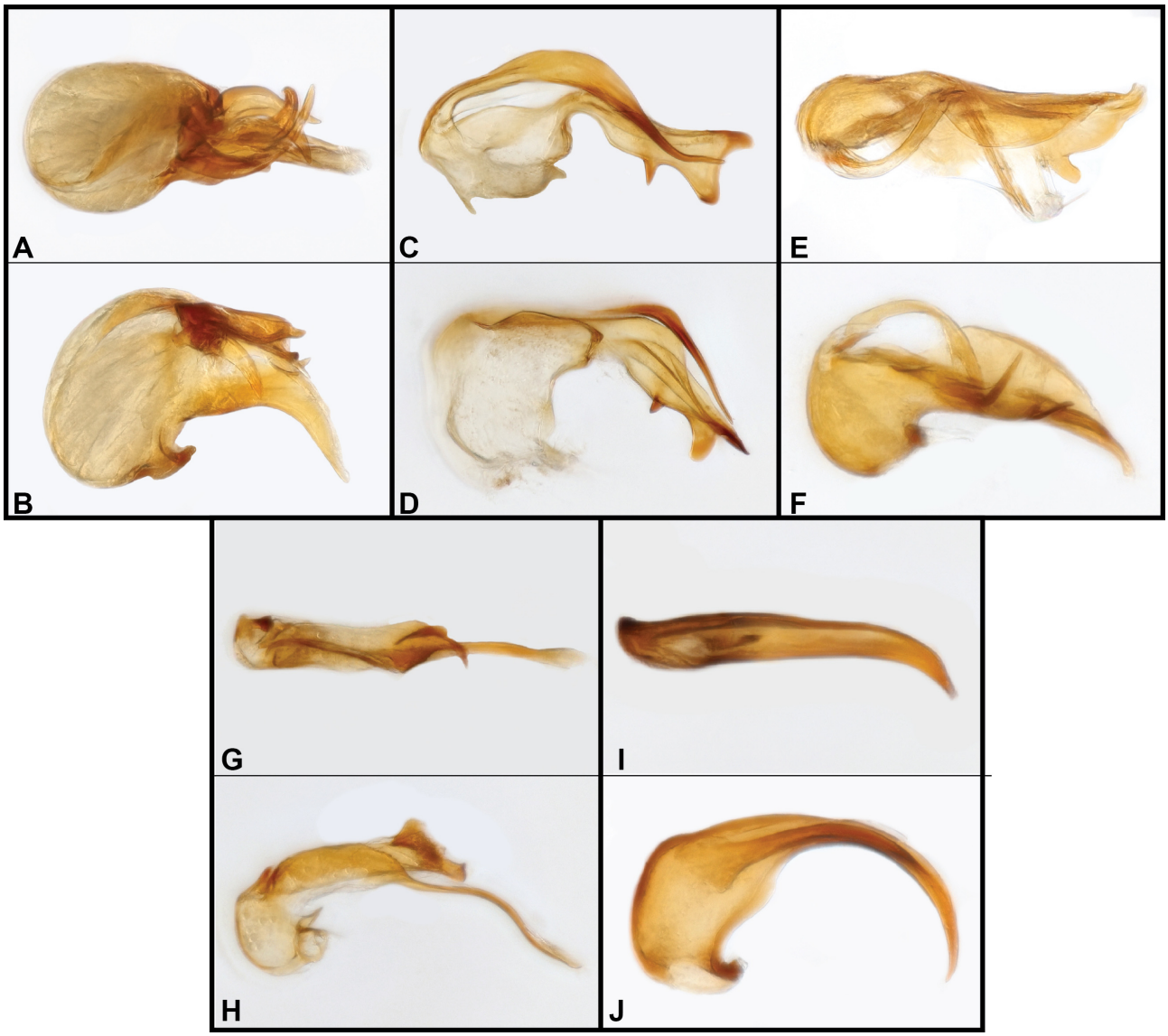

FIGURE 45. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. perplexus* **C, D** *J. effertus* **E, F** *J. gyrus* **G, H** *J. excavatus* **I, J** *J. diazi*.

Diagnosis. (TL: 1.3mm) Body (Fig. 44M) small, orange, shining, setose; head subtriangular, posterior corners rounded; eyes moderately large, diameter about 1.5× postocular genal length; vertexal foveae present between anterior edges of eyes; vertexal sulci thin, short, converging to large, deep, setose median fovea; antennae compact, antennomeres I–II short, little longer than wide, cylindrical, III–IV beadlike, V–VII transverse, progressively wider, VIII–XI forming distinct club, VIII–X wider than long, XI about 3.5× as long as X, apically acuminate; pronotum with strong basal tooth, sides slightly widened anterad, then narrowed strongly to neck; posterior pronotal constriction arcuate; elytra subparallel-sided (winged), each with basal carina weakly arched over very shallow sutural and two lateral basal foveae; subhumeral fovea deep, subhumeral stria cariniform; 1st abdominal tergite about 3× as long as 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Figs. 45I, J) strongly laterally compressed, with distinct basal bulb bearing short basal knob, basal edge rather vertical, tegmen mostly an uninterrupted dorsal prolongation of basal bulb, arching over to ventrally pointed, acute apex; articulated process arising within upper part of basal bulb, paralleling tegmen nearly to apex.

Etymology. I am glad to name this species for my colleague and collaborator at INABIO, Mr. David Ricardo Díaz-Guerrero, who collected the type series.

Distribution. This species is known only from western Amazonia, in the region of Chontapunta in eastern Napo Province, Ecuador.

Remarks. Compared to other species in this group, this species has a particularly deep and well-defined mediofrontal depression (Fig. 44M), and relatively large eyes. Its aedeagus is quite simple, tapering and curving evenly to a downturned apex, and a relatively inconspicuous articulated process (a reduced outer valve?).

Jubus mutabilis **sp. nov.**
Figs 46A–G, 47A–B

Type material. Holotype ♂ (MECN-EN 40830): "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13183, Morphosp. Mch.046"; deposited in MECN. **Paratypes** (9♂, 11♀, same general locality and date as type): 6: same data as type; 5: -1.3801˚, -78.2889˚, 2434m; 2: -1.3838˚, -78.2918˚, 2345m; 3: -1.3868˚, -78.2929˚, 2304m; 4: -1.3829˚, -78.2909˚, 2382m (MECN-EN 40792, 40195, 40198, 40199, 40202, 40223, 40224, 40227, 40239, 40245, 40252, 40263, 40275, 40299, 40300, 40305, 40308, 40309, 40315, 40803). **Other material:** 1♂: "ECUADOR: Tungurahua, -1.4328˚, -78.3121˚, Naturetrek Candelaria Res, 2054m, 13.XI.2024, M.Caterino, sifted litter"; 2♂: "ECUADOR: Tungurahua, -1.4327˚, -78.3120˚, Naturetrek Candelaria Res, 2040m, 13.XI.2024, M.Caterino, sifted litter" (MECN-EN 40860, 40865, 40420).

Diagnosis. (macropterous male, Figs 46A–C; TL: 1.6mm): Body (Fig. 46A, D) moderately small, reddish orange, the head, pronotum, and elytra tending to be darker than the abdomen and venter, with moderately dense, recumbent setae with much longer erect and recurved setae interspersed; head elongate triangular, with rounded posterior corners; eyes large, protuberant, diameter just less than post-ocular genal length; vertexal foveae fine, situated at ends of 'V'-shaped vertexal sulci, sulci meeting in a deep post-antennal impression; antennae compact, antennomere I cylindrical, very short, II elongate oval, III–VII small, increasingly transverse, VIII–XI forming distinct club, VIII–X slightly wider than long, XI almost 3× as long as X, apically acute; pronotum widest just anterad basal constriction, with small lateral subbasal tooth, sides evenly converging anterad; basal constriction gradual; subbasal lateral foveae evident, connected by weakly angulate transverse sulcus; elytra long, parallel-sided, each with sutural and two close lateral basal foveae, with basal carina strongly arched over them; subhumeral fovea and stria present; 1st abdominal tergite almost 3× length of second; basal margin of male 4th tergite depressed (Fig. 46G), bearing several clubbed setae beneath laminate basal hood; last male ventrite weakly depressed at middle, deeply emarginate at apex (Fig. 46B, E); legs lacking obvious secondary sexual characters. Aedeagus (Fig. 47A, B) laterally compressed, with basal bulb well-developed, extended dorsad by two long median processes, left one thicker, longer, sinuate, apically acute, ending above ventral process, right one thinner, shorter, mostly hidden in left view, more easily visible from above; beneath dorsal processes extends a laterally compressed, weakly sclerotized process bearing dense fringe of setae along its dorsal edge; ventral process extending from basal bulb is dorsoventrally compressed, widening slightly to broad, subtruncate apex.

Brachypterous morph (Fig. 46D–F): eyes smaller, diameter about one-third post-ocular genal length, comprising about 16 ommatidia; elytra short, flattened, sides rounded, subhumeral fovea deeply depressed, creating humeral tooth, with broad subhumeral sulcus behind easily visible from above. Aside from subtle modifications of last 4th male abdominal tergite and last male ventrite, indistinguishable from female.

Etymology. This species' name refers to its polymorphism.

Distribution. This species is known from two localities on either side of the Río Pastaza valley in Tungurahua Province, Ecuador. Both the Río Machay Reserve and the Naturetrek Candelaria Reserve are managed by the EcoMingo Foundation.

Remarks. This species is unique as far as known among *Jubus* spp. in exhibiting male polymorphism, with distinct winged and wingless forms. They are unambiguously united by aedeagal morphology, which, with its dense dorsally fringed process, is very distinctive, and both forms are known from both known localities. Recognizing the species independent of eye size, elytral size, and wingedness is more or less possible by the distinctive vertexal sulci, long, converging evenly to a small frontal depression, with short, divergent antennal bullae immediately anterad. The acuminate apical antennomere is also unusually long.

The transverse depression across the base of the male 4th tergite (Fig. 46G) is likely more common and widespread than currently appreciated. It is difficult to see and typically withdrawn into the preceding segment in dried specimens. Its function is a mystery.

Jubus cavus **sp. nov.**
DNA barcodes: GenBank PX930330, PX930334
Figs 46H–I, 47C–D

Type material. Holotype ♂ (MECN-EN 38659): "ECUADOR: Pichincha, 0.0473˚S, 78.7632˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12799, Morphosp. Min.A.021"; deposited in MECN. **Paratypes** (12♂): 10: same data as type; 2: same general locality as type, but 0.0472˚S, 78.7631˚W (MECN-EN 36847–36858).

Diagnosis. (TL: 1.2mm) Male body (Fig. 46H) uniformly light orange, body finely punctate, uniformly setose; head about 1.25× as long as wide, widened posterad, shallowly emarginate at base; eyes rather small, diameter just over half length of post-ocular gena, rather finely faceted; vertexal foveae evident; vertexal sulci 'V'-shaped, diverging from antennal bases, terminating in foveae; antennae rather short, with last 4 antennomeres forming loose club, antennomeres VIII–X subquadrate, XI long and distinctly acuminate; pronotum lacking subbasal tooth, sides weakly rounded; posterior third strongly constricted, with medially angulate basal sulcus connecting large and conspicuous lateral foveae; elytra narrowed anterad (apparently wingless), with straight basal carina extending from very fine sutural fovea to humerus, continuous with subhumeral stria, subhumeral fovea not evident; first abdominal segment more than twice as long as second. Putative female eyes comprising

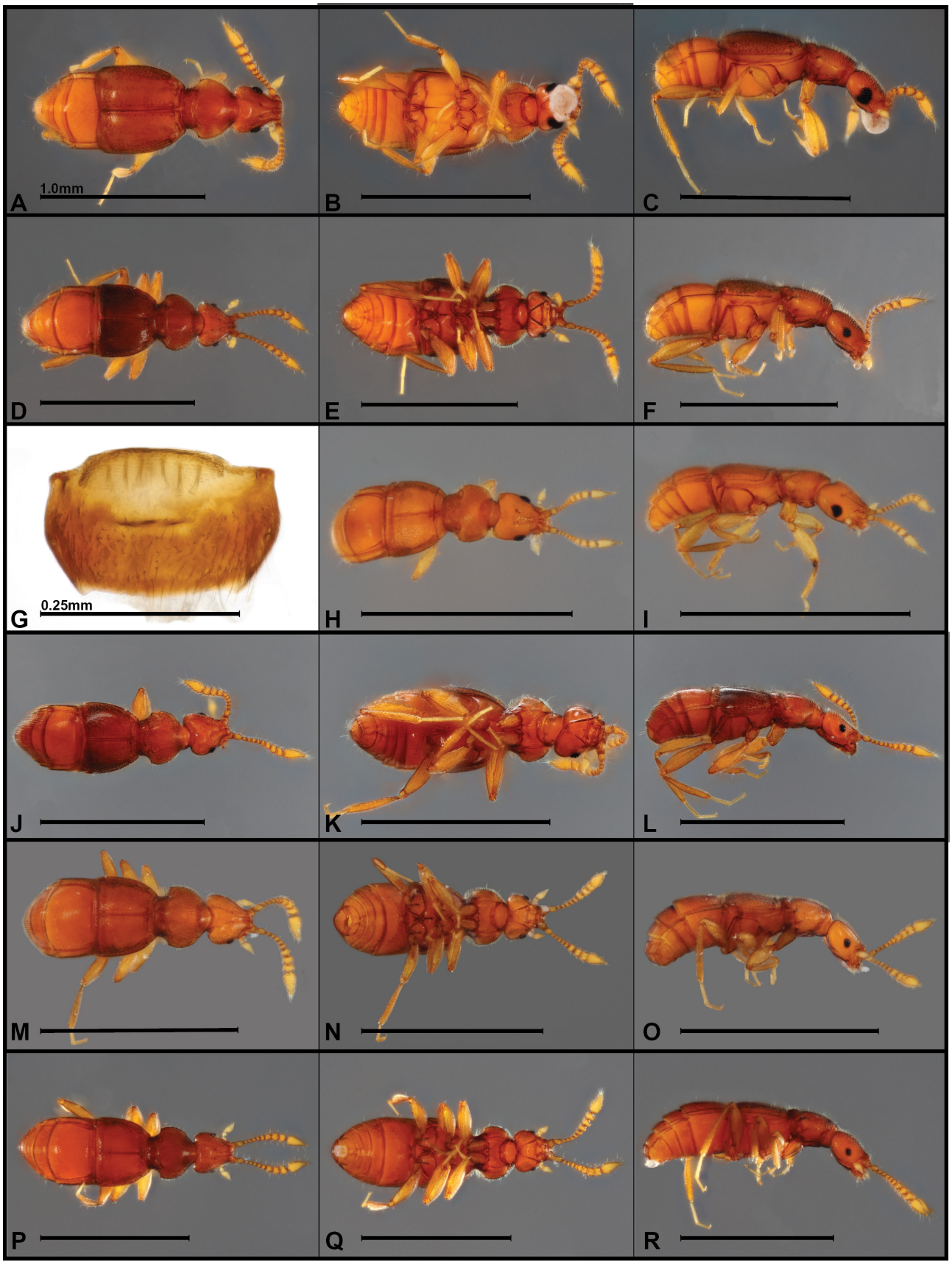

FIGURE 46. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. mutabilis* (macropterous male) **D–F** *J. mutabilis* (micropterous male) **G** *J. mutabilis* male 4th abdominal tergite **H, I** *J. cavus* **J–L** *J. piscator* **M–O** *J. stipulatus* **P–R** *J. reptans.* Scale bars = 1.0mm unless otherwise indicated.

2 ommatidia, antennal club distinct but shorter; pronotum with subbasal tooth, lateral foveae not as conspicuous; other secondary sexual characters not evident. Aedeagus (Fig. 47C, D) relatively broad, with rather distinct basal bulb and triangular ventrobasal foramen; tegmen extending distad broadly at base, then abruptly narrowed and twisting slightly toward subacute apex; one style present (dorsal?) diverging from left side, looping distad and dorsad over tegmen, narrowing and descending into channel formed by apical portion of tegmen.

Etymology. This species' name refers to its pronotal foveae.

Distribution. This species is known only from the cloud forests near Mindo, Pichincha Province, Ecuador.

Remarks. The large and distinct basolateral pronotal foveae of this species are unusual. These, in combination with the long 1st abdominal tergite, and compactly 4-segmented antennal club should distinguish it from others occurring nearby. There are other species with a coiled aedeagal process, but none in which it emerges laterally before curving mediodorsad.

Jubus piscator **sp. nov.**
Figs 46J–L, 47E–F

Type material. Holotype ♂ (MECN-EN 40718): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13063, Morphosp. VS.002"; deposited in MECN. **Paratypes** (4♂, 5♀): 5: same data as type (MECN-EN 40722, 40627, 40649, 40641, 40637); 4: -0.658219˚, -77.591974˚, 1568m, 26-X-2023 (MECN-EN 42048, 41992–41994)

Diagnosis. (TL: 1.5mm) Body (Fig. 46J) small, orange, rather sparsely setose; head subtriangular, not much longer than wide, posterior corners rounded; eyes small, diameter only about half postocular genal length; vertexal foveae small; vertexal sulci well impressed, short, convergent to deep median postantennal depression; antennae short, antennomere II squat, cylindrical, III–V beadlike, VI–VII widened slightly and increasingly transverse, VIII–XI forming distinct four-segmented club, VIII–X wider than long, XI acuminate apically, about 3× as long as X; pronotum with small but distinct subbasal marginal teeth, sides widened slightly anterad, rounded and converging to short cervical collar; basal constriction strong; basolateral foveae deeply impressed and connected by deep, arcuate transverse sulcus; elytra rather short, only parallel-sided in apical half (wingless?); elytra with basal carina weak, each with sutural and 2 lateral basal foveae; subhumeral fovea present, subhumeral sulcus well-developed in basal half, visible from above; first visible abdominal tergite about 2.5× as long as second; male propygidium (penultimate tergite) sulcate along basal margin; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 47 E, F) not strongly laterally compressed, basal bulb present above constricted basal collar; tegmen broad, basally divided into two elongate styles on right side and wider, left-side apical lobe, abruptly notched at left base, narrowing and curving ventrad, terminating in dorsoventrally flattened tongue; longest style is less strongly sclerotized, arching strongly dorsad, then descending to a bobbed tip adjacent to tip of major apical lobe; shorter style is more strongly sclerotized, arching slightly less dorsad but more strongly laterad, terminating in acute tip short of apex of other processes.

Etymology. This species name means 'fisher', refering to the shape of the dorsal process of the aedeagus, which resembles the hanging lanterns of some anglerfish. It is used as a noun in apposition.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. Among the species in this group *J. piscator* is somewhat distinctive in its basally very strongly constricted pronotum, with rather broadly rounded sides, along with short elytra (no winged morphs have been seen, but can't be ruled out). Its aedeagus allies it with a few others here that have a long dorsally projecting process extending over the tegmen, such as *J. reptans* (Fig. 47J) and *J. stipulatus* (Fig. 47H). Such a condition may be further modified to coil (*J. gyrus*; Fig. 45F) or bear apical teeth (*J. pectineus*; Fig. 49B). A somewhat similar form is seen in at least one group 1 species, *J. acuminatus* (Fig. 39L), where, however, the dorsal process is less differentiated from the basal bulb and more closely parallel to the tegmen. Whether that similarity means much remains to be seen.

Jubus stipulatus **sp. nov.**
Figs 46M–O, 47G–H

Type material. Holotype ♂ (MECN-EN 41032): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Ridge Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12954, Morphosp. Yn.A.023"; deposited in MECN [entire specimen in genitalia vial]. **Paratypes** (3♂, 5♀, all same general locality as type): 6: -0.5973˚, -77.8933˚, 2224m; 1: -0.5958˚, -77.8927˚, 2233m; 1: -0.5974˚, -77.8934˚, 2222m (MECN-EN 38673–38675).

Diagnosis. (TL: 1.3mm) Male body (Fig. 46M) orange, setae dense, short, appressed; head rather broad, about as wide as long, posterior corners rounded, weakly emarginate at base; vertexal foveae distinct, close, vertexal sulci rather short, converging to common depression behind elevated, antennal tubercles; eyes small, with only ~15 facets, diameter about half post-ocular genal length; antennae short, antennomeres III–IV beadlike, V–VII transverse, VIII–XI forming distinct club, VIII–X slightly wider than long, terminal segment about 2.5× length of penultimate, narrowed from base to subacute apex; pronotum with subbasal tooth, margins slightly widened anterad then evenly rounded to front, basal fourth constricted; lateral discal foveae distinct, basal transverse sulcus weakly arcuate between them; elytra rather short, humeri rounded (wingless), with

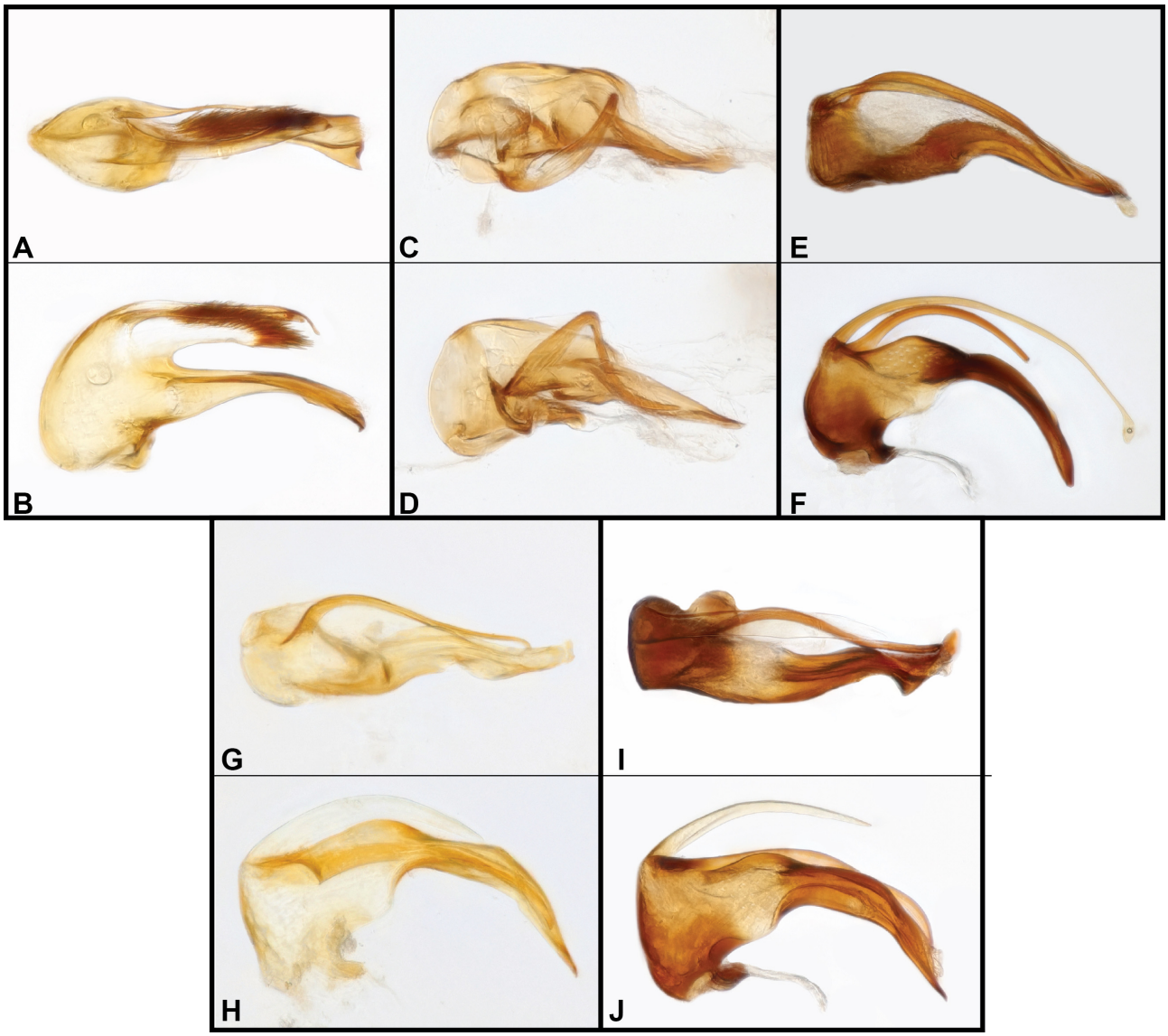

FIGURE 47. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. mutabilis* **C, D** *J. cavus* **E, F** *J. piscator* **G, H** *J. stipulatus* **I, J** *J. reptans*.

complete basal carina weakly interrupted by sutural and two evenly spaced lateral basal foveae on each; humeri weakly dentate, subhumeral fovea present and subhumeral stria complete, forming lateral elytral margin; 1st visible abdominal tergite very long, about 2.5× midline length of second; metaventrite very short; male metafemur (Fig. 46N) with coarse denticles on basal third of inner surface; male pygidium rather convex. Aedeagus moderately laterally compressed; basal bulb present but not voluminous; dorsal process thin (mostly transparent in Figs 47G, H), arched over median and ventral processes; median style arising on upper surface of basal bulb, narrow, well sclerotized, sinuous and ending just short of apicoventral process; ventral process extending from apex of basal bulb, wide, dorsoventrally compressed, with distinct notch on left edge, curved ventrad toward narrowly subquadrate apex.

Etymology. This species' name is a Latin verb meaning 'promise', used as a noun in apposition. It refers indirectly to the 'stippled' appearance of the males' femoral spine patch.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species' flightless, small-eyed males possessing basal metafemoral denticles are unusual among known species. It has a close and almost indistinguishable relative in the following species (*J. reptans*), known from Tungurahua Province, but the two differ in details of aedeagal structure.

Jubus reptans **sp. nov.**
Figs 46P–R, 47I–J

Type material. Holotype ♂ (MECN-EN 40852): "ECUADOR: Tungurahua, -1.4349˚, -78.3113˚, NaturetrekCandelariaRes, 2178m, 13.XI.2024,

M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13205, Morphosp. Cnd.021"; deposited in MECN. **Paratypes** (2♀): same general locality but -1.4327˚, -78.3120˚, 2040m (MECN)

Diagnosis. (TL: 1.6mm) Body (Fig. 46P) small, dark orange, dorsum mostly smooth, with moderately dense, recumbent setae with slightly longer, suberect setae interspersed; head subtriangular, posterior corners rounded; eyes small, comprising about 12 ommatidia; vertexal foveae small; vertexal sulci thin, 'Y'-shaped, converging to common stem; antennae moderately compact, antennomere I cylindrical, short, II elongate oval, III–VII beadlike, each slightly larger than preceding, VIII–XI forming distinct club, VIII–X slightly wider than long, XI almost 4× length of X, narrowly subacute; pronotum with distinct subbasal tooth, sides widened slightly anterad, rounded, then narrowed to front; basal constriction gradual; subbasal lateral foveae evident, connected by subangulate transverse sulcus; elytra short, sides rounded (wingless), lacking dorsobasal foveae; basal marginal carina present, weakly sinuate; subhumeral sulcus deeply impressed; 1st abdominal tergite almost 3× length of second; male metafemur with small cluster of denticles near base of inner surface; male last ventrite emarginate. Aedeagus (Fig. 47I, J) moderately laterally compressed; basal bulb present but not voluminous, basal margin almost vertical; dorsal process thin, becoming membraneous, arched over median and ventral processes; median style arising on upper surface of basal bulb, narrow, well sclerotized, sinuous and ending just short of apex of apicoventral process; ventral process extending from apex of basal bulb, wide, dorsoventrally compressed, with distinct notch and outer angulation on left edge, curved ventrad toward narrowly oblique apex.

Etymology. This species' name is based on a Latin verb for crawling, referring to its inability to fly. It is used as an noun in apposition.

Distribution. This species is known only from cloud forests of the Naturetrek Candelaria Reserve, just south of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species is closely related to *Jubus stipulatus*, sharing the unusual presence of male metafemoral denticles. They are essentially indistinguishable by external characters, both being small in body size, with reduced eyes, short elytra (brachypterous), and having a very long 1st abdominal tergite. While their male genitalia are also clearly similar, there are significant differences in the shape of the median sclerotized process, and especially in the apicoventral process of the tegmen in the placement of the lateral notch and shape distal to it.

Jubus pectineus **sp. nov.**
DNA barcode: GenBank PX930241
Figs 48A–C, 49A–B

Type material. Holotype ♂ (ZSFQ-i23271): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12615, Morphosp. ElP.A.014"; deposited in ZSFQ.

Diagnosis. (TL: 1.6mm) Body (Fig. 48A) light orange, uniformly setose; eyes small, diameter about two-thirds postocular genal length; vertexal sulci long, 'Y'-shaped with distinct vertexal foveae at their posterior ends; antennae compact, antennomeres I–II short, cylindrical, III conical, IV–VII short, increasingly transverse, VIII–XI forming loose club, VIII–X wider than long with basal and distal edges, XI about 3× as long as X, apically acuminate; pronotum with distinct subbasal marginal tooth, sides weakly curved and converging to abruptly narrowed anterior collar; basal constriction similarly emarginate; basolateral foveae present, connected by deep, shallowly 'V'-shaped transverse sulcus; elytra short, sides rounded, humeri sloped (wingless), each with basal carina and distinct sutural fovea, basolateral foveae indistinct; subhumeral elytral stria complete, with deep basal fovea, visible from above; first abdominal segment almost 3× length of second. Aedeagus (Figs. 49A, B) with dorsal style bifid, upper portion laminate, curving dorsad then distad, thickened at tip and subtruncate at apex, bearing inner comb of stiff spines, inner portion shorter, narrowed at middle, expanded apically, terminating in a curved distal comb; ventral style with broad basal portion, curved dorsad then distad, apex slightly twisted, narrowly rounded.

Etymology. This species' name refers to the remarkable comb-like processes of the aedeagus (derivable, perhaps, from those with a simpler dorsal style like *J. piscator* and *J. stipulatus*).

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. Compared to other species in this group, *J. pectineus* is a bit larger, rather distinctly punctate on the head, pronotum, and to a lesser extent, elytra. It has a strong pronotal tooth, the anterior 'collar' of the pronotum rather strongly constricted, and the head considerably longer than wide. The frontal sulci are also relatively long for the group. The opposing combs of the dorsal processes of the aedeagus are unique.

Jubus effeminatus **sp. nov.**
Figs 48D–F, 49C–D

Type material. Holotype ♂ (MECN-EN 40821): "ECUADOR: Tungurahua, -1.3895˚, -78.2929˚, Río Machay Reserve, 2239m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13174, Morphosp. Mch.037"; deposited in MECN. **Paratypes** (2♀): 1: same data as type; 1: same general locality, but -1.3921˚, -78.2932˚, 2100m (MECN-EN 40287, 40326).

Diagnosis. (TL: 1.5mm) Body (Fig. 48D) very small, reddish orange, dorsum finely punctate, head and pronotum moreso than elytra and abdomen, with moderately dense, recumbent setae with longer erect and recurved setae interspersed; head elongate triangular, posterior corners rounded; eyes very small (Fig. 48F), comprising only a few ommatidia; vertexal foveae distinct; vertexal sulci

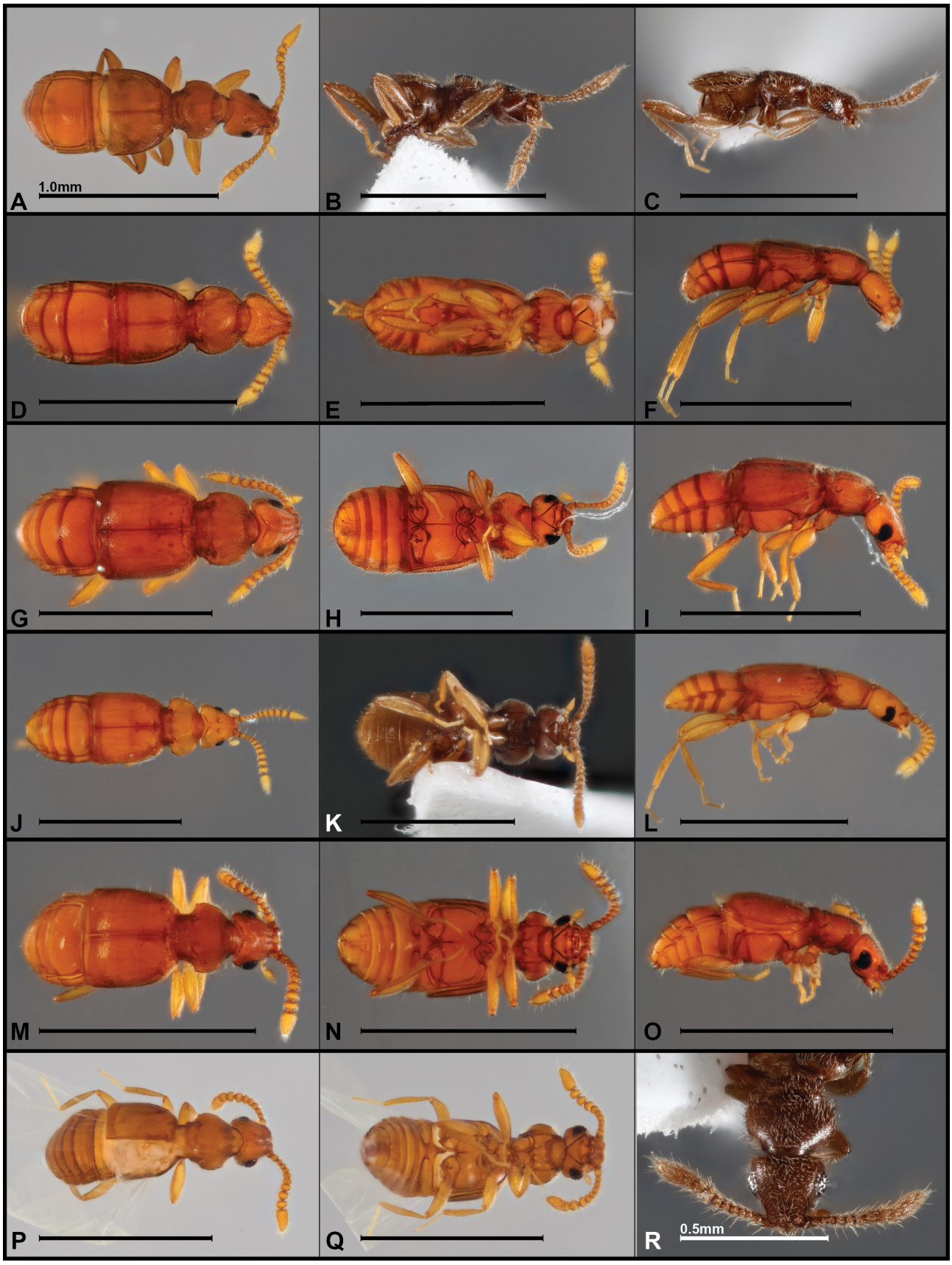

FIGURE 48. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. pectineus* **D–F** *J. effeminatus* **G–I** *J. tetrad* **J–L** *J. clavus* **M–O** *J. vortex* **P–R** *J. cochleatus* (**R** detail view of head). Scale bars = 1.0mm unless otherwise indicated.

thin, subparallel at base then converging to wider common stem; antennae compact, antennomere I cylindrical, very short, II globose, III–VII beadlike, increasingly transverse, VIII–XI forming distinct club, VIII–X wider than long, XI about 2× length of X, subacute apically; pronotum with distinct subbasal tooth, sides widened markedly anterad, then rounded to front, narrowed to base, but not abruptly constricted; subbasal lateral foveae evident, connected by fine transverse sulcus; elytra short, sides rounded (wingless), lacking dorsobasal foveae; basal marginal carina present, weakly sinuate; subhumeral sulcus deeply impressed; 1st abdominal tergite about 2.5× length of second; male terminal ventrites depressed at middle; legs lacking obvious secondary sexual characters. Aedeagus (Fig. 49C, D) weakly laterally compressed, basal bulb strongly reduced, basal apodeme rather long; outer valve very short, bent upwards then distad, ending short of inner valve; inner valve strongly arched dorsad, dorsoventrally compressed, widened at middle, divided, both apical processes bent strongly downward, the right shorter, bulbous, the left longer, apex strongly flattened, paddle-like.

Etymology. The species is named for the 'effeminate' appearance of the males.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species' male (known, notably, from a single specimen) is unusual in having strongly reduced eyes, short elytra and reduced flight wings, while remaining identifiable as a male by the distinct 4 segmented antennal club and the depressed abdominal ventrites. It is certainly possible that large-eyed, macropterous morphs remain to be found. Members of both sexes are rather slender, with moderately elongate antennae. The species' aedeagus is highly distinctive, with a thick upwardly arched tegmen and very short dorsobasal process.

Jubus tetrad **sp. nov.**
Figs 48G–I, 49E–F

Type material. Holotype ♂ (MECN-EN 40793): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13146, Morphosp. Mch.009"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 40196). **Other material:** 1♂: "ECUADOR: Morona-Santiago, -3.0234˚, -78.5893˚, Limón Indanza, Área Ecológica de Conservación Municipal Tinajillas – Río Gualaceño, 2311m, 31.I.2025, M. Barreno | M. Basantes" (MECN-EN 40891).

Diagnosis. (TL: 1.7mm) Body (Fig. 48G) moderate sized, reddish orange, with moderately dense, short recumbent setae with longer suberect setae interspersed; head elongate triangular, with narrowly rounded posterior corners; eyes large, protuberant, diameter slightly greater than post-ocular genal length; vertexal foveae fine, situated at ends of relatively long, subparallel vertexal sulci, which only converge slightly to small postantennal impression; antennae moderately elongate, antennomeres I–II cylindrical, short, III–X progressively larger, club indistinct, XI about 2.5× as long as X; pronotum with weak subbasal marginal teeth, sides weakly rounded anterad; basal constriction gradual; subbasal lateral foveae large, connected by sinuate transverse sulcus, with pair of 'pseudofoveae' (well-defined, shallow circular depressions) immediately behind (Fig. 48G); elytra long, parallel-sided (winged), basal margin of each sinuate, bluntly pointed at middle, each with weak sutural and two weak lateral basal fovea, with basal carina weakly arched over them; subhumeral fovea and stria present; 1st abdominal tergite about 1.5× length of second; male legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 49E, F) simple, weakly laterally compressed, basal foramen broadly open ventrally, basal bulb not well defined; tegmen becoming dorsoventrally compressed, edges slightly raised forming shallow channel, narrowing to downturned, bluntly rounded apex.

Etymology. The name 'tetrad' refers to the quartet-like arrangement of pronotal foveae.

Distribution. This species is described from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador. However, an identical form has been collected in Morona-Santiago Province, 180km to the south, at a similar elevation, also on the eastern slope of the Andes. This is among the larger distributions known for Ecuadorian *Jubus.*

Remarks. This species and the four that follow might key to 'group 2' based on a slightly elongate 1st tergite and the presence of subbasal pronotal marginal teeth. However, they are not obviously related to those, nor to the above, and perhaps not closely to each other. Their position in the manuscript is simply a matter of convenience.

The sinuate elytral apices and pronotal 'pseudofoveae' of *J. tetrad* are unusual among *Jubus* species. Those, in combination with gradually clavate antennae and a 1st ventrite that is ~1.5× as long as the 2nd will help to recognize it externally. The simple aedeagus, without differentiated inner and outer valves is also quite unusual.

Jubus clavus **sp. nov.**
Figs 48J–L, 49G–H

Type material. Holotype ♂ (MECN-EN 38646)**:** "ECUADOR: Pichincha, 0.0472˚S, 78.7631˚W**,** Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12797, Morphosp. Min.A.019"; deposited in MECN. **Paratypes** (7♂, 1♀): 2: same data as type: 6: same general locality as type, but 0.0473˚S, 78.7632˚W (MECN-EN 38638–38645).

Diagnosis. (TL: 1.7mm) Male body (Fig. 48J) uniformly light orange, elytra rather densely but shallowly punctate, uniformly setose, pronotum and head with punctures more lightly punctate; head about 1.25× as long as wide, widened posterad, shallowly emarginate at base, with posterior upper margin carinate; eyes rather small,

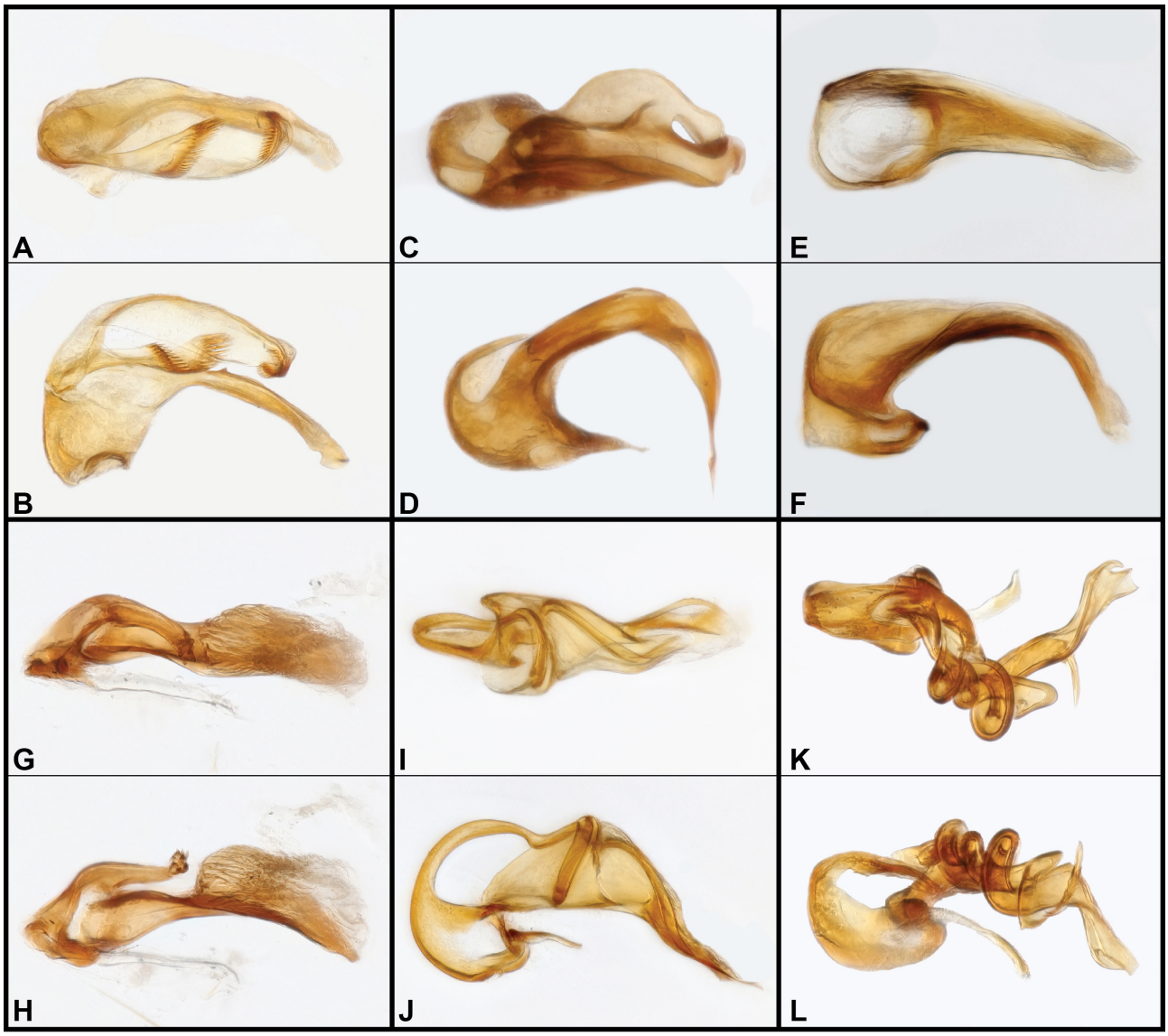

FIGURE 49. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. pectineus* **C, D** *J. effeminatus* **E, F** *J. tetrad* **G, H** *J. clavus* **I, J** *J. vortex* **K, L** *J. cochleatus*.

diameter just over half length of post-ocular gena, rather finely faceted; vertexal foveae distinct; vertexal sulci absent; antennae rather short, with last 5 antennomeres forming loose, indistinct club (antennomeres V–X all transverse); pronotum with very weak subbasal tooth, sides anterad almost evenly rounded, finely crenulate; posterior third strongly constricted, with curved basal sulcus connecting distinct lateral foveae; elytra subparallel-sided (winged), with strong basal carina, outlining only small sutural fovea; subhumeral fovea present; first abdominal segment about 1.5× as long as second. Aedeagus (Fig. 49G, H) with dorsal style angulate above basal junction, elbow slightly expanded, tapering to short, raised multidentate 'fist'; ventral valve thick at base, narrowed slightly distad, then forming long paddle-like apex with inflatable, pleated dorsal sac. Female eyes comprising 2 ommatidia, antennal club indistinct, antennomeres III–XI gradually widening; humeri narrowed (wingless); other secondary sexual characters not evident.

Etymology. This species is named for the unique club-shaped apex of the outer aedeagal valve. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests near Mindo, Pichincha Province, Ecuador.

Remarks. This species is very unusual in having the frontal foveae distinct, while lacking frontal sulci (which under Raffray's scheme would put it in group I, with *J. laeviceps,* which otherwise appears dissimilar in pronotal shape, absence of pronotal tooth, and longer, clubbed antennae).

Jubus vortex **sp. nov.**
DNA barcode: GenBank PX930364
Figs 48M–O, 49I–J

Type material. Holotype ♂ (MECN-EN 40767): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu

Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13112, Morphosp. RAn.003"; deposited in MECN.

Diagnosis. (TL: 1.3mm) Body (Fig. 48M) small, orange, moderately adorned with semirecumbent setae, with scattered longer, erect setae interspersed; head slightly longer than wide, weakly basally emarginate, posterior corners rounded; eyes moderately large, diameter about 1.5× post-ocular genal length, coarsely faceted; vertexal foveae small, rather narrowly separated; vertexal sulci subparallel, weakly converging from foveae to setose, median post-antennal depression; antennae moderately elongate, antennomere I cylindrical, II ovoid, III–IV subquadrate, V–X increasingly transverse, VIII–XI forming weakly differentiated loose club, apical antennomere about 3× length of X, apex narrowly subacute; pronotum broad, with subbasal tooth, sides weakly rounded then narrowed to short apical collar; basal constriction rather long, almost accounting for basal third of pronotum; lateral subbasal foveae weak, connected by arcuate sulcus; elytra subparallel-sided (winged), each with basal carina arched over small sutural and two basolateral foveae; subhumeral fovea and carina present; 1st visible abdominal tergite about 1.75× length of 2nd; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 49I, J) laterally compressed, short, narrow basal bulb present; outer valve ascending from apex of basal bulb, turning to form single, tight perpendicularly spiralled loop, thence loosely spiralling to acute apex, lying largely within trough formed by inner valve; inner valve articulated with inner base of bulb, sides produced dorsad to form trough, flattening toward apex, weakly trilobed, with short left lobe supporting apex of outer valve, longer spatulate lobe forming tegmenal apex, and narrow sinuate process along its right side.

Etymology. This species' name refers to the tightly coiled outer aedeagal valve.

Distribution. This species is known only from Río Anzu Reserve in the Andean foothills of western Pastaza Province, Ecuador.

Remarks. This species can be distinguished by its indistinct antennal club, small median frontal depression, very fine vertexal sulci, imperceptible frontal foveae, and moderately long 1st tergite. The single tight spiral of the outer aedeagal valve is unique.

Jubus cochleatus **sp. nov.**
DNA barcode: GenBank PX930377
Figs 48P–R, 49K–L

Type material. Holotype ♂ (ZSFQ-i23275): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12703, Morphosp. TBS.A.023"; deposited in MECN. **Paratypes** (1♂): same data as type (ZSFQ- i23276).

Diagnosis. (TL: 1.5mm) Body (Fig. 48P) dull orange, with semirecumbent setae; head setose, moderately densely punctate, carinate around posterodorsal and lateral margins, with narrow median incision at dorsal base; eyes protuberant, slightly more than half genal width, coarsely faceted; frontal sulci (Fig. 48R) impressed on anterior two-thirds, subparallel, slightly converging anterad and meeting in deep frontal fovea above and between antennal insertions, united median sulcus continued briefly anterad fovea; antennal bases slightly separated by median epistomal strip about equal in width to one antennal socket; labrum short, broadly emarginate; antennae simple, rather short, unmodified, only gradually expanded from antennomere VI onward; gular carinae present; pronotal disk moderately punctate, sides rounded from basal fourth anterad, apical and basal corners distinctly emarginate; antebasal transverse impression distinct, slightly 'V'-shaped at middle, descending in to posterolateral emargination at sides; elytra with sutural and humeral foveae dorsally, sutural stria complete, subhumeral fovea and complete subhumeral stria present; first abdominal tergite about 1.25× as long as 2nd; legs simple, without secondary modifications; abdominal ventrites IV–VII slightly flattened at middle, apical margin of ventrite VII with asymmetrical blunt median process. Aedeagus (Fig. 49K, L) with minimal basal bulb, open dorsad, distal processes of tegmen extensively corkscrewed around each other, one curving to acute apex, the other longer, bent and flattened into spatulate apex; a shorter, thin, curved median process independently extends from inner basal bulb.

Etymology. The name of this species refers to the 'spiralled' distal aedeagal processes around one another.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador

Remarks. This species shares an unusual head character with a number of other species, having a deep frontal pit where the vertexal sulci meet. Its male genitalia, however, are highly unusual, retaining much of a basal bulb (though it is reduced and broadly open), and having the apical processes not obviously articulated with one another but instead spiraled around one another. Some other species exhibit hints of this, but this is an extreme form.

***Jubus* Group 3**

Jubus arquus **sp. nov.**
DNA barcode: GenBank PX930312
Figs 50A–C, 51A–B

Type material. Holotype ♂ (MECN-EN 40805): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13158, Morphosp. Mch.021"; deposited in MECN. **Paratypes** (4♂, 1♀): 3: same data as type; 1: -1.3921˚, -78.2932˚, 2100m; 1: -1.3895˚, -78.2929˚, 2239m (MECN-EN-40301, 40241, 40284, 40243, 40242).

Diagnosis. (TL: 1.7mm) Body (Fig. 50A) moderately large, reddish orange, the dorsum, especially the head and

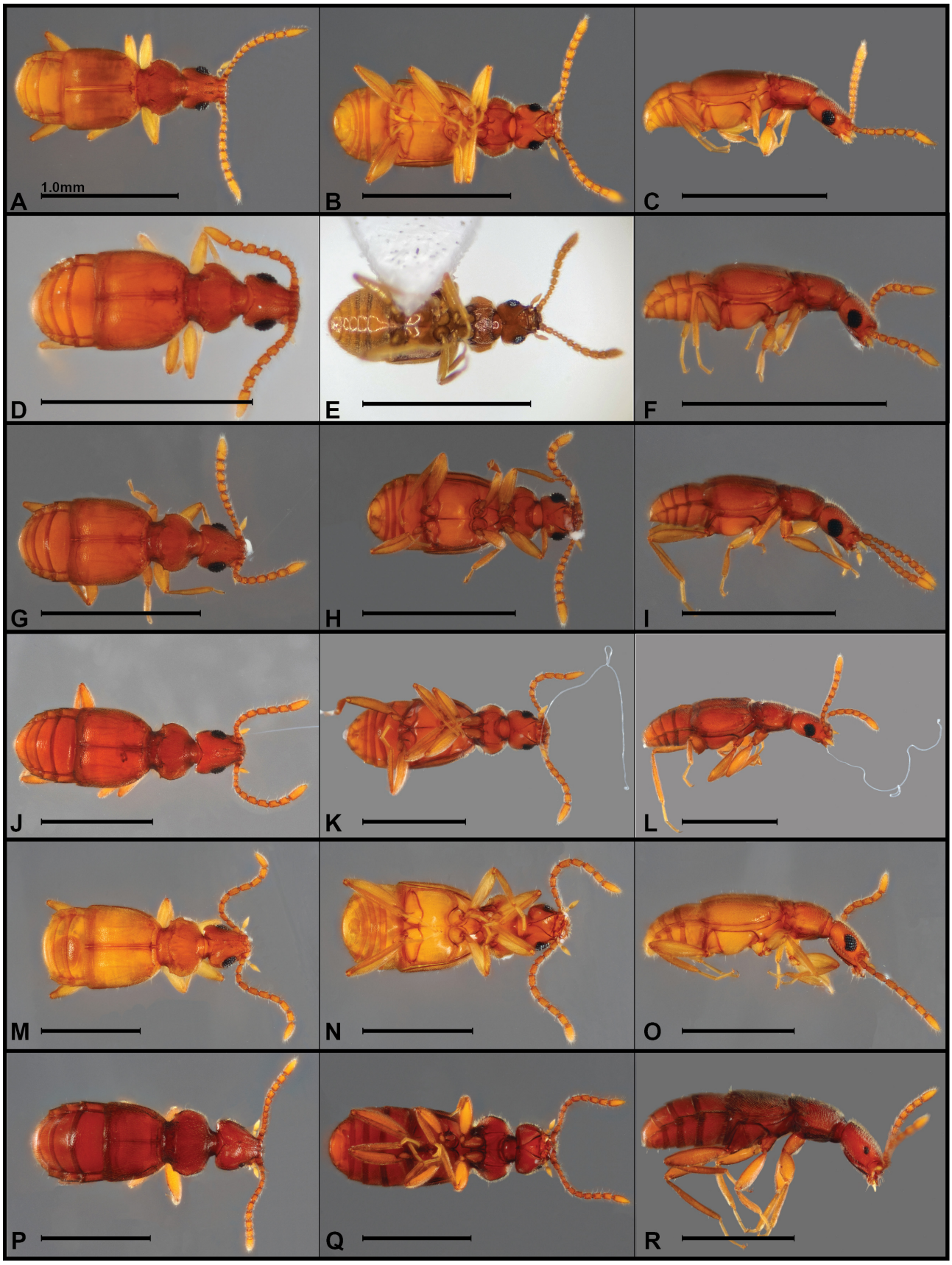

FIGURE 50. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. arquus* **D–F** *J. sextus* **G–I** *J. parallelus* **J–L** *J. kiru* **M–O** *J. triticius* (male) **P–R** *J. triticius* (female). Scale bars = 1.0mm.

pronotum, distinctly but finely punctate, with moderately dense, recumbent setae with longer erect and recurved setae interspersed; head elongate triangular, with weakly angulate posterior corners; eyes large, protuberant, diameter about 1.25× post-ocular genal length; vertexal foveae fine, at ends of fine vertexal sulci which are subparallel at base then converging to deep, setose median post-antennal fovea; antennae elongate, antennomeres I–II cylindrical, slightly longer than wide, III–IV slightly longer than wide, V–X increasing slightly in length, XI about 2.5× as long as X, apically subacute, no club evident; pronotum with distinct lateral subbasal tooth, sides widened slightly anterad, then narrowed slightly before abruptly narrowing to short anterior collar; basal constriction distinct; subbasal lateral foveae evident, connected by fine, sinuate, transverse sulcus; elytra long, parallel-sided (winged), each with sutural and two lateral basal foveae, with basal carina arched over them; subhumeral fovea and stria present; 1st abdominal tergite about 1.75× length of second; last male ventrite weakly depressed at middle; venter and legs otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 51A, B) strongly laterally compressed, basal bulb absent, basal apodeme strongly curved dorsad; outer valve narrow, free for most of its length, looping basad then upward and distad, ending acutely in short channel formed by inner valve; inner valve with thin lamina within about upper half of outer valve's loop, forming narrow dorsal channel for apex of outer valve, narrowing to straight, poorly sclerotized and narrowly rounded apex.

Etymology. This species name is based loosely on the Latin 'arcuatus' referring to its strongly arched basal aedeagal valve.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. *Jubus arquus* is among the larger and larger-eyed *Jubus* species known from the Río Machay area. The species is distinct in its unclubbed antennae where antennomeres V–X are just about 1.3× longer than wide, and in its deep median frontal fovea (Fig. 50A). The long, strongly arched outer aedeagal valve (Fig. 51B) is clearly similar to that of *J. sextus* (Fig. 51D) and *J. kiru* (Fig. 51H), but the containing basal lamina of the inner valve is very weak and minimal, providing little support for its dorsal part.

Jubus sextus **sp. nov.**
DNA barcode: GenBank PX930333
Figs 50D–F, 51C–D

Type material. Holotype ♂ (MECN-EN 38629)**: "ECUADOR:** Pichincha, 0.0473˚S, 78.7619˚W [1458m], Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12781, Morphosp. Min.A.003"; deposited in MECN. **Paratypes** (9): 2♂, 3♀: same data as type; 3♂, 1♀: same general locality, 0.0472˚S, 78.7631˚W [1460m] (MECN-EN 38620–38628).

Diagnosis. (TL: 1.4mm) Male body (Fig. 50D) uniformly light orange, densely but shallowly punctate, uniformly setose; head about 1.25× as long as wide, shallowly emarginate at base; eyes large, about twice diameter of post-ocular gena, coarsely faceted; vertexal foveae not evident; sulci approximately H-shaped, extending posterad to level of middle of eye, subparallel, connected by short transverse sulcus near antennal bases; antennae moderately elongate with last 5–6 antennomeres forming weak, loose club (antennomere VI smaller than more distal antennomeres, but larger than V); pronotum with strong subbasal tooth, sides briefly widened anterad, then evenly narrowed to front; posterior third strongly constricted, with curved basal sulcus connecting distinct lateral foveae; elytra subparallel-sided (winged), with strong basal carina, outlining small sutural and two lateral foveae on each; subhumeral fovea present; first abdominal segment about 1.25× as long as second. Aedeagus (Fig. 51C, D) with dorsal style arched strongly from base, forming most of an oval before straightening in distal third, narrowly incised along dorsal edge, lying within a channel formed by inner valve which fills about half of the oval base as a laminar plate; ventral apex of inner valve with short dentate process. Female eyes small, comprising about 5 ommatidia, antennal club poorly developed, of five antennomeres; humeri narrowed (wingless); other secondary sexual characters not evident.

Etymology. The species is named for its somewhat distinctive six-segmented antennal club. The species name is used as a noun in apposition.

Distribution. This species is known only from cloud forest near Mindo, Pichincha, Ecuador.

Remarks. This species has a strongly toothed pronotum and the last 6 antennomeres barely larger than the basal ones. More unusually, each of the apical antennomeres tapers beyond its outer marginal carina (Fig. 50D), providing more separation between antennomeres than is typical. The eyes are very large and coarsely faceted, and the surfaces of the head and pronotum are rather distinctively punctate. Its aedeagus is similar to that of the preceding species, with a deeply looped and basally free outer valve, but the inner valve is more strongly developed, and its basal lamina fills more of the loop formed by the outer. The apicoventral tooth on the apex of the tegmen (Fig. 51D) is unique.

Jubus parallelus **sp. nov.**
Figs 50G–I, 51E–F

Type material. Holotype ♂ (MECN-EN 41022): "ECUADOR: Cotopaxi, -0.4187˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 2008m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12866, Morphosp. Ot.A.031"; deposited in MECN. **Paratypes** (1♂): same general locality, but -0.4191˚, -79.0039˚, 1990m (MECN-EN 41023).

Diagnosis. (TL: 1.6mm) Body (Fig. 50G) orange, uniformly, not too densely setose, rather densely but shallowly punctate; head about one-third longer than

wide; male eyes large, protruding, diameter almost twice postocular genal length, coarsely faceted; vertexal foveae absent, sulci long, reaching to middle of eye, fine, shallowly impressed, subparallel, appearing separate to antennal tubercles; antennae moderately elongate, antennomeres III–VIII progressively larger, a 4-segmented club barely differentiated, VIII–X similar in size, XI about 2.5× as long as X; pronotal margin with distinct subbasal tooth, sides widened briefly anterad, then narrowing to front; lateral foveae present just anterad basal constriction, connected by evenly curved basal transverse sulcus; male elytra subparallel-sided (winged), each elytron with basal carina arched over fine sutural and two lateral foveae; subhumeral fovea distinct and subhumeral stria complete; first visible abdominal segment about 1.5× midline length of 2nd segment. Aedeagus (Fig. 51E, F) with strongly arched outer valve nearly circling to base; inner valve forming thin semicircular support for outer valve, then extending and widening distad to broad subapical lobe on right side, narrowing again to thin, subacute, ventrally-directed apex.

Etymology. This species' name refers to its more or less parallel vertexal sulci.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. *Jubus parallelus* has a very weakly differentiated, 4-segmented antennal club, and the vertexal sulci are quite long and parallel for most of their lengths. It is otherwise very similar to most of the other members of this group, and reference to the male genitalia is essential to confident identification. The aedeagus is, indeed, quite distinctive, with the outer valve broadly looped but terminating quite short of the apex of the arched inner valve. A somewhat similar 'double-humped' structure is seen in *J. denticulatus* (Fig. 61D), which, due to its very distinct 4-segmented antennal club, is here in group 5.

Jubus kiru **sp. nov.**
Figs 50J–L, 51G–H

Type material. Holotype ♂ (MECN-EN 21028): "ECUADOR: Cotopaxi, -0.4169˚, -79.0042˚, Bosque Integral Otonga, 14.VIII.2024, 2086m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12895, Morphosp. Ot.A.060"; deposited in MECN.

Diagnosis. (TL: 2.3mm) Body (Fig. 50J) large, orange, uniformly not too densely setose, rather densely but shallowly punctate; head about one-third longer than wide, deeply emarginate at base; male eyes large, protruding, diameter slightly greater than postocular genal length, coarsely faceted; vertexal foveae absent, sulci moderately long, reaching to front third of eye, fine, shallowly impressed, subparallel, merging to common stem just behind antennal tubercles; antennae moderately elongate, antennomeres III–V subquadrate, VI–XI larger, forming loose 6-segmented club, XI about 2.5× as long as X; pronotal margin with distinct subbasal tooth, sides widened briefly anterad, then narrowing to front; lateral foveae present on either side of basal constriction, connected by evenly curved basal transverse sulcus; male elytra subparallel-sided (winged), each elytron with basal carina arched over broad but shallow sutural and one lateral foveae; subhumeral fovea similarly shallowly impressed, subhumeral stria complete; first visible abdominal segment about 1.5× midline length of 2nd segment. Aedeagus (Fig. 51G, H) strongly compressed laterally, with outer basal valve broadly and evenly rounded, ventrad, basad, then apicad, ending short of apex of inner valve; inner valve forming narrow trough starting at basal third of outer valve, bent downwards beyond its tip, terminating in weakly barbed apical blade.

Etymology. The name of this species comes from a Kichwa term meaning 'tooth', referring to its prominent marginal pronotal tooth.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is externally similar to *Jubus parallelus* and *J. sextus*, but its eyes are smaller, the antennae lean toward the 6-segmented club of the latter, and the elytral foveae are less deeply impressed than either. The aedeagi of the three are based on a similar basic plan, but that of *J. kiru* is more strongly arched dorsally, and has only a very small denticle beneath the apex of the tegmen.

Jubus triticius **sp. nov.**
DNA barcode: GenBank PX930212
Figs 50M–R, 51I–J

Type material. Holotype ♂ (MECN-EN 40855): "ECUADOR: Tungurahua, -1.4343˚, -78.3114˚, NaturetrekCandelariaRes, 2145m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13208, Morphosp. Cnd.024"; deposited in MECN. **Paratypes** (9) 1♂, 1♀: same general locality as type, but -1.4342˚, -78.3116˚, 2140m; 2♂, 4♀: "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter"; 1♀, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m (MECN-EN 40311, 40391, 40396, 40320, 40317, 40806, 40324, 40314, 40307).

Diagnosis. (TL: 2.3mm) Body (Fig. 50M) large, orange, with dense, recumbent setae with relatively inconspicuously longer, suberect setae interspersed; head elongate, posterior corners rounded, distinctly emarginate at dorsal base; eyes large, diameter about 1.5× post-ocular genal length; vertexal foveae small, situated posterad; vertexal sulci long, thin, subparallel to weakly arcuate, converging only slightly to deep, setose frontal depression; antennae long, not clubbed, antennomere I–II cylindrical, slightly wider than long, III–X cylindrical, about twice as wide as long, XI about 1.5× length of X, apex narrowly rounded; pronotum with subbasal tooth, sides distinctly widened anterad, then rounded to front; basal constriction strong; subbasal lateral foveae present,



FIGURE 51. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. arquus* **C, D** *J. sextus* **E, F** *J. parallelus* **G, H** *J. kiru* **I, J** *J. triticius* **K, L** *J. humboldti*.

connected by arcuate transverse sulcus; elytra long, widening slightly to apex (male winged), with sutural and one far lateral dorsobasal fovea; basal marginal carina weakly arched over foveae; subhumeral fovea deep, making humeri appear slightly dentate; subhumeral stria present; 1st visible abdominal tergite only slightly longer than second; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 51I, J) moderately laterally compressed, with reduced basal bulb, strong upturned basal knob present; outer valve concealed, appearing to bend immediately inward, then dorsad, then apicad, curving and narrowing to acute tip; inner valve very complex, forming complete basal channel on both sides, the left upper edge narrowing to weakly spiralled, elongate, narrow dorsoapical brush; dorsal portion of inner valve bulbous at base, narrowing abruptly to long, apically hooked median rod; right side of inner valve extended distad to form main body of tegmen, with thin, strongly arched median lamina, narrowing to flattened, inwardly hooked rounded apex. Female (Fig. 50P–R) dark orange, broader, with broadly triangular head, very small eyes, a broader pronotum and less elongate antennomeres.

Etymology. This species' name refers to the resemblance of its aedeagal process to a flowering sprig of wheat.

Distribution. This species is known only from cloud forests of the Naturetrek Candelaria Reserve, just south of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species is somewhat distinctive in its large body size, large eyes, toothed pronotum, thin, elongate and subparallel vertexal sulci, and especially in the elongate, unclubbed antennae. Its aedeagus is unlike that of any other known species, particularly in the bottle-brush-like dorsal process.

Jubus humboldti **sp. nov.**
Figs 51K–L, 52

Type material. Holotype ♂ (QCAZ-I-280235/MECN-EN 40696): "ECUADOR: Chimborazo, -2.18775˚, -78.5210˚, Atillo, 3501m, 8JUL2017, S. Muñoz & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13041, Morphosp. Atillo6"; deposited in QCAZ. **Paratypes** (7♂, 1♀): 2: same data as type; 5: same locality but 7.VII.2016 (QCAZ-I-280236–280242). **Other material:** 2♂: "ECUADOR: Pichincha, -0.18338˚, -78.54000˚, Ruco Pichincha, 3951m, 22JUN2016, S.Muñoz, A.Romero & S.Myers, Ex.Berlese" (QCAZ-I-40712, 40713); 1♂, 2♀: "ECUADOR: Cotopaxi, -0.6184˚, -78.4755˚, P.N. Cotopaxi, 3951m, 21JUN2016, S. Muñoz, & S. Myers,Ex. Berlese" / "Caterino DNA voucher, Ext. MSC-13029, Morphosp. Cotopaxi2"; 3♂: "ECUADOR: Pichincha, -0.30795˚, -78.23255˚, La Virgen, 3694m, 28JUL2016, S. Muñoz & R.Tobar, Ex.Berlese".

Diagnosis. (TL: 2.0mm) Body rather large, elongate, slender, variable in color from entirely orange (e.g. Fig. 52A) to variably darkened, often with much of body dark with lighter elytra and appendages (Fig. 52D, G); body densely setose, head and pronotum rather conspicuously punctate; head about one-half longer than wide, weakly emarginate at base, basal corners broadly rounded; eyes prominent, diameter about equal to postocular genal length; vertexal foveae conspicuous; vertexal sulci narrow but well impressed, parallel between eyes, then converging to long, common post-antennal depression; antennae moderately long, antennomere II longer than III, III–X slightly longer than wide, each slightly larger than the last, club indistinctly 5- segmented; gular carinae evident but not strong; pronotum with strong subbasal tooth, slightly widened anterad, tapered abruptly to anterior collar; basal constriction rather long and narrow; lateral basal foveae distinct, transverse subbasal sulcus weakly arcuate between, weak at middle; elytra subparallel-sided (winged); basal carina strong, each elytron with distinct sutural and two lateral dorsobasal foveae; subhumeral fovea deeply impressed, subhumeral stria complete, carinate; 1st visible abdominal tergite about 1.5× midline length of 2nd; venter and legs without obvious secondary sexual characters. Aedeagus (Fig. 51K, L) strongly laterally compressed; basal bulb absent; basal/outer valve free at base, strongly looped basad then dorsoapicad, laterally sinuate near middle, S-shaped, with apex recurved to left; inner valve laminate at base, widened at sinuation of outer valve, forming right-side shield, apex widened slightly to form a narrowly tongue-like distal lobe with a prominent sclerotization running along right edge.

Etymology. The species is named for Alexander von Humboldt, the German explorer who inspired the science of biogeography in part through his explorations and documentation of plant distributions in the high Ecuadorian Andes.

Distribution. This species is known from páramo sites from Pichincha Province in the north to Chimborazo Province in the south, always at high elevation.

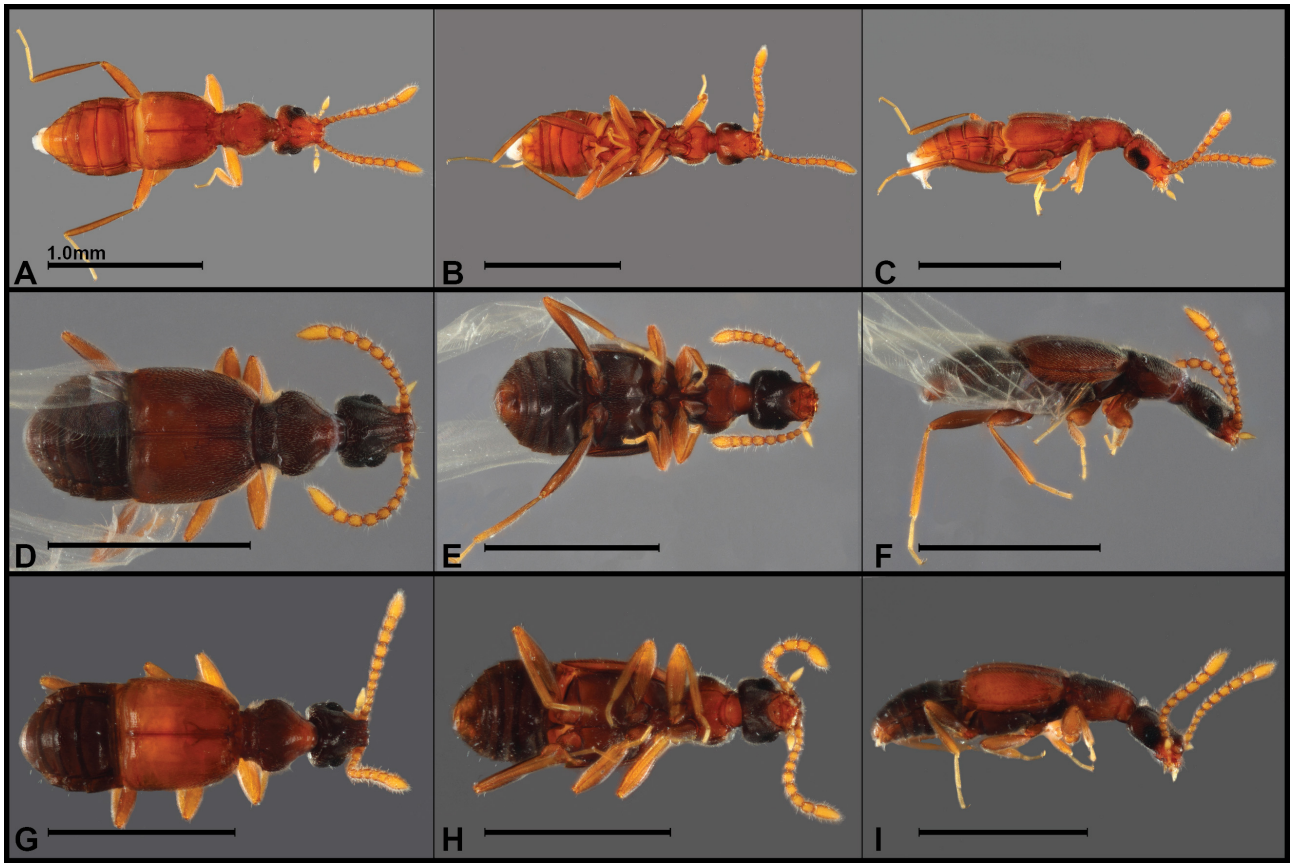

FIGURE 52. Habitus photos, *Jubus humboldti*, dorsal, ventral, lateral views **A–C** Atillo population **D–F** Rucu Pichincha population **G–I** Cotopaxi population. Scale bars = 1.0mm.

Remarks. This 'species' is probably a complex of closely related species, all with very similar male genitalia, with a long, arched, and basally free outer valve, bending and twisting slightly into a sheath formed by the inner valve. Externally these all share an indistinct antennal club, with the antennae gradually and weakly enlarged apically, a basally toothed, anteriorly narrowed/'collared' pronotum, a tendency toward darker pigmentation, deeply impressed lateral pronotal foveae, and a short first abdominal tergite. One of the striking things about the complex as a whole is the range of color variation, from rather dark (Pichincha population) to mostly light (type population at Atillo). Most populations exhibit a body that's mostly dark with lighter elytra and appendages. One individual from the type locality has interesting dark patches just posterad the eyes (Fig. 52A). In the aedeagus, there is some shape variation in the curvature of the outer valve, and in the width of the cradling inner valve. None of these populations are yet represented by very many specimens, however. Further sampling and population level genetic work might well justify splitting this complex up into geographic segregates, but at this point that would be premature.

***Jubus* Group 4**

Jubus monilicornis **sp. nov.**
Figs 53A–C, G–H

Type material. Holotype ♂ (MECN-EN 41029): "ECUADOR: Cotopaxi, -0.4165˚, -79.0047˚, Bosque Integral Otonga, 14.VIII.2024, 2107m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12899, Morphosp. Ot.A.064"; deposited in MECN.

Diagnosis. (TL: 2.2mm) Body (Fig. 53A) orange, uniformly not too densely setose, smooth with punctures indistinct; head elongate about one-half longer than wide, deeply emarginate at base; male eyes rather small, weakly protruding, set about 1.5 eye diameters behind antennae, postocular genal length about 1.75× eye diameter; vertexal foveae fine, about even with rear edge of eye, vertexal sulci moderately long, weakly impressed, outwardly arcuate, remaining separate to inner edges of antennal tubercles; antennae moderately elongate, antennomeres III–IV slightly longer than wide, V–VI wider, roundly subquadrate, VII–XI progressively larger to form weak 5-segmented club, terminal antennomere about 2.5× length of penultimate; pronotum with sides rounded, subbasal tooth absent, abruptly constricted in basal third and apical third, narrowing to distinct basal and apical collars; basolateral foveae indistinct, pronotum appearing simply incised at margins where met by deep transverse sulcus, sides within constriction secondarily swollen behind sulcus; elytra long, subparallel-sided (winged), each elytron with complete basal carina barely interrupted by sutural and two weak lateral foveae; subhumeral fovea indistinct, though subhumeral stria bent upwards to distinct vertical carina; 1st abdominal tergite about 1.5× as long as 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 53G, H) not compressed laterally, with large basal bulb; tegmen comprising four separate distal processes of distinct lengths, the shorter three are all curved and acute, the right-most and most strongly curved appearing to arise from internal, possibly articulated base within the basal bulb, the ventral-most forms a less strongly sclerotized basal platform, narrowly rounded at apex.

Etymology. This species name refers to the somewhat rounded and distinctly separated distal antennomeres.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is best recognized by the shape of its pronotum, with the sides rounded and short, weakly dentate at the *anterior* corner, and strongly constricted posteriorly at the lateral foveae. Its rather rounded and well separated apical antennomeres are also distinctive. It has a near relative in the following species, *J. triangularis*, similar in most of these characters, as well as in male genitalia. But the head of *J. triangularis* is broader, with more distinct posterior corners, and the details of most of the apical aedeagal processes are different.

Jubus triangularis **sp. nov.**
Figs 53D–F, I–J

Type material. Holotype ♂ (MECN-EN 41031): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Ridge Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12952, Morphosp. Yn.A.021"; deposited in MECN [entire specimen in genitalia tube].

Diagnosis. (TL: 2.3mm) Male (Fig. 53D) orange, body setae dense but very short, appressed; head broadly triangular, only slightly larger than wide, weakly emarginate at base; vertexal foveae very fine and shallow, vertexal sulci shallow, curved, meeting at deep, post-antennal depression; eyes small, 1.5 diameters removed from antennal insertion and about two diameters from posterior lateral margin; antennae moderately short, with antennomeres III–VII subquadrate, VIII–XI forming loose club; pronotum with sides untoothed, margins weakly narrowed to distinct anterior constriction, posterior constriction long, with basal portion about one-third total pronotal length; lateral discal foveae indistinct, basal transverse sulcus merging with basal constriction; elytra subparallel-sided (winged), with complete basal carina weakly interrupted by sutural and two lateral basal foveae on each; humeri appearing dentate with vertical carina ascending from base of subhumeral stria, subhumeral fovea indistinct; 1st visible abdominal tergite about 1.5× midline length of second; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 53I, J) with distinct basal bulb about half length of entire aedeagus, barely laterally compressed; aedeagus with three distal processes (in addition to ventral lobe of tegmen), two articulated with distal margin of basal bulb, one free and

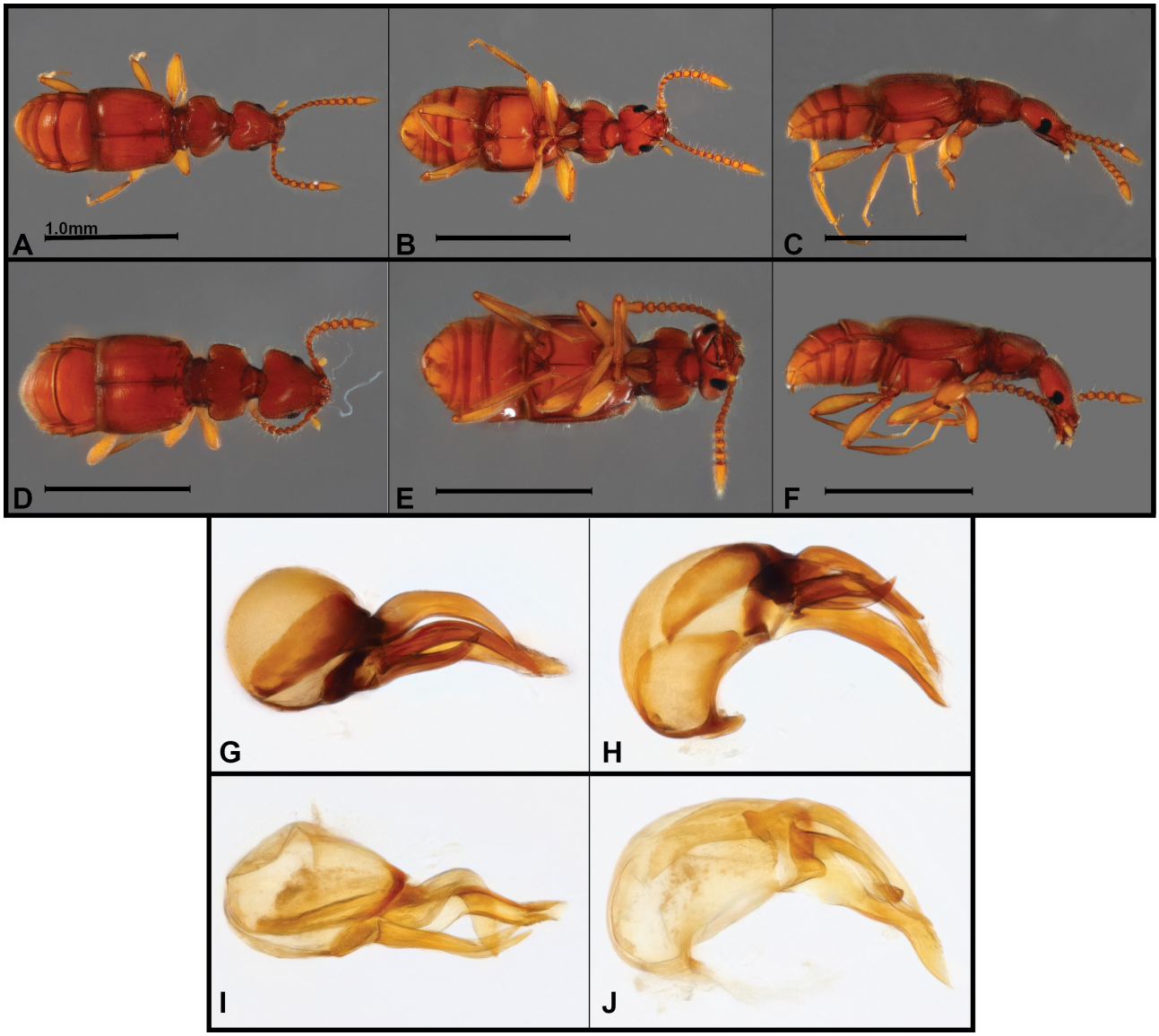

FIGURE 53. Photographs, *Jubus* spp. **A–C, G, H** *J. monilicornis* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *J. triangularis* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

inserted within; the latter strongly bent upon exit, curving rightward over and around ventral process, ending in thick, acute apex; left side with deeply bifid process comprising two parallel, sinuate, apically acute rods; ventral process of tegmen narrow, with edges thickened and raised, sinuous to obliquely truncate apex, left side with short series of minute marginal denticles.

Etymology. This species is named for its distinctive head shape.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This *Jubus* species (along with the preceding) is unusual in several characters, principally in the combination of small eyes with being fully winged. It is a relatively large species, with a broadly triangular head, transverse pronotum (with long basal constriction), and relatively long 1st abdominal tergite. The aedeagus retains a well-developed basal bulb, and inner and outer valves are not clearly identifiable. It is similar and closely related to *J. moniliformis*, the distributions of the two disjunct across the crest of the Andes.

***Jubus* Group 5**

Jubus marissae **sp. nov.**
Figs 54A–C, 55A–B

Type material. Holotype ♂ (MECN-EN 38554): "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12771, Morphosp. Bar.A.003"; deposited in MECN.

Diagnosis. (TL: 1.0mm) Body (Fig. 54A) light orange, male winged; head slightly longer than wide, posterior margin emarginate, interrupting posterior carina;

frontal foveae small, frontal impressions long, subparallel, curving together to short stem just behind antennal bases; labrum bisinuate; eye moderately large, diameter slightly greater than length of genae behind eyes, coarsely faceted; antennomeres III–VII transverse, widening slightly toward distinct four-segmented club; terminal antennomere nearly three times as long as penultimate; pronotal margin with small subbasal tooth, anterior portions of margin weakly rounded to front; each elytron with small sutural and two smaller lateral basal foveae interrupting distinct, complete basal carina; subhumeral fovea distinct, subhumeral stria complete; first abdominal segment about 1.3× length of second. Aedeagus (Fig. 55A, B) lacking basal bulb; dorsal style arched basad and distad, short, extending less than half length of entire aedeagus; ventral process divided at base, with broad, lightly sclerotized plate on right side longest, rounded apically, and narrower; more strongly sclerotized, subacute process on left, extending about three-fourths length of plate.

Etymology. This species is named in recognition of Ms. Marissa Barreno, 'investigadora' with INABIO, who provided considerable assistance in the author's sabbatical studies, as well as numerous interesting specimens, including the present one.

Distribution. This species is known from the seasonal coastal forests of the Santa Elena Province, about 100km NW of Guayaquil, Ecuador.

Remarks. This species is relatively elongate and slender, with a fairly short antennal club. Its aedeagus has a short outer valve, a longer but similar shaped median valve, and a longer, weakly sclerotized tegmen.

Jubus chongon **sp. nov.**
DNA barcode: GenBank PX930205
Figs 54D–F, 55A–B

Type material. Holotype ♂ (MECN-EN 38553): "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12776, Morphosp. Bar.A.008"; deposited in MECN.

Diagnosis. (TL: 1.3mm) Body (Fig 54D) light orange, male winged; head slightly longer than wide, posterior margin emarginate, interrupting posterior carina; frontal foveae indistinct, frontal sulci long, slightly outwardly curved, meeting just behind antennal bases; eye moderately large, diameter slightly greater than length of genae behind eyes, coarsely faceted; antennomeres III–V subquadrate, VI–VII slightly wider, more transverse, VIII–XI forming distinct four-segmented club, VIII–X subquadrate, XI about twice as long as X, narrowly rounded at apex; pronotal margin with distinct subbasal tooth, margin widening slightly anterad tooth, then narrowing evenly to front; each elytron with fine, curved basal carina, with small sutural and one small humeral dorsobasal foveae; subhumeral fovea distinct, subhumeral stria complete; first abdominal segment about 1.5× length of second. Aedeagus (Fig. 55C, D) with expanded base and distinct basal (ventral) foramen, basal part of tegmen narrowly subdivided medially; dorsal style extending from apex of right half, short, narrowly sclerotized, and curving mediad across longer left valve, terminating in long digitform process; left distal process slightly broader, less strongly sclerotized, extending about twice as far from base, flattened dorsoventrally and slightly concave on dorsal surface, narrowly rounded at apex.

Etymology. The species name refers to the coastal mountain range in which it is found, the Cordillera Chongón-Colonche.

Distribution. This species is known from the seasonal coastal forests of the Santa Elena Province, about 100km NW of Guayaquil, Ecuador.

Remarks. This species is broader than the (sympatric) preceding one, with stronger pronotal teeth, and just two dorsobasal elytral foveae, the sutural and a well-separated humeral. The aedeagus is quite unusual among *Jubus*, having a large basal chamber whose lateral halves narrow distally to form the distal valves, likely a rather plesiomorphic configuration.

Jubus depressus **sp. nov.**
Figs 54G–I, 55E–F

Type material. Holotype ♂ (MECN-EN 40809): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13162, Morphosp. Mch.025"; deposited in MECN.

Diagnosis. (TL: 1.1mm) Body (Fig. 54G) small, reddish orange, dorsum finely punctate, with moderately dense, recumbent setae with longer erect and recurved setae interspersed; head elongate triangular, posterior corners narrowly rounded; eyes rather small, diameter slightly less than post-ocular genal length; vertexal foveae fine; vertexal sulci thin, subparallel at base then converging to wider common stem; antennae very compact, antennomere I cylindrical, slightly longer than wide, II globose, III–VII short, increasingly transverse, VIII–XI forming distinct club, VIII–X wider than long, XI about 2.5× length of X, narrowly rounded; pronotum with weak subbasal tooth, sides widened slightly anterad, then narrowed slightly before abruptly narrowing to short anterior collar; basal constriction distinct; subbasal lateral foveae evident, connected by fine, weakly angulate transverse sulcus; elytra long, parallel-sided (winged), each with very weak sutural and two lateral basal foveae, with basal carina barely arched over them; subhumeral fovea and stria present; 1st abdominal tergite about 1.25× length of 2nd; most male abdominal ventrites depressed at middle; legs lacking obvious secondary sexual characters. Aedeagus (Fig. 55E, F) weakly laterally compressed, basal bulb absent, basal apodeme rather long; outer valve angulate at base, extending upward, bent distad, bulbous at base of dorsal arm, narrowed to weakly dorsally hooked apex; inner valve more or less straight, with basal hump meeting outer valve's basal bulge, flattening dorsoventrally

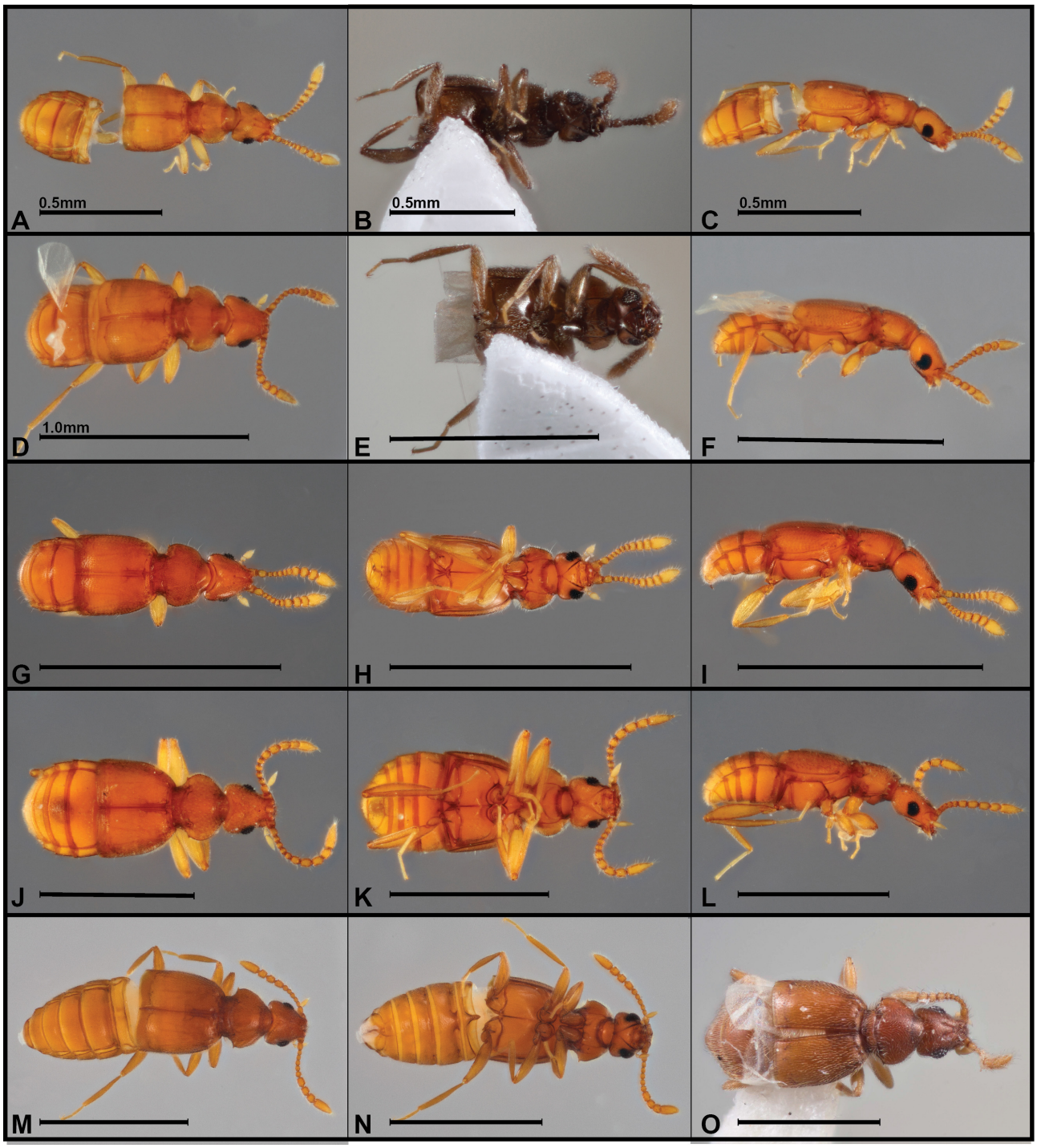

FIGURE 54. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. marissae* **D–F** *J. chongon* **G–I** *J. depressus* **J–L** *J. lunaris* **M, N** *J. limaorum* (dorsal & lateral only) **O** *J. pendulus* (dorsal view only). Scale bars = 1.0mm unless otherwise indicated.

briefly before twisting to laterally compressed blade that curves leftward at apex.

Etymology. This species' name refers to its depressed male terminal abdominal ventrites.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species exhibits few remarkable external characters, apart from the distinctly depressed male ventrites, but its aedeagus is highly distinct from that of other known *Jubus* species.

Jubus lunaris **sp. nov.**
Figs 54J–L, 55G–H

Type material. Holotype ♂ (MECN-EN 41021): "ECUADOR: Santa Elena, -1.83172, -80.65058, 187m,

Manglaralto. Barcelona, 13-Aug-2024" / "Caterino DNA voucher, Ext. MSC-12906, Morphosp. Bar.B.011"; deposited in MECN.

Diagnosis. (TL: 1.8mm) Body (Fig 54J) moderately large, orange, head and pronotum rather densely covered with coarse, shallow punctures, elytra less densely so; head about one-third longer than wide; eye diameter similar to postgenal length, coarsely faceted; vertex lacking foveae or sulci; frons with deep impression between elevated antennal bases; antennae moderately elongate, with weak 5 segmented club; pronotum with subbasal marginal tooth, sides widened, rounded anterad, narrowed evenly to apex, constricted behind; subbasal foveae well-developed, connected by short, deep, curved transverse sulcus; elytra elongate, subparallel-sided (winged), each elytron with basal carina present, weakly deflected over sutural and two weak lateral foveae; subhumeral fovea well developed, subhumeral stria straight removed from margin; abdomen with 1st tergite about 1.5× length of 2nd; legs and venter lacking obvious dimorphisms. Aedeagus (Fig. 55G, H) compressed laterally, lacking basal bulb, only slightly widened at base; inner and outer valves united, basal valve short, entirely enclosed by much longer, basally bent, strongly arched inner valve; inner valve narrows to near apex, then swells slightly at briefly spiralled apical twist.

Etymology. The species takes its name from the 'lunar'-like cratered surface of the head and pronotum.

Distribution. This species is known only from coastal Santa Elena, Ecuador, northwest of Guayaquil.

Remarks. This is among the more readily recognizable species of *Jubus* (at least as far as are known), by the coarsely punctate pronotum and head. Its long, narrow, curved aedeagus with united inner and outer valves is also unusual.

Jubus limaorum **sp. nov.**
DNA barcode: GenBank PX930275
Figs 54M–N, 55I–J

Type material. Holotype ♂ (ZSFQ-i23277): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v-2011, 2000–2100m, Mid canopy FIT, AT1339, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12664, Morphosp. ElP.A.063"; deposited in ZSFQ.

Diagnosis. (TL: 2.1mm) Body (Fig 54M) light orange, winged; head longer, posterior margin emarginate, interrupting posterior carina; vertexal foveae fine, frontal sulci long, sub-parallel, separate throughout; antennal bases slightly swollen behind; labrum outwardly arcuate; antennae moderately elongate, with distinct, loose four segmented club; pronotum abruptly narrowed in basal third, anterior portion of margin strongly curved inward, with distinct basal tooth, margin widened slightly to middle, then narrowed gradually to anterior collar; each elytron with sutural fovea and two small lateral foveae, the latter very small; subhumeral fovea distinct, subhumeral stria complete to elytral apex; first abdominal segment about 1.3× length of second. Aedeagus (Fig. 55I, J) laterally compressed, with inner and outer valves hinged at base, the outer thicker, strongly curved basad before curving distad, ending as acute dorsal process, inner valve rather thick at base, abruptly narrowed, then extending distad past apex of outer valve, curved ventrad apically, subacute but membraneous at apex.

Etymology. This species honors the Lima family, who have stewarded the El Pahuma Orchid Reserve for many years.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. *Jubus limaorum* is a larger species that conforms well with the group delimitation, with strong pronotal teeth, thin, subparallel vertexal sulci meeting in a deep median frontal fovea, and an elongate 4-segmented antennal club. It exhibits, however, few distinctive external characters, and should be identified only by its distinctive aedeagus, with the shorter outer valve extending over the base of the inner.

Jubus pendulus **sp. nov.**
Figs 54O, 55K–L

Type material. Holotype ♂ (ZSFQ-i13679): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m, window traps, S. Smith" / "Caterino DNA voucher, Ext. MSC-12422, Pselaphinae"; deposited in ZSFQ. **Paratype** (1♂): same locality as type, mid-canopy FIT (ZSFQ-i13675).

Diagnosis. (TL: 1.2mm) Body (Fig 54O) medium-small, orange, finely punctate and uniformly setose; head about one-fourth longer than wide, basal corners narrowly rounded; eyes moderately large, protuberant, diameter about 1.25× post-ocular genal length, very coarsely faceted; vertexal foveae distinct, fine; vertexal sulci short, narrowly impressed, 'Y'-shaped, converging to short stem behind antennal elevation; antennae moderately elongate, antennomeres I–II cylindrical, III–VII progressively shorter and wider, increasingly transverse, VIII–XI forming loose club, VIII–X about as wide as long, XI about 3× as long as X, apex narrowly pointed; pronotum with basal marginal tooth, sides slightly widened, rounded, convergent anterad to neck; posterior constriction emarginate, basolateral foveae deep, connected by arcuate, transverse basal sulcus; elytra subparallel-sided (winged), each elytron with sutural and two lateral basal foveae interrupting complete basal carina; subhumeral fovea and carina present; 1st abdominal tergite about twice as long as 2nd; male legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 55K, L) not distinctly divided into dorsobasal and ventral valves; basal piece forming a short socket to articulated, multifurcate apical piece, ventralmost arm of this piece extending as almost straight, acute median spine, second arm longer, narrowed and curving ventrally, ending in rounded apex, third arm arising on left side of second, arched apicodorsally over both others, ending in downwardly bent, strongly bispinose tip.

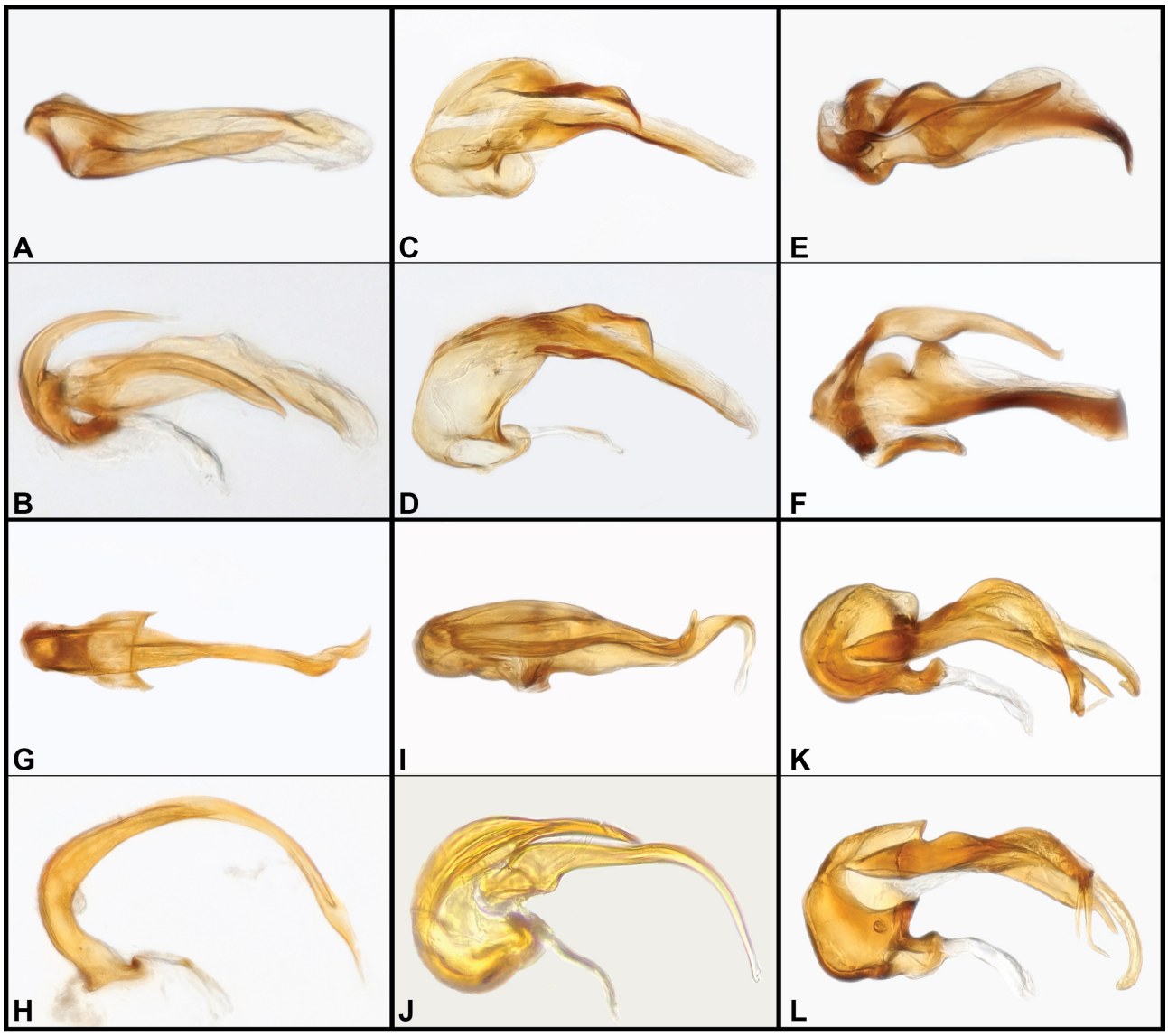

FIGURE 55. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. marissae* **C, D** *J. chongon* **E, F** *J. depressus* **G, H** *J. lunaris* **I, J** *J. limaorum* **K, L** *J. pendulus*.

Etymology. The name of this species refers to the pendant apical processes of the aedeagus.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. *Jubus pendulus* has relatively large eyes and a relatively deep, arcuate basal pronotal sulcus. Its most distinctive characters, however, are found in its aedeagus, with a multi-tipped inner valve articulated at its base with the large, socket-like outer valve.

Jubus tibiodentatus **sp. nov.**
Figs 56A–C, 57A–B

Type material. Holotype ♂ (MECN-EN 40727): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13072, Morphosp. VS.011"; deposited in MECN. **Paratypes** (4♂, 6♀): 5: same data as type; 5: same general locality, -0.658219˚, -77.591974˚, 1568m, 25-X-2023 (MECN-EN 40626, 40611, 40610, 40642, 40636, 42047, 41991, 41990, 41989, 41988).

Diagnosis. (TL: 1.6mm) Body (Fig. 56A) medium sized, dark orange, sparsely setose, elytra finely but distinctly and pronotum and head more densely and conspicuously punctate; head slightly longer than wide, base emarginate, basal corners weakly angulate; eyes protruding, diameter slightly greater than postocular genal length, coarsely faceted; vertexal sulci close, subparallel, meeting anteriorly at small post-antennal depression; antennae moderately elongate, antennomere I short, cylindrical, II globular, III quadrate, IV–VII increasingly transverse, VIII–XI forming loose, setose club, antennomere XI about 3× as long as X, apically rounded; gular carina weakly developed; pronotum with lateral margin dentate, widened slightly anterad, then

narrowed toward front, then abruptly angulate to neck; posterior pronotal constriction concave; lateral pronotal foveae deeply impressed with conspicuous surrounding setae, connected by weakly angulate, deeply impressed transverse sulcus; elytra subparallel-sided (winged), each with weak basal carina and sutural plus two lateral foveae; subhumeral fovea small, subhumeral carina prominent and complete; 1st visible abdominal tergite only slightly longer than 2nd; male protibia with tooth one-third from base of inner margin, densely setose beyond; legs and venter otherwise without obvious secondary sexual characters. Aedeagus (Fig. 57A, B) slightly laterally compressed, basal bulb present, with distinct collar around basal foramen; inner and outer valves not clearly differentiated; tegmen with two distinct distal processes; on left side, arising from upper edge of basal bulb is a well-sclerotized arm projecting slightly laterad then curving in and narrowing abruptly to bluntly acute apical tooth, ending near base of longer median process; distal margin of basal bulb projecting broadly, then abruptly narrowed (in both lateral and dorsal aspects, knobbed ventrally) to sinuate, ventrally curving apical lobe, its apex more weakly sclerotized and obliquely truncate.

Etymology. This species is named for the unusual secondary character of the males' dentate protibia.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is unique among known *Jubus* species in having the inner margin of the male protibia dentate (Fig. 56B, C). The aedeagus is also quite unusual, with a distinct basal bulb and not having clearly differentiated inner and outer valves. This is likely indicative of an early branching lineage.

Jubus spiralis **sp. nov.**
Figs 56D–F, 57C–D

Type material. Holotype ♂ (MECN-EN 41035): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Ridge Tr., 2386m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12953, Morphosp. Yn.A.022"; deposited in MECN. **Paratypes** (4♂, all same general locality): 1: same data as type; 1: -0.5974˚, -77.8934, 2222m; 1: -0.5939˚, -77.8980˚ 2368m; 1: -0.5983˚, -77.8954˚ 2192m (MECN-EN 38701–38704).

Diagnosis. (TL: 2.5mm) Male (Fig. 56D) large, orange, body setae dense but very short, appressed; head longer than wide, slightly widened to base, weakly emarginate at base; vertexal foveae close, fine, vertexal sulci long, narrowly but deeply impressed, meeting behind elevated, subconjoined antennal tubercles; eyes large, diameter about equal to post-ocular genal length, coarsely faceted; antennae moderately long, with antennomeres II–VII subquadrate, slightly wider than long, VIII–XI distinctly larger, forming elongate, club, VIII–X with parallel sides and well-defined basal and apical corners, terminal segment about twice length of penultimate; pronotum with subbasal tooth, margins widened anterad, rounded, narrowing more or less evenly to front, basal fourth constricted; lateral discal foveae distinct, basal transverse sulcus weakly biarcuate between them; elytra subparallel-sided (winged), with complete basal carina weakly interrupted by sutural and only one lateral basal foveae on each; subhumeral fovea present and subhumeral stria complete; 1st visible abdominal tergite about 1.5× midline length of second; male first visible ventrite slightly flattened at middle. Aedeagus (Fig. 57C, D) laterally compressed, basal bulb indistinct; basal/outer valve curved basad then distad, spiraled once around corresponding spiraled process of left side of inner valve; inner valve widening from base, deeply concave dorsally, with, in addition to well-sclerotized spiralled process, a thin, elongate apical style.

Etymology. This species takes its name from the spiralled aedeagal processes.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This is a distinctive species, in the large body size, elongate head and antennae, deeply impressed, subparallel vertexal sulci, and, especially, in the depressed first male abdominal ventrite, secondary sexual characters being generally rare in *Jubus*.

Jubus iactus **sp. nov.**
Figs 56G–I, 57E–F

Type material. Holotype ♂ (MECN-EN 41039): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Ridge Tr., 2356m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12966, Morphosp. Yn.A.035"; deposited in MECN.

Diagnosis. (TL: 1.7mm) Body (Fig. 56G) orange, male winged; head slightly longer than wide, posterior margin weakly emarginate; eyes large, protruding, coarsely faceted, diameter slightly greater than postocular genal length; frontal foveae weak, frontal impressions narrowly impressed, subparallel, meeting at deep median impression just behind antennal bases; antennae moderately long, antennomeres III–V roundly subquadrate, VI–VII widening slightly toward four-segmented club, antennomeres VIII–X larger with distinct basal and distal edges, terminal antennomere almost 3× as long as penultimate; pronotal margin with distinct subbasal tooth, barely widening anterad before evenly narrowing to front; basal pronotal constriction accounting for almost one-third pronotal length; lateral pronotal foveae deep, joined by curving basal sulcus; each elytron with small sutural and two smaller lateral basal foveae interrupting distinct, complete basal carina; subhumeral fovea distinct, with short vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete, almost straight; first abdominal segment about 1.3× length of second; venter lacking obvious secondary sexual characters. Aedeagus (Fig. 57E, F) with outer/basal style free at base, strongly arched ventrad

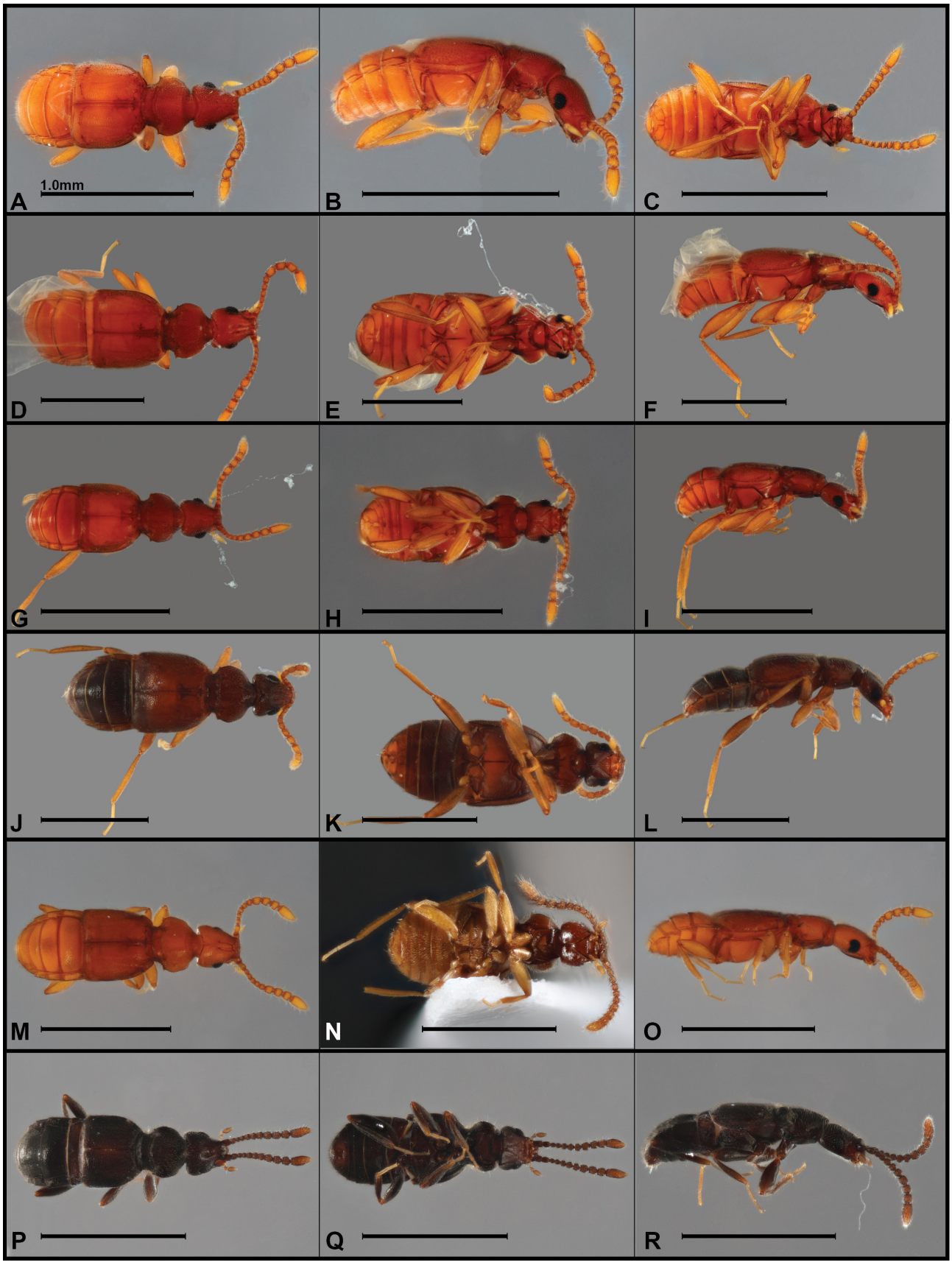

FIGURE 56. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. tibiodentatus* **D–F** *J. spiralis* **G–I** *J. iactus* **J–L** *J. amplexus* **M–O** *J. sulcatus* **P–R** *J. culebrillas.* Scale bars = 1.0mm.

and basad before curving distad, short, weakly concave dorsally, curving over to right, terminating in acute apex, lying within channel formed by inner valve; inner valve broad at base, narrowed slightly at middle, right edge with secondary thickening curves leftward across truncate left edge, strongly curving ventrad to acute apex.

Etymology. This species' name means 'shot' or 'cast', referring to the extruded oral secretions visible in the type. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This relatively large species has a toothed pronotum with deep lateral foveae, an elongate head, and strongly four-segmented antennal club. Among such species it can really only be distinguished by its aedeagus, which has a relatively broad, flattened, unevenly divided apex to the inner valve. The related *Jubus vulgus* is similar externally, and has an aedeagus with a similar basic plan. *Jubus iactus*, however, has smaller eyes, the pronotum less strongly constricted anteriorly, and the apical lobe of the aedeagus is much broader. Discussion of some other potentially related species can be found under *Jubus cusicayo*.

The holotype of this species retained the long maxillary secretions that appear to be common to many Jubini (visible in Fig. 56G).

Jubus amplexus **sp. nov.**
Figs 56J–L, 57G–H

Type material. Holotype ♂ (MECN-EN 41040): "ECUADOR: Napo, -0.5974˚, -77.8934˚, Est. Biol. Yanayacu, Ridge Tr., 2222m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12985, Morphosp. Yn.A.054"; deposited in MECN. **Paratypes** (2♂, 1♀, same general locality as type) 1: -0.5963˚, -77.8954˚, Stream Tr., 2192m (MECN-EN 38700); 1: -0.5947˚, -77.8945˚, Piha Tr., 2248m (MECN-EN 38680); 1: -0.5958˚, -77.8927˚, Aburrian Tr., 2233m (MECN-EN 38699).

Diagnosis. (TL: 2.3mm) Body (Fig. 56J) large, dark, with lighter legs and palpi; head slightly longer than wide, posterior margin weakly emarginate; eyes large, protruding, coarsely faceted, diameter slightly greater than postocular genal length; frontal foveae distinct, frontal sulci narrowly impressed, slightly curved, meeting behind antennal bases; antennae moderately long, antennomeres III–IV subquadrate, V–X gradually enlarged with increasingly distinct basal and distal edges, club poorly defined, terminal antennomere about 2.5× as long as penultimate; pronotal margin with distinct subbasal tooth, widening anterad before roundly narrowing to front; basal pronotal constriction rather short; lateral pronotal foveae deep, joined by nearly straight basal sulcus; each elytron with sutural fovea and one smaller lateral basal fovea interrupting complete basal carina; subhumeral fovea distinct, with short vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete, curving along elytral margin; 1st abdominal segment about 1.3× length of 2nd; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 57G, H) laterally compressed, with outer/basal valve thick and wide at base (remnant of basal bulb), abruptly narrowed to narrow dorsal style running to middle of left side of ventral/inner valve; inner valve stalked, free at base, widening and elevated along right edge, with small flap curving mediad, presumably to cover outer valve in repose, apex narrowed and flattened, with fistlike knob at apex bearing small ventral tooth.

Etymology. This species' name refers to the two similar aedeagal valves with the outer appearing set to mount the inner, comparable to frogs *in copula*. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species shares some characters with *Jubus spiralis*, in particular large body and eye size in combination with depressed male abdominal ventrites. However, they are easily separated by the darker coloration of this species, its 6 segmented antennal club, and the male genitalia; this species shows no hint of the spiralled valves of *J. spiralis*.

Jubus sulcatus **sp. nov.**
Figs 56M–O, 57I–J

Type material. Holotype ♂ (MECN-EN 38498): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 22.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12750, Morphosp. SK.A.011"; deposited in MECN. **Paratype** (1♀): same data as type (MECN-EN 38497).

Diagnosis. (TL: 1.9mm) Body (Fig. 56M) light orange, male winged; head longer than wide, posterior margin emarginate, interrupting posterior carina; frontal foveae indistinct, frontal impressions deeply impressed, slightly curved outward, meeting at deep median impression just behind antennal bases; eye diameter slightly less than length of genae behind eyes; antennomeres III–VII subquadrate to weakly transverse, widening slightly toward distinct four-segmented club, antennomeres VIII–X slightly wider than long, with distinct basal and distal edges, terminal antennomere about 2.5 times as long as penultimate; pronotal margin with distinct subbasal tooth, widening slightly then evenly narrowed to front; lateral pronotal foveae distinct, joined by curving basal sulcus; each elytron with small sutural and two smaller lateral basal foveae interrupting distinct, complete basal carina; subhumeral fovea distinct, with short vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete; 1st abdominal segment about 1.25× length of 2nd. Aedeagus (Fig. 57I, J) with dorsal style slightly expanded, gourd-shaped at base, then arched dorsad, forming long, slightly corkscrewed distal style; ventral process rather broad from base, a left-side plate curving up almost to enclose dorsal process over its middle section.

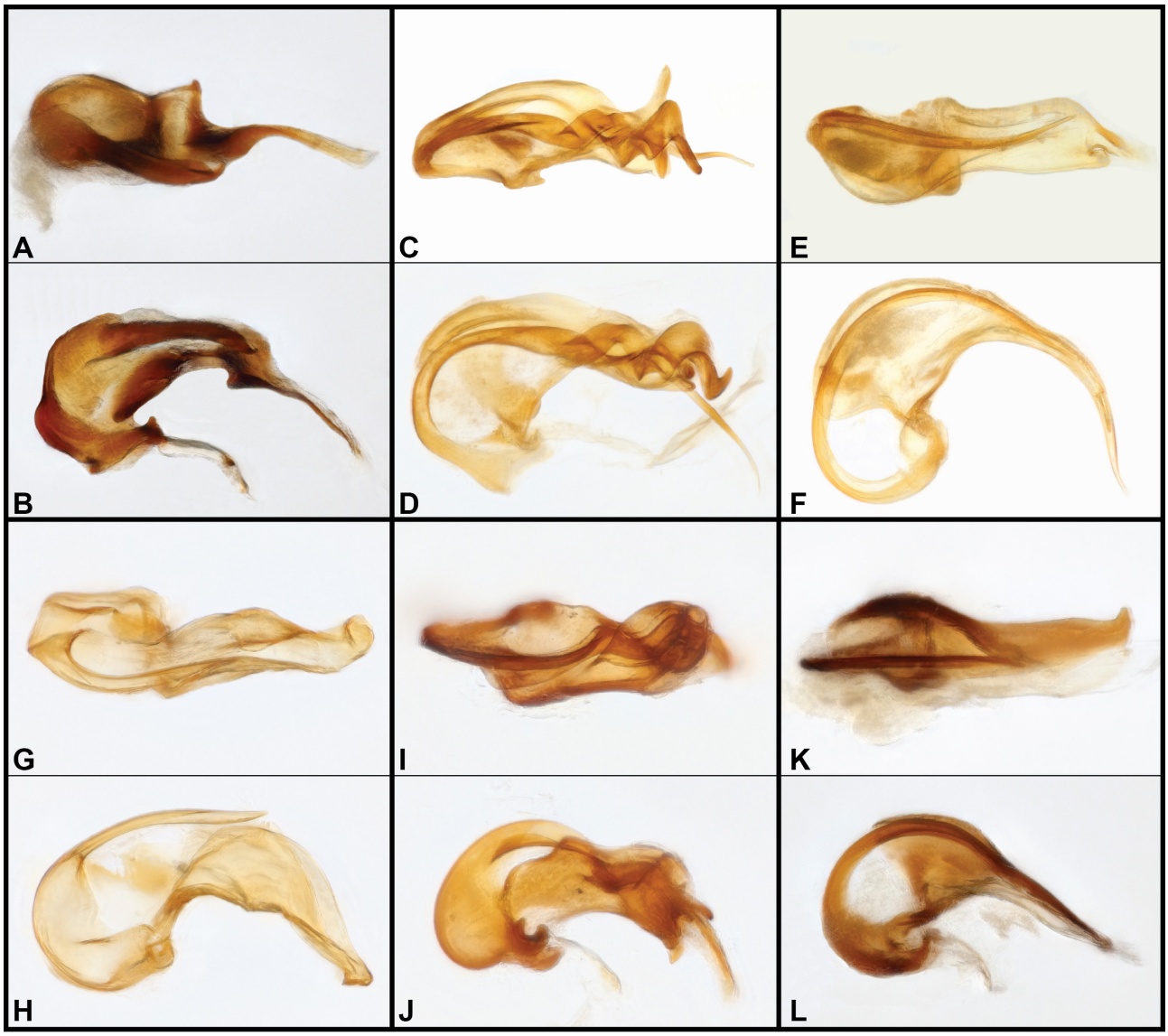

FIGURE 57. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. tibiodentatus* **C, D** *J. spiralis* **E, F** *J. iactus* **G, H** *J. amplexus* **I, J** *J. sulcatus* **K, L** *J. culebrillas*.

Etymology. The species name refers to its distinctive vertexal sulci.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. The species has quite distinctive, deeply impressed and arcuate vertexal sulci that meet in a deep, median frontal fovea (Fig. 56M).

Jubus culebrillas **sp. nov.**
Figs 56P–R, 57K–L

Type material. Holotype ♂ (QCAZ-I-280244/MECN-EN 40710): "ECUADOR: Cañar, -2.43843˚, -78.89532˚, Culebrillas, 3880m, 17JUL2017, S. Muñoz & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13055, Morphosp. Culeb1"; deposited in QCAZ. **Paratype** (1♂): same data as type (QCAZ-I-280245). **Other material:** "ECUADOR: Pichincha, -0.18765˚, -78.54053˚, RucoPichincha, 3897m, 22JUN2016, S.Muñoz, A.Romero & S.Myers, Ex.Berlese" (QCAZ-I-280246).

Diagnosis. (TL: 1.6mm) Body (Fig. 56P) medium-sized, slightly depressed, dark brown, rather densely setose; head slightly longer than wide, slightly emarginate at base, basal corners narrowly rounded; eyes small, diameter just over half postocular genal length; vertexal foveae well impressed; vertexal sulci fine, slightly arcuate, converging just behind antennal insertions to short, common stem; antennae moderately elongate, antennomere II bulbous, III–IV subquadrate, weakly rounded at apices, V–VII wider slightly transverse, VIII–XI forming fairly distinct 4-segmented club (antennomere VIII distinctly longer than VII), terminal segment about twice length of penultimate; gular carinae present but weak, especially posteriorly; pronotum with very weak subbasal tooth, widened and rounded anterad, tapered evenly to front; lateral basal

foveae distinct, transverse subbasal sulcus weakly arcuate between; elytra subparallel-sided (winged); each elytron with basal carina weakly arched over strong sutural and one (outer) lateral dorsobasal foveae; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite about 1.5× midline length of 2nd; male venter and legs without obvious secondary sexual characters. Aedeagus (Fig. 57K, L) extremely similar to that of *J. humboldti*, differing only in the following characters: outer/basal valve more strongly arcuate basally, almost evenly rounded from base to apex; not at all sinuate laterally towards apex; inner valve extended further basad along outer valve, rather broadly hooded on right side; apex of inner valve flattened dorsoventrally, narrowing slightly toward apex, apically truncate with blunt lateral tooth on right margin.

Etymology. This species is named for its type locality.

Distribution. This species is certainly known only from páramo habitats in the Culebrillas region of northern Cañar Province, Ecuador. Confirmation of the identity of the population from the second, Pichincha locality cited above under 'other material' will require further data (including sequences and/or male genitalia).

Remarks. This species is similar to several others occurring in Páramo highlands, such as *J. humboldti*. It is distinctive, however, in its uniformly dark coloration, shorter elytra (possible winglessness), less anteriorly prolonged pronotum, straight outer aedeagal valve, and dorsoventrally flattened, apically truncate inner valve. The specimen cited under 'other material' has not been dissected to confirm its seemingly close similarity to this. It differs in one obvious respect in that its elytra and presumably flight wings are fully developed.

Jubus cusicayo **sp. nov.**
Figs 58A–C, 59A–B

Type material. Holotype ♂ (QCAZ-I-280247): "ECUADOR: Azuay, -3.2132˚, -79.0376˚, Siña, 3328m, 17JUN2017, S. Muñoz, & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13030, Morphosp. Siña1"; deposited in QCAZ.

Diagnosis. (TL: 2.0mm) Body (Fig. 58A) rather large, orange, densely setose and finely punctate; head about one-fourth longer than wide, weakly emarginate at base, basal corners narrowly rounded; eyes prominent, diameter slightly greater than postocular genal length; vertexal foveae small; vertexal sulci fine, narrowly separated, converging slightly to common depression behind antennal bases; antennae moderately long, antennomeres III–VII subquadrate, VIII–XI distinctly elongate, forming distinct club, terminal antennomere about 3× length of penultimate; gular carinate weak, short, limited to anterior third of gula; pronotum with weak subbasal tooth, slightly widened anterad, tapered evenly to front; basal constriction emarginate at sides; lateral basal foveae distinct, transverse subbasal sulcus weakly arcuate between; elytra subparallel-sided (winged); basal carina weak, each elytron with sutural and two lateral dorsobasal foveae; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite about 1.5× midline length of 2nd; venter and legs without obvious secondary sexual characters. Aedeagus (Fig. 59A, B) strongly laterally compressed; basal bulb absent; basal/outer valve free at base, strongly looped basad then dorsoapicad, mostly straight, weakly sinuate near apex, lying within channel of inner valve; inner valve laminate at base, left flange widening toward apex, curving over apex of dorsal valve, then curving strongly ventrad, terminating in acute apex.

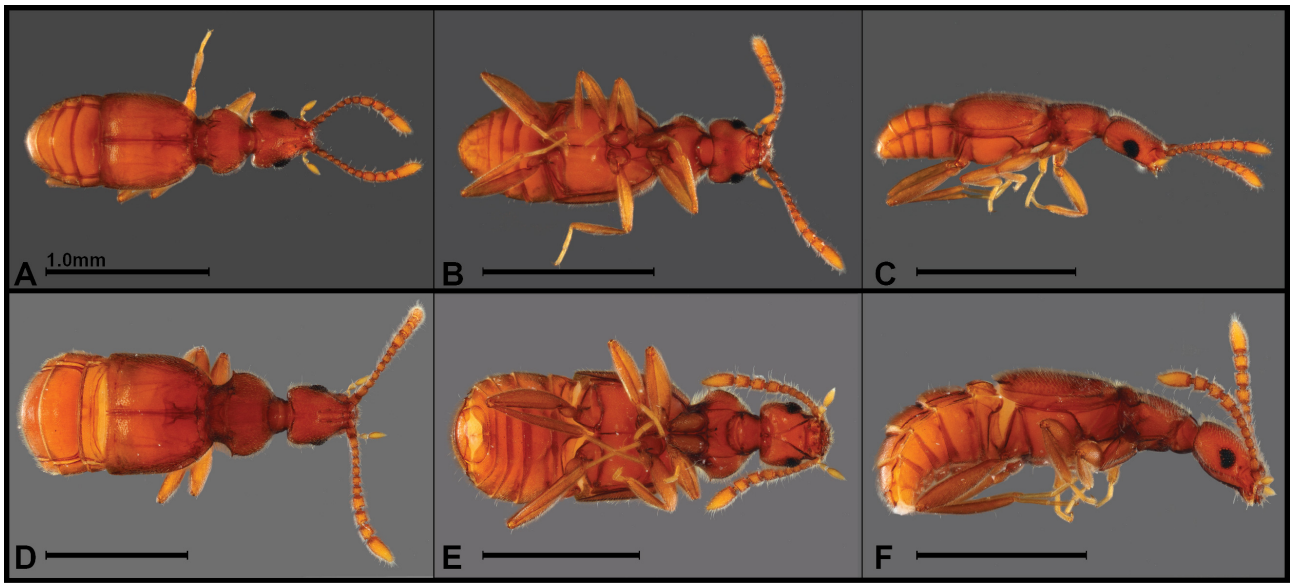

FIGURE 58. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. cusicayo* **D–F** *J. ataorupagui.* Scale bars = 1.0mm.

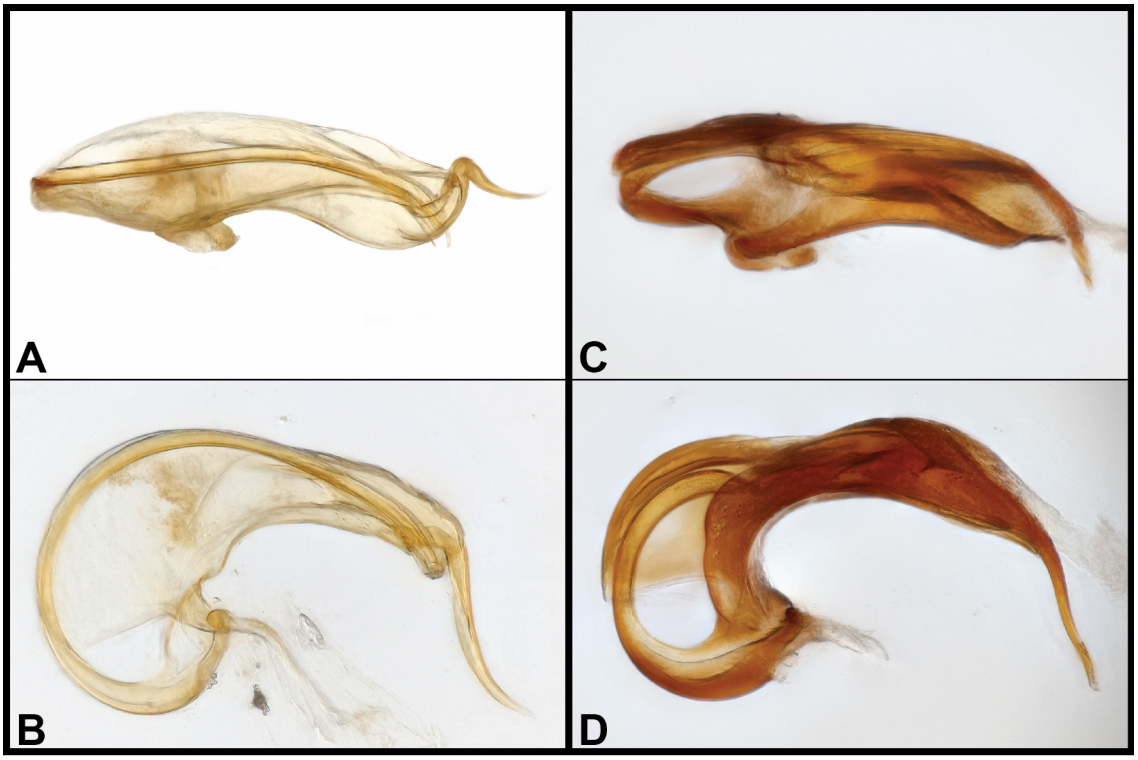

FIGURE 59. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. cusicayo* **C, D** *J. ataorupagui*.

Etymology. This species and the following are named together, as a mythical pair of ancient brothers who ascended the highest mountain in the region (in story, known as Wakayñan) to escape a great flood. After some time, they found a cave, occupied by a pair of chicha-bearing macaws/women, with whom then eventually mated, their union to spawn the Cañari people.

Distribution. This species is known only from páramo habitats about 30 km south of Cuenca, Azuay Province, Ecuador.

Remarks. This species is closely related to the following (*J. ataorupagui*), sharing a relatively large and elongate body form, strongly toothed pronotum, long, thin vertexal sulci that meet in a small but distinct post-antennal fovea, and robustly 4-segmented antennal clubs. Their aedeagi share a basally free outer valve, and long, cradling inner valve, but the shapes of both are very distinct. Other species that appear similar and potentially related include, *J. kiru*, *J. iactus*, and *J. vulgus*, as well as *J. longipennis* Raffray (from Bogota, Colombia).

Jubus ataorupagui **sp. nov.**
Figs 58D–F, 59C–D

Type material. Holotype ♂ (QCAZ-I-280248): "ECUADOR: Pichincha, -0.30795˚, -78.23255˚, La Virgen, 3694m, 28JUL2016, S. Muñoz & R.Tobar, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13045, Morphosp. Virgen3"; deposited in QCAZ. **Paratypes** (1♂): "ECUADOR: Pichincha, -0.18765˚, -78.54053˚, RucoPichincha, 3897m, 22JUN2016, S.Muñoz, A.Romero & S.Myers, Ex.Berlese" (QCAZ-I-280249). **Other material:** 2♂: "ECUADOR: Carchi, 0.75587˚, -77.96642˚, El Angel, Saladero, 3301m, 26JUL2016, S. Muñoz" (QCAZ-I-280250–280251).

Diagnosis. (TL: 2.7mm) Body (Fig. 58) large, orange, rather sparsely setose; head slightly longer than wide, weakly emarginate at base, basal corners broadly rounded; eyes slightly prominent, diameter about equal to postocular genal length; vertexal foveae small; vertexal sulci parallel in posterior halves, converging to small post-antennal depression; antennae moderately long, antennomere II short, cylindrical, III–VII slightly longer than wide, each slightly larger than preceding, VIII–XI forming distinct 4-segmented club, terminal segment about 2.5× length of penultimate; gular carinae distinct; pronotum with strong subbasal tooth, barely widened anterad, tapered evenly to front; lateral basal foveae distinct, transverse subbasal sulcus short, weakly arcuate between; elytra subparallel-sided (winged); each elytron with basal carina weakly arched over small sutural and two lateral dorsobasal foveae; subhumeral fovea rather deeply impressed, subhumeral stria complete, carinate; 1st visible abdominal tergite about 1.25× midline length of 2nd; male abdominal ventrites II–V slightly concave (Fig. 58E, F); legs without obvious secondary sexual characters. Aedeagus (Fig. 59C, D) laterally compressed, lacking basal bulb; outer/basal valve free, short, strongly curved, forming ¾ of an oval ending free above basal articulation with stout, acute apex; inner valve with laminate basal plate covering right side of inner valve, remainder forming rather broad trough with high sides, each side narrowing into separate, bluntly acute

apices, the right one considerably longer, bent strongly downward.

Etymology. See the preceding species for the story underlying this species' name.

Distribution. This species is known from three páramo localities, from central Pichincha, both east and west of the Valle de Quito, north to central Carchi, a separation of about 115km (though the Carchi specimens are excluded from the type series, in recognition of the possibility of cryptic species).

Remarks. This species is closely related to the preceding, also a páramo inhabitant, as well as a few others that occur below páramo elevations (see preceding discussion). This species has a more strongly dentate and slightly wider pronotum, a somewhat narrower head, and vertexal sulci that are slightly outwardly arcuate, instead of straight. Its aedeagus is also distinctive, in particular in its very short outer valve.

Jubus fraternus **sp. nov.**
DNA barcode: GenBank PX930213
Figs 60A–C, 61A–B

Type material. Holotype ♂ (MECN-EN 40858): "ECUADOR: Tungurahua, -1.4342˚, -78.3118˚, NaturetrekCandelariaRes, 2140m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13211, Morphosp. Cnd.027"; deposited in MECN. **Paratypes** (13♂, 2♀, same general locality and date as type): 10: -1.4327˚, -78.3120˚, 2040m; 5: -1.4328˚, -78.3121˚, 2054m (MECN). **Other material:** 1♂: "ECUADOR: Tungurahua, -1.3829˚, -78.2909˚, Río Machay Reserve, 2382m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13155, Morphosp. Mch.018" (MECN).

Diagnosis. (TL: 1.8mm) Body (Fig. 60A) moderately large, reddish orange, the dorsum, especially the head and pronotum, distinctly but finely punctate, with moderately dense, recumbent setae with longer erect and recurved setae interspersed; head elongate triangular, with weakly angulate posterior corners; eyes large, protuberant, diameter almost twice post-ocular genal length; vertexal foveae fine, at ends of fine, subparallel vertexal sulci, sulci converging weakly to deep post-antennal impression; antennae moderately elongate, antennomeres I–II cylindrical, short, III–VII small, increasingly transverse, VIII–XI forming distinct club, VIII–X slightly longer than wide, XI barely twice as long as X, apically rounded; pronotum with distinct lateral subbasal tooth, sides widened slightly anterad, then narrowed slightly before abruptly narrowing to short anterior collar; basal constriction distinct; subbasal lateral foveae evident, connected by arcuate transverse sulcus; elytra long, parallel-sided (winged), each with sutural fovea and one lateral basal fovea, with basal carina arched over them; subhumeral fovea and stria present; 1st abdominal tergite about 1.75× length of 2nd; last male ventrite weakly depressed at middle; legs lacking obvious secondary sexual characters. Aedeagus (Fig. 61A, B) strongly laterally compressed, basal bulb absent, basal apodeme strongly curved dorsad; outer valve thick at base, narrowing, basal three-fourths free, looping basad then upward and distad, sinuately dropping into short channel formed by inner valve; inner valve with strong basal angle, becoming dorsoventrally flattened for short distance before narrowing to descending, knob-like apex.

Etymology. The name of this species refers to the sibling status of the two known populations, whatever their species-level status.

Distribution. This species is known from two localities on either side of the Río Pastaza valley in Tungurahua Province, Ecuador. Both the Río Machay Reserve and the Naturetrek Candelaria Reserve are managed by the EcoMingo Foundation.

Remarks. At these localities, this is among the larger and larger-eyed *Jubus* species present. It otherwise exhibits few distinguishing external characters from other such species at other locations. The aedeagi from Machay and Candelaria differ slightly in details of the inner valve base and the knobbed tip. However, longer series of both would have to be examined to determine the significance of those minor differences.

Jubus denticulatus **sp. nov.**
Figs 60D–F, 61C–D

Type material. Holotype ♂ (MECN-EN 38637): "ECUADOR: Pichincha, 0.0473˚S, 78.7632˚W [1458m], Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12798, Morphosp. Min.A.020"; deposited in MECN. **Paratypes** (4♂, 3♀): 3: same data as type; 4: same general locality as type, but 0.0472˚S, 78.7631˚W [1460m] (MECN-EN 38630–38636).

Diagnosis. (TL: 1.6mm) Male body (Fig. 60D) uniformly light orange, densely but shallowly punctate, uniformly setose; head about 1.25× as long as wide, shallowly emarginate at base; eyes moderately large, diameter slightly greater than post-ocular gena, moderately coarsely faceted; vertexal foveae not evident; sulci fine, extending posterad to level of middle of eye, curving slightly together at both ends, connected by short transverse sulcus near antennal bases; antennae rather short, with last 4 antennomeres forming loose club; pronotum with weak subbasal tooth, sides anterad almost evenly rounded; posterior third strongly constricted, with curved basal sulcus connecting distinct lateral foveae; elytra subparallel-sided (winged), with strong basal carina, outlining very fine sutural and two lateral foveae on each; subhumeral fovea present; first abdominal segment about 1.25× as long as second. Female eyes comprising 2–3 ommatidia, antennal club poorly developed, of four antennomeres; humeri narrowed (wingless); other secondary sexual characters not evident. Aedeagus (Fig. 61C, D) with outer valve arched strongly from base, basally thick, narrowed to apex, forming most of an oval before ending within base of inner/ventral valve; ventral valve expanded broadly from base, forming large, cup-like

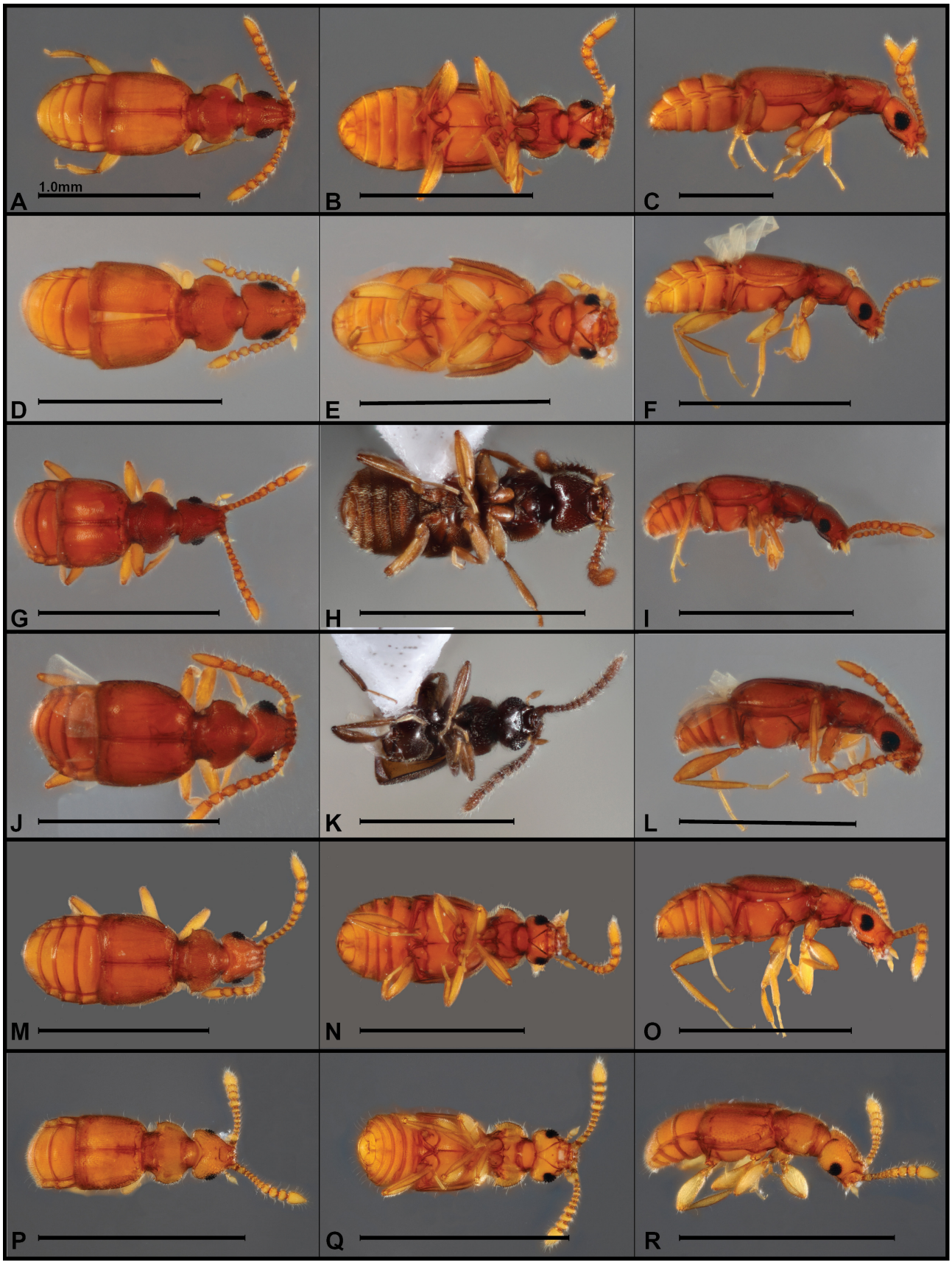

FIGURE 60. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. fraternus* **D–F** *J. denticulatus* **G–I** *J. risus* **J–L** *J. vulgus* **M–O** *J. pradoi* **P–R** *J. specus.* Scale bars = 1.0mm.

plate, with considerable inner space, its lower right corner extended into a short, apicoventral digitiform process.

Etymology. This species is named for its finely denticulate pronotal margins.

Distribution. This species is known only from the cloud forests near Mindo, Pichincha, Ecuador.

Remarks. This species has a remarkably distinctive aedeagus, with the inner valve abruptly expanded beyond the end of the outer valve. It appears possible that this is inflated and balloon-like in life, and has perhaps collapsed in preserved material.

Jubus risus **sp. nov.**
Figs 60G–I, 61E–F

Type material. Holotype ♂ (MECN-EN 38495): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 22.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12752, Morphosp. SK.A.013"; deposited in MECN. **Paratypes** (4♀): 1: same data as type (MECN-EN 38501); 3: "ECUADOR: Napo, -0.65822, -77.59197 Archidona, Pacto Sumaco, 22.I.2024, 1468m, Winkler, A. Pazmiño | M. Barreno" (MECN-EN 38748–38750).

Diagnosis. (TL: 1.4mm) Body (Fig. 60G) darker orange, male winged, head and pronotum punctate; head slightly longer than wide, posterior margin weakly emarginate; eyes moderately large, protruding, diameter slightly greater than post-ocular genal length, coarsely faceted; frontal foveae indistinct, frontal impressions well impressed, subparallel, meeting at narrow median impression between antennal bases; antennae moderately long, antennomeres III–VI weakly transverse, VII wider, VIII–X larger, similar in size, subquadrate, with distinct basal and distal edges, terminal antennomere about 2.5× as long as penultimate; pronotal margin with weak subbasal tooth, widening briefly anterad, then evenly narrowing to front; basal pronotal constriction accounting for about one-third pronotal length; lateral pronotal foveae deep, joined by curving basal sulcus; each elytron with distinct sutural fovea and two lateral basal foveae interrupting basal carina; subhumeral fovea distinct, with short vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete; first abdominal segment about 1.3× length of second. Aedeagus (Fig. 61E, F) with rather large basal foramen, basal bulb distinct; dorsal valve arising from upper basal edge of basal bulb, thick at base, then bent slightly ventrad and narrowing to truncate tip; ventral process wider, directed dorsad at base, bent at 90° distad, with right lateral flange that curves up over apex of dorsal valve, apex of ventral process extending beyond dorsal, curved strongly at apex to obliquely truncate tip.

Etymology. The name of this species is a Latin term for 'smile', referring to the distinctly arcuate basal pronotal sulcus. It is used as a noun in apposition.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. The punctate head and pronotum along with the deep, curving pronotal sulcus will help distinguish this species.

Jubus vulgus **sp. nov.**
Figs 60J–L, 61G–H

Type material. Holotype ♂ (MECN-EN 38496): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 22.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12751, Morphosp. SK.A.012"; deposited in MECN.

Diagnosis. (TL: 1.7mm) Body (Fig. 60J) moderately large, light orange, male winged; head about as long as wide, posterior margin weakly emarginate; eyes very large, occupying most of side of head, coarsely faceted; frontal foveae indistinct, frontal impressions narrowly impressed, subparallel, meeting at deep median impression just behind antennal bases; antennae moderately long, antennomeres III–VI subquadrate to weakly transverse, widening slightly toward weakly five-segmented club, antennomere VII wider, weakly transverse, VIII–X slightly longer than wide, with distinct basal and distal edges, terminal antennomere slender, about 2.5 times as long as penultimate; pronotal margin with distinct subbasal tooth, barely widening anterad before evenly narrowing to front; basal pronotal constriction accounting for almost one-third pronotal length; lateral pronotal foveae deep, joined by curving basal sulcus; each elytron with small sutural and two smaller lateral basal foveae interrupting distinct, complete basal carina; subhumeral fovea distinct, with short vertical carina extending dorsad to humerus (not joining dorsobasal carina); subhumeral stria complete; 1st abdominal segment about 1.3× length of 2nd. Aedeagus (Fig. 61G, H) with dorsal style strongly arched ventrad and basad before curving distad, short, weakly concave dorsally, curving over to right, terminating in acute apex, lying within channel formed by broader ventral process, which extends distally, abruptly narrowed then curving ventrad to weakly sinuate, subacute apex.

Etymology. This species is named as 'one of the crowd' of *Jubus* species. The species name= is used as a noun in apposition.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. *Jubus vulgus* is a larger species, with moderately punctate head and pronotum, and a large, deep, setose median frontal depression with thin, parallel sulci extending posterad.

Jubus pradoi **sp. nov.**
Figs 60M–O, 61I–J

Type material. Holotype ♂ (MECN-EN 40746): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m,

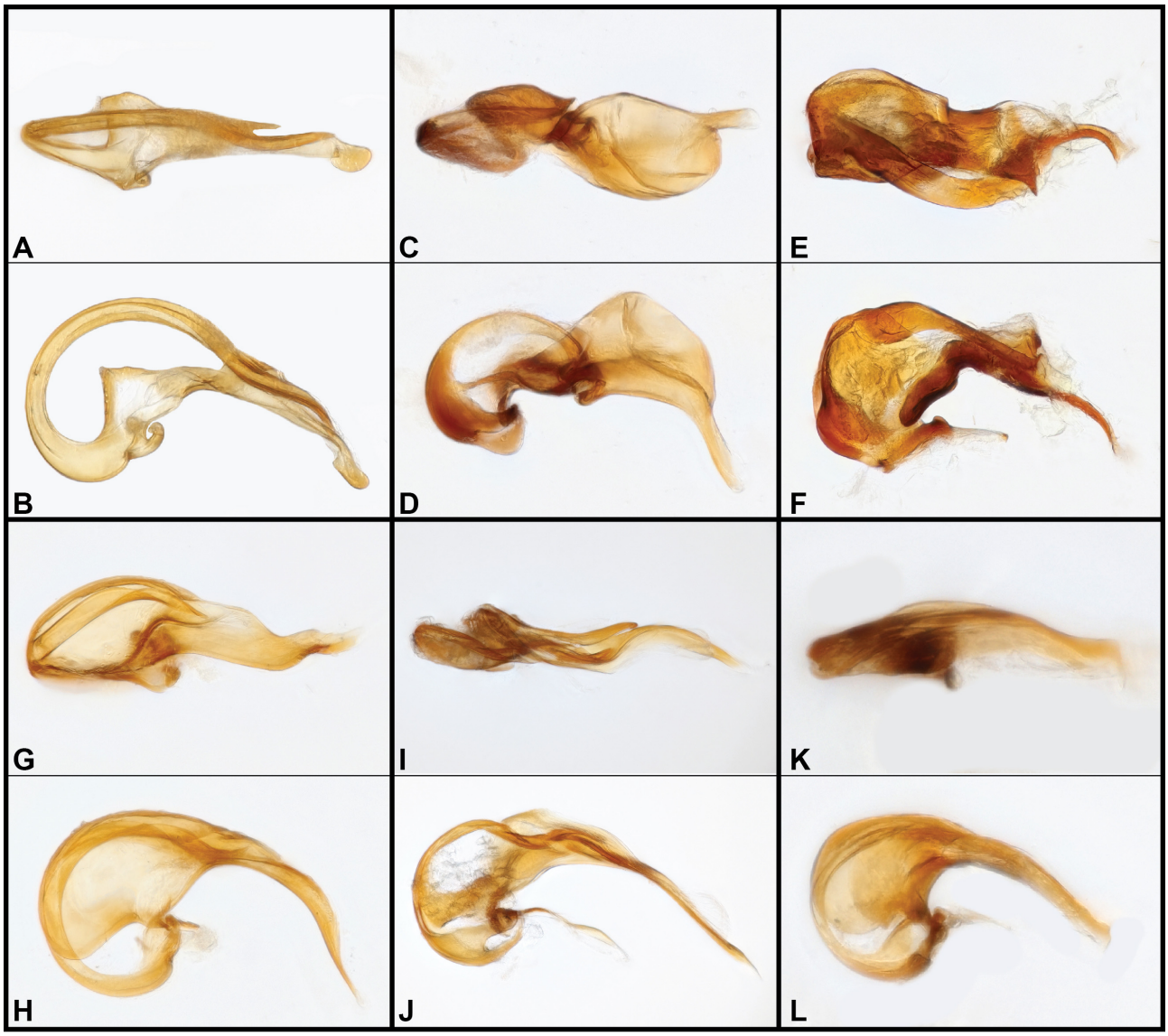

FIGURE 61. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. fraternus* **C, D** *J. denticulatus* **E, F** *J. risus* **G, H** *J. vulgus* **I, J** *J. pradoi* **K, L** *J. specus*.

1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13091, Morphosp. Cu.008"; deposited in MECN. **Paratypes** (1♂, 2♀): 2: same data as type (MECN-EN 40464, 40457); 1: same general locality, but -0.2077˚, -75.9272˚, 220m, 2.XI.2024 (MECN-EN 40506).

Diagnosis. (TL: 1.6mm) Body (Fig. 60M) orange, with recumbent, golden pubescence and scattered longer erect setae; head roughly equilateral, emarginate posteriorly, posterior corners rounded; eyes large, diameter about 1.25× postocular genal length, coarsely faceted; vertexal foveae small, close; vertexal sulci thin, weakly sinuate, joined just behind antennal elevation; antennae moderate in length, antennomeres I and II short, cylindrical, III–V beadlike, VI–VII slightly transverse, VIII–XI forming loose club, VII–X slightly longer than wide, XI 2.5× length of X; pronotum with strong subbasal tooth, sides weakly rounded anterad, then abruptly narrowed to anterior margin, posterior constriction gradual; basolateral foveae about neck-width apart, joined by weakly angulate transverse sulcus; elytra subparallel-sided; each with basal carina weakly interrupted by sutural and one lateral fovea; male winged; subhumeral fovea and stria present; 1st visible tergite barely longer than 2nd; male last ventrite weakly depressed, venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 61I, J) laterally compressed, lacking basal bulb; outer/basal valve briefly free at base, then briefly cradled by basal extension of inner valve, then free again before narrowly spiralling, then ending in a subapical, acute point; inner valve with basal support, medially forming right-side flange along and partly above spiral of basal valve, subdivided with short, blunt extension of upright lateral flange, and sinuate distal extension elongate, descending, tapering to bluntly acute apex.

Etymology. I am pleased to name this species in honor of Mr. Diego Prado, co-director of the Waita Lodge, in gratitude for his dedication to sharing his knowledge

and appreciation of the region, and for his assistance with the author's family's trip there in 2024 that resulted in the collection of this species.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is distinct in its particularly short pronotum, which is very widely campanuliform with projecting posterior corners (teeth). The vertexal sulci are subparallel, meeting at a relatively narrow frontal groove. The male's club antennomeres are distinctly elongate.

Jubus specus **sp. nov.**
DNA barcode: GenBank PX930228
Figs 60P–R, 61K–L

Type material. Holotype ♂ (MECN-EN 40756): "ECUADOR: Sucumbíos, -0.2066˚, -75.9262˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13101, Morphosp. Cu.018"; deposited in MECN. **Paratypes** (1♂, 1♀): same data as type (MECN-EN 40495, 40500).

Diagnosis. (TL: 1.2mm) Body (Fig. 60P) small, orange, conspicuously punctate, with moderately dense recumbent setae and longer, erect setae interspersed; head about as broad as long, basally emarginate, posterior corners rounded; eye diameter slightly greater than post-ocular genal length, coarsely faceted; vertexal foveae small, distinct, separate from broad, setose frontal depression (Fig. 60P), vertexal sulci otherwise absent; antennae compressed, antennomeres I–II short, cylindrical, III–VII transverse, increasing in width, VIII–XI forming distinct, loose club, VIII–X slightly wider than long, basal and distal edges rounded, XI about 2× length of X, apex acuminate; pronotum broad, lateral margin with distinct subbasal tooth, sides weakly crenulate, widened slightly anterad, narrrowed to short apical collar; basal constriction concave; lateral subbasal foveae present, connected by subangulate sulcus; elytra subparallel-sided (winged), each with basal carina arched over small sutural and two basolateral foveae; subhumeral fovea and carina present; 1st visible abdominal tergite about 1.25× length of 2nd; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 61K, L) laterally compressed, basal bulb absent; outer valve briefly free at base, looped upward and distad, terminating acutely within broad inner valve; inner valve with basal laminate plates filling most of loop of outer valve, forming deep channel, widened very slightly above basal hinge, narrowing toward apex, weakly sinuate, apex truncate, slightly hooked to left.

Etymology. The species name comes from a Latin word for 'pit', referring to the large frontal depression. It is used as a noun in apposition.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This small species is distinguished by its deep, setose frontal depression, essentially obliterating the vertexal sulci. The vertexal foveae are small and just visible posterad the depression. The head shape is also unusual, the genal and vertexal margins being almost continuously subcarinate.

***Jubus* Group 6**

Jubus kutsi **sp. nov.**
Figs 62A–C, J–K

Type material. Holotype ♂ (ZSFQ-i23278): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12613, Morphosp. ElP.A.012"; deposited in ZSFQ.

Diagnosis. (TL: 2.4mm) Body (Fig. 60A) light orange, winged; head longer, posterior margin emarginate, interrupting posterior carina; frontal foveae much smaller, frontal impressions longer, more parallel, curving together just behind antennal bases; antennal bases with slightly wider epistomal band between; labrum bisinuate; eyes larger, diameter almost twice length of genae behind eyes; antennae much longer, basal antennomeres slightly longer than wide, antennomeres of club (VIII–XI) at least three times as long as wide, terminal antennomere nearly twice as long as penultimate; pronotum less abruptly narrowed at base, with subbasal tooth on lateral margin, anterior portions of pronotal margin rounded, slightly widened immediately anterad tooth, then converging to front; each elytron with small sutural and two smaller lateral basal foveae; subhumeral fovea distinct, subhumeral stria complete; first abdominal segment about 1.3× length of second. Aedeagus (Fig. 62J, K) with dorsal style strongly arched basad and upward over ventral piece before curving distad, evenly tapered to apex; ventral process divided at base, converging and thickened slightly medially, forming a saddle within which the outer style rests, apically bifurcate, with ventral fork short, acute; dorsal fork of style elongate, sinuous, curving over dorsal style then bent ventrad.

Etymology. This species name comes from a Kichwa word meaning 'agile' referring to its relatively elongate body and appendages.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. *Jubus kutsi* is distinctive in external and aedeagal characters. The body is relatively large, and has an elongate head with particularly large eyes and elongated terminal antennomeres. The aedeagus has a largely free outer style, and the inner valve has a fine, sinuate apex.

Jubus ruku **sp. nov.**
Figs 62D–F, L–M

Type material. Holotype ♂ (MECN-EN 38682): "ECUADOR: Napo, -0.5939˚, -77.8980˚, Est. Biol.

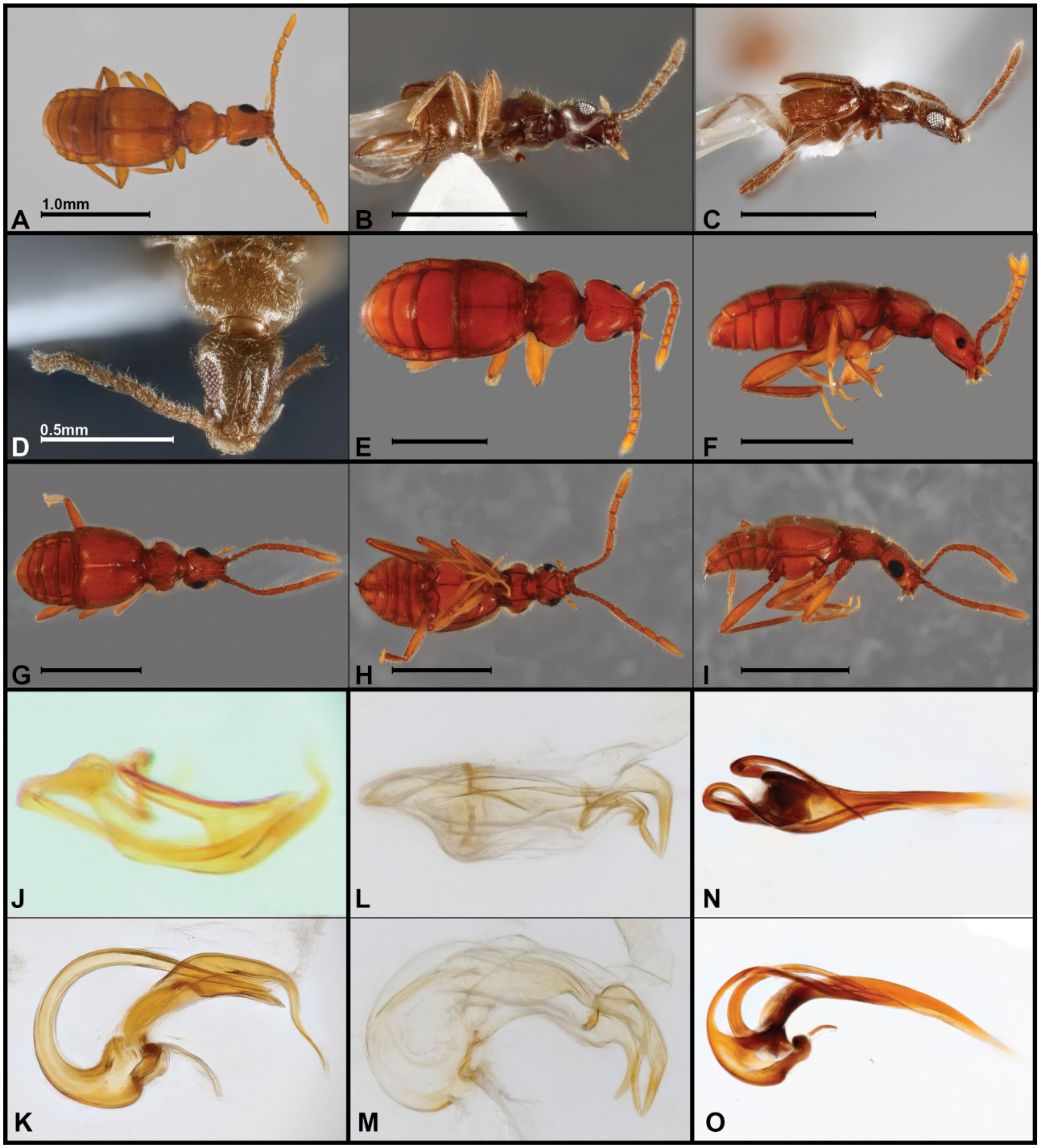

FIGURE 62. Photographs, *Jubus* spp. **A–C, J, K** *J. kutsi* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *J. ruku* (**D** male head, frontal view [cleared specimen]l; female: **E** dorsal, **F** lateral; aedeagus: **L** dorsal, **M** lateral) **G–I, N, O** *J. superbus* (body: **G** dorsal, **H** ventral, **I** lateral; aedeagus: **N** dorsal, **O** lateral). Scale bars = 1.0mm unless otherwise indicated.

Yanayacu, Ridge Tr., 2368m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13005, Morphosp. Yn.A.074"; deposited in MECN. **Paratypes** (2♀): 1: same data as type (MECN-EN 38681); 1: same general locality, -0.5958˚, -77.8927˚, Aburrian Tr., 2233m (MECN-EN 41041).

Diagnosis. (TL: 2.9mm) Body (Fig. 62E) large, orange; relatively conspicuously setose; head elongate, almost 1.5× as long as basal width, basal margin deeply and acutely emarginate, basal corners narrowly rounded; frontal foveae small, frontal sulci (Fig. 62D) narrowly but deeply impressed, subparallel, weakly arcuate, separate anteriorly to deep post-antennal depression; eyes very large, occupying most of sides of head, post-ocular gena length about one-third eye diameter; antennae elongate, slender, antennomeres II–XI all more than twice as wide as long, VIII–XI forming an indistinct club, terminal antennomere only about 1.5× as long as penultimate;

pronotum with distinct subbasal tooth, pronotum abruptly widened anterad, then roundly narrowed to front; basal constriction short; lateral foveae deep, pronotal disk somewhat transversely depressed laterad; foveae connected by deeply impressed, arcuate subbasal sulcus; elytra with sides subparallel (winged); each elytra with complete basal carina minimally arcuate over sutural and two small subbasal foveae; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite about 1.25× midline length of 2nd; legs rather elongate, but lacking secondary sexual differences. Aedeagus (Fig. 62L, M) moderately laterally compressed, narrow at base, widened at middle, tapered apically; basal bulb present but narrow, with evident basal foramen; basal valve present as short dorsobasal acute process; tegmen elaborated with three apical ventrally-directed styles, two hooklike, one thinner and sinuous.

Etymology. This species' name comes from a Kichwa word meaning 'old' or 'ancient'.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is distinctive in its elongate antennae, large eyes, and long vertexal sulci that tend to converge posterad. The multi-tipped aedeagus is also very distinctive.

Jubus superbus **sp. nov.**
DNA barcode: GenBank PX930350
Figs 62G–I, N–O

Type material. Holotype ♂ (MECN-EN 41030): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12900, Morphosp. Ot.A.065"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Body (Fig. 62G) large, dark orange, uniformly, conspicuously setose, head and pronotum moderately punctate; head about one-third longer than wide; male eyes rather large, protruding, coarsely faceted, occupying about 4/5 of genae; vertexal foveae indistinct; vertexal sulci moderately long, reaching middle of eye, deeply and broadly impressed, subparallel but weakly sinuate; merging just behind antennal tubercles; antennae elongate, antennomeres II–IV distinctly longer than wide, V–VII shorter, subquadrate, VIII–XI slender and elongate, forming distinct 4-segmented club; pronotal margin with strong subbasal tooth and secondary smaller teeth along anterior part of margin, constricted in basal third and apical third, narrowing to a distinct collar; basolateral foveae distinct, with short longitudinal impressions extending anterad onto disk, transverse basal sulcus curved between foveae; elytra long, subparallel sided (winged), each elytron with complete basal carina arched over strong sutural and two smaller lateral foveae; subhumeral fovea distinct and subhumeral carina deeply impressed; 1st abdominal tergite about as long as 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 62N, O) compressed laterally, lacking basal bulb; two outer/basal styles present, one curving over midline and terminating freely, the other sinuously entering in to trough formed by inner valve, terminating within it; inner valve rather wide at base, narrowing, sides parallel in apical half, apex narrowly rounded.

Etymology. This species is named for its (for *Jubus*) exceptional appearance.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is distinctive in numerous characters, most noteably the very elongate terminal antennomeres (of the male). In addition the large, coarsely faceted eyes, deeply impressed frontal sulci, and short, strongly dentate pronotum make this species quite recognizable.

Jubus sebagoides **sp. nov.**
Figs 63A–C, 64A–B

Type material. Holotype ♂ (MECN-EN 41044): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13024, Morphosp. Can.A.010"; deposited in MECN [entire specimen in genitalia vial in glycerin].

Diagnosis. (TL: 1.6mm) Body (Fig. 63A) small, orange, with recumbent setae throughout and sparsely scattered longer, erect setae interspersed, particularly along margins of nota, elytra, and abdomen; head rather broadly triangular, emarginate at base, basal corners narrowly rounded; eyes large, diameter about 1.25× to postocular genal length; vertexal foveae deep; vertexal sulci deeply impressed, narrowly separated, and meeting between antennal tubercles; antennae short, antennomeres III–IV short, transverse, V–VI gradually enlarged, VII–XI forming loose, indistinctly 5-segmented club, terminal antennomere narrowly subacute, about 3× longer than penultimate; pronotum short and wide, with distinct subbasal tooth, widened immediately anterad, tapered strongly to front; basal constriction abrupt, short; lateral basal foveae distinct, transverse subbasal sulcus weakly biarcuate between; elytra subparallel-sided (winged); basal carina present, slightly interrupted by sutural and two lateral foveae on each; humeri weakly dentate; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite about 1.25× midline length of 2nd; venter and legs without obvious secondary sexual characters. Aedeagus (Fig. 64A, B) laterally compressed; basal bulb strongly reduced, short thumblike process distal to small basal foramen; basal/outer valve curving dorsad, obliquely sinuous between lobes of ventral portion of tegmen, terminating in dorsal-rightward pointing acute apex; inner/ventral portion of tegmen with elongate, subrectangular lobe extending dorso-distad on left side, a much larger, medially bent process thinning to laterally laminate apical plate.



FIGURE 63. Habitus photos, *Jubus* spp., dorsal, ventral, lateral views **A–C** *J. sebagoides* **D–F** *J. compactus* **G–I** *J. lyriformis* **J–L** *J. vipereus.* Scale bars = 1.0mm.

Etymology. This species name refers to its resemblance to species of *Sebaga.*

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species bears a rather strong resemblance to a group of *Sebaga* species with a rather short, flattened head and deep vertexal sulci (like *Sebaga ampla* **sp. nov.**) These characters can help distinguish it from other *Jubus* species, which its lack of male pronotal modifications and narrower epistoma clearly ally it with.

Jubus compactus **sp. nov.**
DNA barcode: GenBank PX930227
Figs 63D–F, 64C–D

Type material. Holotype ♂ (MECN-EN 40753): "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13098, Morphosp. Cu.015"; deposited in MECN.

Diagnosis. (TL: 1.1mm) Body (Fig. 63D) small, orange, uniformly setose, elytra, head and pronotum distinctly but not densely punctate; head little longer than broad, weakly emarginate along well defined base, posterior corners narrowly rounded; eyes large, diameter about 1.5× postocular genal length; vertexal foveae not evident; vertexal sulci deep, rather short and narrow, 'V'-shaped, converging to slightly setose depression behind antennal elevation; antennae moderately elongate, antennomeres I and II short, cylindrical, III–IV subquadrate, V–VII widening slightly, VIII–XI forming weakly distinct club, VIII–X wider than long, XI about 3× as long as X, narrowly rounded at apex; pronotum with distinct subbasal tooth, lateral margin weakly crenulate anterad, widening slightly, then narrowed to neck; posterior constriction concave; lateral pronotal foveae



FIGURE 64. Aedeagus photos, *Jubus* spp., dorsal, lateral views **A, B** *J. sebagoides* **C, D** *J. compactus* **E, F** *J. lyriformis* **G, H** *J. vipereus*.

present, connected by weak, arcuate transverse sulcus; elytra subparallel-sided (winged), each with weak basal carina over sutural and two lateral basal foveae; 1st visible abdominal tergite only slightly longer than 2nd; male legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 64C, D) laterally compressed, lacking basal bulb; outer valve free from base, entering inner valve above basal knob, loosely and narrowly spiralling around its inner structure; inner valve complex, expanded along right side, rising to dorsal hood that terminates in short bifid process; inner structure involves corkscrewed process that intertwines with outer valve; origins of three additional apical styles are difficult to resolve.

Etymology. This species' is named for its small size and relatively short legs.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This is a smaller species, somewhat distinguishable externally by its gradually (5-segmented) clubbed antennae. The basolateral pronotal teeth are present but very small, and the sides of the pronotum anterad the teeth are very finely serrate.

Jubus lyriformis **sp. nov.**
Figs 63G–I, 64E–F

Type material. Holotype ♂ (MECN-EN 40754): "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13099, Morphosp. Cu.016"; deposited in MECN. **Paratypes** (2♀): 1: same data as type (MECN-EN 40479); 1: same general locality but -0.2049˚, -75.9266˚ (MECN-EN 40452).

Diagnosis. (TL: 1.4mm) Body (Fig. 63G) small, somewhat broad, orange, with mix of recumbent setae and sparse, longer, erect setae; elytra, head and pronotum distinctly but not densely punctate; head broad, distinctly emarginate at base, posterior corners narrowly rounded; eye diameter about equal to postocular genal length; vertexal foveae deep, vertexal sulci narrower, converging to a rounded anterior loop just behind antennal elevation; antennae rather short, indistinctly clubbed, antennomeres I and II short, cylindrical, III–X increasing in width, XI about 3× as long as X, narrowly rounded at apex; pronotum wide and short, with small subbasal tooth, sides rounded and weakly crenulate; posterior constriction deeply emarginate; lateral pronotal foveae present, connected by arcuate transverse sulcus, disk relatively smooth behind sulcus; elytra subparallel-sided (winged), each with weak basal carina arching weakly over sutural

and one lateral basal fovea; 1st visible abdominal tergite only slightly longer than 2nd; male legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 64E, F) laterally compressed, basal bulb very reduced; outer valve free from near base dorsoventrally flattened, curving upward and distad, then narrowing to acute apex; inner valve with basal pedestal extending distad, expanded laterally and dorsad beneath apex of outer valve, with extended apicodorsal hood, venter narrowing to extended, digitiform apical lobe.

Etymology. The name of this species refers to the shape of its vertexal sulci.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is distinguished by its distinctive vertexal sulci, which connect the foveae in a lyriform, anteriorly rounded loop. This is distinct in the females, as well. The male's antennae are also indistinctly clubbed, gradually enlarged from antennomere VII apicad. *Jubus lyriformis* shares its deep foveae, broad head, wide shortish pronotum with *J. laticollis* Raffray (Group IV), though its antennae are different.

Jubus vipereus **sp. nov.**
Figs 63J–L, 64G–H

Type material. Holotype ♂ (MECN-EN 42058): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13353, Morphosp. PS.B.018"; deposited in MECN.

Diagnosis. (TL: 1.5mm) Body (Fig. 63J) small, orange, impunctate, densely covered with recumbent setae, with few longer setae interspersed; head almost equilaterally triangular, posterior corners subacute, posterior margin of occiput deeply and narrowly emarginate; vertexal foveae deep, setose; frontal sulci very fine, almost indistinct; eyes rather small, (dorsally) elongate oval, slightly emarginate posteriorly, postocular gena about 1.5× eye width; antennae compact, antennomeres I–II slightly longer than wide, cylindrical, III short, conical, IV transversely oval, V transverse, VI–XI forming weakly distinct club, progressively larger toward apex, antennomere XI narrowed from base, about 3× as long as X; pronotum with subbasal tooth, markedly widened anterad, then narrowed more or less evenly to apex; posterior pronotal constriction deep, almost semicircular; lateral pronotal foveae deeply impressed, with weakly sinuate, medially angulate subbasal transverse sulcus between them; elytra long, subparallel-sided, each with sutural fovea and one lateral fovea, basal carina strongly arched over them, humeri weakly dentate; subhumeral fovea and carina distinct; 1st visible abdominal tergite about 1.3× as long as 2nd; last male abdominal ventrite weakly depressed, venter and legs otherwise lacking secondary sexual characters. Aedeagus (Fig. 64G, H) complex, basal bulb strongly reduced, a small basal knob present at its base; outer valve bent dorsad at base, thence distad, narrowing and curving left, short, ending in slight knob; inner valve thick at base, straight, narrowing and arched weakly upward at middle, apex narrow, deeply bifid, curving ventrally and leftward, one tip acute, the other sinuous and apically rounded; alongside inner valve runs the base of an apically inflated (inflatable) internal sac, its surface coarsely denticulate.

Etymology. The name of this species refers to its vertexal 'pits' (somewhat reminiscent of those of pitvipers).

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. Among Ecuadorian *Jubus* species, this species is relatively distinctive, with its deeply impressed vertexal foveae contrasting with its barely impressed vertexal sulci. These in combination with the weakly six-segmented clubbed antennae should distinguish it from most. In the configuration of these structures, it would appear to be the only local representative of Raffray's group VI or VII, such as *J. subrectus* Raffray or *Jubus simoni* Reitter (both group VII). The aedeagus is also quite unusual, with the strongly bent outer valve, and especially the voluminous sac (though who knows what sacs other species are hiding, unextruded), although at least in valve configuration, it is perhaps related to some of those in group 5 with a short outer aedeagal valve.

***Jubus* Group X**

Jubus cinctus **sp. nov.**
DNA barcode: GenBank PX930336
Figs 65A–C, J–K

Type material. Holotype ♂ (QCAZ-I-280243/MECN-EN 40714): "ECUADOR: Imbabura, 0.14517˚, -78.27922˚, Mojanda, 3715m, 28DEC2016, S.Muñoz, A.Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13059, Morphosp. Mojanda1"; deposited in QCAZ.

Diagnosis. (TL: 1.1mm) Body (Fig. 65A) small, elongate, parallel-sided, orange, uniformly setose; head slightly longer than wide, slightly emarginate at base, basal corners narrowly rounded; eye diameter slightly less than postocular genal length; vertexal foveae well impressed; vertexal sulci fine, slightly arcuate, converging just behind antennal insertions to short, common stem; antennae short, antennomere II bulbous, III conical, IV–VII weakly transverse, each slightly wider than preceding, VIII–XI forming distinct four segmented club, VIII–X increasingly large, but shorter than long, terminal segment about 3× length of penultimate; gular carinae distinct; pronotum narrow, lacking subbasal tooth, narrowed evenly from widest point, then tapered evenly to front; lateral basal foveae weak, transverse subbasal sulcus coincident with anterior margin of basal constriction, weak; elytra rather long, parallel-sided (winged); each elytron with basal carina weakly arched over sutural and two lateral dorsobasal foveae; subhumeral fovea present, subhumeral stria complete; 1st visible abdominal tergite about equal in midline length to 2nd; male venter and legs

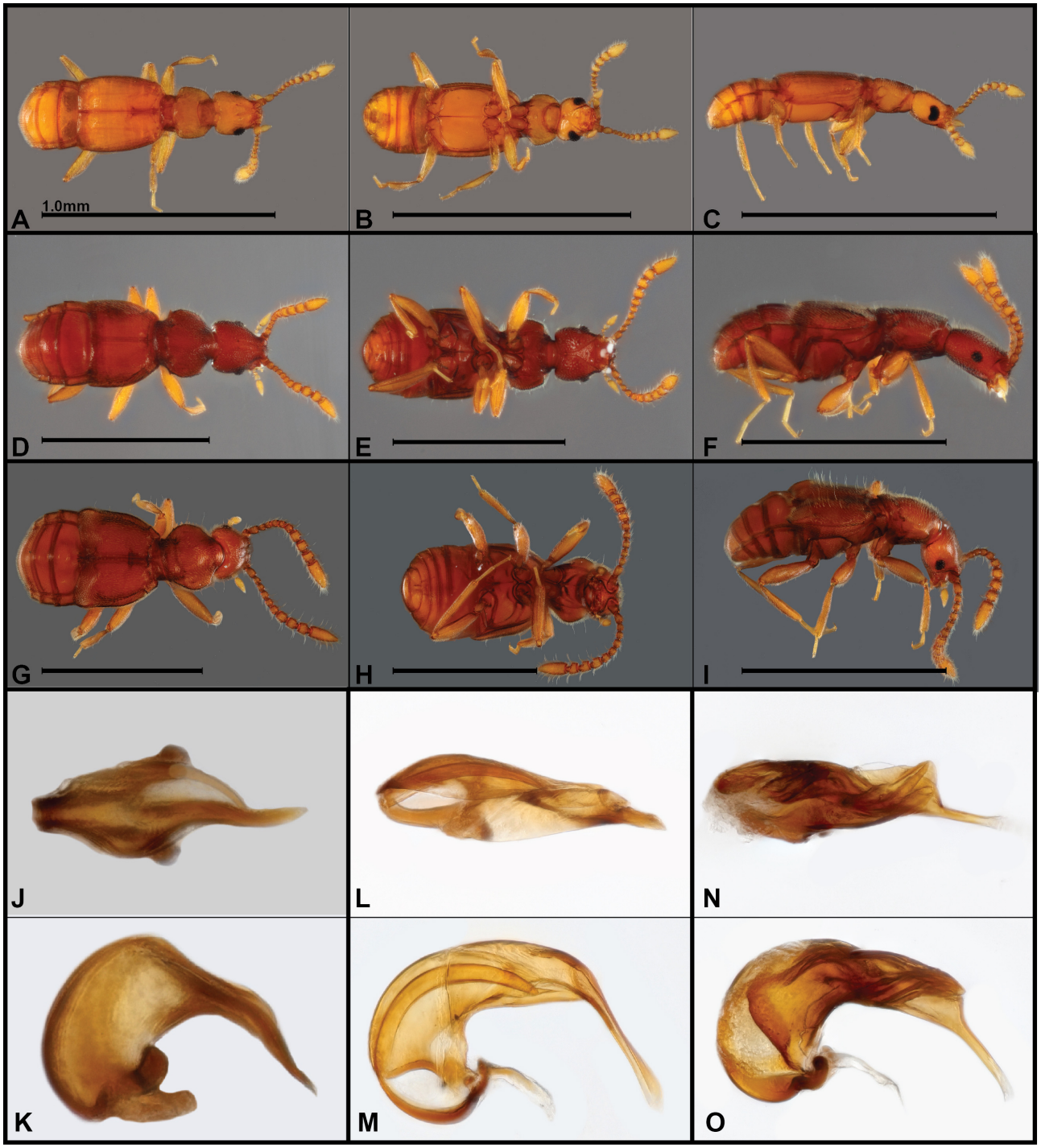

FIGURE 65. Photographs, *Jubus* spp. **A–C, J, K** *J. cinctus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral,) **D–F, L, M** *J. tamizado* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *J. tumidus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

without obvious secondary sexual characters. Aedeagus (Fig. 65J, K) short, laterally compressed, basal bulb not well developed; not obviously differentiated into outer and inner valves, tegmen broadly upright at base, sides translucent, dorsally widening and divided into two processes, right one shorter, curving mediad toward apex, ending bluntly beneath longer, sinuate left-side process.

Etymology. This species is named for its distinctive pronotal constriction, being 'cinched' as by a belt.

Distribution. This species is known only from páramo habitats on the western slopes of Volcán Mojanda, Imbabura Province, Ecuador.

Remarks. Among the smaller-bodied species with an untoothed pronotal margin and a four segmented antennal club, this species has an unusually long basal pronotal constriction.

Jubus tamizado **sp. nov.**
Figs 65D–F, L–M

Type material. Holotype ♂ (MECN-EN 40838): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13191, Morphosp. Cnd.007"; deposited in MECN. **Paratypes** (3♂, 3♀, same general locality as type): 2: same data as type; 1: -1.4357˚, -78.3111˚, 2218m; 1: -1.4342˚, -78.3118˚, 2140m; 1: -1.4328˚, -78.3121˚, 2054m; 1: -1.4327˚, -78.3120˚, 2040m (MECN). **Other material:** 1♂ (MECN-EN 40822): "ECUADOR: Tungurahua, -1.3895˚, -78.2929˚, Río Machay Reserve, 2239m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13175, Morphosp. Mch.038"; 4: -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m; 1: -1.3829˚, -78.2909˚, Río Machay Reserve, 2382m; 1: -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m (MECN).

Diagnosis. (TL: 1.7mm) Body (Fig. 65B) medium-sized, dark orange, dorsum rather densely punctate, especially head and pronotum, with moderately dense, recumbent setae with slightly longer, suberect setae interspersed; head elongate, rather flat, sides rounded, posterior corners subangulate; eyes small but protuberant, comprising about 10 ommatidia; vertexal foveae small; vertexal sulci thin, subparallel, weakly converging to shallow depression between antennae; antennae moderately elongate, antennomere I cylindrical, short, II globose, III–VII starting small, becoming wider and more quadrate, VIII–XI forming distinct club, VIII–X slightly wider than long, XI almost 3× length of X, narrowly rounded apically; pronotum with distinct subbasal tooth, sides widened markedly anterad, rounded, then abruptly narrowed to short anterior collar; basal constriction gradual; subbasal lateral foveae evident, connected by arcuate transverse sulcus; elytra short, sides rounded (wingless), lacking dorsobasal foveae; basal marginal carina present, weakly sinuate; subhumeral sulcus deeply impressed; 1st abdominal tergite about 1.5× length of 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 65L, M) strongly laterally compressed; basal bulb absent; basal apodeme strongly knobbed, upturned; outer valve rather thick, free for basal fourth curving basad, upward, then distad, ending bluntly within channel formed by inner valve; inner valve with right side developed as laminate plate alongside and over the apical portion of outer valve, left side extending upward only beyond end of inner valve, curving over to form closed, downturned apical channel extending most of the way to the slightly thickened tip.

Etymology. The species name is a Spanish word for 'sifted', acknowledging the importance of this method to documenting arthropod biodiversity.

Distribution. This species is known from two localities on either side of the Río Pastaza valley in Tungurahua Province, Ecuador. Both the Río Machay Reserve and the Naturetrek Candelaria Reserve are managed by the EcoMingo Foundation.

Remarks. This species' males are unusual in having reduced but prominent eyes, a densely puncate, flattened head, and a lack of flight wings. The two known localities are close together, but for a flightless species, perhaps distant enough to have promoted meaningful divergence, hence the separation of Río Machay specimens as 'other material'.

Jubus tumidus **sp. nov.**
Figs 65G–I, N–O

Type material. Holotype ♂ (MECN-EN 40796): "ECUADOR: Tungurahua, -1.3821˚, -78.2902˚, Río Machay Reserve, 2402m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13149, Morphosp. Mch.012"; deposited in MECN.

Diagnosis. (TL: 1.7mm) Body (Fig. 65G) moderate sized, reddish orange, with dense, short recumbent setae with longer suberect setae interspersed; head, pronotum, and especially apices of elytra distinctly punctate; head elongate triangular, with rounded posterior corners; eyes rather small, diameter about 2/3 post-ocular genal length; vertexal foveae indistinct; vertexal sulci subparallel, converging slightly to small postantennal impression; antennae moderately elongate, antennomeres I–II cylindrical, short, III–VI similar in size, slightly longer than wide, VII wider, VIII–XI forming weak club, VIII–X subquadrate, XI about 2.5× as long as X, apically subacute; pronotum with weak, upturned subbasal marginal teeth, sides broadly rounded anterad, basal constriction weak; subbasal lateral foveae large, connected by short transverse sulcus; elytra short, widened to apex (wingless), with strong subhumeral fovea and sulcus, the humeri appearing dentate; apical margin of (male only?) elytra depressed, particularly at middle (Fig. 65I), all setae directed mediad, with sutural angles prolonged and dentate; outer apical angle of elytra with disk-like supramarginal ridge; base of each elytron with sutural and two lateral basal fovea, with strong basal carina arched over them; 1st abdominal tergite about 1.5× length of second, depressed at base and distinctly swollen in apical two-thirds of middle (in male?); male ventrites slightly flattened at middle; legs lacking obvious secondary sexual characters. Aedeagus (Fig. 65N, O) weakly laterally compressed, with strongly upturned basal knob, basal bulb absent; outer valve free for basal third, spiralling into dorsal channel formed by inner valve; inner valve with (two?) distinct spiralled processes joining that of outer valve, each ending acutely; channel of inner valve broad, with sides raised, then abruptly narrowed to long, thin, narrowly rounded apex.

Etymology. The name of this species refers to the swelling of the male abdominal tergites.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. The radically modified elytra and median swelling of the 1st abdominal tergite of this species distinguish it from any other known *Jubus* species. However, it remains to be seen if this is a male character,

as I would predict, or common to both sexes. The most distinctive character unlikely to be sex-associated is the broadly rounded pronotum with small, upturned subbasal marginal teeth and a basal constriction so weak as to be almost absent. The vertexal sulci are also subparallel and unusually long.

Phamisus Aubé, 1844
Fig. 66

=*Stratus* Schaufuss, 1872

There are ten described species of *Phamisus*, all from Latin America, including two from neighboring Colombia (Asenjo *et al.* 2019). Four new species are described below.

Diagnosis. (TL: 2.3–3.3ymm, Avg. 2.7mm) *Phamisus* includes a diversity of Jubini sharing longitudinal depressions along the sides of the pronotum, 'Y'-shaped vertexal sulci, and a densely setose body. Park (1952a) included separate keys to *Phamisus* and the now-synonymous *Stratus*, separating the two by the latter's less dense pubescence and weakly sulcate postgula. At least the types of both *P. reitteri* (Raffray) and *P. velutinus* Raffray appear to be flightless based on elytral proportions, although it remains to be seen whether this represents a consistent sexual dimorphism in *Phamisus*, as in many other Jubini. The "*Stratus"* species described and illustrated by Park (*P. laminatus* and *P. sulcatus*) differ considerably from other *Phamisus*, with the former resembling a species of *Pselaphomorphus* Motschulsky, at least in external morphology. These are also the only two species for which male genitalia have been illustrated, and those differ fairly strongly, with *P. laminatus* having a well-developed but short basal bulb, and that of *P. sulcatus* characterized as membraneous. It is likely that the type (*P. reichenbachii* Aube) may be *Pselaphomorphus*-like as well ('body elongate', 'head narrowed in front', pronotal disk with 'horseshoe-shaped furrow'). *Phamisus velutinus* and *P. myrmophilus* Silvestri (based on illustrations accompanying their original descriptions) are quite distinct, and it is evident that considerable work is needed to delimit these genera and assign species correctly. All the new species described below fit the latter form, being much more robust, with short vertexal sulci, short antennae, and weakly laterally sulcate pronota.

Phamisus angelicus **sp. nov.**
Figs 66A–F, P–Q

Type material. Holotype ♂ (QCAZ-I-280363): "ECUADOR COTOPAXI OTONGA 2000m, 00°25'S, 79°00'W, 18JUL1997, LTapia&P Ponce" / "ex. Pasto C1" / "MSC-13380"; deposited in QCAZ. **Other material:** 1♀ (MECN-EN 38619)**:** "ECUADOR: Pichincha, 0.0473˚S, 78.7619˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12787, Morphosp. Min.A.009".

Diagnosis. (TL: 2.5mm) Body (Fig. 66A) densely and dually setose, with appressed setae under sparser longer erect setae, underlying integument of head and pronotum rugosely textured; head rather short and broad, rounded posteriorly; vertexal foveae close together, joined by narrowly triangular sulcus with very short foveal extensions (weakly 'Y'-shaped), extending anterad between the swollen antennal bases; eyes (of male) dorsoventrally elongate, slightly emarginate behind, comprising about 38 ommatidia; antennae short, with antennomeres VII–X very gradually enlarged, antennomere XI not quite as long as preceding three together; pronotum short, strongly constricted in basal third behind small lateral marginal teeth; anterior portions of margin broadly campanuliform anterad; basolateral foveae indistinct, but basolateral margin deeply incised, shallow longitudinal creases extending anterad from these incisions; elytra short, widening posterad (flight wings absent); each elytron with strong basal marginal carina, with weakly developed sutural and two lateral foveae present beneath carinal edge; subhumeral fovea and curving subhumeral stria present; tarsi, especially metatarsi elongate, together almost as long as metatibia. Aedeagus (Fig. 66P, Q) with distinct but short basal bulb, with distinct ventral collar around basal foramen; main body of tegmen curved downward to tongue-like, broadly rounded apex; basal margins of tegmen curving upward, forming a broad channel, on the right side this upward flange bears a short serrate edge apically; a distinct dorsal sclerite articulates with upper edge of basal bulb lying within this channel, wide at base, about half length of tegmen, narrowing to subacute tip.

Etymology. The widened margins of this species pronotum somewhat resembles an angel's wings, giving the species its name.

Distribution. The type locality of this species is in the cloud forests of the Otonga Reserve, in northern Cotopaxi Province. The female cited as 'other material' (Fig. 66D–F) is from Mindo, Pichincha Province, approximately 45km to the northeast from the type locality.

Remarks. The posteriorly widening pronotal shape is distinctive of this species. The frontal sulcus of the female cited as 'other material' has a narrower anterior stem, and is slightly more ''Y'-shaped'. Discovery of a male from the Mindo area would be necessary to determine the distinctiveness of this variant.

Phamisus beatus **sp. nov.**
Figs 66G–I

Type material. Holotype ♀ (MECN-EN 40857): "ECUADOR: Tungurahua, -1.4342˚, -78.3118˚, NaturetrekCandelariaRes, 2140m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13210, Morphosp. Cnd.026"; deposited in MECN. **Paratype** (1♀): same general locality and date as type, but -1.4328˚, -78.3121˚, 2054m (MECN-EN 40407).

Diagnosis. (TL: 3.3mm) This species, known only from a single female, is similar in most respects to the

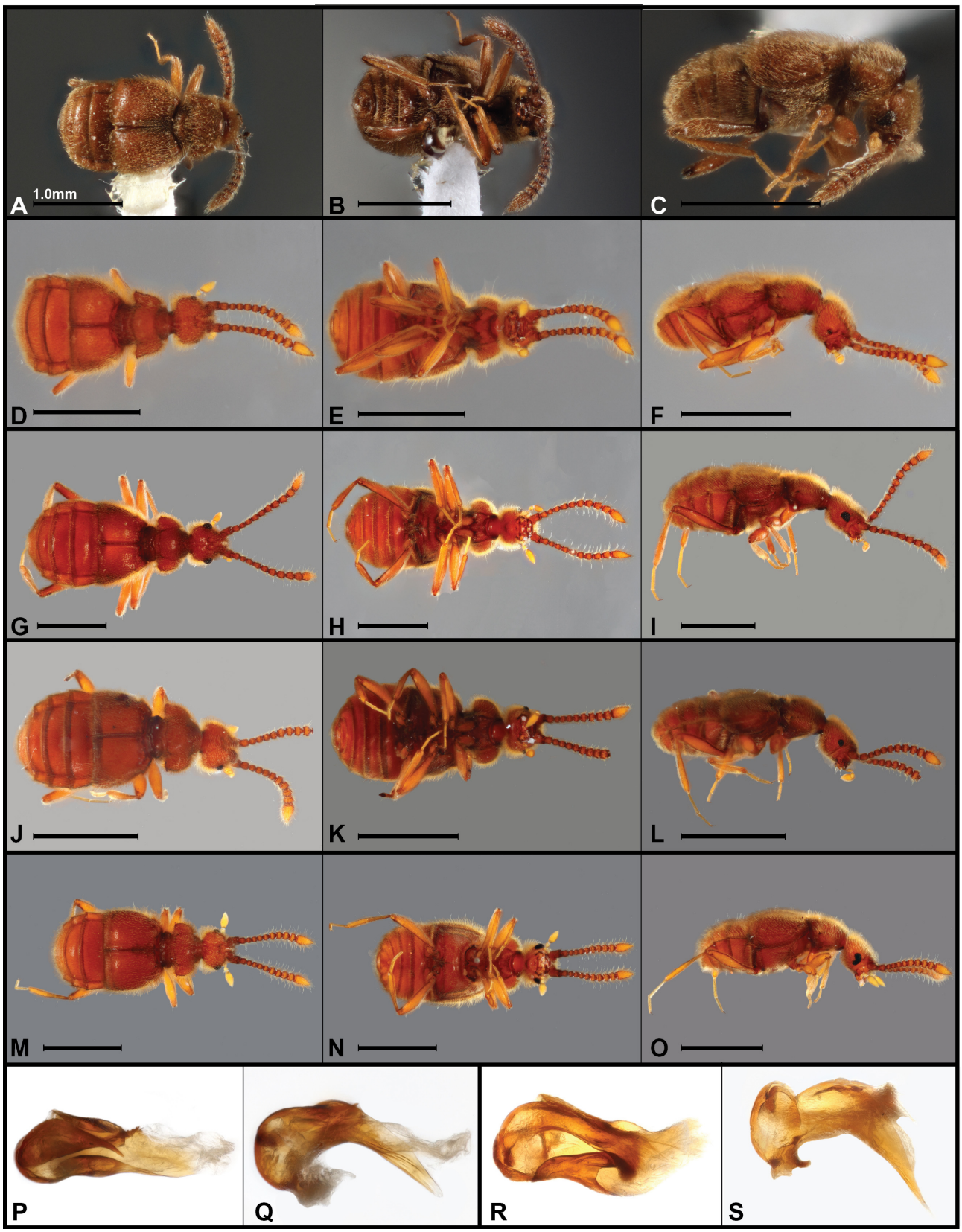

FIGURE 66. Photographs, *Phamisus* spp., dorsal, ventral, lateral views **A–C** *P. angelicus* (male) **D–F** *P. angelicus* (female) **G–I** *P. beatus* **J–L** *P. cataracta* **M–O** *P. hatunpaku* **P–Q** *P. angelicus* aedeagus, dorsal, lateral views **R, S** *P. hatunpaku* aedeagus, dorsal, lateral views. Scale bars = 1.0mm.

others described here. It differs, however, in the following characters: female eyes relatively large, comprising ~29 facets (Fig. 66I); antennae relatively elongate, with all antennomeres longer than wide, simply clavate and lacking a distinct club; pronotum (Fig. 66G) with lateral longitudinal sulci reasonably well defined, diverging to front, anterior margin slightly interrupted where they intersect with margin; subbasal teeth of pronotum well-developed, but slightly in front of posterior constriction, posterior corners rounded; subbasal transverse sulcus produced posterad at middle, appearing more 'V'-shaped, posterior portion of disk convex behind and at sides; basal elytral foveae, particularly sutural and inner lateral, well developed.

Etymology. The species name means 'fortunate' or 'enviable'.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. The posterior portion of the pronotal disk being swollen, along with the well-impressed and anteriorly diverging lateral pronotal sulci should help distinguish this species. The eye size and antennal length are unusual among the females described here, although these might be expected to differ in males, once discovered.

Phamisus cataracta **sp. nov.**
Figs 66J–L

Type material. Holotype ♀ (MECN-EN 41681): "ECUADOR: Pichincha, 0.0915˚, -78.5165˚, Res. Geobot. Pululahua, Cascada de la Peña, 1708m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12916, Morphosp. Pul.A.010"; deposited in MECN. **Paratypes** (1♀), same data as type (MECN-EN 28752).

Diagnosis. (TL: 2.5mm) This species is very similar to the preceding, differing principally in the following characters: antennae more robust, individual antennomeres slightly shorter (Fig. 66J); arms of vertexal 'Y'-shaped sulci longer; body larger; pronotal sides more strongly rounded, not directly narrowed anterad from subbasal marginal tooth; basal portion of pronotum behind constriction bilaterally swollen, convex both dorsally and laterally; basal elytral foveae more distinct, lateral pair close together; elytral humeri more strongly dentate.

Etymology. This species' name is Latin for 'waterfall,' in reference to that near which it was found. It is used as a noun in apposition.

Distribution. This species is known only from the vicinity of Volcán Pululahua in Pichincha, Ecuador.

Remarks. Also being known from only (2) female specimens, this species is impossible to fully characterize, although it is distinct in sufficient characters to justify its recognition as separate. The slight constriction in front of the basolateral pronotal teeth is unusual, as is the pattern of convexity of the pronotal disk.

Phamisus hatunpaku **sp. nov.**
Figs 66M–O, R–S

Type material. Holotype ♂ (MECN-EN 40775): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13120, Morphosp. RAn.011"; deposited in MECN.

Diagnosis. (TL: 2.7mm) As with the preceding, this species is highly similar to the first *Phamisus* species described above. It does, however, differ in several characters, some of which may be related to sex (this only being known from a male), such as larger eyes, longer elytra and presence of flight wings. Distinctive features least likely to be secondary sexual ones include: posterior margin of head more rounded; antennae short, antennomeres III–X all distinctly transverse; pronotum (Fig. 66M) very wide, with strong subbasal marginal tooth, slightly widened anterad before narrowing abruptly to distinct anterior collar; pronotal constriction narrower at junction than behind. No other secondary sexual characters are evident on venter, legs, or other body parts. Aedeagus (Fig. 66R–S) with distinct but very short basal bulb, with distinct ventral collar around basal foramen, open dorsally, strongly constricted at junction with tegmen; main body of tegmen extended from basal bulb as elongate, deflexed lobe, with raised left-side flange in basal half that curves dorsomediad to meet articulated median process, narrowed apically to subacute tip; broad, articulated median process emerging from basal bulb, arching right and slightly spiralled inward, terminating above midpoint of tegmen in widened, densely setose apical brush.

Etymology. This species name is a contraction of two Kichwa words, together meaning 'important beetle', as this is among the first male *Phamisus* species to be fully described.

Distribution. This species is known only from the Río Anzu Preserve, in the lower part of the Río Pastaza Watershed in the Andean foothills of Pastaza Province, Ecuador.

Sebaga Raffray, 1891
Figs 67–73

This genus contains 12 species from North to South America (Asenjo *et al.* 2019). Most of the neotropical species have been described from Panama (4 spp.), with others from Venezuela (1), Mexico (3), Brazil (1), and Suriname (1) (Park 1952a). Nineteen new species are described below.

Diagnosis. (TL: 1.3–3.5mm, Avg. 2.2mm) *Sebaga* is among the more difficult Jubine genera to diagnose. The body is typically shorter and broader than that of *Jubus.* The species have quite varied pronotal shapes, with the margin either abruptly constricted (as in *Jubus*, *Barrojuba*, *Morphogenia*, and *Balega*) or entire. The male antebasal pronotal impression is typically elaborated into a variety of more or less species-specific structures (as

in *Barrojuba*), though this is not the case in a few of the species newly described below. The vertexal foveae are present and represent the terminus of distinct, usually deep and distinct vertexal sulci. And the gula exhibits complete 'Y'-shaped carinae, variously modified or lost in other genera. The main key character is the relatively broad separation between the antennal bases across the frons, compared to *Jubus*. But there is a fair bit of variation in this width in both genera. Male antennae generally have the last four antennomeres lengthened into a club, sometimes extremely so, also, however, true in many *Jubus*. The male genitalia possess a distinct basal bulb, with varied terminal processes. Illustrations of the aedeagus of three described species, *S. ocampi* Park (Chandler 1989b), *S. punctata* (Sharp) and *S. centralis* Park, are available in the existing literature (Park 1952a). Jeannel (1962) described the genus *Kuscheliotes* (1962) without mentioning any Jubini. It also exhibits male pronotal modifications and similar genitalia, and is likely related.

Remarks. The species newly described here make the genus still more difficult to diagnose, presenting a range of gross morphological forms as well as differences in character systems like sexual dimorphisms and genitalia. One particularly unusual group contains several new species with short heads, big eyes (tending to be semicircular above, rather than emarginate behind), deep but short vertexal sulci, relatively loosely articulated apical antennomeres, and a tooth within the basal pronotal constriction (*S. scurra, S. calcis, S. laxa,* and *S. ampla*). These tend to have the mesoventrite strongly dentate in front of the mesocoxae, while such a tooth is at most weak in other *Sebaga*. Only two of these, however, are known from males, one of those lacking pronotal modifications. So, while it is premature to consider splitting these out, future revision may deem it necessary.

The species below are roughly ordered from most 'typical' for the genus (the males having tuberculate modifications to the pronotum, first close together then further apart), to those having other (non-tuberculate) male pronotal modifications, to those exhibiting no pronotal modifications, and being otherwise distinct from the *Sebaga* norm.

Sebaga colunca **sp. nov.**
DNA barcode: GenBank PX930251
Figs 67A–C, 68A–B

Type material. Holotype ♂ (ZSFQ-i23286): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12631, Morphosp. ElP.A.030"; deposited in ZSFQ.

Diagnosis. (TL: 3.0mm) Body (Fig. 67A) rather large, elongate, orange with dense semirecumbent setae, pronotum and head shallowly but distinctly punctate; head slightly elongate, vertexal impressions 'V'-shaped, divergent from antennal bases to lateral foveae, enlarged posteriorly; eyes large, extending well onto ventral surface of gena; gular carinae well-developed, with elongate basal fovea on stem; antennae elongate, scape and antennomere I cylindrical, similar in length, intermediate antennomeres (III–VII) longer than wide, VI smaller than either V or VII, antennomeres VIII–IX subequal, cylindrical, X similar in width but slightly shorter, XI almost twice as long as X; pronotum unevenly narrowed to denticulate base, anterior portions weakly convergent; antebasal impression nearly complete, interrupted above lateral foveae, median portion widened, anterior edge with small posteriorly directed tooth, posterior edge with two small round, elevated, flat-topped tubercles; elytra subparallel-sided (male winged), each elytron with sutural fovea and one lateral fovea; basal elytral carina strong, barely interrupted over dorsobasal foveae, continuous laterally with distinct humeral tooth; sutural stria complete, discal stria absent; male 6th visible ventrite depressed, medially glabrous, more densely setose distally with blunt apical recurved tooth; legs and venter otherwise without obvious secondary sexual characters. Aedeagus (Fig. 68A, B) with basal bulb rather small, dorsally widely membraneous; left side of basal bulb with long narrow, arched process extending to aedeagal apex; right side of basal bulb with curving and apically massively barbed process; median process broad, articulated at base, narrowed and undulating to upturned apex.

Etymology. The name of this species refers to an ancient montane trail system in the Andes, the 'coluncos' used by the Incas and earlier inhabitants. This species was collected near one of these coluncos in nothern Pichincha.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This medium-sized species has a relatively elongate head and moderately elongate antennae. The pronotum has a strong posterior constriction with two secondary basal marginal denticles. The male's pronotum has two very small, close-set glabrous tubercles behind the main transverse sulcus.

Sebaga alpina **sp. nov.**
DNA barcode: GenBank PX930199
Figs 67D–F, 68C–D

Type material. Holotype ♂ (QCAZ-I-280252/MECN-EN 40697): "ECUADOR: Chimborazo, -2.18775˚, -78.5210˚, Atillo, 3501m, 8JUL2016, S. Muñoz & A. Romero, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13042, Morphosp. Atillo7"; deposited in QCAZ. **Other material**—1♂: "ECUADOR: Imbabura, 0.14517˚, -78.27922˚, Mojanda, 3715m, 28DEC2016, S.Muñoz, A.Romero, Ex.Berlese"; 1♂, 1♀: "ECUADOR: Carchi, 0.75587˚, -77.96642˚, El Angel, Saladero, 3301m, 26JUL2016, S. Muñoz, & R.Tobar, Ex.Berlese" (QCAZ-I-280253–280254).

Diagnosis. (TL: 2.2mm) Body (Fig. 67D) rather large, elongate, slender, orange, densely setose, with setae of head and pronotum particularly pronounced; head elongate, posterior corners narrowly rounded; eyes

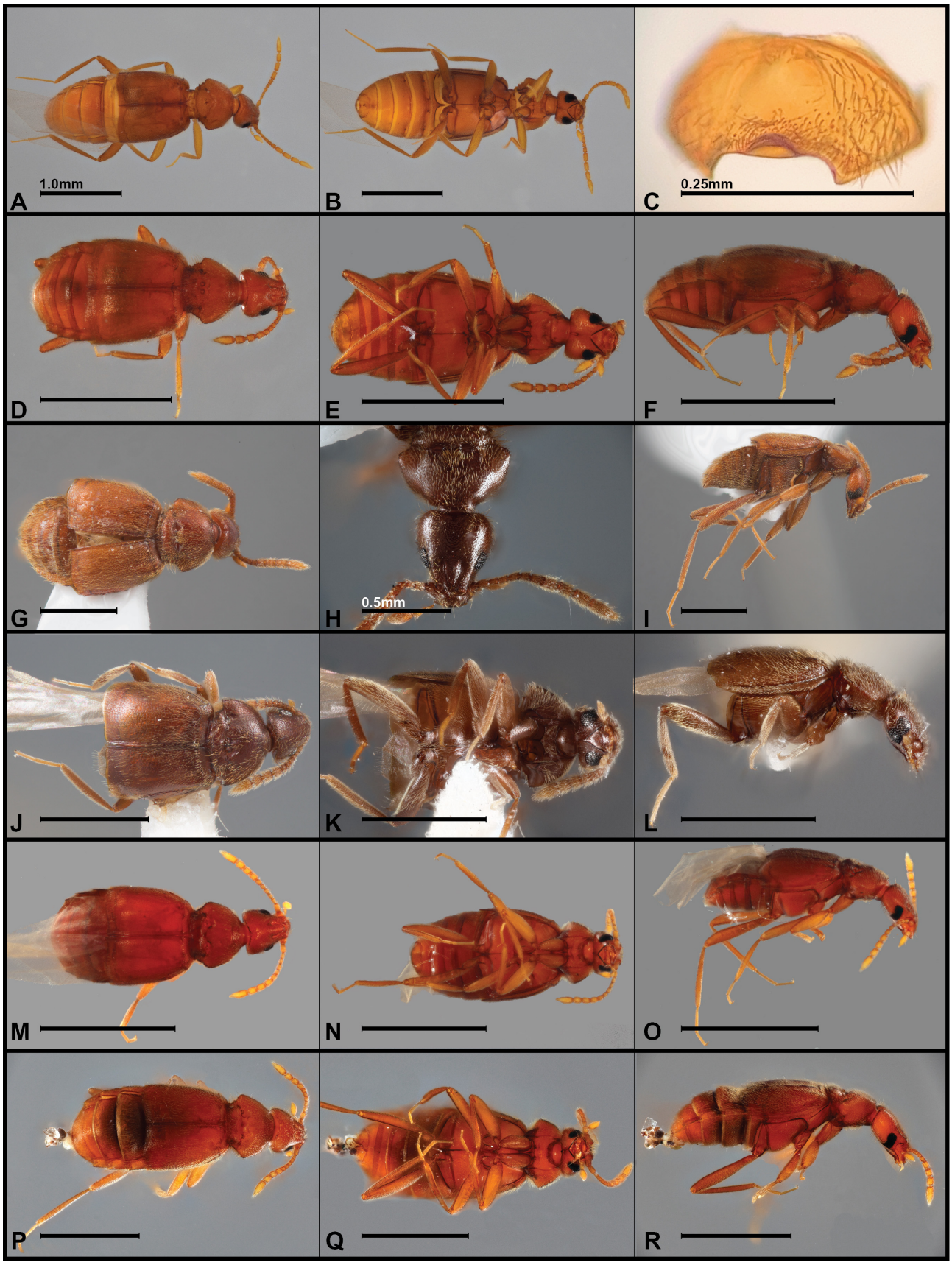

FIGURE 67. Habitus photos, *Sebaga* spp., dorsal, ventral, lateral views **A–C** *S. colunca* (**C** penultimate male ventrite) **D–F** *S. alpina* **G–I** *S. cirrata* (**H** detail view of head) **J–L** *S. simia* **M–O** *S. karu* **P–R** *S. rumipamba*. Scale bars = 1.0mm unless otherwise indicated.

medium-small, occupying just under half of side of head, finely faceted; vertexal sulci short, from front of eyes anterad, deeply depressed posterad, narrower and shallower anterad, converging slightly but not meeting, a transverse depression joining them on posterior rise of antennal elevation; gular carinae well-developed, with elongate basal fovea on long stem; antennae moderately elongate, scape short, cylindrical, antennomere II longer, narrower, cylindrical, antennomeres III–VI longer than wide, VII shorter, subquadrate, VIII–XI forming weakly differentiated, loose club, XI about 2× length of X; pronotum with sides bluntly angulate behind middle, basal constriction somewhat gradual, strongly, evenly narrowed anterad; lateral foveae shallow; male pronotal base with pair of small, round, flat-topped glabrous tubercles in median depression; elytra subparallel-sided (male winged), each with basal carina arching over sutural and one lateral dorsobasal fovea; subhumeral fovea present; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 68C, D) with large basal bulb, dorsal diaphragm large, oval, without distinct diaphragmatic sclerite, tegmen extended on left side by three distal processes; dorsal-most process a short, laterally compressed blade with blunt apical tooth curved ventrad; ventral process a shorter ventrally curving rod; between these is a longer straight process apparently articulated within the basal bulb, its apex less strongly sclerotized and slightly spatulate.

Etymology. This species is named for its apparent restriction to high elevation páramo habitats.

Distribution. This species is known from several high elevation (>3500m) páramo sites along the Andean crest. Interestingly the sites span over 300km, from Carchi Province in the north to Chimborazo Province in the south, with one site in between (Imbabura).

Remarks. Although widely separated, the three known populations of this species remain very similar in both external and aedeagal morphology. They are large and elongate in body form, with smaller eyes, and close-set tubercles on the male pronotum. Some slight differences in the aedeagus may indicate significant intraspecific divergence, but too little material is available to assess their significance. In particular, the curvature of the dorsal tegmenal hook and the ventral tegmenal process varies to a slight degree.

Sebaga cirrata **sp. nov.**
DNA barcode: GenBank PX930282
Figs 67G–I, 68E–F

Type material. Holotype ♂ (ZSFQ-i23288): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 31.v.2011, 2500m, understory fogging, AT1335, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12732, Morphosp. ElP.A.090"; deposited in ZSFQ.

Diagnosis. (TL: 3.3mm) Body (Fig. 67G) broad, rather short, densely setose; head (Fig. 67H) elongate, rather densely punctate and setose; eyes moderate, diameter slightly less than postocular width, with rather small ommatidia; frontal impressions deeply impressed, slightly deeper toward frontal foveae, slightly separate between antennal bases, diverging posterad; antennae compact, antennomeres III–VII subquadrate, slightly longer than wide, club antennomeres (VIII–XI) only barely distinct from basal antennomeres, VIII and IX about 1.6× length of VII, X about 1.5× length of IX, ultimate antennomere just less than twice length of penultimate, gradually narrowed apically; pronotum abruptly narrowed in basal one-third, lacking marginal teeth, but basolateral emargination finely serrate, apical portion of lateral margin weakly rounded, converging anterad; antebasal transverse impression deep, but interrupted at middle by pair of glabrous tubercles, overlain by dense tuft of setae projecting posterad from anterior margin; lateral foveae deep, situated just laterad median impression; elytra with weakly arcuate basal carina, interrupted by small sutural and one lateral fovea; sutural stria present but no other dorsal striae; subhumeral fovea present, subhumeral stria complete; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 68E, F) with large basal bulb bearing very short 'pseudoparameres' at inner base; tegmen extended on left side by laminate blade narrowed abruptly to curved digitiform apical process, right side thinner, bifid, with very short acute lateral process near middle, apex sinuate, shorter than left-side process; between tegmenal blades is an inner, median process, dorsoventrally flattened, apically sinuately narrowed.

Etymology. This species' name is Latin for 'fringed', referring to the setal tufts of the male pronotum.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. Very similar to others from El Pahuma, the form of this species' male pronotal characters are subtly unique, with divot-like excavations on either side of close-set median tubercles, the latter shielded by setae projecting backward from the anterior margin of the depression. The aedeagal form is rather different from many, having a large dorsobasal diaphragm and relatively inconspicuous articulated armature. That of *S. simia* is similar in form.

Sebaga simia **sp. nov.**
Figs 67J–L, 68G–H

Type material. Holotype ♂ (ZSFQ- i13680): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m., FIT, M. Caterino, A. Tishechkin, AT1323" / "Caterino DNA voucher, Ext. MSC-12496, Pselaphinae" / "ZSFQ-i13680"; deposited in ZSFQ.

Diagnosis. (TL: 2.8mm) Body (Fig. 67J) broad, dark orange, densely setose; head subtriangular, slightly elongate, posterior dorsal margin subcarinate, only indistinctly emarginate at middle; eyes large, emarginate posteriorly, finely faceted, genae behind about as long as horizontal diameter of eye; vertex moderately densely

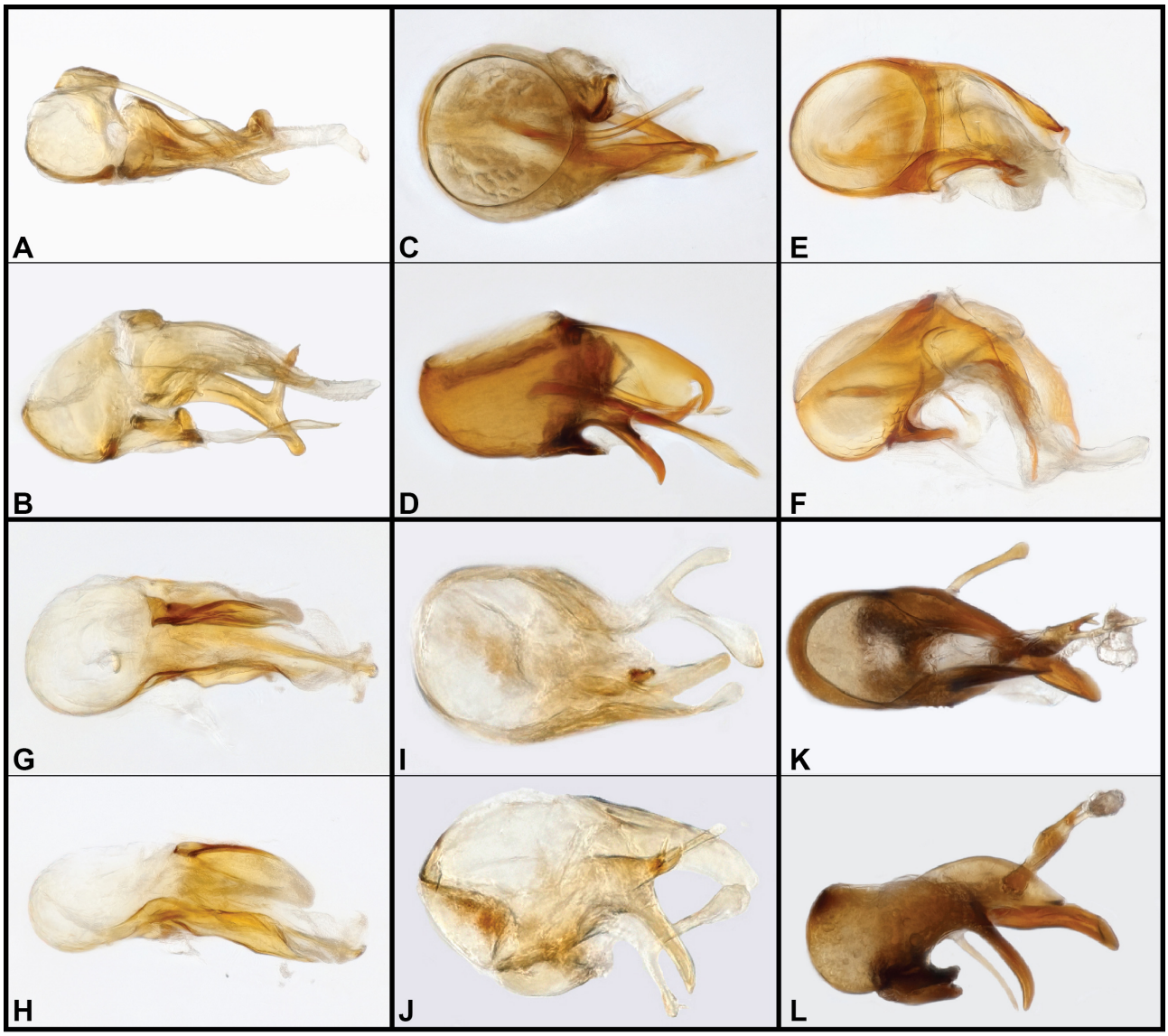

FIGURE 68. Aedeagus photos, *Sebaga* spp., dorsal, lateral views **A, B** *S. colunca* **C, D** *S. alpina* **E, F** *S. cirrata* **G, H** *S. simia* **I, J** *S. karu* **K, L** *S. rumipamba*.

punctate, with sparse long setae; vertexal foveae obsolete, with very shallow, irregular sulci ascending separately from antennal bases; antennae III–VII increasingly wide and transverse, antennomeres VIII–XI enlarged to form loose club, VIII–X about as long as wide, XI about as long as IX–X together, apically subacute; pronotum strongly transverse, abruptly constricted in basal one-fifth, with very small tooth at base of anterior portion, converging roundly to anterior margin; antebasal impression deeply impressed at sides and middle, lateral foveae not well developed, middle with narrow subquadrate shelf extending posterad from anterior margin, depressed anteriorly, connected by narrow bridge to posterior margin, with slightly translucent points anterad; basal elytral carina sinuate around sutural and dorsal humeral depressions, no well-developed dorsal foveae, marginal carina continuing anterad to subhumeral depression (fovea also absent), angled posterad at distinct humeral tooth, complete to posterior elytral margin; last abdominal ventrite slightly depressed, but not emarginate or densely setose at apex. Aedeagus (Fig. 68G, H) with basal bulb about one-third total length, tapering to three terminal processes—dorsal process shortest and well sclerotized, unevenly parallel-sided, slightly twisting distad, and obliquely rounded at tip, ventral process wider and longer, with expanded, weakly sclerotized, apical pad, median process slender and well-sclerotized, longer than others, weakly bifurcate at tip, with expanded membranous halo.

Etymology. The name of this species refers to the 'monkey'-face like arrangement of pronotal foveae and transverse sulcus, and nods to the white-fronted capuchin monkeys that live in El Pahuma. It is used as a noun in apposition.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species seems to blur the line between *Sebaga* and *Arctophysis*, retaining the pronotal

dimorphisms typical of the former, but almost entirely lacking the vertexal sulci as in the latter. The male genitalia, on the other hand, strongly resemble those of *Barrojuba*, but this species possesses a distinct transverse basal pronotal sulcus that those species are supposed to lack. The vertexal sulci, while vestigial, are clearly not located laterally near the eyes (Chandler 1983, 1988). Whether these genera are indeed all reciprocally monophyletic remains questionable.

Sebaga karu **sp. nov.**
Figs 67M–O, 68I–J

Type material. Holotype ♂ (MECN-EN 41057): "ECUADOR: Napo, -0.5947˚, -77.8945˚, Est. Biol. Yanayacu, Piha Tr., 2248m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12978, Morphosp. Yn.A.047" / "MECN-EN 41057"; deposited in MECN. **Paratypes** (2♂, 5♀, same general locality as type): 1: -0.5952˚, -77.8994˚, Piha Tr., 2386m; 2: -0.5983˚, -77.8954˚, Stream Tr., 2192m; 3: -0.5939˚, -77.8980˚, Piha Tr., 2368m; 1: -0.5934˚, -77.8922˚, Aburrian Tr., 2198m (MECN-EN 38708, 38721, 41058–41062).

Diagnosis. (TL: 2.0mm) Body (Fig. 67M) both broad and elongate, dark orange, rather densely covered with short, recumbent setae; head elongate triangular; eyes medium-sized, weakly convex, slightly less in diameter than postocular gena, posteriorly emarginate; vertexal foveae impressed; vertexal sulci rather short, broader at bases, curving mediad and narrowing to meet at interantennal median impression; antennae elongate, scape short and cylindrical, antennomere II slightly thinner, about twice as long as wide, III narrow, elongate, IV–VII becoming wider and less elongate, VIII–XI forming loose, elongate club, VIII–X each slightly longer than wide, XI about 2.5× as long as X; pronotum widest behind middle, strongly narrowed to front, posterior constriction gradual, slightly serrate within; basolateral foveae present near sides; transverse sulcus enlarged on either side into round, glabrous impressions each with elevated, round median tubercle; pronotal disk transversely convex behind sulcus; elytra long, subparallel-sided (flight wings present), humeri weakly dentate; each elytron with basal carina that arches weakly over shallow sutural and one lateral dorsobasal foveae; subhumeral fovea not deeply impressed, but subhumeral carina continues around it; abdominal tergites I slightly longer than II; legs and venter lacking obvious dimorphisms, last male ventrite simply depressed. Aedeagus (Figs. 68I, J) small, with conspicuous basal bulb, broadly membraneous dorsally, a rather long but narrow dorsal hood extending distad from it; right side with distinctly 'Y'-shaped process, stem short, sinuate, the inner median branch thicker than outer; left side with short, apically setose process extending slightly upward, with a longer, inner process directed ventrad.

Etymology. The name of this species refers to the 'distant' pronotal tubercles (in Kichwa).

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This is a fairly typical *Sebaga* species, with distinct pronotal tubercles in the male. The vertexal sulci are unusually deeply impressed, and enlarged and slightly bent at the foveae. On pronotal form alone it would appear related to *S. rumipamba* **sp. nov.** (see below), with these tubercles widely separated, and a somewhat gradually narrowed posterior pronotal constriction. These two share an elongate four-segmented antennal club as well. Male genitalia of the two are quite different in detail, though sharing a similar general structure.

Sebaga rumipamba **sp. nov.**
Figs 67P–R, 68K–L

Type material. Holotype ♂ (MECN-EN 40870): "ECUADOR: Pichincha, -0.1811˚, -78.5002˚, ParqueArqueologica Rumipamba, 2896m, 28.I.2025, sifted litter, M.Caterino | S. Muñoz" / "Caterino DNA voucher, Ext. MSC-13257, Morphosp. Rumi1" / "MECN-EN 40870"; deposited in MECN. **Paratypes** (1♂, 7♀, same general locality and date as type): 2: same data as type; 1: -0.1794˚, -78.5015˚; 5: -0.1785˚, -78.5008˚ (MECN-EN 41673–41680).

Diagnosis. (TL: 2.5mm) Body (Fig. 67P) moderately large, dark orange, densely setose, most setae recumbent, but with slightly longer, suberect setae intermingled; head slightly wider than long, weakly depressed between eyes, posterior corners rounded; vertexal foveae not too deep; vertexal sulci extending anterad, converging weakly to front; eyes medium, taller than wide, weakly emarginate posteriorly, coarsely faceted; antennae moderately compact, antennomeres I–II short, cylindrical, III–VII weakly subquadrate, slightly longer than wide, increasing very slightly in width, VIII–XI forming, loose, 4-segmented club, IX and X slightly longer than VIII, apical antennomere almost twice as long as X, apex narrowly rounded; pronotum widest near base, strongly narrowed to front; posterior pronotal constriction slightly dentate, pronotal disk with deeply impressed lateral foveae, deeply impressed transverse sulcus extending between and beyond them to sides; male with transversely ovoid tubercles widely separated behind sulcus, the leading edge of the sulcus weakly bituberculate between them; elytra long, with sides mostly subparallel, each with basal carina weakly arched over faint sutural and one dorsolateral fovea; male with flight wings present; subhumeral fovea weak; abdominal tergites similar in length, 1st only slightly longer than 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 68K, L) with large basal bulb with strong basal apodeme, dorsal diaphragm broadly open; right side of tegmen with curved outer ridge, prolonged into thick, weakly downturned apical process; below main process a lightly sclerotized, knobbed process extends ventrolaterally toward right; left side narrowed into strongly downturned, curving, subacute rod; in type, an articulated internal process is extruded dorsad, bearing a

short subapical fork and a narrower apical rod associated with membraneous sac.

Etymology. This species is named for the type locality.

Distribution. This species is known only from the Parque Arqueológica Rumipamba, a small city park on the slopes of Mount Pichincha on the western side of Quito.

Remarks. This species is distinguished by the small, wide-set pronotal tubercles of the male. The type locality is a city park organized around several important pre-Columbian sites, where older indigenous cultures became later intermingled with Incan influences. The vegetation represents well-preserved subparamo, with many native shrubs and small trees.

Sebaga laxa **sp. nov.**
Figs 69A–C, 70A–B

Type material. Holotype ♂ (MECN-EN 41684): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13025, Morphosp. Can.A.011"; deposited in MECN [entire specimen in genitalia vial in glycerin].

Diagnosis. (TL: 1.8mm) Body (Fig. 69A) small, rather broad, sides evenly rounded, dusky orange, moderately densely setose, most setae recumbent, but with fine, longer, suberect setae intermingled; head almost as wide as long, posterior corners narrowly rounded; vertex convex, vertexal foveae deep, with deep, well developed sulci extending anterad, converging weakly to front; eyes large, emarginate posteriorly, coarsely faceted; vertical preocular carina present along anterior edge of eye, with row of elongate setae; gular carinae long, convergent posterad; antennae moderately elongate, antennomeres I–II short, cylindrical, III conical, expanded apically, IV–VII transverse, each slightly wider than the preceding, V slightly longer than IV or VI, VIII–XI forming elongate, loose, 4-segmented club, apical antennomere only about 1.75× as long as X, apex bluntly rounded; pronotum lacking subbasal marginal tooth, simply angulate at basal constriction, sides evenly rounded anterad to neck; posterior pronotal constriction slightly notched, weakly produced behind; pronotal disk with deeply impressed lateral foveae, male with raised, transverse plateau elevated above leading edge of deeply impressed, complete, transverse subbasal sulcus; elytra with sides mostly subparallel, weakly rounded (winged), each with strong basal carina extended laterad to form humeral tooth, basal carina weakly arched at sutural stria, more strongly arched over better-developed lateral basal fovea; dorsobasal carina continuous with subhumeral stria, subhumeral fovea weak; abdominal tergites similar in length, 1st only slightly longer than 2nd; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 70A, B) with large basal bulb, dorsal diaphragm broadly open; main body of tegmen comprising basally broad, right-curving, narrowed, acute apex; overlying that, right side of tegmen produced into more distinct hook, terminating over and just short of apex of ventral plate; a shorter, more strongly hooked, articulated process arises from left-side base of tegmen, its long, narrow apex recurving and reflexed slightly dorsad.

Etymology. This species' name refers to the very loosely articulated antennal club, with long stems separating the antennomeres.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species is distinguished by its single, wide median plateau in front of the deep basal sulcus of the male pronotum.

Sebaga ukupacha **sp. nov.**
Figs 69D–F, 70C–D

Type material. Holotype ♂ (ZSFQ-i23289): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12630, Morphosp. ElP.A.029"; deposited in ZSFQ. **Paratypes** (5 ♂, 1♀): 4: same data as type; 1: 0.0264˚N, 78.6344˚W, 2100m; 1: same locality as type, litter sifting (ZSFQ-i23290–i23294).

Diagnosis. (TL: 2.3mm) Body (Fig. 69D) medium sized, orange, densely setose, weakly punctate; head elongate with weakly carinate posterodorsal margin, granulate along edge, base slightly emarginate at middle; vertexal foveae deep; long, curved vertexal sulci united between antennal bases; eye diameter about equal to postocular genal length; antennomeres I–II cylindrical, antennomeres III–VII progressively shorter and wider, terminal four antennomeres forming distinct, loose, setose club, antennomeres VIII–X cylindrical, about twice as wide as long; antennomere XI almost twice as long as X; pronotum weakly depressed along sides in basal half, abruptly narrowed in basal one-third, basal corners of anterior portions rounded, margins more or less straight, converging anterad; antebasal impression deep and complete, middle portion widened, glabrous, with deep foveae on either side, anterior edge weakly depressed, depressions margined posteriorly; each elytron with a complete basal carina, with shallow sutural and one lateral fovea, a stria extending to elytral midpoint from lateral fovea; basal elytral carina continuous around humeral swelling and with subhumeral stria; subhumeral fovea lacking. Aedeagus (Fig. 70C, D) with large basal bulb, ventrally with apically divergent pseudoparameres, right side more strongly enlarged into an apicolateral plate with basally constricted, bulbous median lobe; strongly sclerotized free, extensible median rod present, arched dorsally, apically blunt and with short articulated digitiform process.

Etymology. This species name comes from a Kichwa compound word meaning 'under-world'.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

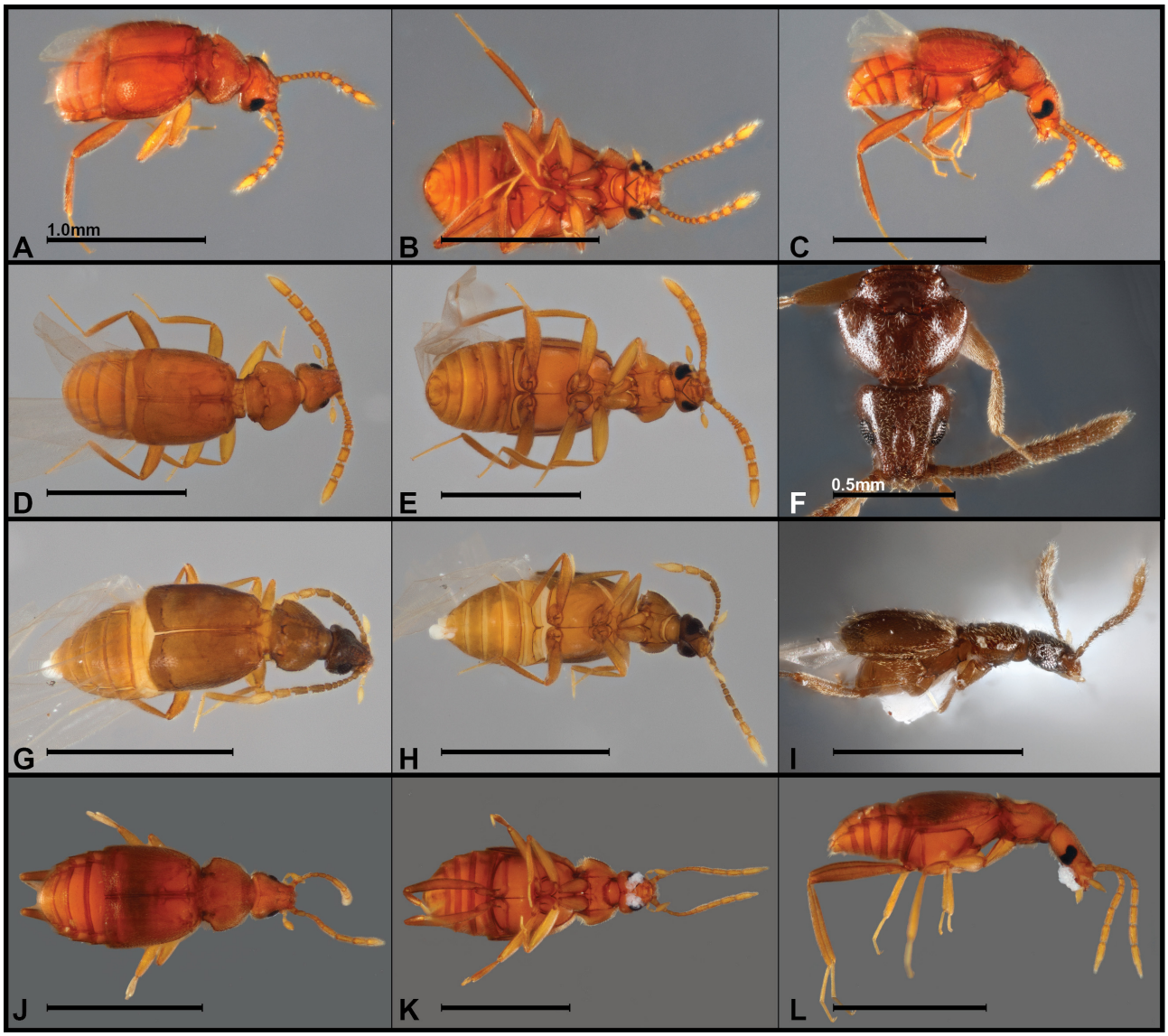

FIGURE 69. Habitus photos, *Sebaga* spp., dorsal, ventral, lateral views **A–C** *S. laxa* **D–F** *S. ukupacha* (**F** detail view of head) **G–I** *S. diffusa* **J–L** *S. sapan.* Scale bars = 1.0mm unless otherwise indicated.

Remarks. In this species, the male pronotum doesn't have tubercles, but an irregular transverse sulcus, which is undercut on either side by a sharp, deep fovea. The vertexal sulci deepen toward the vertexal foveae, and the antennal club is moderately elongate.

Sebaga diffusa **sp. nov.**
Figs 69G–I

Type material. Holotype ♂ (ZSFQ-i23287): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v-2011, 1900–2100m. Understory fogging, M.Caterino, A.Tishechkin, AT1330" / "Caterino DNA voucher, Ext. MSC-12659, Morphosp. ElP.A.058"; deposited in ZSFQ [genitalia lost during extraction].

Diagnosis. (TL: 1.8mm) Body (Fig. 69G) small, light brown, head darker, tips of antennae lighter; head subtriangular, with narrowly rounded posterior corners, shallowly emarginate posteriorly, otherwise posterior dorsal margin distinctly carinate; eyes large, diameter almost twice postocular length; vertexal sulci thin, convergent but not joined anterad; antennae reaching about middle of elytra, antennomeres III–VII slightly longer than wide, club segments VIII–X cylindrical, each slightly longer than the preceding, antennomere XI cylindrical to midpoint, narrowed to softly acute tip; pronotum abruptly narrowed in basal one-fifth, with small tooth at base of anterior portion; transverse antebasal impression rather shallow, interrupted by narrow anterior-posterior bridge; each elytron lacking sutural fovea but with conspicuous lateral dorsal fovea, interrupting the basal carina; subhumeral fovea lacking but subhumeral stria complete. Aedeagus small, simple, and weakly sclerotized (possibly teneral); basal bulb prominent; tegmen with longer left and shorter right sinuate lateral lobes; median process longer than either, thin, straight, and dorsal.

Etymology. The name of this species refers to its

relatively dark head fading to lighter coloration in all directions.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species is small-bodied, has a short head that is posteriorly margined, and moderately elongate antennae. The basal pronotal constriction is narrow and discrete, appearing almost as a narrow bite out of the corner of the pronotum. The male's basal sulcus is only weakly modified, with a narrowly pinched section in the middle. The single large basolateral elytral fovea is also somewhat distinctive.

The aedeagus of the type was extremely small and poorly sclerotized, and was not possible to photograph effectively.

Sebaga sapan **sp. nov.**
Figs 69J–L, 70E–F

Type material. Holotype ♂ (MECN-EN 41054): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol. Yanayacu, Ridge Tr., 2397m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12941, Morphosp. Yn.A.010" / "MECN-EN 41054"; deposited in MECN [entire specimen in genitalia vial]. **Paratype** (1♂): same general locality as type, but -0.5952, -77.8994, 2386m (MECN-EN 41055).

Diagnosis. (TL: 2.0mm) Male (Fig. 69J) orange, rather densely covered with short, recumbent, golden setae; head elongate triangular, weakly emarginate at base; eyes moderately large, weakly convex, diameter about 0.8× postocular genal length; vertexal foveae impressed, sulci short, reaching anterior fourth of eye, rather deep, outwardly arcuate, meeting between antennal bases; antennae elongate, scape and pedicel cylindrical, antennomeres III–VI about twice as long as wide, VII distinctly larger, VIII–XI forming slender elongate club; pronotum large, broadly shieldlike, lacking subbasal tooth, evenly rounded to apex, constricted/emarginate at base; basolateral foveae distinct, not connected by sulcus; disk of (male) pronotum with three large, setose impressions, the lateral pair with the foveae at their inner, deepest corners; elytra subparallel-sided, each with distinct basal carina arcuate over sutural fovea and one lateral dorsobasal fovea; humeri weakly dentate; subhumeral fovea indistinct; subhumeral stria complete; abdominal tergites I–III similar in length; legs and venter lacking obvious dimorphisms. Aedeagus (Fig. 70E, F) with distinct basal bulb; a dorsal process extends upward from right side, then bends immediately apicad, subdivided into two subacute tips; ventral aspect of tegmen bears three adjacent extensions, a very short ventrally hooked one, dorsad that a thinner, more or less straight median process, and thicker lateral one, bent ventrad at apex.

Etymology. The name of this species comes from a Kichwa term meaning 'unique'.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. The three impressions across the base of the male pronotum are peculiar to this species.

Sebaga nocturna **sp. nov.**
Figs 71A–C

Type material. Holotype ♂ (MECN-EN 41685): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13017, Morphosp. Can.A.003"; deposited in MECN [genitalia overcleared, not described or figured].

Diagnosis. (TL: 2.2mm) Body (Fig. 71A) rather broad, sides evenly rounded, dusky orange, densely setose, most setae recumbent, but on head and pronotum with short, coarser suberect setae intermingled; head only slightly longer than wide, posterior corners weakly

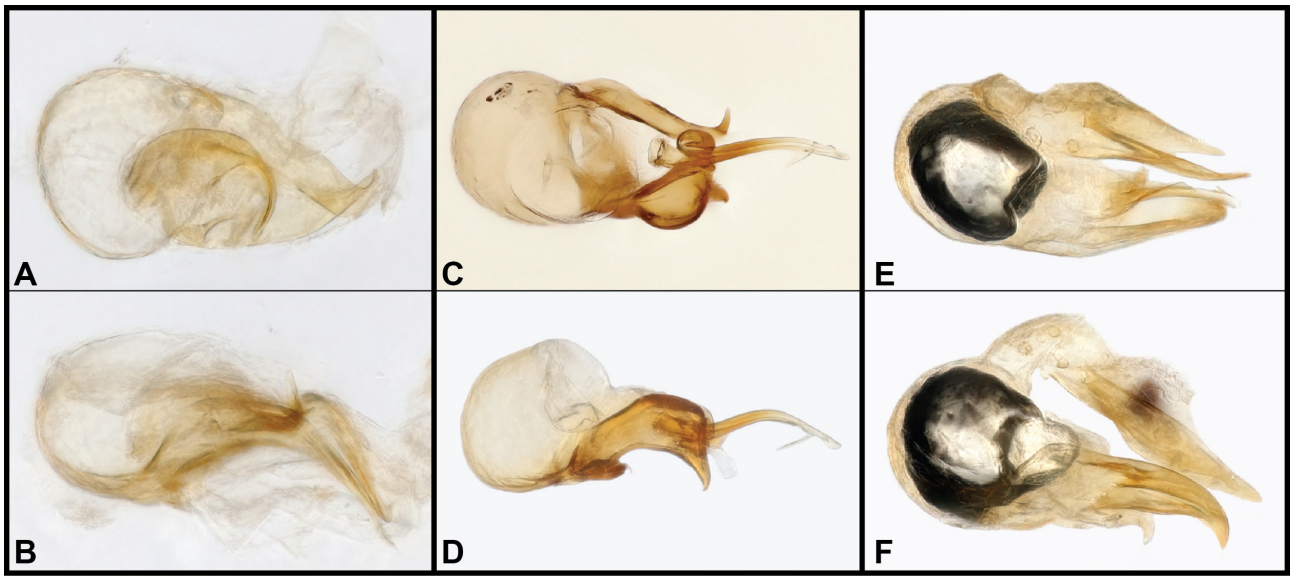

FIGURE 70. Aedeagus photos, *Sebaga* spp., dorsal, lateral views **A, B** *S. laxa* **C, D** *S. ukupacha* **E, F** *S. sapan*.

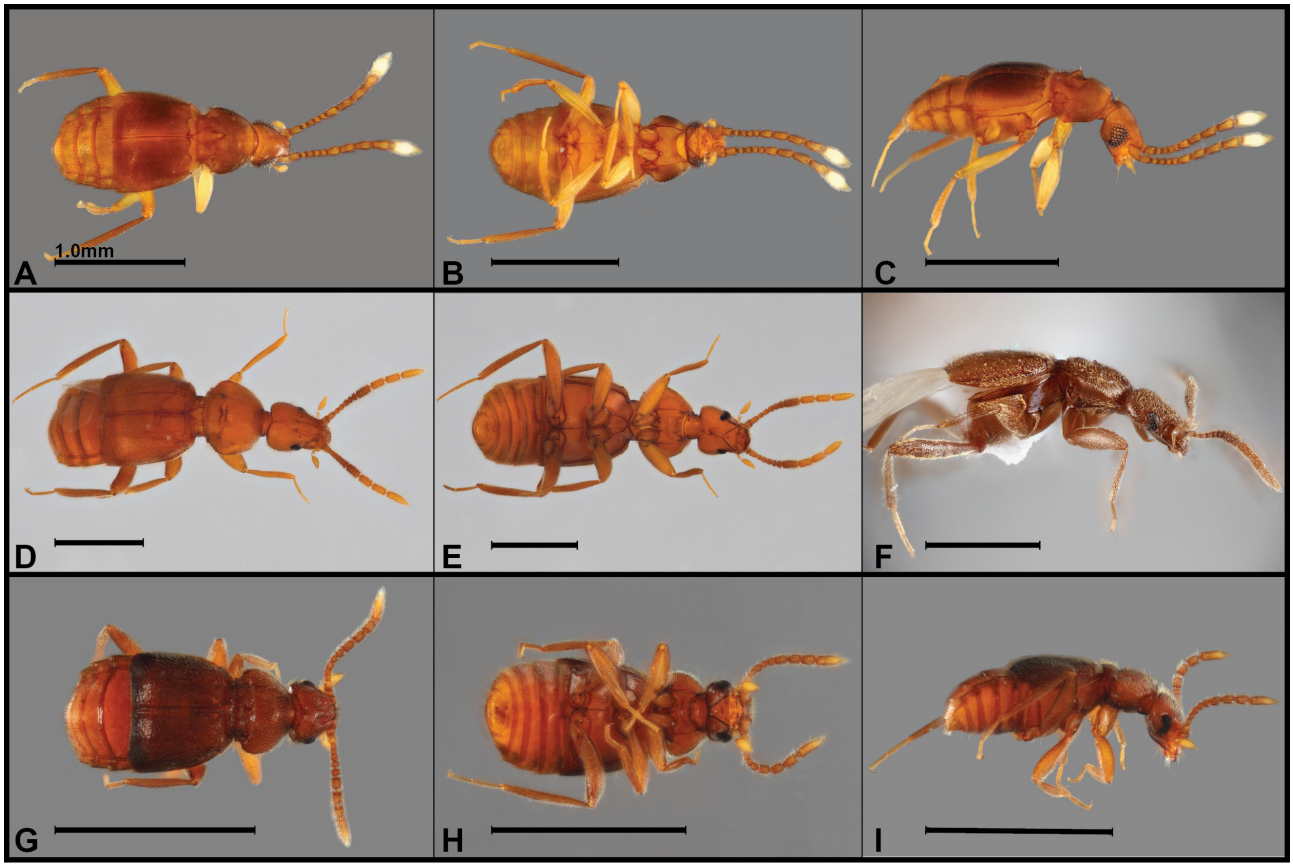

FIGURE 71. Habitus photos, *Sebaga* spp., dorsal, ventral, lateral views **A–C** *S. nocturna* **D–F** *S. agilis* **G–I** *S. bifoveata.* Scale bars = 1.0mm.

rounded; vertex convex, vertexal sulci vestigial, only barely detectable immediately behind interantennal elevation; eyes large, emarginate posteriorly, very coarsely faceted; vertical preocular carina present along anterior edge of eye, with row of elongate setae; gular carinae long, convergent posterad; antennae elongate, antennomere I broad at base, narrowed to apex, II cylindrical, slightly longer than wide, III conical, expanded apically, IV subquadrate, V–VI weakly transverse, VII–XI forming elongate, loose, 5-segmented club, apical antennomere white, bulbous, acute apically, about 1.5× length of X; pronotum with strong subbasal marginal tooth, sides evenly rounded anterad to neck; posterior pronotal constriction abrupt but not too strong; pronotal disk with deeply impressed lateral foveae, male with inverted, subtriangular glabrous depression with strong median triangular (in lateral view; Fig. 71C) elevation bearing a few setae at its apex; elytra with sides weakly rounded (winged), each with strong basal carina extended laterad to form humeral tooth, basal carina conspicuously arched over very weak sutural fovea and one lateral basal foveae; dorsobasal carina continuous with subhumeral stria, also arched over inconspicuous subhumeral fovea; abdominal tergites similar in length; legs and venter lacking obvious secondary sexual characters.

Etymology. The name of the species refers both to its coarsely faceted eyes, which often indicate nocturnal habits, and to the headlight-like white apical antennomere.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species is distinguished by its unique pronotal carina, where other *Sebaga* males have paired tubercles, depressions, or some variants of such. The constrastingly colored white apical antennomere is also unique, not only among *Sebaga* species, but across most Pselaphines of the region. The male genitalia of the only known specimen was overcleared, and exhibits few useful details. However the external morphology is sufficiently distinctive to allow unambiguous identification.

Sebaga agilis **sp. nov.**
DNA barcodes: GenBank PX930249, PX930250
Figs 71D–F, 72A–B

Type material. Holotype ♂ (ZSFQ-i13688): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m., FIT, M. Caterino, A. Tishechkin, AT1323" / "Caterino DNA voucher, Ext. MSC-12398, Jubinini?" / "ZSFQ-i13688"; deposited in ZSFQ. **Paratypes** (2♂, 1♀; ZSFQ): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, 2200–2400, FIT; 1: 0.0182˚N, 78.6372˚W, 2200–2400, litter sifting (ZSFQ-i23283–i23285).

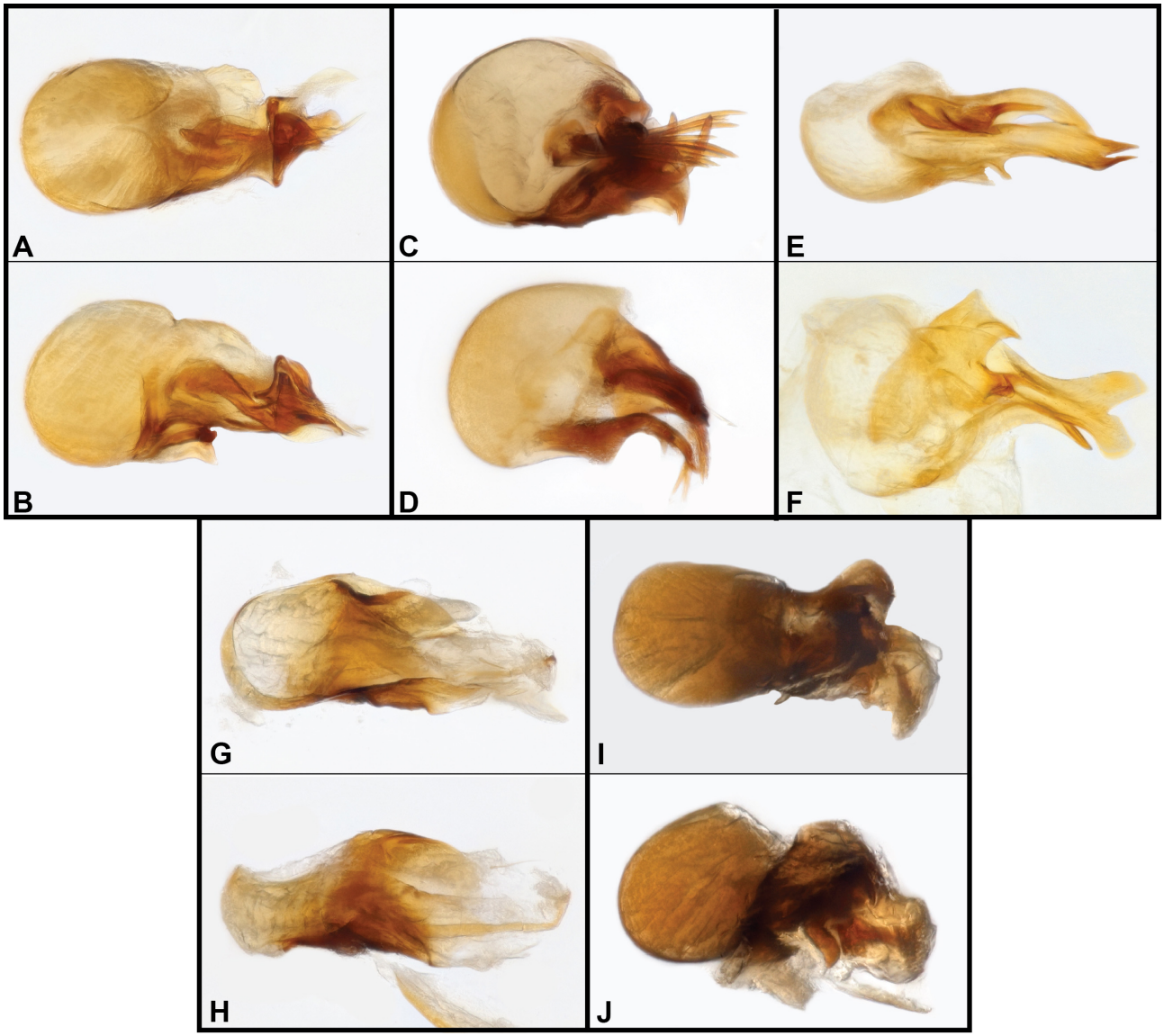

FIGURE 72. Aedeagus photos, *Sebaga* spp., dorsal, lateral views **A, B** *S. agilis* **C, D** *S. bifoveata* **E, F** *S. ampla* **G, H** *S. prodigiosa* **I, J** *S. renata*.

Diagnosis. (TL: 3.5mm) This species is very similar to the sympatric *S. ukupacha*, differing mainly in the following characters: body (Fig. 71D) slightly larger; head more distinctly elongate, posterior corners rounded; eyes consequently smaller, only about one-third length of postocular genal length; antennae, particularly intermediate antennomeres, more elongate, antennomere VIII longer and slightly thicker than IX or X; sides of pronotum (Fig. 71D) almost evenly rounded, widest at basal third, with small basal tooth at basal corner, sides of anterior portion convergent anterad; antebasal impression deepest in middle, anterior edge with small, median glabrous tubercle flanked by shallow glabrous depressions, posterior edge with narrow, downcurved inner flange; median impression separated from deep lateral foveae by weak impression. Aedeagus (Figs. 72A, B) with large basal bulb, sclerotized, rod-like inner processes, and a crown-like apical complex; left inner process straight, narrow, terminating acutely within apical crown, right inner process shorter, thicker, curved; apical crown with basal plate surrounding right-side apex and narrowing to apical tuft, open on left side, with club-like apical process projecting from center.

Etymology. This species' name refers to its elongate body and long-leggedness.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This is among the largest *Sebaga* species, with long legs, an elongate head, and relatively elongate antennae. The male pronotum has the sides almost evenly rounded, not constricted basally, just narrowed more abruptly than anterad. The basal sulcus has a pair of median depressions immediately anterad, with a small, setose tubercle between them projecting posterad slightly over the sulcus.

Sebaga bifoveata **sp. nov.**
DNA barcode: GenBank PX930321
Figs 71G–I, 72C–D

Type material. Holotype ♂ (MECN-EN 40818): "ECUADOR: Tungurahua, -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13171, Morphosp. Mch.034"; deposited in MECN.

Diagnosis. (TL: 1.6mm) Body (Fig. 71G) dark orange, with abdomen and legs lighter, densely covered with subrecumbent setae; head widest at eyes, slightly narrowed to base, posterior corners and dorsobasal edges weakly ridged, base emarginate; eyes not large, posteriorly emarginate, occupying about half of gena as seen from above; vertexal foveae deeply impressed; vertexal sulci slightly less deeply impressed, converging weakly to single frontal impression; gular carinae distinct, convergent to near base; antennae moderately elongate, scape short and cylindrical, antennomere II longer, sides slightly rounded, III–V slightly longer than wide, apices increasing slightly in width, VI–VII weakly transverse, VIII–XI forming loose, elongate club, VIII–X elongate, with square edges, XI about 2.5× length of X; pronotum widest near base, strongly narrowed to front, posterior corners weakly serrate; posterior constriction abrupt and short; lateral subbasal foveae distinct, disk transversely impressed between, glabrous along posterior edge, setose along anterior; elytra widened slightly to apices, each with distinct sutural and one lateral dorsobasal fovea, basal carina arched over foveae; humeri weakly dentate at distinct subhumeral fovea, subhumeral stria complete; 1st visible abdominal tergite about 1.3× length of 2nd; male last ventrite weakly depressed; legs and venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 72C, D) with large basal bulb, lacking distinct dorsal diaphragm, but right apical surface largely membraneous; ventral tegmenal process thick at base, flattened slightly, subdividing into four divergent, acute apical teeth, two downturned, one extending right, one left; extending from apical opening, an extrudible median armature comprises ~nine thin, closely parallel, downturned spikes; a rather broad, laterally compressed, twisted plate extending from left side of basal bulb mostly conceals this armature from lateral view.

Etymology. This species' name refers to its deep basal elytral foveae.

Distribution. This species is known only from cloud forests on the north side of the Río Pastaza valley, Tungurahua, Ecuador.

Remarks. This species is not a typical *Sebaga*, with the male's pronotal dimorphism relatively inconspicuous. There seems to be a group sharing deeply impressed vertexal foveae and sulci that also lack such dimorphisms (e.g. *Sebaga ampla* and *S. sapan*), although males are not known for all, leaving the pronotal state ambiguous as a potential synapomorphy (unknown in *S. calcis*, *S. scurra*). The male genitalia of this potential group, where known, are widely divergent, and that of this species is particularly distinctive, being short, bulbous, and having the distinctively multipronged median armature. Externally, its most distinguishing features are the relatively elongate four-segmented antennal club and the rather deeply bifoveate elytra.

Sebaga scurra **sp. nov.**
DNA barcode: GenBank PX930240
Figs 73A–C

Type material. Holotype ♀ (MECN-EN 40745): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13090, Morphosp. Cu.007"; deposited in MECN.

Diagnosis. (TL: 1.8mm) Body (Fig. 73A) orange, with rather dense, recumbent, golden pubescence, sides rounded; head subtriangular, with posterior corners sharply rounded, posterior margin emarginate; eyes large, coarsely faceted, forming a dorsal semicircle with lower edge nearly straight; vertexal foveae not evident; frontal sulci deep, short, and separate, not meeting anteriorly; antennae rather short, antennomeres I and II short and cylindrical, III weakly conical, IV–VII transverse, weakly expanded apicad, VIII–XI forming distinct club, VIII–X about as long as wide, XI 2.5× as long as X; pronotum broad, with strong basal constriction, rounded and strongly narrowed anterad, posterior corners projecting slightly backwards, lateral margin within constriction distinctly dentate; basolateral foveae weakly impressed, connected by weakly arched transverse sulcus, pronotal disk simply convex behind; elytra rather short (apparently wingless); each with complete basal carina extended laterad as humeral denticle, continued by subhumeral stria; dorsobasal and subhumeral elytral foveae not evident; 1st visible abdominal tergite almost twice as long as 2nd; mesoventrite rather long, with strong median tooth near its base.

Etymology. This species' name comes from a Latin word for clown, or joker. It is used as a noun in apposition.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. While quite distinctive, this species appears to be related to several others, forming a distinct subgroup of *Sebaga*, sharing relatively short, triangular heads, large eyes, deep but short vertexal sulci, and an angulation within the basal pronotal constriction. Of described species, *S. scydmaenilla* (Sharp) may also be related to these. Of the new species, *Sebaga calcis* is particularly close to *S. scurra*, with the eye coarsely faceted and tending to be semicircular above, rather than emarginate behind. This species is known only from a single female, but its morphology is sufficiently distinctive to justify its description.

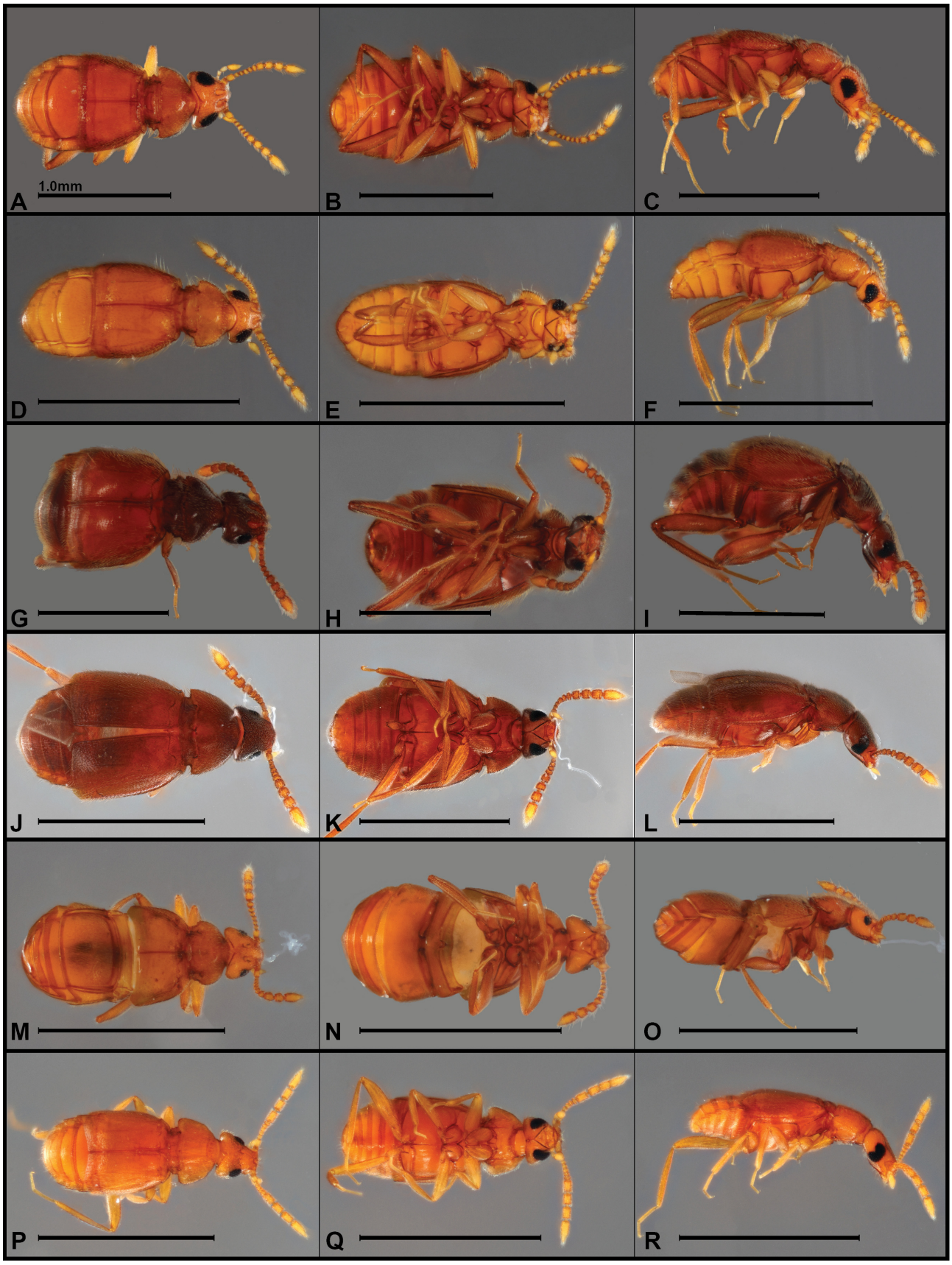

FIGURE 73. Habitus photos, *Sebaga* spp., dorsal, ventral, lateral views **A–C** *S. scurra* **D–F** *S. calcis* **G–I** *S. ampla* **J–L** *S. prodigiosa* **M–O** *S. pulga* **P–R** *S. renata.* Scale bars = 1.0mm.

Sebaga calcis **sp. nov.**
DNA barcode: GenBank PX930365
Figs 73D–F

Type material. Holotype ♂ (MECN-EN 40768): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13113, Morphosp. RAn.004"; deposited in MECN.

Diagnosis. (TL: 1.3mm) This species, also being described from a female, differs only very little from the preceding, and is described here only to the extent that they differ: Body (Fig. 73D) setae sparser; head with vertexal sulci slightly narrower, diverging posterad, not fully parallel; eyes large, emarginate near lower posterior corners, extending narrowly onto ventral surface of head; coarsely faceted, forming a dorsal semicircle with lower edge nearly straight; posterior corners of pronotum not projecting, tooth within basal constriction present but weaker; elytra long (wings present), basal carina not very strong, slightly arched over single, weak lateral fovea; humeri only weakly dentate.

Etymology. This species is named for the limestone that occurs near the type locality, with numerous caves in the region. It is used as a noun in apposition.

Distribution. This species is known only from the Río Anzu Preserve, in the lower part of the Río Pastaza Watershed in the Andean foothills of Pastaza Province, Ecuador.

Remarks. This species is clearly related to the preceding, while differing in a number of respects, perhaps most notably in being fully winged (having flown to a blacklight). Discovery of the males of these species will be interesting and crucial to assessing their relationships to the rest of the genus.

Sebaga ampla **sp. nov.**
Figs 72E–F, 73G–I

Type material. Holotype ♂ (MECN-EN 41056): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Ridge Tr., 2356m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12965, Morphosp. Yn.A.034" / "MECN-EN 41056"; deposited in MECN.

Diagnosis. (TL: 2.1mm) Body (Fig 73G) broad, dark orange, elytra lighter, rather densely covered with short, recumbent, golden setae; head broadly triangular, weakly emarginate at base; eyes moderately large, convex, slightly greater in diameter than postocular gena; vertexal foveae impressed within deep posteriorly divergent vertexal sulci that remain separate to front; antennae with scape and pedicel short, cylindrical, III–V beadlike, increasing slightly in size, VI–VII transverse, VIII–XI forming short, loose club, VIII–X slightly wider than long, XI about 2× length of X; pronotum wide, strongly narrowed to short anterior collar, posterior constriction abrupt, with distinct secondary tooth within constriction; basolateral foveae present at sides, connected by slightly sinuate, deeply impressed transverse sulcus; pronotal disk without tubercles or other typical male secondary modifications, simply convex behind sulcus; elytra wide, long (winged), humeri rounded, each with distinct basal carina that arches weakly over shallow sutural and one lateral dorsobasal foveae; subhumeral fovea indistinct, but subhumeral stria complete; visible abdominal tergite I slightly longer than II; legs and venter lacking obvious dimorphisms, last male ventrite simply depressed. Aedeagus (Fig. 72E, F) with large basal bulb, distal portion comprising three processes; ventral-most process apparently contiguous with basal bulb, an intermediate length, rightwardly arcuate and apically acute hook; short median process apparently articulated with longest distal process, arising within basal bulb, forming laterally compressed dorsal blade with strongly sclerotized distal spike; longest articulated process broad at base bearing short, acute tooth on left side, narrowing, then widening to laterally compressed, dorsoventrally bifid apex, lower portion subquadrate, upper rounded above to blunt apical point.

Etymology. The name of this species refers to its relatively wide body form.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is related to a subgroup of *Sebaga* that lacks the distinctive male pronotal modifications more typical of the genus, which also share strongly impressed vertexal sulci and secondarily toothed basal pronotal margins. This species has a particularly wide body form, and has the vertexal sulci very deeply impressed. The 'Y'-shaped distal process of the aedeagus is also unique.

Sebaga prodigiosa **sp. nov.**
Figs 72G–H, 73J–L

Type material. Holotype ♂ (MECN-EN 41063): "ECUADOR: Napo, -0.5974˚, -77.8934˚, Est. Biol. Yanayacu, Ridge Tr., 2222m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13304, Morphosp. Yn.A.066" / "MECN-EN 41063"; deposited in MECN. **Paratypes** (1♂, 1♀): "-0.5958˚, -77.8927˚, Aburrian Tr., 2233m, 1 also "Caterino DNA voucher, Ext. MSC-12994, Morphosp. Yn.A.063" (MECN-EN 41682–41683).

Diagnosis. (TL: 1.8mm) Body (Fig. 73J) dark orange, sides rounded, uniformly and rather densely covered with semirecumbent setae; head triangular, posterior corners subacute, transversely rugose; vertexal foveae and sulci barely indicated; eyes large, tall, slightly 8-shaped in lateral view (i.e., weakly emarginate on anterior and posterior edges), minimum width about equal to postocular genal length; antennae moderately long, antennomeres I–II cylindrical, slightly longer than wide, III small, subquadrate, IV–VII weakly conical, increasingly transverse, VIII–XI forming very loose club, with segments well separated by intervening articulations,

VIII–X weakly transverse, XI about 2.25× as long as X; gular carinae distinct, meeting even with posterior margin of eye, with distinct stem; pronotum with posterior corners acute, weakly dentate, evenly and arcuately narrowed to neck; posterior pronotal constriction strong, very short; lateral pronotal foveae strong, connected by deep transverse sulcus just weakly interrupted at middle by short ridge; male without subbasal tubercles (not sexually dimorphic); elytra long, subparallel-sided, each with basal carina arching over very weak sutural and one lateral basal foveae; humeri weakly dentate at subhumeral fovea, subhumeral stria complete; 1st abdominal tergite about equal in length to 2nd; legs and venter without obvious secondary sexual characters. Aedeagus (Fig. 72G, H) with basal bulb distinct, but low, broadly open dorsally, lacking dorsal diaphragmatic sclerite; basal bulb prolonged by upright plates on either side narrowing to rounded apices, tegmen between descending to increasingly membranous apex; inner articulated rod extending distad beneath tegmenal lobe, abruptly bent upwards at apex.

Etymology. This species name roughly means 'oddball', as a morphological outlier among *Sebaga* spp.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, western Napo Province, Ecuador.

Remarks. This species is an atypical *Sebaga*, most particularly in lacking male pronotal modifications, but also in having shallow vertexal sulci, relatively short antennae, and a rounded body form. The pronotal shape is unique, narrowing from acute posterior corners, with a very short basal constriction. The aedeagus is not, however, all that unusual, with an articulated distal process extending from a low basal bulb.

Sebaga pulga **sp. nov.**
Figs 73M–O

Type material. Holotype ♀ (MECN-EN 41671): "ECUADOR: Napo, -0.5974˚, -77.8934˚, Est. Biol. Yanayacu, Ridge Tr., 2222m, 10.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12984, Morphosp. Yn.A.053"; deposited in MECN. **Paratypes** (4♀): same locality as type, 1: Same data as type; 2: -0.5983, -77.8954, 2192m, 1: -0.5973, -77.8933, 2224m (MECN-EN 38662–38665).

Diagnosis. (TL: 1.4mm) Female: Body (Fig. 73M) light orange in color, short, flattened, and broad; head subtrianagular, with posterior corners rounded; eyes small, composed of ~6 ommatidia; vertexal foveae deep, each with short curved sulcus extending anterad, ending freely near antennal bases; antennal insertions separated by smooth frontal surface, about 3× width of basal antennomere; labrum short; antennae with scape and pedicel short, subquadrate, antennomeres III–VI beadlike, VII slightly wider and transverse, VIII–XI forming loose four-segmented club; gular carina complete, sinuate, only meeting at cervical margin, lacking stem; pronotum broad, sides widely rounded, basal portions crenulate; disk with lateral foveae in basal third connected by sinuate transverse sulcus; basal margin with oval impressions in each corner; elytra short, posterior margins emarginate, each elytron with continuous basal+subhumeral carina, the basal portion curving over three small foveae: sutural, discal, and subhumeral; abdomen with long first tergite about 6× length of second along midline, subsequent segments progressively shorter; prosternum short (Fig. 73N), with fovea in front of each coxa; procoxae strongly exserted; metaventrite short, with weak median carina; all legs slender, setose, and unmodified; tarsomeres slender, II and III similar in length.

Etymology. This species' name (from Spanish) refers to its somewhat flea-like appearance. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species, even though known only from females, was initially considered to represent an undescribed genus. It is quite unusual among Jubini, distinguished by its short, wide, flattened body shape, in combination with a head with deep vertexal foveae and shallow frontal sulci extending anterad, a pronotum with its sides lacking an abrupt basal constriction, but retaining basolateral foveae connected by a transverse sulcus; elytra with a continuous basal and subhumeral carina, and a very long basal abdominal segment, as long as the remaining abdominal segments combined. The gular carinae are sinuate and separate nearly to the base of the head. Yet a number of atypical species of *Sebaga* approach this in form (e.g. *S. calcis, S. scurra, and S. laxa*), although not in all the specifics, particularly the elongate 1st abdominal segment and the separate gular carinae. Nonetheless, until males can be found, and pronotal and genitalic characters assessed, it seems appropriate to place this species in a known genus, however awkwardly.

Sebaga renata **sp. nov.**
Figs 72G–H, 73P–R

Type material. Holotype ♂ (MECN-EN 42056): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13351, Morphosp. PS.B.016"; deposited in MECN.

Diagnosis. (TL: 1.4mm) Body (Fig. 73P) small, orange, densely covered with semi-recumbent setae; head subtriangular, about 1.3× longer than wide; eyes moderately large, extending beneath head; vertexal foveae deeply impressed, with arcuate sulci deep at foveae, curving mediad and becoming shallower and thinner, meeting at short stem between antennal bases; width of frons between antennal insertions about 2/3 length of scape; antennae with shaft short, club long, antennomere I–II cylindrical, slightly longer than wide, III–V subconical, slightly wider than long, VI–VII distinctly shorter and transverse, VIII–XI forming elongate club, segments ~2× as long as wide, with distinct separations (stem of next antennomere) between them, XI about 2× as long as X,

tapered to subacute apex; pronotum widest near base, evenly then more abruptly narrowed anterad, posterior constriction deep, with small denticles within constriction; lateral foveae present, deep, connected by arcuate subbasal transverse sulcus; male pronotum unmodified; elytra long, subparallel-sided, each with sutural and one lateral fovea, basally carinate, with carina arched weakly over foveae, projecting at sides as humeral denticle; first three visible abdominal tergites approximately equal in midline length; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 72I, J) with large basal bulb, diaphragm distinct, located dorsoapically; strong basal knob present in front of small basal foramen; tegmen short, dorsal portion curved rightward, with rounded lateral lobe, ventral portion with trigger-shaped ventral process, weakly 'Y'-shaped (dorsal arm longer than ventral) distal process embedded in weakly sclerotized sac.

Etymology. This species name is based on the Latin verb renatus, or 'to be reborn', as a reference to its seeming 'reversion' to a *Jubus*-like habitus.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species might easily be placed in *Jubus* based on external characters, with the key character, the width of the frons between the antennal insertions quite narrow and the pronotum lacking sexual modifications. The male genitalia, however, are fairly unambiguously *Sebaga*-like, with particular similarity to those of *S. ukupacha, S. agilis,* and *S. bifoveata*, which have a diaphragm located dorsoapically. While the first two of those species do have male-modified pronota, they also have very elongate 4-segmented antennal clubs and deep vertexal sulci, with those of *S. ukupacha* appearing quite similar, deep basally and shallower/thinner anterad. So, despite uncertainty in particular placement, a relationship within *Sebaga* seems reasonably well-founded.

Euplectitae: Metopiasini

Bibrax Fletcher, 1928

Until recently there were just two described Neotropical species in this genus, from Brazil and Colombia (Asenjo *et al.* 2019a, 2024a). However, twelve new species from Ecuador have been recently described, treated in detail elsewhere (Tapuy-Avilés *et al.* 2025), and several more are known (unpub. data).

Metopiellus Raffray, 1908

The genus *Metopiellus* has attracted some recent taxonomic attention, adding 3 new species from Brazil (Asenjo *et al.* 2017, 2023; Mário Chaul & Lopes-Andrade 2024) and 1 from Colombia (Fiorentino *et al.* 2022) to those already known from Brazil and Argentina (Asenjo *et al.* 2019). Two new species from Ecuador have recent been described elsewhere (Tapuy-Avilés *et al.* 2026), from both Amazonian and cloud lower cloud forest habitats.

Rhinoscepsis LeConte, 1878
Fig. 74

There are 11 described Neotropical species in this genus, from Mexico and the West Indies south to Argentina (Asenjo *et al.* 2019). I describe one new species below.

Diagnosis. *Rhinoscepsis* was previously recognized as distinct from Metopiasini, but Chandler (2002) united them with Metopiasini as a monotypic subtribe, Rhinoscepsina, a division that may yet be revised. The two subtribes share the strongly projecting antennal base, sulcate inner protibial surface, and a divided seventh male sternite. *Rhinoscepsis* lacks the strongly geniculate antennae that the genera of Metopiasina possess. The only male genitalia previously illustrated for the genus are for the nearctic *R. bistriatus* LeConte (by Grigarick and Schuster 1980) and Park's (1955) *R. militaris*. That of *R. bonita* Becker and Sanderson (Becker & Sanderson 1953a) was purportedly illustrated as well. However, it appears that they illustrated the female genitalia, and they note that the type does not possess the typically divided seventh (or 'eighth', in their description) sternite of the group, further indicating that it is a female.

Rhinoscepsis diabolicus **sp. nov.**
DNA barcode: GenBank PX930237
Fig. 74

Type material. Holotype ♂ (MECN-EN 40741): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13086, Morphosp. Cu.003"; deposited in MECN. **Paratypes** (1♂, 4♀): 1: same data as type; 1: same general locality and date but -0.2066˚, -75.9262˚; 3: same general locality and date but -0.2044˚, -75.9267˚ (MECN-EN 40468, 40472, 40485, 40492, 40502).

Diagnosis. (TL: 1.6mm) Body (Fig. 74A) orange, with rather dense, golden pubescence, with scattered longer, erect setae; head triangular, shallowly but coarsely punctate; angulate sulci extending from the posterior occipital surface mediodorsad, bending laterad above the vertexal foveae, ending at the dorsal margin of the eye; vertex with fine median carina meeting slightly broader frontal sulcus; eyes well developed, comprising about 30 ommatidia, diameter slightly less than post-ocular genal length; genae with deep, well-defined, ovoid depressions posterad eyes; rostrum slightly widened at antennal insertions; scape subcylindrical, slightly tapered apicad, about twice as long as wide, antennomere II ovoid, antennomeres III–VIII beadlike, weakly alternating in size (V and VII larger), antennomeres IX–XI forming very weak club, antennomere XI largest and acuminate apically; pronotum wider than long, strongly constricted behind the middle, rounded in front of constriction, angulate behind; pronotal disk with median posterior and anterior foveae, but lacking median sulcus; transverse subbasal sulcus only very weakly developed; elytra subparallel-sided, each with weak basal carina, arched over sutural and one

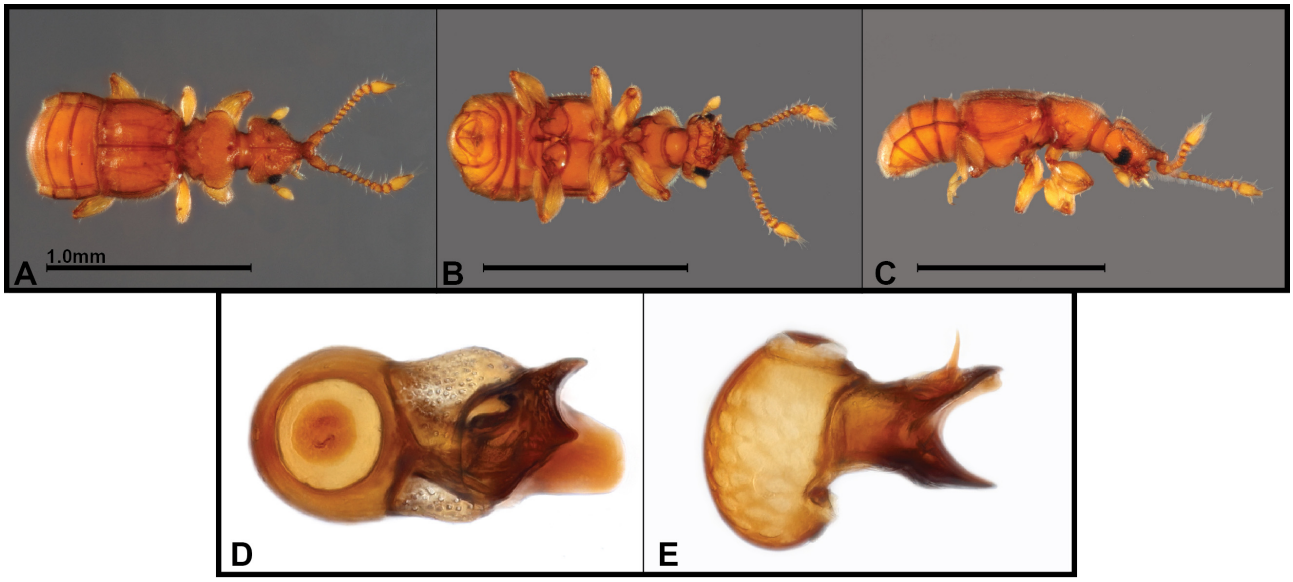

FIGURE 74. Photographs, *Rhinoscepsis diabolicus* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

lateral basal fovea; subhumeral fovea and subhumeral stria present; male metatrochanters with blade-like posterior margin; male abdominal ventrites II–V weakly depressed medially. Aedeagus (Fig. 74D, E) with well developed, upright ovoid basal bulb with small, circular dorsal diaphragm with distinct diaphragmatic sclerite; tegmen with thick base arising from upper half of basal bulb, microgranulate on sides, dividing into dorsal and ventral processes, the ventral flattened and tongue-like; dorsal process of tegmen asymmetrical, with bifid apical margin, a dorsal foramen concealing a multidenticulate internal (presumably extrusible) armature, a single acute tooth extending dorsad at rest.

Etymology. The species' name refers to the almost hornlike processes formed by the lateral, postocular sulci (Fig. 74C).

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. In Park's (1952) key to the species of *Rhinoscepsis*, this keys to *R. militaris* (Schaufuss), mainly on the basis of well developed eyes, a moderately transverse pronotum, and an incomplete median longitudinal pronotal sulcus. The male metatrochanter modifications, however, differ between the species. The aedeagus follows the same general plan of that illustrated for *R. bistriatus* and *R. militaris*, sharing the upright ovoid basal bulb, and a dorsoventrally divided tegmen. The processes in *R. diabolicus* are much less elongate (although it may be wondered whether some of their dorsal processes may be extruded inner armature).

Euplectitae: Trichonychini

Biblomelba Park, 1952b

Fig. 75

Only one species is described in this genus, *Biblomelba profunda* Park from central Mexico (Park 1952b). I will describe one new species below.

Diagnosis. This monotypic genus has been distinguished by its short, convex body form, capitate setae on the venter of the head, single segmented antennal club, pronotum with only lateral foveae that are displaced beneath the lateral margin, connected by a straight transverse sulcus, each elytron having two basal foveae, contiguous mesocoxae, separated metacoxae, and a carinate prosternum that lacks procoxal foveae (Park 1952b, Grigarick & Schuster 1980). As the genus is still apparently only known from a single species and a single female, no male genitalia have been illustrated.

Remarks. Placement of this new species here is very tentative, as it does not conform entirely to the above diagnosis, in particular having the lateral pronotal foveae distinctly dorsal, and having a subhumeral fovea, purportedly lacking in *B. profunda*. However, it is reasonably consistent in other characters, and provides additional details on what characters males of *Biblomelba* may exhibit.

Biblomelba umbracula **sp. nov.**

Fig. 75

Type material. Holotype ♂ (ZSFQ-i13686): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m., FIT, M. Caterino, A. Tishechkin, AT1323" / "Caterino DNA voucher, Ext.



FIGURE 75. Photographs, *Biblomelba umbracula* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

MSC-12721, Bibloplectus [sic] ElP.A.087"; deposited in ZSFQ. [head of type specimen is damaged.]

Diagnosis. (TL: 1.1mm) Body (Fig. 75A) weakly elongate; vertex apparently biimpressed, without distinct foveae, posterior edge with short median longitudinal carina, sides of impressions elevated above eyes, with lateral setal fringe; antennomere I short, cylindrical, antennomere II wider, bead-like, antennomeres III–VIII smaller, rounded, IX–X short, disk-like, antennomere XI large, oval, setose; pronotum widened from base, anterior corners rounded, sides only weakly serrate near lateral foveae; pronotal disk with transversely triangular impression not reaching lateral foveae, median fovea absent; elytra with sutural fovea slightly removed from anterior margin, two additional dorsobasal foveae present, the outermost with distinct impression extending posterad on basal third of elytron; subhumeral elytral fovea deeply impressed, subhumeral stria complete; aside from (possibly) impressed vertex, no obvious secondary sexual characters apparent. Aedeagus (Fig. 75D, E) rather simple, large basal bulb with small ventral basal foramen and small, distally pointed dorsal diaphragm; tegmen evenly narrowed with ventral plate narrowly, unevenly dentate at apex, bearing two strong, closely-set setae on outer edge and two short setae along inner edge near apex; tegmen with left lateral process curving upward at apex, bearing two strong setae on its outer edge and few short setae on its inner edge; complex inner armature comprising long, downturned, apically acute rod and transverse comb of subapical spines.

Etymology. This species name refers to the 'sunshade' or visor-like ridge above each eye.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Chakanamecia Caterino, **gen. nov.**

Figs 76–77

Type species. *Chakanamecia daga*, **sp. nov.**, presently designated.

Diagnosis. (TL: 1.3–1.7mm, Avg. 1.3mm) Considering those characters most used to define genera in Trichonychini, *Chakanamecia* exhibits: a reasonably distinct three-segmented antennal club (though segment IX is rather small); distinct vertexal foveae with anterior sulci meeting at a broad frontal depression; a complex cordiform pronotum with lateral and median foveae; an interrupted transverse basal sulcus, and isolated anterior and posterior fragments of a longitudinal median sulcus; elytra with large sutural depression that appears to be two foveae united, with a basally deep sutural stria extending posterad; an additional lateral dorsobasal elytral fovea present (also apparently two foveae united), with shallow impression extending most of elytral length; subhumeral fovea and strong subhumeral carina present; 1st and 2nd abdominal tergites short, similar in length, 3rd and 4th slightly longer; prosternum with anterior margin serrate and with a median carina; meso- and metacoxae approximate; metaventrite with converging, shallow sulci behind mesocoxae; males may have various dentation on the tibiae; three tarsomeres present, but basalmost short and inconspicuous. Aedeagus (Fig. 77) with strong, somewhat upright basal bulb with distinct dorsal diaphragm, a tongue-like ventral tegmenal process, and a dorsal process with both sclerotized and membraneous elements.

Remarks. *Chakanamecia* is described from five species from two locations. Most of these are very similar in body form, flat, flightless, and with strongly reduced eyes. *Chakanamecia panoptes*, however, couldn't look more different, superficially, having enormous eyes, almost unmatched in other Pselaphinae, well developed

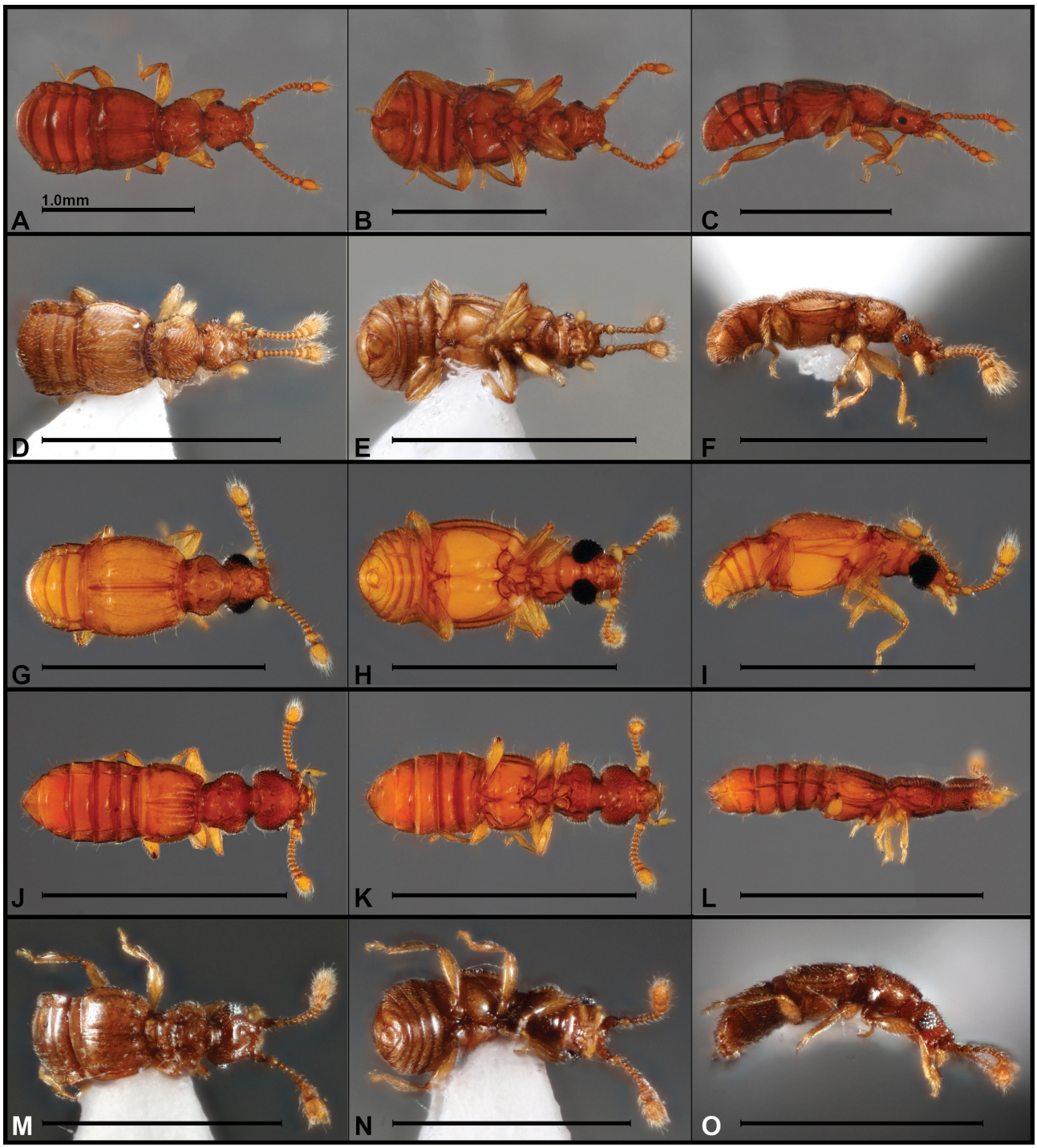

FIGURE 76. Habitus photos, *Chakanamecia* spp., dorsal, ventral, lateral views **A–C** *C. daga* **D–F** *C. micra* **G–I** *C. panoptes* **J–L** *C. mora* **M–O** *C. pichan.* Scale bars = 1.0mm.

flight wings, and a generally more convex form. Yet they all share some inarguable synapomorphies, including vertexal foveae with sulci that meet in a frontal depression, interrupted transverse and longitudinal pronotal sulci, a denticulate lateral pronotal margin, a serrate and medianly carinate prosternum, united inner elytral foveae with a deep sutural depression posterad, and posteriorly converging metaventral sulci. The discovery of the eyed, winged form should prove useful in assessing their relationships to other Trichonychini.

This genus appears to be allied to *Ramecia* Casey, *Verabarolus* Park, and especially *Thesium* Casey. It exhibits characters that obscure its subtribal placement, such as a distinct prosternal carina (which would place it in Bibloporina), but its genitalia exhibit seemingly clear similarities to those of *Ramecia* (Panaphantina), with a large basal bulb with large open dorsal diaphragm, free, asymmetrical parameres, and membraneous median lobe. The latter is also somewhat similar to that of *Panaramecia* (Trichonychina). With at least some species of *Thesium*

it shares the convergent sulci behind the mesocoxae, the prosternal carina, and serrate prosternal margin, though species of *Thesium* never have the basal elytral foveae paired. It may ultimate prove to be derivative from within *Thesium*, but at least represents a distinct clade.

In the barcode-based tree presented below, *Chakanamecia* is resolved in a clade with *Thesium*, which gives weight to some of those similarities listed above with it, and by extension Panaphantina. COI barcodes alone, however, are generally too rapidly evolving to resolve intergeneric relationships in staphylinoid beetles.

In addition to the species described below, I have seen a single female from cloud forests in Napo Province (Yanayacu) looking very similar to *C. micra*. Discovery of a male would likely reveal it to be distinct.

Etymology. The name of this genus comes from a Quechua word referring to the 'Andean cross', a common motif in Incan and pre-Incan iconography, combined with a common suffix among neotropical Euplectites. Here the 'cross' refers loosely to the crossed sulci of the pronotum. The name is feminine.

Chakanamecia daga **sp. nov.**
Figs 76A–C, 77A–B

Type material. Holotype ♂ (MECN-EN 41768): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12901, Morphosp. Ot.A.066"; deposited in MECN. **Paratypes** (1♂, 2♀): same data as type (MECN-EN 41769–41771).

Diagnosis. (TL: 1.8mm) Body (Fig. 76A) orange, somewhat flattened, broader posteriorly, with subrecumbent setae on most surfaces, only a few longer, suberect setae on lateral margins of pronotum and elytra; head distinctly flattened, wide posteriorly, narrowed to front, posterior corners rounded, frons squared off; vertexal foveae distinct, setose, just closer together than antennal bases, sulci extending anteromediad to broad frontal depression; no median frontal fovea, however; eyes small, ~17 ommatidia, in middle of genae; antennae rather elongate, scape about twice as long as wide, antennomere II nearly as wide, narrower at base, apex rounded, III conical, IV–VII beadlike, VIII shorter, IX–XI forming loose club, IX transverse, X twice as long as XI, XI about 2.5× as long as X, narrowly rounded at apex; pronotum widest near front, sides rounded, narrowed strongly to apex, gradually to base, sides weakly and irregularly denticulate; lateral fovea rather far forward, shallowly impressed, connected by weakly biarcuate transverse sulcus; pronotum with discrete, isolated median depression between transverse sulcus and anterior margin; basal part of disk irregularly depressed; elytra widened to rear, sides weakly rounded; each elytron with sutural fovea closely paired with one lateral fovea, a second lateral fovea more distant; weak setose depressions extend posterad from these foveae for short distance; subhumeral fovea present, visible from above, subhumeral carina well developed; abdomen with first three tergites similar in length, 4th longer, paratergites well developed; prosternum with anterior margin serrate, longitudinal median carina present; male profemur swollen and arched; male protibia excavate along apical half of inner margin, with strong, acute, perpendicular apical spike; male mesotrochanter slightly expanded, with short carina along apical margin; male mesotibia with small tooth at inner apical corner; metaventrite with oblique sulci from posterior margins of mesocoxae converging to center of posterior margin between metacoxae; venter otherwise lacking secondary sexual characters. Aedeagus (Fig. 77A, B) with large basal bulb with large, irregularly round, open dorsal diaphragm; prominent basal knob present proximad ventral foramen; right paramere very large, extending distad, curving mediad, expanded apically into bluntly T-shaped apex; left paramere not evident; median lobe dorsal process extending from upper apex of basal bulb, mostly membraneous and poorly defined, shorter than paramere, with sinuous internal median process extending to its apex.

Etymology. The name of this species comes from the Spanish, referring to daggerlike apical protibial processes.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is quite distinctive, especially in its relatively flat body, small eyes, close association of the inner two elytral foveae with a strong sulcus extending posterad, and in the broken pattern of pronotal sulci. The strongly developed right paramere and apparent absence of the left compares well with male genitalia of *Ramecia crinita* (Brendel), though that may be only superficial. The relationships among these genera need additional study.

Chakanamecia micra **sp. nov.**
DNA barcode: GenBank PX930344
Figs 76D–F, 77C–D

Type material. Holotype ♂ (MECN-EN 41772): "ECUADOR: Cotopaxi, -0.4172˚, -79.0040˚, Bosque Integral Otonga, 13.VIII.2024, 2073m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13337, Morphosp. Ot.A.051" / "MECN-EN 41772"; deposited in MECN. **Paratypes** (3♀): same general locality and date as type, 1: -0.4165˚, -79.0041˚,14.VIII.2024, 2098m; 1: -0.4167˚, -79.0043˚,14.VIII.2024, 2097m; 1: -0.4168˚, -79.004˚,14.VIII.2024, 2093m (MECN-EN 41773–41775).

Diagnosis. (TL: 1.1mm) This species is similar to and closely related to the above, differing principally in the following characters: body (Fig. 76D) small, close to half the size of the preceding; mostly smooth, with recumbent setae, few longer setae at sides of pronotum, elytra, and abdomen; head narrower, rugose at sides for most of its length, smoother at middle; vertexal foveae deeply impressed, with anterior sulci meeting in very deep frontal depression; labrum bluntly acute at middle; eyes similar in total size, but with fewer (~6), larger

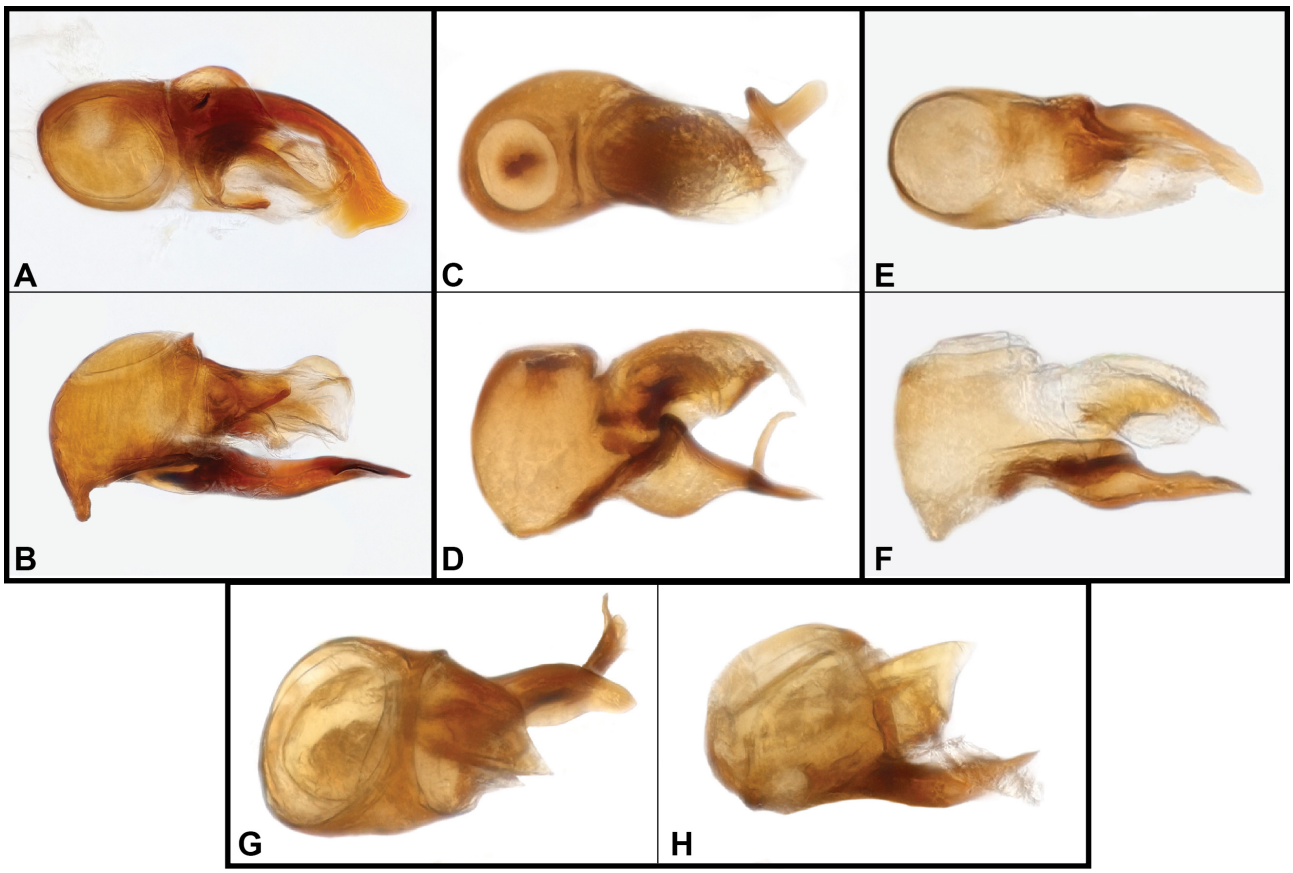

FIGURE 77. Aedeagus photos, *Chakanamecia* spp., dorsal, lateral views **A, B** *C. daga* **C, D** *C. micra* **E, F** *C. panoptes* **G, H** *C. pichan*.

ommatidia; antennae shorter, antennomeres I and II very globose, III–VII beadlike, weakly transverse, VIII–X increasingly transverse, IX–XI forming club, XI about 3× length of X; pronotum with sides not as strongly narrowed posterad, margins more uniformly denticulate; anterior portion of median longitudinal pronotal sulcus short and shallow; pronotum more distinctly depressed at sides; elytra similarly sulcate, basal foveae deeply impressed; male protibia lacking inner marginal tooth, but similar, dagger-like tooth present subapically on male mesotibia. Aedeagus (Fig. 77C, D) with large, upright basal bulb with large, circular dorsal diaphragm, a small, irregularly oval diaphragmatic sclerite within; tegmen with strong ventral and generally more membraneous dorsal processes, ventral process with ventral keel, dorsoventrally flattened distad, curving right, with strong, narrow subapical dorsal lamina arising from right edge, and narrowly rounded apex; dorsal process with sclerotized basoventral part and granulate, membraneous dorsal part (apparently a convolutedly folded, unextruded internal sac within).

Etymology. The name of this species refers to its very small body size.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is quite distinctive, especially in its smaller body size, eyes with fewer facets, more compact antennae, and less posteriorly constricted pronotum.

Chakanamecia panoptes **sp. nov.**
DNA barcode: GenBank PX930310
Figs 76G–I, 77E–F

Type material. Holotype ♂ (MECN-EN 40799): "ECUADOR: Tungurahua, -1.3829˚, -78.2909˚, Río Machay Reserve, 2402m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13152, Morphosp. Mch.015"; deposited in MECN.

Diagnosis. (TL: 1.2mm) Body (Fig. 76G) elongate, orange, particularly head and elytra moderately punctate, rather densely setose with most setae short, semierect, curved at tips, with few longer erect setae interspersed; head approximately equilaterally triangular, vertex punctate, slightly swollen over deeply impressed vertexal foveae, sulci curving anteromedially to meet behind pronounced antennal bases; eyes enormous, occupying entire sides of head and extending a considerable way beneath, coarsely faceted; antennae moderately elongate, antennomeres I and II short, globular, with whorl of long setae; III conical, IV–VIII similar, rounded, slightly wider than long, IX a little wider, X–IX forming setose club, X about as long as wide, cupuliform, XI about twice as long as X, apex narrowly rounded; pronotum widest at middle, narrowed somewhat abruptly to front, more gradually to base, sides denticulate, each tooth bearing a seta; basal portion of disk with several short, longitudinal carinae, depressed between; lateral foveae impressed at sides,

joined by sinuate transverse sulcus; short, isolated median sulcus present along anterior portion of midline; elytra long, with sides rounded, flight wings present; sutural and 1st lateral foveae approximate, sharing a common depression leading to deep sutural stria; two outer foveae appear to similiarly share a common depression with broad elytral stria extending posterad about ¾ elytral length, curving inward apically; humeri weakly dentate at subhumeral fovea, subhumeral stria well impressed; 1st three abdominal tergites similar in length, paratergites distinct; anterior margin of prosternum serrate; median longitudinal prosternal carina present; mesocoxae separated slightly by narrow meso- and metaventral processes; metaventrite with sulci extending posterad from inner metaventral foveae, meeting at midline in front of metacoxae; metacoxae meeting at middle; male with small penial plate, penultimate sternite weakly depressed, otherwise lacking in obvious secondary sexual characters. Aedeagus (Fig. 77E, F) with large, upright basal bulb; round dorsal diaphragm present with weakly sclerotized diaphragmatic sclerite; basal knob present proximad ventral foramen; right paramere large, extending distad, bent mediad near base, terminating in dorsoventrally flattened, elongate paddle-shaped lobe; left paramere not evident; dorsal process of median lobe weakly sclerotized at base, with slightly ventrally curved process on right, weakly sclerotized, sac-like and apically granulose process on left side.

Etymology. This species is named for its remarkably large eyes.

Distribution. This species is known only from cloud forests north of the Río Pastaza, in EcoMinga's Río Machay Preserve, Tungurahua Province, Ecuador

Remarks. Recognizing that this species is related to the others in the genus is more difficult than distinguishing it from them. In general this species has more the appearance of a member of Proterini, with a sort of elongate-quadrate body form, deep subhumeral sulcus, elongate antennae, and serrate prosternum. But the similarities with the other species of *Chakanamecia* are more compelling, and the genitalia of all of them show important similarities to those of other Trichonychini.

Chakanamecia mora **sp. nov.**
DNA barcode: GenBank PX930325
Figs 76J–L

Type material. Holotype ♀ (MECN-EN 40825): "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13178, Morphosp. Mch.041"; deposited in MECN.

Diagnosis. (TL: 1.3mm) Body (Fig. 76J) small, orange, head very densely punctate, pronotum somewhat less so, elytra and abdomen more lightly punctate still; setae conspicuous, whitish, suberect; head broad, flat, widest at base, basal corners rounded, narrowed in front of eyes; fine median carina present at very base; vertexal foveae distinct, closer together than either is to eye, head smooth in broad longitudinal band of this width, depressed anteriorly behind raised frontal margin, frons slightly projecting at middle; eyes very small, berry-like, comprising 2–3 ommatidia; antennae compact, scape bulbous, barely wider than long, antennomere II narrower, globose, III–VIII small, short, increasingly transverse, IX–XI forming loose, club, IX–X transverse, XI about 4× as long as X, rounded at apex; pronotum cordate, widest in anterior half, sides distinctly serrate, narrowed to neck, less so to base; lateral foveae distinct, just behind midline, subbasal transverse sulcus limited to middle third, not reaching lateral foveae; anterior part of disk with deep median puncture just anterad subbasal sulcus; elytra short, flight wings absent, each elytron with close pair of sutural foveae and distinct lateral foveae, both with long, deep depressions posterad, reaching apical third of elytron; subhumeral fovea and stria distinct; prosternum with disk coarsely but sparsely punctate, anterior margin serrate, median carina weak; metaventrite with oblique depressions converging just anterad metacoxae.

Etymology. The species name refers to its 'berry-like' eyes, mora being a commonly consumed *Rubus* fruit in Ecuador.

Distribution. This species is known from cloud forests north of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. While the differences from other species of *Chakanamecia*, such as the highly flattened body and tiny protruding eyes, are obvious, the similarities deserve emphasis. This species shares one of the most significant characters of the genus, the coinjoined sutural and inner lateral elytral foveae, with deep impressions running posterad from both those and the outer lateral fovea. The multi-foveate pronotum, with the transverse basal sulcus are distinctive characters, as are the convergent metaventral depressions. Thus I have little doubt about its placement.

Although only a single female specimen was collected, and this will leave a number of ambiguities in our knowledge of the species, it is highly distinctive in characters that should be readily recognizable in the male, and it extends the variability of this interesting lineage further. This will be helpful to determine its place in the broader scheme of Trichonychini classification.

Chakanamecia pichan **sp. nov.**
Figs 76M–O, 77G–H

Type material. Holotype ♂ (QCAZ-I-280369): "ECUADOR: Pichincha: Quito, 27 km WNW, Campamiento Pichan (above Nono), 0°7'31"S, 78°33'56"W, 3350m, 22 OCT 1999, R. Anderson ECU1A99 202H, ex. cloud forest litter"; deposited in QCAZ.

Diagnosis. (TL: 1.1mm) This species is externally very similar to *C. micra*, differing principally in the following (Fig. 76M–O): male eyes slightly larger, comprising about 16 coarse ommatidia; frons slightly broader, median frontal depression deeper; basal antennomeres slightly

elongate, antennomere IX barely enlarged, club appearing two-segmented; base of pronotum slightly more strongly constricted; post-foveal depressions of elytra very short, barely developed. Aedeagus (Fig. 77G, H) with large basal bulb, diaphragm large and dorsobasal, without distinct diaphragmatic sclerite; apical foramen broadly open, with short, vertically laminate, subquadrate blade emerging from it, its dorsoapical corner subacute; tegmen ventral and extending from right side, slightly sinuate to narrowly broadly subacute apex, secondary process extending rightward from its underside.

Etymology. The species is named for the Río Pichán, in the upper reaches of which it was collected.

Distribution. This species is only known from high cloud forests northwest of Quito, Pichincha Province, Ecuador.

Remarks. This species is very similar to *Chakanamecia micra,* but in addition to highly distinct male genitalia, there are a few external characters by which to distinguish them, particularly the larger eyes and shorter longitudinal elytral depressions.

Cupiloides Caterino **gen. nov.**
Fig. 78

Type species. *Cupiloides joniceus*, by present designation.

Diagnosis. Body (Fig. 78A–C) very small, elongate, head and elytra wider than pronotum and abdomen; head weakly triangular, rounded posteriorly; pair of vertexal foveae present in line with posterior half of eyes, weak sulci slightly converging anterad; antennal bases weakly raised, frontal margin depressed between; last maxillary palpomere elongate oval, widest at base, narrowly subacute at apex; antennae compact, antennomere X asymmetrically cupuliform, interior edge longer than outer, more strongly sclerotized than XI, which is setose and narrowly rounded apically; pronotum about as wide as long, widest near front, sides rounded, smooth; lateral foveae deeply and slightly transversely impressed; subbasal transverse sulcus complete, 'Y'-shaped, with deep stem into median basal fovea; elytra elongate, widened to rear; flight wings present; each elytron with sutural and two lateral basal foveae, the inner lateral smaller than the outer lateral, the latter the origin of a short sulcus extending posterad; subhumeral fovea and subhumeral stria present; first three abdominal tergites similar in length, the first with basal longitudinal carinae slightly closer together than width of neck; prosternum short, convex, with one pair precoxal foveae; procoxae slightly projecting; metaventrite with setose median fovea and a setose lateral fovea elongated along elevated meso-metaventral suture; metacoxae contiguous; penultimate male ventrite longer than preceding, ultimate ventrite (penial plate) transversely oval, slightly asymmetrical; femora weakly clavate; 2nd tarsomeres wider and longer than 3rd. Aedeagus (Figs. 78D, E) with large, elongate basal bulb bearing narrow basal knob; paramere (representing both parameres fused?) very large, articulated at sides of ventral foramen, longer than median lobe, bifid distally, subapically setose along right edge; median lobe dorsoventrally compressed, sinuous, apically bifid, ending short of more massive paramere; inner armature present, difficult to resolve.

Etymology. The genus name refers to the similarity and presumed relationships to *Cupila* Casey. The name is masculine.

Remarks. This genus appears related to *Cupila*, *Trimiopsis* Reitter, and *Pseudotrimium* Raffray based on the seemingly significant character of having an asymmetrical tenth antennomere (not limited to the male sex). In review it was suggested that the species should be considered a member of the genus *Melba*. Although *Melba* is a large and diverse genus, I do not find species with a cupuliform subapical antennomere. I am not assigning it to any of these existing genera due to radically distinct male genitalia, with a single (fused?) paramere that is larger than the median lobe, with strong apical processes. *Cupiloides* also differs in some important external characters. In particular, it lacks the abdominal modifications common to male *Cupila* (Grigarick & Schuster 1968), and it lacks the head modifications of *Trimiopsis*. *Pseudotrimium* is apparently known from a single female specimen from an uncertain North American locality. So that genus retains a question mark as to male diagnostic features.

Cupiloides joniceus **sp. nov.**
Fig. 78

Type material. Holotype ♂ (MECN-EN 41755)**: "**ECUADOR: Pichincha, 0.0473˚S, 78.7619˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12786, Morphosp. Min.A.008"; deposited in MECN. **Paratypes** (6♂, 5♀): same data as type (MECN-EN 41756–41766).

Diagnosis. (TL: 1.5mm) Most significant characters are covered by the generic description. Some of the more likely species level characters are as follows: body (Fig. 78A) orange, rather inconspicuously setose, setae short and recumbent; antennae very short, scape cylindrical, little longer than wide, antennomere II globular, III–VIII half its width, transverse, IX disklike, a little wider than VIII, X almost twice width of IX, XI about three times length of maximum (inner) length of X; eyes moderately large, low on genae, comprising about 46 ommatidia; male mesotibia widened to apex with distinct inner apical tooth. Aedeagus (Fig. 78D, E) with paramere strongly hooked at left side of apex, with raised, roundly subquadrate lobe on right edge; median lobe deeply emarginate on left side, with short, quadrate process, right side longer, acute.

Etymology. I am pleased and proud to name this species for my younger son, Jonah Michael (who had a hand in Latinizing himself). He has helped me on numerous collecting trips, including the one that resulted in the discovery of this species, and made my adventures in Ecuador more fun and more meaningful.

Distribution. This species is known only from the cloud forest around Mindo, Pichincha Province, Ecuador.

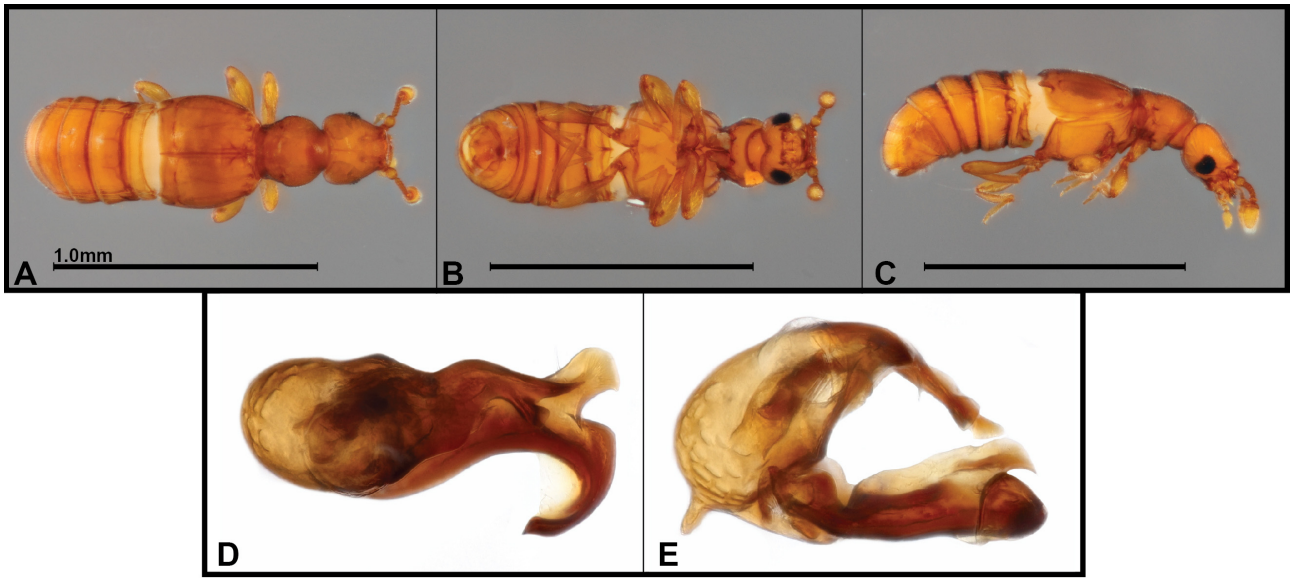

FIGURE 78. Photographs, *Cupiloides joniceus* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

Dalmosanus Park, 1952
Fig. 79

= *Pygmactium* Schuster & Grigarick, 1968
= *Triangusella* Park, 1952

This genus currently contains five known species, most from the Nearctic region, though two are known from Mexico (Chandler 1999, Asenjo *et al.* 2019b). Two new species are described below.

Diagnosis. (TL: 0.9–1.1mm, Avg. 1.0mm) Among Trimiina, *Dalmosanus* is distinguished by the combination of minute eyes in both sexes, capitate setae on the venter of the head, 2 basal foveae on each elytron, slightly separated metacoxae, and elytra with a subhumeral fovea and marginal sulcus. Several of the known species (of the former *Pygmactium* Schuster and Grigarick) have modifications on the sides of the male 2nd abdominal ventrites. This is not true of the species below, which seem only to show slight modifications of the male profemora. The aedeagus has been illustrated and described by Schuster and Grigarick (1968) and Grigarick and Schuster (1980) to have a distinct basal bulb with small dorsal diaphragm, and distinct, asymmetric, setose parameres flanking a simple median lobe.

Dalmosanus carinatus **sp. nov.**
Figs 79A–C, G–H

Type material. Holotype ♂ (MECN-EN 40797): "ECUADOR: Tungurahua, -1.3821˚, -78.2902˚, Río Machay Reserve, 2402m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13150, Morphosp. Mch.013"; deposited in MECN. **Paratypes** (5♂, 8♀, same general locality as type): 1: -1.3812˚, -78.2895˚, 2416m; 5: -1.3895˚, -78.2929˚, 2239m; 4: -1.3838˚, -78.2918˚, 2345m; 3: -1.3829˚, -78.2909˚, 2382m (MECN-EN 40210, 40278, 40297, 40280, 40249, 40245, 40225, 40233, 40230, 40247, 40289, 40282, 40237).

Diagnosis. (TL: 0.9mm) Body (Figs.79A) very small, orange, inconspicuously covered with fine recumbent setae; head elongate triangular, sides subparallel at base; occipital margin emarginate; vertexal foveae strongly depressed, not sulcate; deep median depression present between antennal bases; weak carinae diverging posterad from antennal bases, separating frons from genae; eyes very small (in both sexes) very low on genae, comprising only 3–4 ommatidia; antennae compact, basal two antennomeres cylindrical, about as long as wide, antennomere III conical, IV–VII beadlike, increasing slightly in width and becoming transverse, VIII–X widening and becoming disklike, XI large, rounded, and setose, ~8× as long as X; venter of head with about 8 long, capitate setae; pronotum widest behind middle, evenly rounded to apex, more abruptly narrowed to base; lateral foveae deeply impressed; basal sulcus absent, but median basal third of disk deeply and broadly depressed; elytra with sloped humeri (flight wings absent), widening to apex, each with sutural and one lateral fovea, slightly raised along basal margins; complete sutural stria present; subhumeral fovea deeply impressed, visible from above, with deep subhumeral sulcus posterad; first visible tergite slightly longer than second, with pair of short median longitudinal carinae; paratergites present on first three segments, narrow; length of prosternum in front of coxae about equal to procoxal width, disk lacking carina, anterior margin weakly serrate; precoxal foveae absent; hypomeral suture distinct at sides; procoxae weakly projecting; meso- and metacoxae contiguous; metaventrite short and smooth; 1st visible ventrite crenulate along basal margin, with longitudinal carina on each side, from half length of segment to nearly complete (Fig. 79B, C); male femora slightly thicker than those of female; secondary sexual

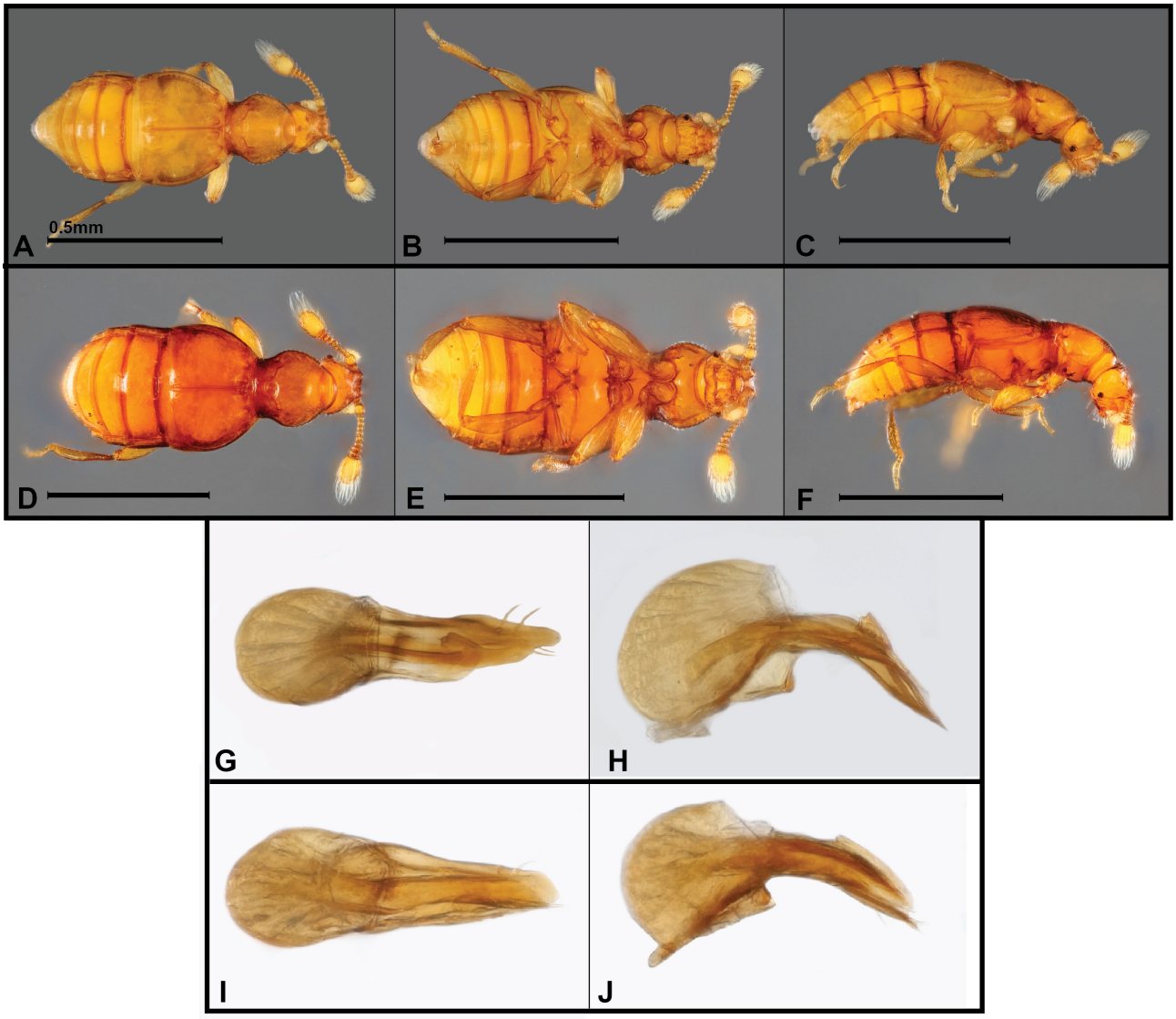

FIGURE 79. Photographs, *Dalmosanus* spp. **A–C, G, H** *D. carinatus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *D. myops* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 0.5mm.

characters otherwise not evident. Aedeagus (Fig. 79G, H) with large basal bulb, small basal knob, without dorsal diaphragm, but open apically above ventral processes (parameres?); basal keel strong; ventral process curves downward strongly basad midpoint, apex narrowly rounded, with pair of strong subapical setae along right margin and closer, more apical pair along left margin; eversible armature laying atop ventral processes, with blunt, median recurved hook, extending to narrowly rounded apex.

Etymology. The name of this species refers to the lateral carinae of the 1st abdominal ventrite.

Distribution. This species is known only from cloud forests north of the Río Pastaza, in EcoMinga's Río Machay Preserve, Tungurahua Province, Ecuador.

Remarks. This species and the following are very similar and closely related, but may be separated by aedeagal and abdominal characters (in both sexes) as detailed below.

Dalmosanus myops **sp. nov.**
Figs 79D–F, I–J

Type material. Holotype ♂ (MECN-EN 40834): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13187, Morphosp. Cnd.003"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 40349).

Diagnosis. (TL: 1.1mm) This species is very similar to the preceding, differing principally in the following characters; 1st abdominal ventrite without long carina at side (Fig. 79F); Aedeagus (Fig. 79I, J) smaller, basal bulb lower and ratio of basal bulb length to median lobe length smaller; ventral keel less pronounced and more basal; ventral process of aedeagus straighter, curving ventrad only weakly, its apex broader and obliquely truncate; articulated median process sinuate along its length, apically simple.

Etymology. The species name comes from its reduced eyes.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. The differences between this species and the preceding are small, but, especially for a minute flightless species, seem reasonably supportive of separate species status. The two type localities are separated by a deep canyon (1000m lower) of rather different habitat. They may be separated without dissection by the lack of a lateral longitudinal carina of the 1st abdominal ventrite in *D. myops*.

Meandrophilus Caterino **gen. nov.**

Fig. 80

Type species. *Meandrophilus petrus*, by present designation.

Diagnosis. Body (Figs. 80A–C) rather short; head narrower than pronotum which is narrower than elytra, lateral margins of elytra and abdomen forming smooth curve; head widest at eyes, narrowed slightly to abrupt neck; posterior margin weakly emarginate, with distinct dorsal denticle on each side of occipital margin, separated by about width between antennal bases; vertexal foveae widely separated, located just behind antennal elevations, epistoma prolonged slightly beyond antennal bases, rounded; labrum short, wide, weakly emarginate; eyes small in both sexes, with 4–5 ommatidia; antennae geniculate, scape as long as next 6 antennomeres combined, narrowed slightly from base to apex, antennomere II weakly conical, III–VIII short, transverse, increasing slightly in width, IX–XI forming compact club; head beneath with rather dense beard of setae; pronotum widest in front, sides weakly crenulate, rather strongly but evenly constricted posterad; lateral foveae present, small, connected by weak transverse sulcus, base of pronotum behind sulcus slightly flattened; elytra rather long, sides rounded, widened to rear, each with sutural and two, close-set lateral foveae; sutural and discal striae absent; first three abdominal tergites similar in length, 4th longer, without carinae; paratergites distinct on first three abdominal segments, narrow; prosternum longer in front of coxae than procoxal length, slightly depressed around distinct precoxal foveae, smooth and glabrous between distinct hypomeral striae; procoxae prominent; metaventrite with inner and outer lateral foveae present and setose; meso- and metacoxae contiguous; male last ventrite simply depressed, lacking other obvious sexual dimorphisms. Aedeagus (Fig. 80D, E) with large, upright basal bulb lacking distinct dorsal diaphragm; elongate ventral process (fused parameres?) extending from apicoventral edge of basal bulb; dorsal process of median lobe articulated around upper circumference of basal bulb, deflexed ventrad, widening slightly to bifid apex.

Remarks. This genus exhibits features of a few Euplectite tribes and subtribes. It has a Trogastrine-like beard of ventral head setae, and the elongate prosternum would be consistent with that association as well. But the general habitus is rather different, particularly the narrowed pronotum lacking a median sulcus. The male genitalia are also unlike most Trogastrina. I have assigned it to Trichonychini on the basis of the presence of distinct (if narrow) paratergites, presence of a subhumeral fovea, lack of a median pronotal sulcus, and lack of a separate penial plate, but leave it unplaced to subtribe. In review it was suggested potentially to be a member of Iniocyphini. That tribe, however, typically has symmetrical male genitalia, and members have the 1st and 2nd visible abdominal sternites similar in length. Reassessment of placement nonetheless should be considered in future revisions.

Etymology. The name of this genus refers to the river meanders, or oxbows, along the Cuyabeno where it was discovered.

Meandrophilus petrus **sp. nov.**

Fig. 80

Type material. Holotype ♂ (MECN-EN 40748): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13093, Morphosp. Cu.010" / "MECN-EN 40748"; deposited in MECN. **Paratype** (1♀): same general locality but 0.2044˚, -75.9267˚, 1.XII.2024 (MECN-EN 40488).

Diagnosis. (TL: 1.1mm) The genus diagnosis covers most of the characters necessary to recognize this species, but a few additional characters may be useful at the species level: body (Fig. 80A) rather densely setose, most setae subrecumbent, with slightly longer erect setae interspersed; head rather coarsely but shallowly punctate; base of pronotum punctate, anteriorly smoother; setal bases of elytra slightly raised, giving their punctures an uneven surface; metaventrite (Fig. 80B) rather densely punctate. Aedeagus (Fig. 80D, E) with apex of ventral process bent right from base, curving back to left, apex bifid, with bluntly triangular marginal process and longer, rounded apical lobe; dorsal median process narrowed from base, then widening out slightly, with right side developed into a prominent, recurved apical hook opposed to a strong, blunt basal plate.

Etymology. I am pleased to be able to name this species for my older son, Peter Roderick, whose help, interest, support, and love over the years have kept me motivated. He assisted with the collection of this species on our unforgettable family trip to the Amazon. It is used as a noun in apposition.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

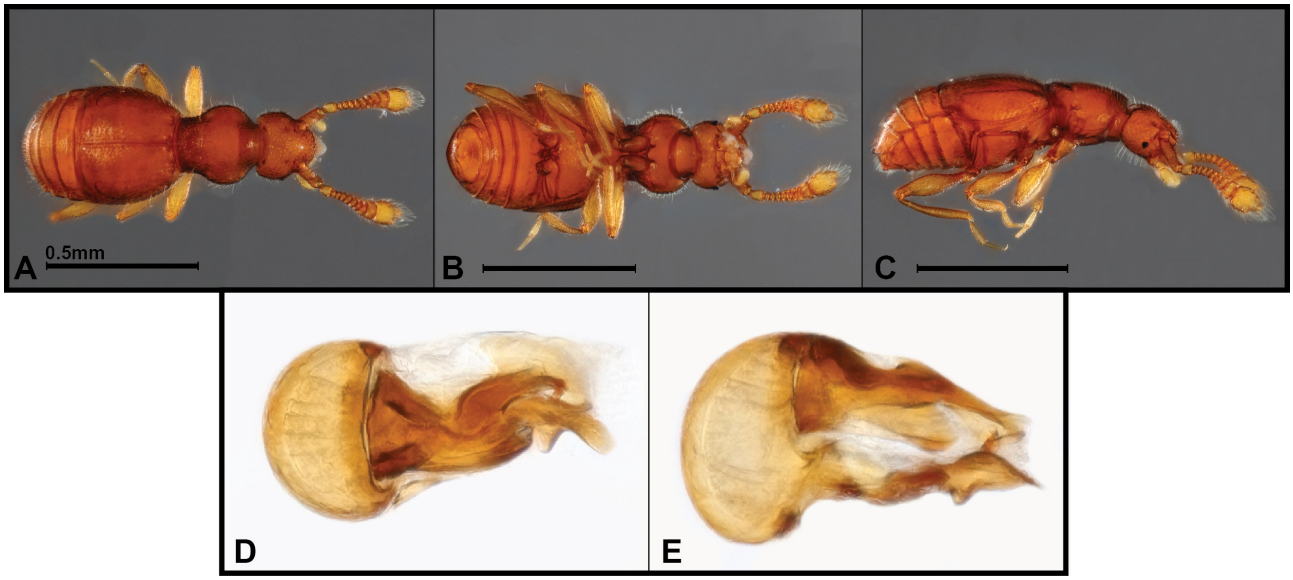

FIGURE 80. Photographs, *Meandrophilus petrus* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 0.5mm.

Melba Casey, 1897
Fig. 81

Fourteen species of this large and diverse New World genus are known from Latin America, the nearest from French Guiana and Brazil (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. Like most Trimiina, *Melba* species are typically small, have a single-segmented antennal club, have bifoveate elytra, capitate setae on the venter of the head, and an oval penial plate in the male. *Melba* are further distinguished by a non-carinate prosternum, contiguous metacoxae, non-dentate elytral humeri, presence of a laterally located (and thus invisible from above) pronotal fovea, presence of a fine marginal epipleural stria (Park 1952b), and four sensory foveae on the inner margin of the profemur (Grigarick & Schuster 1980). Park (1942) notes that males of many species have modifications of, usually, the mesothoracic legs, which may include femoral swelling and/or tibial modifications from setose swellings to proper teeth. The male genitalia have been illustrated for a few species by Park (1952b) and Chandler (1989b) to have a distinct, round basal bulb with dorsal or apicodorsal diaphragm, no free parameres, a broad tegmen that is variously ornamented apically, usually with at least one setose lobe, and an articulated, rod-like inner armature.

Remarks. Park (1942, 1952b) recognized six subgenera in addition to the nominate one. None of these have been critically evaluated, and most authors have emphasized close relationships of *Melba* to various other Trimiine genera. Grigarick & Schuster (1980) summarize that 'a complete revision of the genus is needed.'

Melba tabugae **sp. nov.**
DNA barcode: GenBank PX930302
Fig. 81

Type material. Holotype ♂ (ZSFQ-i23257): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12686, Morphosp. LL.A.022"; deposited in MECN. **Paratypes** (4♂, 7♀): same data as type (ZSFQ-i15253–i15256, i23258–i23264).

Diagnosis. (TL: 1.1mm) Head (Fig. 81A) subtriangular, eyes slightly protuberant; vertex with shallow pair of inconspicuous foveae; antennae short, with single, enlarged club segment; pronotal sides widest apically, narrowed at base, with curved transverse basal impression, no pronotal foveae present; each elytron with sutural and one humeral basal foveae, humeral fovea continued posterad by poorly defined elongate impression; subhumeral fovea absent; profemur with short series of incisions along inner basal margin; last male abdominal ventrite depressed, setose, and weakly emarginate. Aedeagus (Fig. 81D, E) large, elongate, with rounded basal bulb, small basal foramen ventrally and larger dorsal diaphragm; tegmen slightly widened and deeply emarginate apically, edges with small dentate processes; inner extensible armature present.

Etymology. This species is named for the small town of Tabuga, near which this species was collected.

Distribution. This species is known only from coastal lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. Based on the lack of unusual dimorphisms, and the presence of an oblique subhumeral elytral line, this species, as most of the genus, would belong in *Melba* s. str.

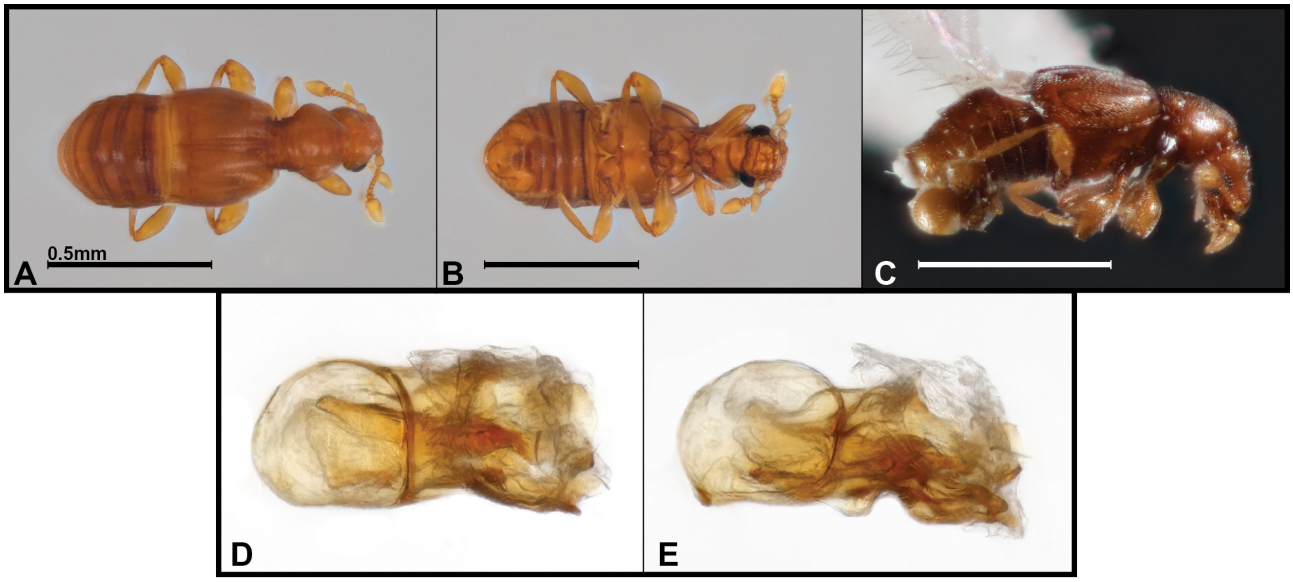

FIGURE 81. Photographs, *Melba tabugae* **A–C** Body: dorsal, ventral, lateral views **D, E** Aedeagus: dorsal, lateral views. Scale bars = 0.5mm.

Pachamelba Caterino, **gen. nov.**
Fig. 82

Type species. *Pachamelba yanayacu* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.3–1.4mm, Avg. 1.35mm) Among Trimiina, this new genus appears closest to *Dalmomelba* Park 1954b (which is known only from the Bahamas). They share a general body form with the pronotum narrower than the elytra or head, lacking capitate setae beneath the head (having only short, sparse setae), in form of the maxillary palpi, in the elongate second tarsomeres, in possessing lateral modifications of the male basal abdominal ventrites, and in the relatively simple aedeagal form. The aedeagus has a prominent basal bulb with a membraneous dorsoapical diaphragm, both parameres apparently present but differentially developed, each with setae (not necessarily apical), a short median lobe, and a relatively simple but distinct, articulated internal rod. This genus differs most substantially from *Dalmomelba* in the elongate pronotum with a distinctly angulate subbasal transverse sulcus, possession of distinct subhumeral elytral foveae, relatively narrowly separated metacoxae, and elongate rather than transversely oval male penial plate. The body in general is rather elongate, not only the pronotum.

Etymology. The generic name combines the Kichwa 'Pacha', or 'world', with the Trichonychine stem *-melba*. It is feminine.

Distribution. This genus is known from two species collected in cloud forest leaf litter at the Estación Biologica Yanayacu, in western Napo Province, one species from the Otonga Reserve in northern Cotopaxi on the other side of the Andean crest, and female specimens of what are likely distinct species from Volcán Pululahua and El Pahuma Orchid Reserve in northern Pichincha.

Pachamelba yanayacu **sp. nov.**
DNA barcode: GenBank PX930391
Figs 82A–F

Type material. Holotype ♂ (MECN-EN 41698): "ECUADOR: Napo, -0.5958˚, -77.8927˚, Est. Biol. Yanayacu, Aburrian Tr., 2233m, 10.IX.2024, sifted litter, M.Caterino"; deposited in MECN. **Paratypes** (17♂, 2♀): same general locality as type; 7: same data as type (1♂: "Caterino DNA voucher, Ext. MSC-12994, Morphosp. Yn.A.063"); 9: -0.5935˚, 77.8982˚, Piha Tr., 2356m; 2: -0.5945˚, 77.9003˚, Piha Tr., 2397m; 2: -0.5934˚, 77.8922˚, Aburrian Tr., 2198m (MECN-EN 41699–41717).

Diagnosis. (TL: 1.4mm) Body (Fig. 82A) somewhat tricolored, with dark reddish pronotum and elytra, lighter head and abdomen, and lighter legs and distal antennomeres; body setae short, sparse, recumbent, integument smooth and shining; head slightly elongate subtriangular, wider than pronotum, basal corners rounded; vertex convex; vertexal foveae deeply impressed in front of convexity; eyes prominent, diameter about equal to post-ocular genal length; antennal bases separated, frontal shelf slightly elevated at corners over antennal bases; antennae short, with scape subcylindrical (though base is slightly curved upward), antennomere II thick, elongate subquadrate, III elongate subconical, IV–VII beadlike, VIII–X increasingly transverse, X disklike, XI forming single-segmented club, widest at base, evenly narrowed to rounded apex; pronotum about a third longer than wide, widest in front, posterior part of lateral margin weakly emarginate, anterior part of disk convex; lateral subbasal foveae impressed, transverse subbasal sulcus curved at sides, angulate at middle; elytra long, sides rounded, each with large sutural and single, slightly smaller lateral dorsobasal fovea, the elytral disk weakly impressed for short distance behind each; flight wings present;

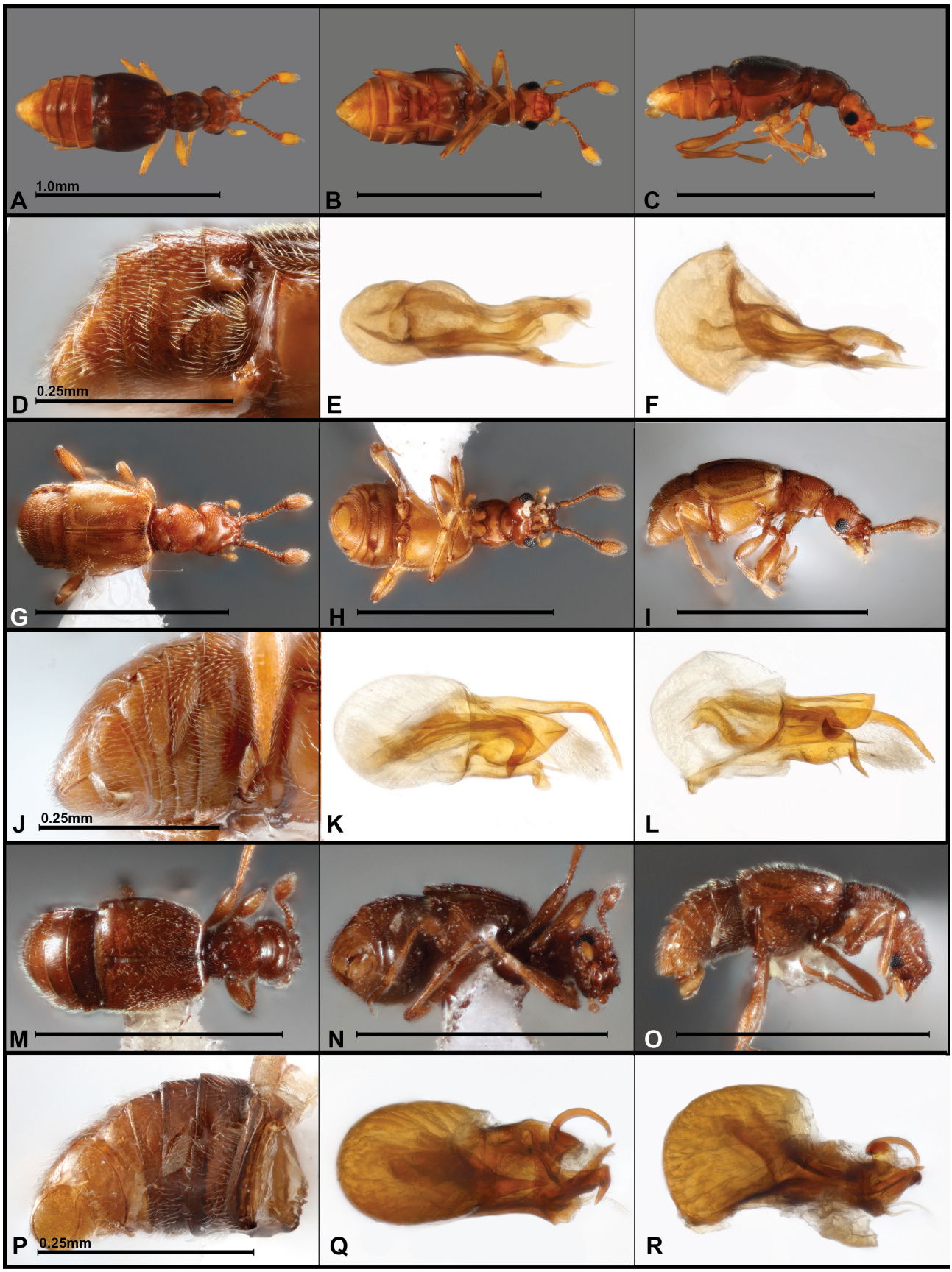

FIGURE 82. Photographs, *Pachamelba* spp. **A–F** *P. yanayacu* (body: dorsal, ventral, lateral, detail of abdomen; aedeagus: dorsal, lateral) **G–L** *P. subtilis* (body: dorsal, ventral, lateral, detail of abdomen; aedeagus: dorsal, lateral) **M–R** *P. otongachi* (body: dorsal, ventral, lateral, detail of abdomen; aedeagus: dorsal, lateral). Scale bars = 1.0mm unless otherwise indicated.

subhumeral fovea present, subhumeral stria complete; abdominal tergites similar in median length; male 2nd and 3rd abdominal ventrites (Fig. 82D) modified at sides, a continuous setose incision appearing to continue from anterior lateral corner of 2nd ventrite, wide at base, then sinuate and narrowing to continue mediad on anterior half of 3rd; 2nd male abdominal ventrite also with semicircular apical plate extending posterad medial to this incision, overhanging a slightly larger basal depression of 3rd ventrite; penial plate elongate oval. Aedeagus (Fig. 82E, F) with large basal bulb, dorsally convex, dorsal diaphragm distal above median lobe; both parameres apparently present, borne on common base, deeply emarginate between; left paramere shorter, slightly arched upward from near basal foramen, then narrowed downward, with apical setae; left paramere longer, emarginate on outer edge, bluntly truncate at apex, with three subapical setae; median lobe short, narrow, curving and with narrowly rounded apex; inner articulated rod present, extending from basal bulb, slightly sinuous, curved ventrad at apex.

Etymology. This species is named for the Yanayacu Biological Station where it was found.

Distribution. This species is known only from the cloud forests at the type locality, at about 2000m in the Napo Province of Ecuador.

Remarks. Males of the two Yanayacu species of *Pachamelba* can be relatively easily distinguished by the distinct abdominal modifications, with *P. yanayacu* having more deeply incised arcs that include parts of the 2nd and 3rd visible abdominal ventrites.

Pachamelba subtilis **sp. nov.**
DNA barcode: GenBank PX930392
Figs 82G–L

Type material. Holotype ♂ (MECN-EN 41719): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Piha Tr., 2386m, .IX.2024, sifted litter, M.Caterino"; deposited in MECN. **Paratype** (1♂): same data as type (MECN-EN 41718).

Diagnosis. (TL: 1.3mm) This species is almost indistinguishable from the preceding, differing principally in the following characters: body (Fig. 82G) slightly lighter in color, orange; pronotum shorter, slightly broader, sides more distinctly denticulate, basal margin slightly reflexed; elytra longer, more parallel-sided; male 1st visible abdominal ventrite (Fig. 82J) with small projection of posterior margin on either side, behind middle of metacoxa, more densely setose than rest of margin; 2nd visible ventrite depressed immediately behind and slightly mediad these processes. Aedeagus (Fig. 82K, L) with large basal bulb, ventrobasal knob small, dorsal diaphragm rather large and membraneous; both parameres present, right paramere elongate, narrow, strongly bent leftward to subacute apex, bearing two strong setae at its base; left paramere about half its length, thicker, bent perpendicularly ventrolaterad at apex, with two strong setae near the bend on the dorsal surface, and two shorter setae beneath; median lobe subtriangular, sides rounded, apex subacute, extending two-thirds length of longer paramere, a membraneous and apically fimbriate sac extending beneath it; internal armature comprising a strongly sclerotized hook recurved toward left.

Etymology. The species name comes from the relatively subtle modifications of the male abdominal ventrites.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species was initially sorted with the preceding as simply teneral individuals, but closer examination of the modifications of the male ventrites revealed them to be quite distinct, albeit subtle. Those of *P. subtilis* comprise weak extensions of abdominal ventrite 2 over depressions of the 3rd ventrite.

Pachamelba otongachi **sp. nov.**
Figs 82M–R

Type material. Holotype ♂ (QCAZ-I-280364): "ECUADOR COTOPAXI OTONGA 2000m, 00°19'11''S, 78°57'00''W, 29MAR2000, IG.Tapia&P.Ponce" / "CH1" / "MSC-13367"; deposited in QCAZ. **Paratype** (3♂, 1♀): 3: same general locality as type, but: 29MAR2000, 9JUL2000, 01JUL2000; 1: Otonga, 00°25'S, 79°00'W, 2AUG1997 (QCAZ-I-280365–280368).

Diagnosis. (TL: 2.5mm) This species differs in few external characters from *P. yanayacu,* except in male secondary characters: male 1st visible abdominal sternite (Fig. 82P) with small oblique depression about midway between midline and lateral margin, with very small apical tubercle at its inner edge; each side of male 2nd visible sternite with oblique, flattened, very slightly raised disk behind depression of the 1st, appearing matte due to presence of very short, fine, dense setae, the inner apex of the disk extending just slightly beyond the margin of the segment. Aedeagus (Fig. 82Q, R) with large basal bulb about half total aedeagus length, diaphragm located apically above tegmen; left paramere bearing two long, curved apical spines; tegmen complex, extending distad from lower half of basal bulb, right side with prominent, subapical, dorsolaterally arched hook, left apex with more strongly bent spine and straight, acute process; inner armature comprising basally broad and sinuate process, narrowing to acute tip laying on top of tegmen in repose.

Etymology. This species is named for the research station founded by Giovanni Onore and the Fundacion Otonga, located near the town of La Union del Toachi.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species can be recognized by the distinctive, densely setose male abdominal disks, and the unique aedeagus.

Placamecia Caterino, **gen. nov.**
Fig. 83

Type species. *Placamecia virgenensis*, **sp. nov.**, presently designated.

Diagnosis. This genus shares with other Euplectitae the distinct abdominal paratergites, contiguous, projecting metacoxae, and broad, shield-like pronotum (Fig. 83A). With other Trichonychini it shares the distinct penial plate. Among Trichonychini, it exhibits a mix of characters that obscure subtribal placement. Body generally elongate, slightly flattened, and unevenly parallel-sided; head broad, flat, widest at base, with rounded basal corners, subtruncate across front; vertexal foveae deeply impressed, with broadly arcuate anterior sulcus connecting them; antennae elongate with three segmented club; maxillary palpi with moderately long, stalked 2nd palpomere, short, triangular penultimate palpomere, and elongate oval terminal palpomere, narrowed at apex and bearing short palpal cone; gula flat, with deep basal fovea; pronotum broad, flat, with deep lateral foveae, shallow median fovea, with biarcuate transverse sulcus; very fine, shallow median longitudinal sulcus; prothorax rather strongly constricted at base; elytra with large sutural and one small lateral fovea; basal carina complete, slightly separated anterad foveae; sutural stria complete; subhumeral fovea and stria present, humerus weakly dentate; first three abdominal tergites similar in length, lacking carinae or other modifications; prosternum lacking median carina, anterior margin smooth; mesocoxae contiguous; metacoxae contiguous and strongly projecting; median metaventral foveae absent; lateral metaventral fovea large, setose; femora robust, rather short, tibiae short, slender, setose; 2nd tarsomeres slightly enlarged, especially 2nd protarsomere of male, setose beneath, terminal tarsomere longer, slender; tarsi with single large claw; male metaventrites unmodified; penultimate ventrite deeply emarginate; penial plate elongate oval. Aedeagus (Fig. 83D–F) elongate, slender; basal bulb distinct, with round dorsal diaphragm bearing distinct, albeit weakly sclerotized diaphragmatic sclerite; rather long basal knob present basad ventral foramen; parameres present, asymmetrical; median lobe with three slender apical processes of varied lengths.

Etymology. The name of the genus combines the Spanish 'Placa-', or shield' with the ending *-mecia*, indicating its similarity to other so-named genera, such as *Euplectamecia* and *Panaramecia*. It is feminine.

Remarks. This genus is quite possibly a highly modifed, high elevation offshoot of a more widely distributed genus (something like *Euplectamecia* Park), having diverged in general appearance due to flightlessness and other adaptations to a novel environment. However, any such obvious connections are unclear, and its recognition at the generic level is useful to calling attention to its uniqueness. That said, it is also possible that not all related species will be flightless and as strongly modified. As with other Pselaphine genera that are found in Andean páramo (eg. *Panabachia, Jubus, Arthmius*) it may be that there will be more, related species restricted to other mountains in the region.

Placamecia virgenensis **sp. nov.**
Fig. 83

Type material. Holotype ♂ (QCAZ-I-280232/MECN-EN 40699): "ECUADOR: Pichincha, -0.30795˚, -78.23255˚, La Virgen, 3694m, 28JUL2016, S. Muñoz & R.Tobar, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13043, Morphosp. Virgen1"; deposited in QCAZ. **Paratype** (1♀): same data as type (QCAZ-I-280233).

Diagnosis. (TL: 2.3mm) In addition to the generic level characters detailed above, the body of this species (Fig. 83A–C) is light brown, sparsely covered with short, suberect setae, with a few longer erect setae intermingled; all body surfaces smooth, with fine, sparse punctures

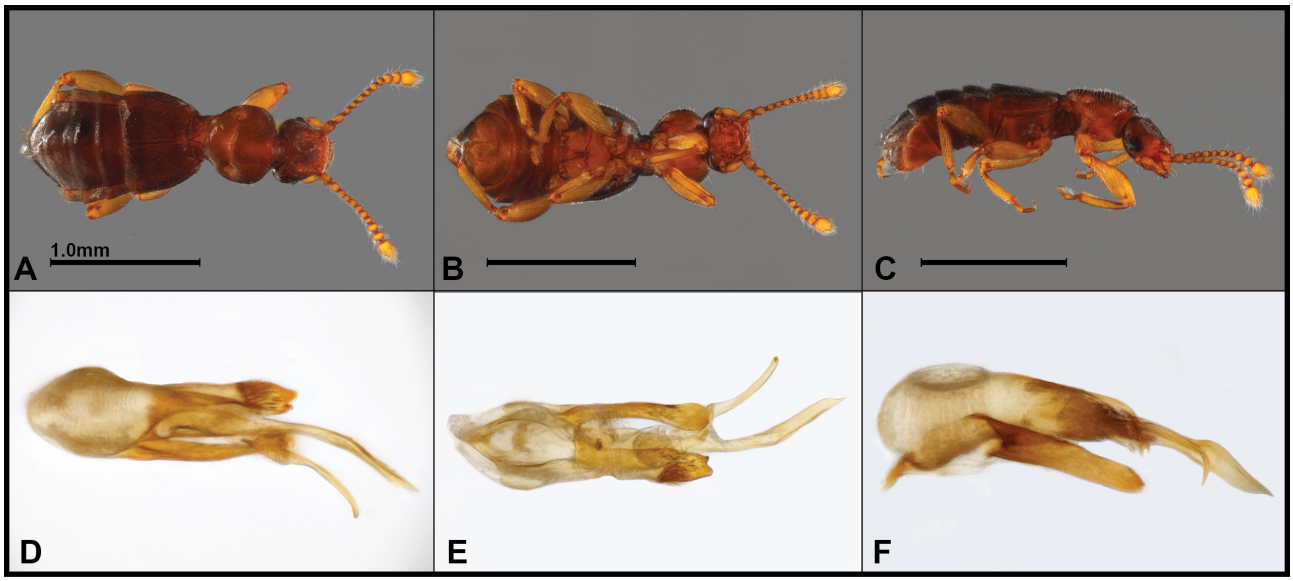

FIGURE 83. Photographs, *Placamecia virgenensis* **A–C** Body: dorsal, ventral, lateral views **D–F** Aedeagus: dorsal, lateral, ventral views. Scale bars = 1.0mm.

mostly evident on the elytra and abdominal tergites; eyes small, diameter about one-third post-ocular genal length, comprising about 14 small facets; antennae elongate, scape cylindrical, about twice as wide as long, antennomere II narrow at base, widening to apex, almost twice as long as wide, III conical, IV–VII beadlike to slightly elongate, VIII shorter, rounded, IX–XI forming loose club, IX and X with sides rounded, shorter than wide, XI widest at base, narrowed in apical two-thirds to subacute apex; pronotum very broad, with sides rounded, widest toward front, narrowed to very short anterior collar less than one-third maximum width, narrowed to base about one-half maximum width; elytra short, about two-thirds as long as conjoined apical width; large sutural fovea with pronounced basal rim; flight wings absent; male metatrochanters dentate at apices; otherwise lacking in obvious secondary sexual characters. Female last ventrite weakly bituberculate at apex; female last tergite narrowly and briefly carinate at apex. Aedeagus (Fig. 83D–F) elongate, slender; basal bulb longer than wide, dorsal diaphragm present; right paramere dorsoventrally flattened, apex broad, unevenly bifid, with outer tooth larger, with distinct transverse, subapical row of strong setae; left paramere laterally compressed, wide, narrowing only to more or less rounded apex; dorsal median lobe process shorter than parameres, offset to right, narrowed to acute apex; main, central median lobe process wide at base, narrowing to long, slender, curving, then slightly widening (laterally compressed) subacute apex; additional distal process articulated one-third from base of median process, abruptly narrowed before midpoint, shorter than but curving in parallel to long median process, apex curved downward and narrowly rounded.

Etymology. This species name comes from the monument to La Virgen at the pass along Hwy E20, near the type locality, that separates Pichincha from Napo Province.

Distribution. This species is only known from páramo habitats near Papallacta, southeast of Quito, Pichincha Province, Ecuador.

Thesiastes Casey, 1893
Fig. 84

This genus is known from 17 species, from the Nearctic to Chile, and extending into the Oriental and Afrotropical realms as well (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. Published diagnoses of *Thesiastes* (e.g. Park 1952b) mainly emphasize the similarity with *Euplectus*, but with the distinction of having a penial plate in the male, rather than a subdivided last ventrite. Accordingly, the genus is no longer included in Euplectini, but Trichonychini (Panaphantina). *Thesiastes* typically exhibit a variously interrupted median longitudinal sulcus on the pronotum, three elytral foveae, distinct subhumeral and lateral metasternal foveae, setose depressions on the basal abdominal tergites, and capitate setae on the ventral surface of the head. The male genitalia have a large basal bulb, a strong ventral, parameral shelf, and a complex median lobe above it (see, e.g., Chandler 1989). The new species described below conforms in nearly all these respects, except it lacks capitate ventral head setae.

Thesiastes stellata **sp. nov.**
Fig. 84

Type material. Holotype ♂ (ZSFQ-i13685): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12720, Morphosp. ElP.A.086"; deposited in ZSFQ.

Diagnosis. (TL: 1.6mm) Body (Fig. 84A) elongate, setose, somewhat parallel-sided, rather dark, pronotum

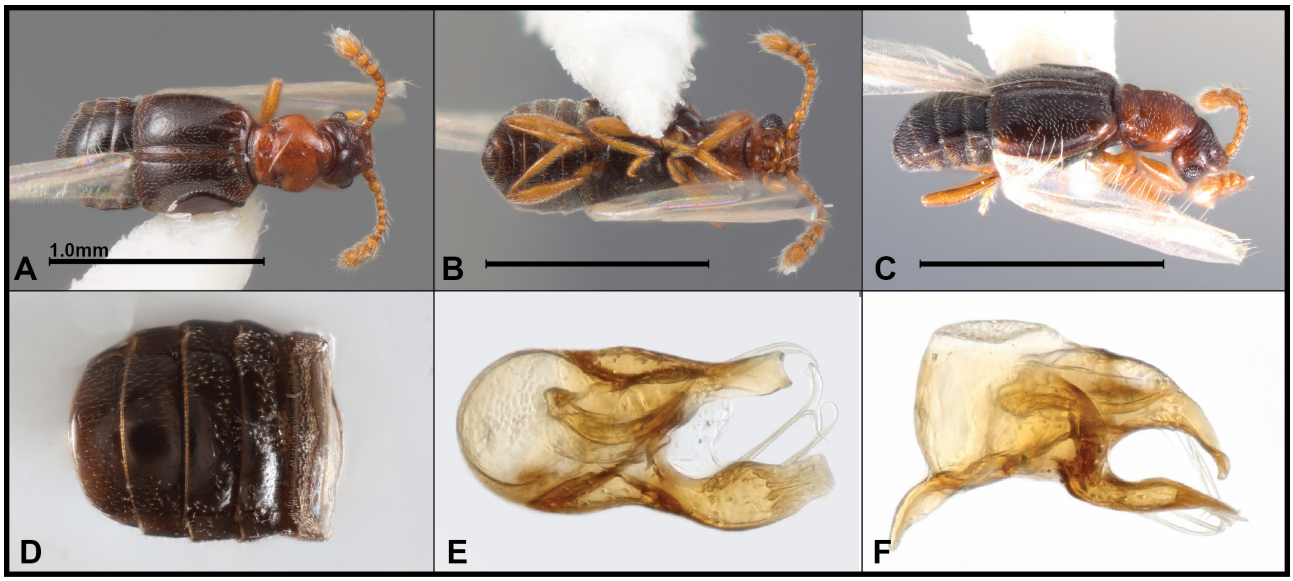

FIGURE 84. Photographs, *Thesiastes stellata* **A–C** Body: dorsal, ventral, lateral views **D** detailed dorsal view of abdomen **E, F** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

and, less so, head lighter; head smooth, setose; eyes protuberant, moderately coarsely faceted, vertex with deep setose foveae, no vertexal sulci, antennal base slightly swollen, with fine groove along posterior edge; epistoma smooth, labrum broadly emarginate, sides rounded; antennomere I short, cylindrical, II large and bead-like, III–VI smaller and bead-like, VII more quadrate, VIII smaller and transverse, IX–XI forming a distinct loose club; pronotum widened from base, anterior corners broadly rounded, margins finely serrate, disk with large setose lateral foveae, weakly impressed transverse groove connecting them through indistinct, round median depression; each elytron with four small dorsobasal foveae, third from suture continued posterad by weak impression; subhumeral fovea and complete stria present; abdominal tergites 2 and 3 with shallow mediobasal depressions with short scale-like setae; male metatrochanter with small basal tooth. Aedeagus (Fig. 84E, F) with large, elongate oval basal bulb with spike-like basal process, with small ventral basal foramen, larger dorsal diaphragm; left side of tegmen extended as twisted, dorsal sinuate plate, subtruncate apically; right side of tegmen extended as broader ventral process, widened at middle, narrower and weakly quadrate at apex, bearing several long, curved setae along its inner edge; internal extensible armature comprising two long, curved, apically acute processes.

Etymology. This species name refers to the stellate lateral pronotal foveae.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species could equally well (or equally awkwardly) go in either *Euplectamecia* or *Thesiastes*. It lacks the capitate setae alleged to be common to *Thesiastes* (Park, 1952). But I take that to be a weaker conflict than with the smooth, non-sulcate pronotum shown by the sole described species of *Euplectamecia*. *Euplectamecia* also have a subdivided last male ventrite instead of a penial plate, as seen in this species and *Thesiastes* in general.

Thesium Casey, 1884
Fig. 85

There are 16 described species of *Thesium*, from the Nearctic through Brazil (Asenjo *et al.* 2019). The nearest locality in South America for any other species is southeastern Brazil. Species have also been described from Guatemala. Three new species are described below.

Diagnosis. (TL: 1.1–1.6mm, Avg. 1.2mm) *Thesium* is among the more distinctive Euplectite genera, sharing the elongate, parallel-sided body form with many, but having a distinctive two-segmented antennal club, separated mesocoxal cavities, a basally narrowed pronotum with serrate margin, a medianly carinate prosternum, and very conspicuous frontal, lateral pronotal, and basal elytral foveae. It shares a serrate prosternal margin with a number of related and perhaps some unrelated genera (such as *Chanakamecia* gen. nov., and *Verabarolus* Park, respectively). The male genitalia of *T. cavifrons* (LeConte) and *T. fasiculatus* Park have been illustrated previously (Park 1952b and Grigarick & Schuster 1980), both showing a narrow, elongate basal bulb, continuous with a short median lobe with small basal foramen, and what appears to be a single long paramere extending from one side. Those of the species described below are quite different, from this and from each other.

Thesium apicale **sp. nov.**
DNA barcodes: GenBank PX930201, PX930358
Figs 85A–C, J–K

Type material. Holotype ♂ (MECN-EN 41750): "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12770, Morphosp. Bar.A.002". Bar.A.002"; deposited in MECN. **Paratypes.** (1♂, 2♀): same data as type (MECN-EN 41751–41753). **Other material:** 1♂: "ECUADOR: Pichincha, 0.0914˚, -78.5164˚, Res. Geobot. Pululahua, Cascada de la Peña, 1715m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12922, Morphosp. Pul.A.016." (MECN-EN 41754).

Diagnosis. (TL: 1.1mm) Body (Fig. 85A) reddish orange, elytral apices and base of head darker, with numerous semirecumbent setae, longer erect setae interspersed; head widest at base, narrowed anterad; vertexal foveae deep, closer to eyes than to each other, sulci extending anteromediad to meet in frontal depression; eyes very large, occupying entire genae, rather finely faceted; antennal bases slightly elevated and projecting across front, epistoma recessed beneath; antennae short, scape cylindrical, about 1.5× as long as wide, antennomere II globular, shorter, III weakly conical, IV–VIII transverse, increasing in width, IX similar in width to VIII, thicker, X–XI forming club, X weakly cupped, XI about 2.25× as long as X, narrowed abruptly near apex, middle projecting, apex setose; pronotum widest near front, sides rounded, finely denticulate, slightly concave narrowing to rear; lateral foveae rather far forward, median fovea absent, a slightly arcuate transverse sulcus connecting laterals, fragments of longitudinal median sulcus present anteriorly; elytra subparallel-sided (winged), each with sutural and two lateral basal foveae, the inner closer to sutural than to outer, humeri slightly dentate at well-developed subhumeral fovea; subhumeral stria well-developed. Aedeagus (Fig. 85J, K) with basal bulb convex, short, with small vertical basal apodeme; set off by weak constriction from distal portion, with small ventral basal foramen and larger, dorsal diaphragm; diaphragmatic sclerite weak; tegmen slightly widened from base, deeply subdivided into long, curved left and right distal rods, the right one dorsally crested, along base, elevated and weakly hooked apically, the left narrowing more evenly to subacute apex below; median lobe between them largely membraneous, its wide, unevenly rounded apex densely setose.

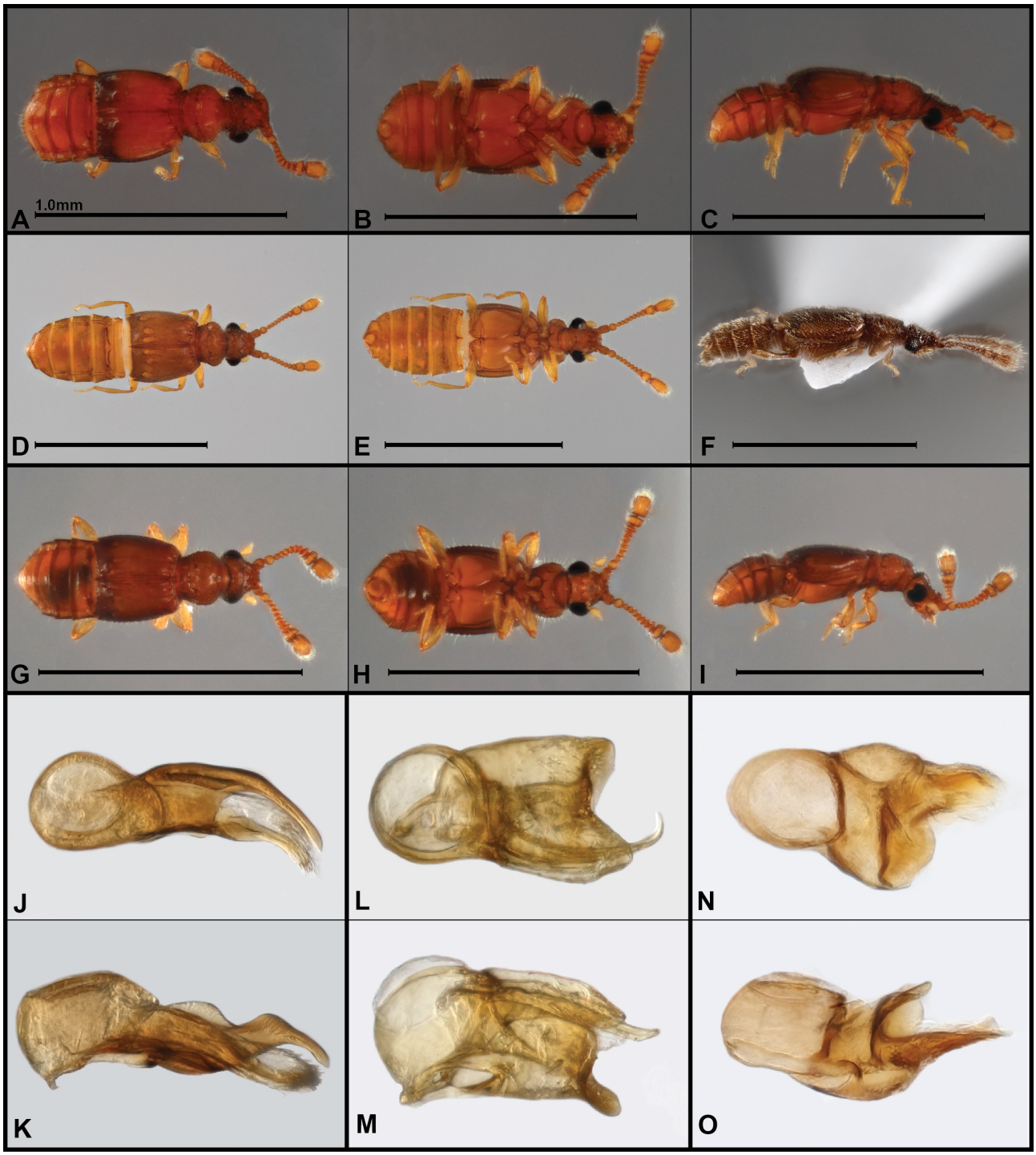

FIGURE 85. Photographs, *Thesium* spp. **A–C, J, K** *T. apicale* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *T. crenulatum* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–H, N, O** *T. magnaclavus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 0.5mm.

Etymology. The species name refers to the darkened posterior elytral margin.

Distribution. This species is known from two localities, the type locality in coastal Santa Elena Province, and a montane (nearly 2000m) locality in Pichincha Province, with quite different habitats. This is a case where both localities were successfully barcoded, and they do cluster closely together.

Remarks. This species differs from the following in having the setae of head, pronotum, and elytra sparser but slightly longer and more erect, the antennae shorter, antennomeres of the funicle transverse, antennomeres of the club distinctly shorter, the pronotum slightly more elongate, cordate, the surface of head smooth (rather than conspicuously rugose), and the 1st visible abdominal tergite with basal depression not as wide, arched forward at middle, similar in thickness throughout.

Thesium crenulatum **sp. nov.**
Figs 85D–F, L–M

Type material. Holotype ♂ (ZSFQ-i23320): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12645, Morphosp. ElP.A.044"; deposited in ZSFQ.

Diagnosis. (TL: 1.5mm) Body (Fig. 85D) rather densely covered with short setae; elongate, widened to apex of elytra, abdomen relatively broad; head broadest at base, eyes situated at base of sides of head, strongly protuberant, moderately coarsely faceted; sides of frons denticulate; vertex rugosely tuberculate at sides, bearing moderately long setae, depressed and smooth at middle with pair of large, round setose foveae, sulci extending anteromediad to frontal depression; antennae inserted beneath elevated tubercles at anterior corners of head, epistoma elevated between antennal bases with short median carina; antennae with thick cylindrical scape; pedicel similar in width, subspherical; antennomeres III–VIII subquadrate, half the width of pedicel, antennomere IX wider, transverse, antennomeres X and XI larger, forming a distinct club; pronotum with dorsum slightly convex, sides widened to front, distinctly serrate, anterior corners rounded; transverse impression shallowly 'V'-shaped, between prominent round, lateral dorsal foveae, continued posterad by shallow median impression; disk with short, isolated anterior median impression flanked by smaller impressed points; each elytron with two basal foveae, one at suture, one closer to humeral angle, sutural fovea with short stria extended posterad from its outer edge; humeral fovea with slightly longer striae extending posterad from inner and outer edges; subhumeral elytra fovea present, with complete subhumeral stria; 1st visible abdominal tergite with basal depression strongly transverse, wider, especially anteriorly, at middle; legs and abdomen without obvious secondary sexual characters, aside from deeply emarginate ventrite VII. Aedeagus (Fig. 85L, M) with basal bulb convex, short, set off by constriction from distal portion, with small ventral basal foramen and larger, membraneous dorsal diaphragm; tegmen widened from base to broadly emarginate distal opening; inner armature with long, apically hooked distal process.

Etymology. The species' name refers to the strongly crenulate pronotal and frontal margins.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. The long last antennomere distinguishes this species from the others described here, and as far as can be told from online type photos, from any of the described species. *Thesium clavatum* (Raffray) is said to have elongate club antennomeres (Park 1952), but it has not been available for study, and occurs only in Mexico, so is very unlikely to be the same. The very broad tegmen of this species distinguishes it strongly from any species for which male genitalia have been described.

Thesium magnaclavus **sp. nov.**
DNA barcode: GenBank PX930357
Figs 85G–H, N–O

Type material. Holotype ♂ (MECN-EN 41733): "ECUADOR: Pichincha, 0.0914˚, -78.5164˚, Res. Geobot. Pululahua, Cascada de la Peña, 1715m, 29.VIII.2024, sifted litter, M.Caterino | A.Pazmiño" / "Caterino DNA voucher, Ext. MSC-12922, Morphosp. Pul.A.016" / "MECN-EN 41733"; deposited in MECN.

Diagnosis. (TL: 1.1mm) Body (Fig. 85G) dark brownish-orange, legs and palpi lighter, basal semirecumbent setae sparse, longer erect setae interspersed at sides; head smooth, convex above vertexal foveae, which are deeply impressed, anterior sulci converging in deep median frontal fovea; eyes very large, occupying most of genae, finely faceted; scape short, cylindrical, antennomere II wider, globular, III conical, IV–VII increasingly transverse, X–XI forming large club, XI about 3× as long as X, apically subtruncate, with median point; pronotum widest toward front, evenly narrowed to base, sides slightly denticulate; lateral and median foveae distinct; subbasal transverse sulcus complete; pair of non-foveal impressions present on either side of pronotal base; elytra subparallel-sided, long, each with sutural and two lateral basal foveae, the inner lateral fovea close to sutural; flight wings present; base of 1st abdominal segment depressed along entire width. Aedeagus (Fig. 85N–O) with basal bulb large, with broadly open dorsal diaphragm; free parameres not evident; tegmen expanded widely from apex of bulb, with lower part concave and hoodlike, right side with longer sinuate process.

Etymology. This species is named for its large antennal club. It is used as a noun in apposition.

Distribution. This species is known only from the Río Blanco drainage on the eastern outflow of the Reserva Geobotánica Pululahua, Pichincha, Ecuador.

Remarks. This species is similar in genitalic morphology to *T. crenulatum,* but differs in the size of the apical antennomere, wider in *T. magnaclavus*, but longer in *T. crenulatum.*

Trimiopsis Reitter, 1882
Fig. 86

This genus comprises four described neotropical species, from Mexico to Colombia (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. According to Park (1952b), *Trimiopsis* has a 'characteristic habitus', which includes a wide head and vaulted vertex (in the males), along with an asymmetric tenth antennomere. Grigarick & Schuster (1980) assert that *Trimopsis* lacks an epipleural elytral stria (present in the putatively related *Dalmomelba*), and has a median pronotal fovea, lacking in *Dalmomelba*. They, however, studied only one species, and neither of those characters apply in the species described below. What I consider the 'subhumeral stria' is visible in the type photo of *Trimiopsis furcalis* Park (https://collections-

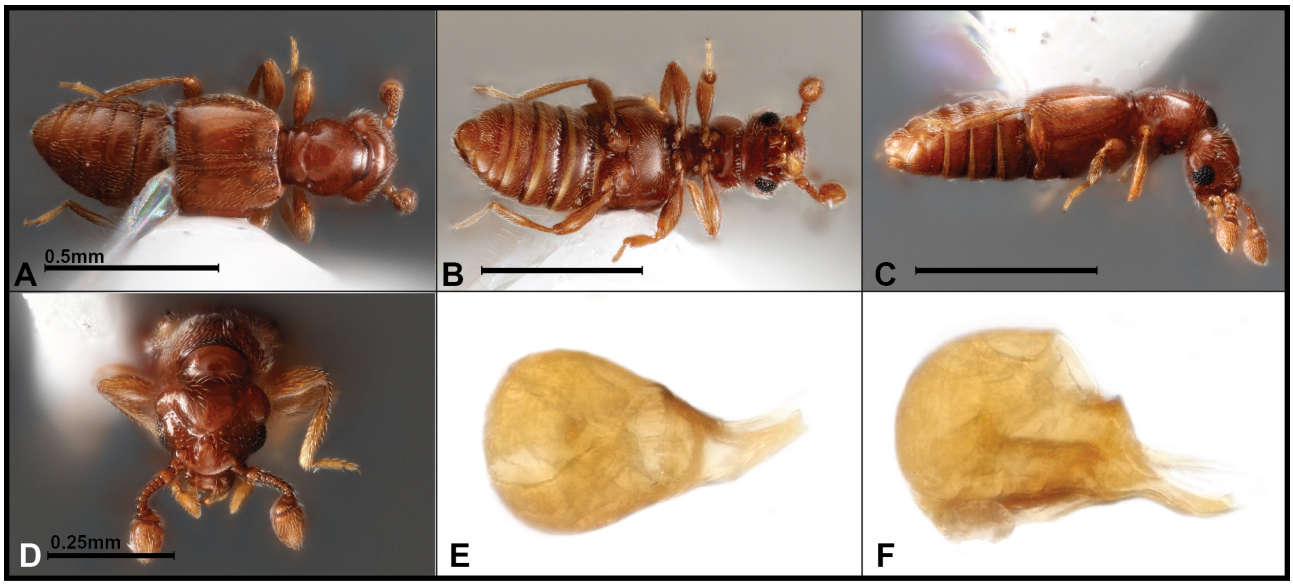

FIGURE 86. Photographs, *Trimiopsis peragena* **A–D** Body: dorsal, ventral, lateral, head detail views **E, F** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

zoology.fieldmuseum.org/catalogue/4229152), close to and parallel to the lateral elytral margin. This latter species has a modified mesofemur in the male, not evident in the species described below. The aedeagus of only *T. furcalis* Park has been illustrated (by Grigarick & Schuster 1980), and it exhibits a very large and amorphous basal bulb, with membraneous dorsal diaphragm, asymmetrical setose parameres, and a spear-like internal articulated process. That of the new species below fits this characterization in only the most general terms, but has a smaller, more rounded basal bulb, and very short apical parts, both the parameres and the median lobe.

Remarks. It is worth noting that several other genera have been split out from *Trimiopsis* over the years, and those species that remain have not been critically examined for coherence.

Trimiopsis peragena **sp. nov.**
DNA barcode: GenBank PX930294
Fig. 86

Type material. Holotype ♂ (ZSFQ-i23318): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 22–27.v.2011, AT1313, M. Caterino, A. Tishechkin, mid-canopy FIT" / "Caterino DNA voucher, Ext. MSC-13333, LL.A.004"; deposited in ZSFQ. **Paratype** (1♀): same data as type but "leaf/rotting stick litter" (ZSFQ-i23319; DNA MSC-12678).

Diagnosis. (TL: 1.2mm) Body (Fig. 86A) dark orange, elongate, head and elytra slightly wider than prothorax or abdomen, finely and not too densely setose, most setae short, white, subrecumbent; head of male (Fig. 86D) subtriangular, wide and swollen behind eyes, as well as across most of vertex; vertexal foveae inconspicuous, located at inner edges of narrow depressed plateaus between eyes and triangular vertexal swelling; frons 'pinched' in middle between vertexal swelling and narrower frontal swelling; epistoma weakly, obliquely incised behind antennal insertions, slightly rounded anteriorly; eyes large, diameter slightly less than post-ocular genal length, weakly emarginate behind, finely faceted, comprising ~38 ommatidia; antennae short, scape little longer than wide, cylindrical, antennomere II about as wide, globular, III–VI short, transverse, VII–VIII slightly longer, IX almost twice as wide, disklike, X (in male) cupuliform, asymmetrical, with inner margin longer than thin outer margin, XI ovoid, setose; pronotum longer than wide, widest just behind middle, sides rounded; lateral foveae distinct, closer together than basal pronotal width, connected by arcuate transverse sulcus; lacking median fovea and any indication of median longitudinal sulcus; elytra long, sides rounded; flight wings present; each elytron with sutural and one lateral basal fovea, sutural stria distinct; subhumeral fovea absent, subhumeral stria distinct; abdominal tergites 1–3 similar in length, 4 and 5 slightly longer; prosternum short, very weakly serrate along anterior margin, lacking precoxal foveae; metaventrite with inner metaventral foveae close together; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 86E, F) with basal bulb large, basally rounded, with small, membraneous apicodorsal diaphragm; parameres short, convergent, apical setae apparently only present on the right; median lobe inconspicuous; internal articulated rod short, blunt.

Etymology. The name of this species combines the Latin words for 'cheek' and 'pouch' referring to the swollen genae of the male. It is used as a noun in apposition.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. Park (1952b) includes a key to the known species of *Trimiopsis*, in which this species would run to *T. clavicornis* Sharp, lacking a median carina on the male

vertex (possessed by *T. claviceps* Reitter), and lacking a median tubercle or setal bundle (present in *T. furcalis* Sharp and *T. femoralis* Sharp, respectively). There is little in the short description of Sharp's *T. clavicornis* to distinguish it clearly from the present species, although one would be hard-pressed to describe *T. peragena*'s frons as 'deeply impressed', but instead rather narrowly and acutely so.

Verabarolus Park, 1942
Figs 87–88

This genus contains a single described species, *V. subdendrus* Park 1942, known only from Panama. Three new species are described below.

Diagnosis. (TL: 1.5–1.7mm, Avg. 1.6mm) *Verabarolus* is a poorly documented genus, known from a single female specimen. Park (1942) characterized the genus as having: vertexal foveae present; antennae widely separated with a three segmented club; terminal maxillary palpomere subsecuriform; pronotum obcordate with non-dentate lateral margins, lateral and median foveae present, connected by a biarcuate, transverse sulcus; median longitudinal pronotal sulcus present, maybe short, not reaching apical margin or subbasal transverse sulcus; each elytron with four basal foveae; subhumeral fovea and a subepipleural carina present but humeri not dentate; female abdomen with five visible tergites subequal in length, lacking basal discal carinae; prosternum lacking distinct median carina, but weakly carinate in basal third; female with six visible sternites, second to fifth sternites progressively shorter; middle coxae subcontiguous; posterior coxae contiguous; tarsi three-segmented, with second tarsomere longer and thicker than third; tarsi with a single claw. Grigarick & Schuster (1980), apparently studying only the type, claimed that it does have a complete median prosternal carina, as the species that I assign here also do. They also added that the lateral mesoventral foveae are forked, and that the metasternum has two foveae. Other useful characters include weak longitudinal carinae both above and below the eyes, and a serrate prosternal margin. Three new species described below from males and females allow a few more sex-specific details to be added; sexual dimorphisms are minimal, but two species have a small tooth on the inner edge of the male pro- and/or mesotibia, while one has long setae on a small male protrochanteral denticle. The last male ventrite is simply, rather narrowly depressed in the middle. Male genitalia, based on the species described herein (Fig 88), can be characterized as having a large basal bulb with round dorsal diaphragm and a small ventral foramen, fused, asymmetrical parameres, the right one shorter, membraneous, and fimbriate, the left better sclerotized and dorsoventrally compressed. An articulated median armature with at least one sclerotized hook-like process is present, but the entirety is difficult to resolve.

Remarks. This genus shares some features, as well as a general habitus, with *Placamecia*, described above, and they may be related. However, two rather significant differences, namely the presence, here, of a median prosternal carina and in *Placamecia* of an oval penial plate would separate them rather distantly in current Trichonychini classification.

Verabarolus scabrifrons **sp. nov.**
DNA barcodes: GenBank PX930343, PX930347
Figs 87A–C, 88A–C

Type material. Holotype ♂ (MECN-EN 41776): "ECUADOR: Cotopaxi, -0.4169˚, -79.0042˚, Bosque Integral Otonga, 14.VIII.2024, 2086m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12893, Morphosp. Ot.A.058" / "MECN-EN 41776"; deposited in MECN. **Paratypes** (1♂, 3♀, same general locality and date as type): 1: same data as type; 1: -0.4192˚, -79.0031˚, 13.VIII.2024, 1966m; 1: -0.4187˚, -79.0039˚, 13.VIII.2024, 2008m; 1: -0.4167˚, -79.0046˚, 14.VIII.2024, 2101m (MECN-EN 41777–41780).

Diagnosis. (TL: 1.7mm) Body (Fig. 87A) elongate, slightly flattened, dark orange, surface lightly to heavily rugose (head), with numerous short, recumbent setae and few longer erect setae intermingled, particularly along the sides of the elytra and on the abdominal paratergites; head subquadrate, slightly widened to rear, surface densely rugose; vertex with fine, median dorsal carina, slightly swollen between vertexal foveae, about equidistant to each other as to eyes; sulci extending anteromedad from vertexal foveae, not meeting, separated across generally transverse depression of frons; frons squared off in front, projecting slightly over bases of antennae, with translucent 'windows', appearing as pseudofoveae over antennal insertions; eyes medium-small, slightly protruding, weakly emarginate posteriorly, each comprising about 25 ommatidia; last maxillary palpomere narrow at base, widening to widest point just basad middle, arcuate along inner edge, straight externally, narrowed to subacute apex; antennae of moderate length, scape subcylindrical, 1.5× as long as wide, antennomere II narrower, cylindrical, almost twice as long as wide, III subconical, IV–VII subquadrate, VIII–IX become wider, X–XI forming loose club, X slightly wider than long, XI about 2.5× as long as X; pronotum widest near front, sides rounded, narrowing to very short anterior collar, basal sides slightly concave, narrowing to base, weakly denticulate; lateral pronotal foveae shallow, more darkened than impressed, connected by shallow, arcuate transverse sulcus; median longitudinal sulcus very weakly impressed; elytra with sides weakly rounded, each with four basal foveae and complete basal carina; subhumeral fovea deeply impressed, subhumeral stria complete and cariniform; flight wings present; basal four abdominal segments with well developed paratergites, with distinct inner and outer sutures; 1st visible abdominal segment only barely longer than 2nd; prosternum serrate along anterior margin; mesocoxae not separated, mesoventral process short and acute; metaventrite convex, metacoxae approximate; male last ventrite entire, simply depressed; male protibia swollen toward apex, with weak tooth on inner margin

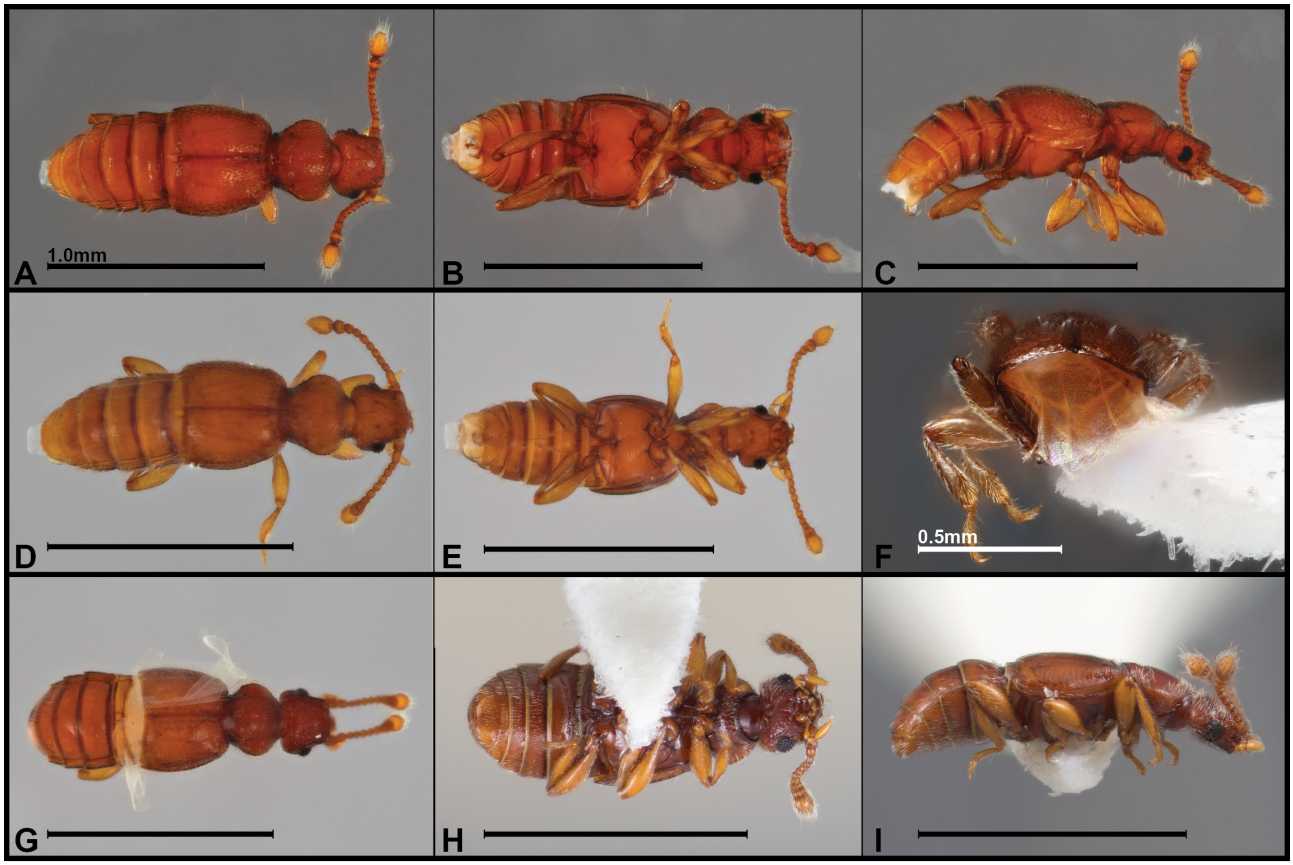

FIGURE 87. Habitus photos, *Verabarolus* spp., dorsal, ventral, lateral views **A–C** *V. scabrifrons* **D–F** *V. puyu* (**F** posterior view showing protibial tooth) **G–I** *V. obcasus.* Scale bars = 1.0mm unless otherwise indicated.

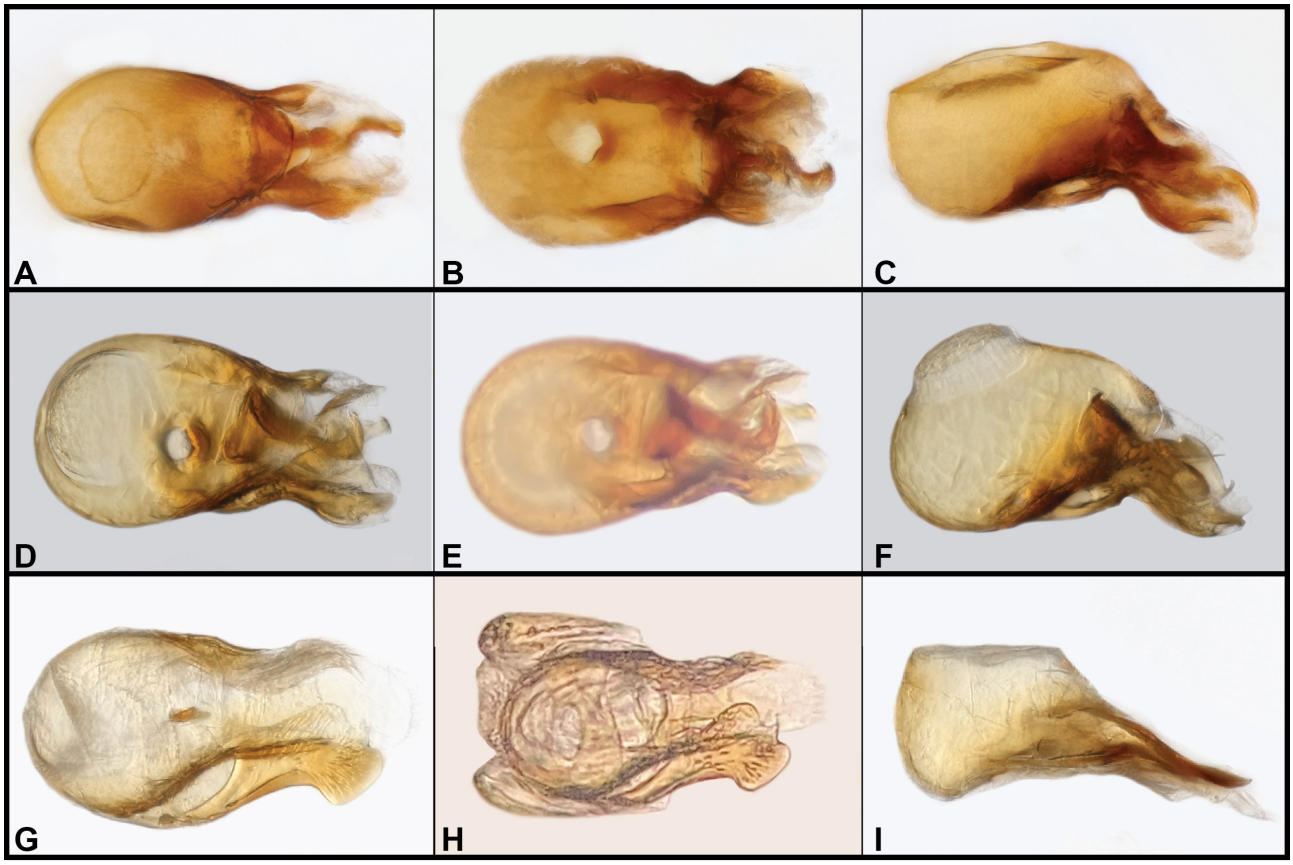

FIGURE 88. Aedeagus photos, *Verabarolus* spp., dorsal, ventral, lateral views **A–C** *V. scabrifrons* **D–F** *V. puyu* **G–I** *V. obcasus*.

about one-third from apex (Fig. 87C); mesotibia with stronger tooth about one-third from apex of inner margin; 2nd tarsomeres slightly swollen, those of metatarsus also elongate. Aedeagus (Fig. 88A–C) with large, elongate basal bulb with dorsal diaphragm about half its length, diaphragmatic sclerite distinct; basal foramen small and basal; parameres apparently present, short, mostly fused with and extending from apical sides of basal bulb; left paramere longer than right, side uneven, median lobe very short, curved down, then distad, then down at apex.

Etymology. This species' name refers to the distinctive rough texture of the head.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species and the following are similar and closely related. Both have a tooth on the inner edge of the male protibia. The anterior sulci converge more strongly in the following species, clearly meeting, while the protibial tooth is weaker in *V. scabrifrons* than in *V. puyu*. They also differ in the degree of ventral curvature in the apex of the left paramere.

Verabarolus puyu **sp. nov.**
DNA barcode: GenBank PX930261
Figs 87D–F, 88D–F

Type material. Holotype ♂ (ZFSQ-i23321): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12643, Morphosp. ElP.A.042"; deposited in ZSFQ.

Diagnosis. (TL: 1.6mm) Head (Fig. 87D) broad, subquadrate, rugosely sculptured, moderately setose; eyes weakly protuberant, about half diameter of genal length; vertex with short median carina, pair of vertexal foveae present, sulci extending anteromediad from foveae, broadening and shallowly meeting between antennal bases; epistoma slightly recessed under frontal shelf; labrum rounded at sides, emarginate but with quadrate median tooth; scape and pedical subcylindrical and similar in size, antennomeres III–VIII elongate oval, similar in size, antennomere IX slightly larger, X and XI forming loose setose club; pronotum subcordate, widest near front, evenly narrowed posterad, sides weakly serrate; pronotal disk lacking foveae, but with shallow lateral and median depressions united by weakly impressed, 'V'-shaped transverse sulcus; each elytron with sutural and three additional dorsobasal foveae connected by weak basal carina, subhumeral fovea and stria present; male protibia (Fig. 87F) with blunt tooth along inner margin one-third from apex; male mesotibia with blunt flange on inner margin near apex; male abdomen unmodified. Aedeagus (Fig. 88D–F) with large basal bulb, basal foramen small and ventral, well-delimited round dorsal diaphragm present; tegmen produced on right by ventrolateral sinuate, bifid process with distal portion apically narrowly rounded, basal upper portion broader and obliquely truncate; complex inner armature present, with prominent, basally bent, apically curved ('2'-shaped) median process, ventrolateral curved rod, and other weakly sclerotized processes.

Etymology. This species name comes from a Kichwa word for 'cloud', referring to the forest type in which it was found.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of Pichincha, Ecuador.

Remarks. This species and the preceding are closely related, with minor differences in aedeagal shape and a few external characters as detailed above.

Verabarolus obcasus **sp. nov.**
DNA barcodes: GenBank PX930301, PX930306
Figs 87G–I, 88G–I

Type material. Holotype ♂ (ZSFQ-i23322): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12684, LL.A.020" / "ZSFQ-i15250"; deposited in ZSFQ. **Paratypes** (4♂, 1♀): 4: same data as type; 1: "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 23–27.v.2011, AT1307, M. Caterino, A. Tishechkin, under bark, rotting wood" (ZSFQ-i15245, i15248, i15251, i23324–i23325). **Other material:** 1♀: "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" (MECN-EN 42060).

Diagnosis. (TL: 1.5mm) This species is similar to both of the preceding, differing principally in the following characters: Body (Fig. 87G) mostly impunctate; head with anterior frontal corners strongly quadrate; vertexal sulci weakly converging to front; antennal club more compact, antennomeres IX and X distinctly transverse; apical maxillary palpomere more slender; pronotum with sides more evenly rounded, widest near middle (rather than anteriorly), mostly smoother, but with weak subbasal tooth at posterior constriction; elytra wider, with more distinctly rounded sides, four basal foveae present but weak; subhumeral sulcus well-developed, visible from above; prosternum with median carina weak, perhaps 'basally gibbous' as described for *V. subdendrus*; male pro- and mesotibiae lacking inner marginal teeth, but male protrochanter with minute denticle bearing long seta. Aedeagus (Fig. 88G–I) with larger dorsal diaphragm, flat-topped; median lobe of aedeagus and left paramere paralleling each other to apex, not turned downward as in preceding species.

Etymology. This species' name is a Latin word for 'sunset', as it lives along Ecuador's west coast. It is used as a noun in apposition.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Euplectitae: Trogastrini

Allparhexius Caterino, **gen. nov.**
Fig. 89

Type species. *Allparhexius barbatus* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.2–1.7mm, Avg. 1.4mm) Body (Fig. 89A–F) light to dark orange, rather conspicuously setose, elongate, abdomen thick and wide, pronotum and head narrow; head small, subtriangular, rounded posteriorly, narrowed to front; vertexal foveae distinct; eyes small, comprising ~4 small facets; antennae inserted high on frons, above deep supraocular concavity, delimited posteriorly by carina; venter of head convex, with dense beard of elongate setae; antennae geniculate, scape as long as next six antennomeres combined, scape short, globular, antennomeres III–VIII short, roundly transverse, IX–XI forming loose enlarged club; maxillary palpi small, terminal palpomere about twice length of penultimate, acuminate apically; pronotum narrow, elongate, sides weakly rounded, unmargined; lateral foveae present but shallow, connected by weak transverse basal sulcus; elytra rather short (wingless), with four small but distinct dorsobasal foveae, narrowed to base, with prominent, denticulate humeri; each elytron prolonged at apicolateral corner into broad, acute tooth; subhumeral fovea and stria distinct; first three abdominal tergites similar in midline length, with narrow paratergites, fourth slightly longer, lacking paratergite; prosternum long, lacking midline carina, with pair of precoxal foveae; pro- and mesofemora swollen; metathorax short; metacoxae toothed; male abdomen with 6 visible ventrites, the last one being a small penial plate. The aedeagus (Fig. 89G–J) has a distinct basal bulb, with a large, circular dorsal diaphragm lacking an obvious diaphragmatic sclerite, no free parameres, an elongate and apically strongly sclerotized tegmen with a thin right-side appendix, and a long, articulated dorsoapical arm.

Etymology. This generic name derives from a Kichwa word referring to the Earth or soil, in combination with the stem *-rhexius*, common to several genera in the tribe. It is masculine.

Distribution. This genus is known from two species, both from cloud forests on the eastern slope of the Ecuadorian Andes.

Remarks. This genus seems to be part of a Trogastrine lineage with elongate prothorax and geniculate antennae with a three segmented club. This genus and *Mukirhexius*, described below, seem particularly close, having distinctive, subacute posterolateral elytral extensions, prolonged metacoxae, reduced eyes, and an almost physogastric habitus. Yet there are enough differences to leave a little doubt as to their reciprocal monophyly. The two species assigned here are larger in body size, with a narrower, more nearly laterally rounded pronotum, an apically acuminate antennal club, and an abdomen that narrows more distinctly at the base.

Allparhexius barbatus **sp. nov.**
Figs 89A–C, G–H

Type material. Holotype ♂ (MECN-EN 40788): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13141, Morphosp. Mch.004"; deposited in MECN. **Paratypes** (1♂, 2♀, same general locality and same data as type): 2: -1.3868˚, -78.2929˚, 2304m; 1: -1.3838˚, -78.2918˚, 2345m (MECN-EN 40262, 40244, 40271).

Diagnosis. (TL: 1.2mm) Both species included here conform closely to the generic diagnosis, differing from each other principally in the following characters: body (Fig. 89A) unevenly dark, parts of pronotum and elytra darker than others; head slightly wider, with vertexal foveae a little closer together; antennae rather elongate, separations (stems) between antennomeres III–IX almost as long as the antennomeres themselves; pronotum rather broad, widest at middle, about 4/5 as wide as long, basal transverse sulcus rather shallow; posterolateral teeth of elytra shorter and blunter than in the following species. Aedeagus (Fig. 89G, H) well sclerotized, articulated dorsoapical arm strongly hooked at apex; tegmen slightly sinuous and unevenly narrowed to bluntly acute apex; right lateral process inserted beyond midpoint, thin, sinuous, apically curved to side, squared off.

Etymology. This species' name refers to its 'bearded' genal regions.

Distribution. This species is known only from cloud forests north of the Río Pastaza, in the Río Machay Preserve, Tungurahua Province, Ecuador

Allparhexius cuspidatus **sp. nov.**
Figs 89D–F, I–J

Type material. Holotype ♂ (MECN-EN 41692): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol. Yanayacu, Piha Tr., 2397m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12938, Morphosp. Yn.A.007" / "MECN-EN 41692"; deposited in MECN [entire specimen in genitalia vial in glycerin].

Diagnosis. (TL: 1.7mm) As above, this species conforms well to the generic description, and differs from the preceding principally in the following characters: head (Fig. 89D) slightly narrower, with vertexal foveae more widely separated, just mediad the supraocular carinae; antennae more compact, with funicular antennomeres more closely stacked; pronotum narrower, widest toward front, with transverse basal sulcus deeply impressed; teeth of posterolateral elytral corners very strongly developed (the paratergites of the first abdominal segment slightly excavated to accommodate). Aedeagus (Fig. 89I, J) more lightly sclerotized at base, strongly at apex; articulated dorsoapical arm weakly sinuous and curving laterad to acute tip; main body of tegmen broad at base, narrowed from left to strong apical tooth; right-lateral process inserted subbasally, curving evenly inward to near tegmenal apex.

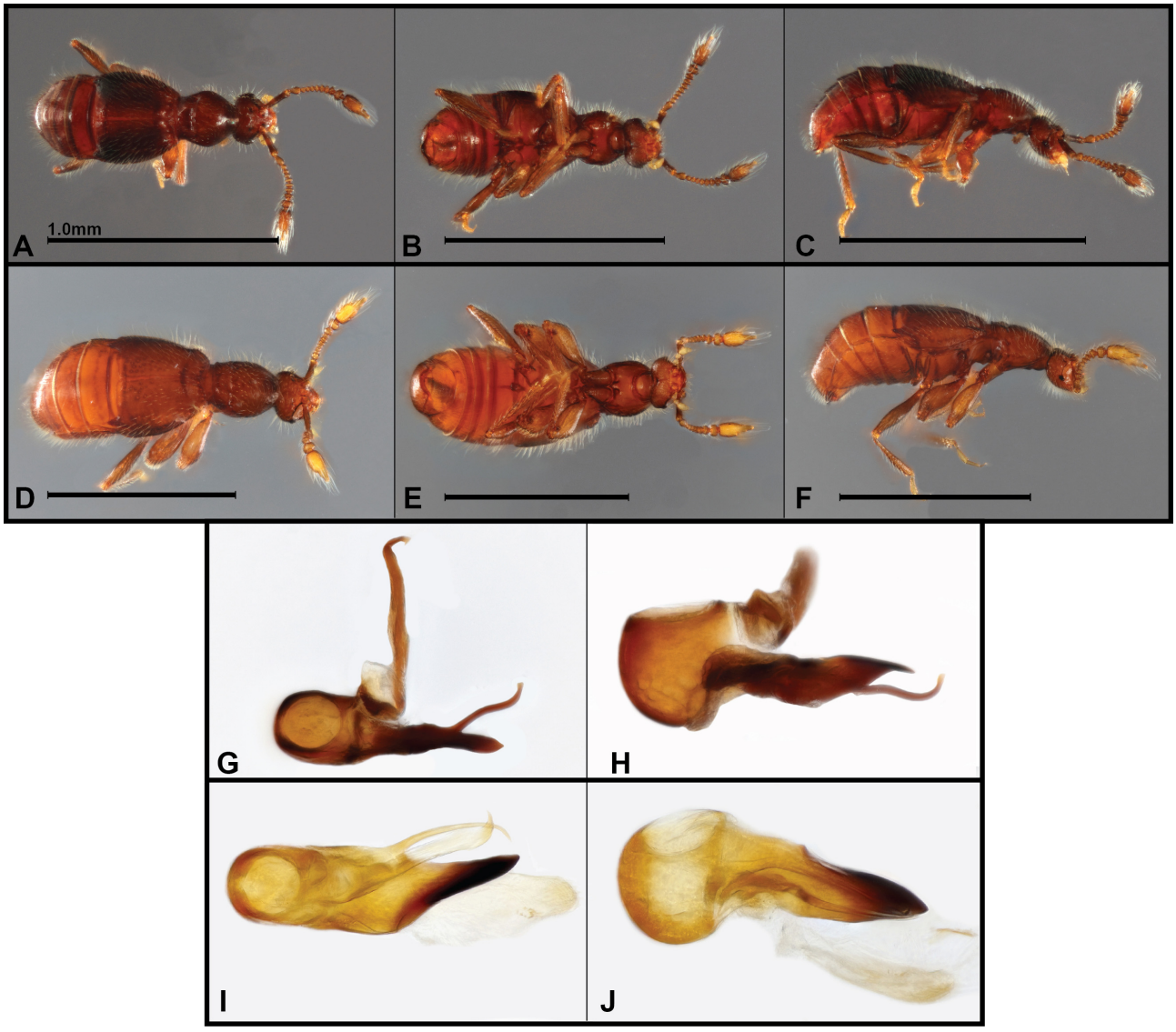

FIGURE 89. Photographs, *Allparhexius* spp. **A–C, G, H** *A. barbatus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *A. cuspidatus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

Etymology. This species' name refers to the distinctive tooth at the outer apical corners of the elytra.

Distribution. This species is known only from cloud forests of the Yanayacu Biological Station, in western Napo Province, Ecuador.

Eurhexius Sharp, 1887
Figs 90–92

Eurhexius includes 30 species, ranging from Central to South America (Asenjo *et al.* 2019). Park (1952b) provided a key to the known species. However, based entirely on external characters, it provides no more than a rough guide to existing diversity. Nine new species are described below.

Diagnosis. (TL: 1.5–3.4mm, Avg. 2.5mm) As with most Trogastrini, the head of *Eurhexius* has a long dense ventral beard of gular setae, along with a generally broad head bearing geniculate antennae. Among Trogastrini, *Eurhexius* is distinguished by the barely prolonged anterior pronotal margin (unlike subtribe Rhexiina), lack of subhumeral elytral foveae, a 1st abdominal tergite that is subequal to or only slightly longer than the 2nd, a basal antennomere no longer than the next three combined, and the presence of several small marginal teeth anterior to the basal pronotal marginal constriction. Few of the species exhibit conspicuous secondary sexual characters, although males of a few in Raffray's group III have modifications to the 3rd and/or 4th abdominal tergites. In addition, a few newly described species show some subtle modifications of the male trochanters.

Park (1952b) illustrated the male genitalia of four species, all of which are members of Raffray's (1904) group IV. Nonetheless they exhibited rather remarkable morphological diversity, leading Park to hint that maybe even this group of *Eurhexius* might represent multiple genera. Genitalia among the species that I place here are also very diverse, and underscore this likelihood. I also describe some species of *Xerhius* in this paper that

blur some of the external differences between it and *Eurhexius.* Much broader studies of Trogastrine generic limits will have to be undertaken to resolve any questions of monophyly.

Park (1942) raised the issue that Sharp (1887), when describing the genus *Eurhexius*, did not figure the included species (including the now-recognized type species *E. vestitus* Sharp) in much detail. In particular Park expressed concern that if the type were found to lack pronotal marginal teeth then considerable chaos might be result in Trogastrine generic taxonomy. While I have not examined the type of *E. vestitus* personally, photographs provided by Dr. Chris Carlton of Sharp's types suggest that this may in fact be the case, that *E. vestitus* lacks pronotal teeth and that at best *Eurhexius* needs to be defined by some other characters. Some of Sharp's other (1887) species (e.g. *E. trimioides, E. ventralis*) would similarly not be placed in *Eurhexius* as presently conceived. This is not a problem I can solve here.

Eurhexius profundus **sp. nov.**
Figs 90A–C, 91A–B

Type material. Holotype ♂ (MECN-EN 41053): "ECUADOR: Napo, -0.5974˚, -77.8934˚, Est. Biol. Yanayacu, Ridge Tr., 2222m, 10.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12980, Morphosp. Yn.A.049" / "MECN-EN 41053"; deposited in MECN.

Diagnosis. (TL: 3.1mm) Body (Fig. 90A) dark orange, densely covered with dark semi-erect setae; head subtriangular, broad, broadly emarginate posteriorly with narrow deeper emargination at middle; vertexal foveae deeply impressed, joined by complete, anteriorly arcuate sulcus; eyes moderate, diameter about equal to post-ocular genal length, genae carinate behind lower margin of eye; head beneath with dense beard of longer, golden setae; antennae weakly geniculate, scape slightly longer than antennomeres II–IV, antennae slightly bent at scape apex, antennomeres III–VIII weakly transverse, IX–XI larger, forming distinct, loose club; pronotal margins broadly rounded, bearing 5–6 denticles, the anterior-most small, margin narrowing to distinct but short collar; lateral foveae deeply impressed, joined by deep transverse basal sulcus; median longitudinal sulcus deeply impressed, with a large, subtriangular basal impression, narrowed where crossing transverse sulcus, then widening gradually to front; elytra subparallel-sided, each with four distinct basal foveae; longitudinal sulci running posterad from sutural and 3rd foveae; subhumeral fovea absent, stria complete; abdominal tergites roughly similar in length; male venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 91A, B) with basal bulb convex, much of dorsal part membraneous; tegmen with strongly bidentate distal process extending from left side, with low quadrate dorsal flange at its base, and a clubbed and marginally dentate process extending distad from right side, also with a mirroring quadrate flange extending dorsomesad from its base; a roughly tubular, poorly sclerotized internal sac is visible within the tegmen.

Etymology. This species name refers to its very deep and broad pronotal sulci.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. The form of the pronotal sulci, in particular the large, subtriangular basal impression, is unique among known species. This species, along with the newly described *E. pilosus*, *E. cavipygus*, and *E. dentipes* form a rather distinctive group based on aedeagal characters, with the right apical process curving over the median articulated process, and forming most of the apical structure. A somewhat similar form is observed in *E. excavatus* **sp. nov.**, as well.

Eurhexius pilosus **sp. nov.**
Figs 90D–F, 91C–D

Type material. Holotype ♂ (MECN-EN 41052): "ECUADOR: Cotopaxi, -0.4187˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 2008m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12864, Morphosp. Ot.A.029" / "MECN-EN 41052"; deposited in MECN.

Diagnosis. (TL: 3.1mm) Body (Fig. 90D) large, dark orange, densely but shallowly punctate, appearing matte, and densely covered with short setae; head strongly emarginate behind; vertexal foveae well impressed, more or less connected by arcuate frontal sulcus; eyes prominent, finely faceted; weak postocular carina present on gena; venter of head with dense setal beard, setae slightly longer anterad; antennae with scape as long as next three antennomeres combined, antennomere II slightly larger than III–VI which are similarly subquadrate, VII–VIII becoming more transverse, IX–XI forming loose club, IX–X about as long as wide, tapered distally, XI only about 1.5× as long as X, asymmetrically subacute; pronotum widest at middle, tapered rather strongly to front, lateral margins with moderately strong subbasal tooth and series of 5–6 progressively weaker teeth anterad; lateral and median basal pronotal foveae well impressed, median longitudinal sulcus deep at base, narrowed at middle, then widening again to front; basal transverse sulcus not as deeply impressed, arcuate between lateral foveae; each elytron with four dorsobasal foveae, a long stria extending from the 2nd lateral fovea 2/3 the elytral length; subhumeral fovea absent; 1st visible abdominal tergite slightly longer than 2nd, others similar in length to 2nd; legs and venter lacking conspicuous secondary characters. Aedeagus (Fig. 91C, D) with basal bulb convex, much of dorsal part membraneous; median part of tegmen entirely membraneous, finely longitudinally pleated, apically subacute; lateral portions of tegmen (expanded parameres?) more strongly sclerotized, longitudinally concave, basal portions wrapping dorsally over median lobe; right arm with two strong, incurved apical teeth, left arm with single, shorter, digitiform apical process curved weakly laterad.

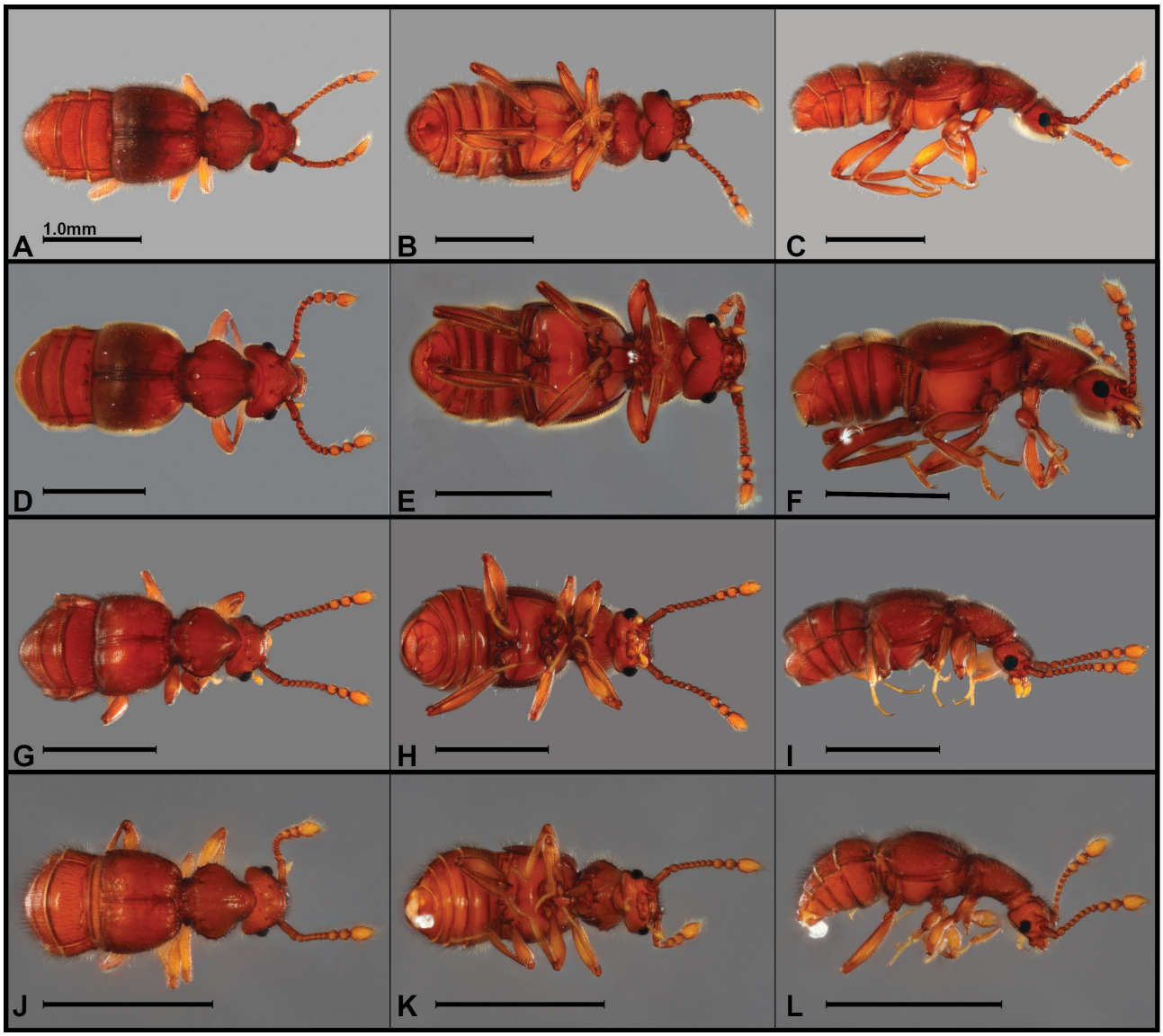

FIGURE 90. Habitus photos, *Eurhexius* spp., dorsal, ventral, lateral views **A–C** *E. profundus* **D–F** *E. pilosus* **G–I** *E. cavipygus* **J–L** *E. dentipes.* Scale bars = 1.0mm.

Etymology. This species is named for the dense, golden setae of the body.

Distribution. This species is known only from the cloud forests of the Bosque Integral Otonga, in northwestern Cotopaxi Province.

Remarks. This species is distinct from most in its densely punctate, almost matte dorsum, with very dense, erect, golden setae, especially on the elytra.

Eurhexius cavipygus **sp. nov.**
DNA barcode: GenBank PX930239
Figs 90G–I, 91E–F

Type material. Holotype ♂ (MECN-EN 40743): "ECUADOR: Sucumbíos, -0.2049˚, -75.9266˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13088, Morphosp. Cu.005" / "MECN-EN 40743"; deposited in MECN.

Diagnosis. (TL: 2.5mm) This species is very similar in most characters to the preceding, differing principally in the following: body (Fig. 90G) slightly smaller, head and pronotum narrower; eyes larger, diameter about 1.5× postocular genal length; antennomeres III–VIII slightly shorter than wide, IX–XI forming distinct club; pronotal margins rounded, widest just behind middle, bearing 6 denticles, basal two prominent, others progressively smaller anterad; male penultimate tergite with deep, setose basal depression; male protrochanter dentate, setose at apex; male metatrochanter deeply concave along its entire length, posterior edge curved anterad; last male ventrite weakly convex, densely punctate at middle. Aedeagus (Fig. 91E, F) with large basal bulb bearing small dorsal apical diaphragm, diaphragmatic sclerite indistinct; tegmen with large right-side process curving mediad and over

articulated median rod, widened subapically with bluntly angulate lateral processes, bifid apically, terminating in one rounded and one longer subangulate tooth; process of left side of tegmen shorter, curving mediad and under articulated median rod; median rod emerging from basal bulb, divided into subquadrate distal right-side lobe and ventrally curving, acute hook.

Etymology. This species' name refers to the depressed male penultimate abdominal tergite.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species' male exhibits a unique depression at the middle of the penultimate tergite. The metatrochanteral modifications are similar to those of the preceding species, but the metatrochanter is more entirely modified, not just the posterior margin.

Eurhexius dentipes **sp. nov.**
DNA barcode: GenBank PX930225
Figs 90J–L, 91G–H

Type material. Holotype ♂ (MECN-EN 40751): "ECUADOR: Sucumbíos, -0.2044˚, -75.9267˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 1.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13096, Morphosp. Cu.013" / "MECN-EN 40751"; deposited in MECN. **Paratypes** (1♂, 1♀): 1: same data as type; 1: same general locality but 0.2066˚, -75.9262˚, 2.XII.2024 (MECN-EN 40476, 40496).

Diagnosis. (TL: 1.8mm) This species is very similar in most characters to the preceding, differing principally in the following: body (Fig. 90J) smaller; body setae longer, finer, and slightly sparser, setae along sides of elytra and abdomen appearing notably unkempt; eyes slightly smaller; anterior pronotal marginal denticles more consistently prominent; 1st visible abdominal tergite nearly 2× as long as 2nd; male protrochanters with prominent acute tooth; male metatrochanters unmodified; last male ventrite shallowly depressed; legs and venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 91G, H) with basal bulb large, with small apicodorsal diaphragm, diaphragmatic sclerite indistinct; tegmen with right side produced into elongate, apically flattened lateral lobe, with secondary flange curving mediad and over articulated median rod; left side of tegmen with short, curved, flesh lateral lobe; median rod wide, gently curved and flattened toward broad, weakly sclerotized median blade.

Etymology. This species name refers to the dentate male protrochanters.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This small species' males are relatively easily identified by the long teeth on the protrochanters.

Eurhexius mirapygus **sp. nov.**
Figs 91I–J, 92A–D

Type material. Holotype ♂ (MECN-EN 38508): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" " / "Caterino DNA voucher, Ext. MSC-12760, Morphosp. SK.A.021" / "MECN-EN 38508"; deposited in MECN. **Paratypes** (1♂, 5♀): same data as type (MECN-EN 38502–38507).

Diagnosis. (TL: 2.2mm) Body (Fig. 92A) reddish orange, densely setose; head broad, slightly emarginate at base, with two pair of small vertexal denticles on either side of the short pronotal cervical collar; eye medium-sized, diameter about equal to post-ocular genal length; vertexal foveae weak and widely separated; frons shallowly depressed between antennal bases; scape subcylindrical, slightly expanded to apex, equal in length to succeeding 3 flagellomeres; scape slightly wider than antennomeres III–VIII, IX–X slightly larger, IX–XI forming loose club; pronotal sides broadly rounded widest just in front of middle, margins with 6 small denticles, progressively closer together toward the front; pronotal base constricted, slightly wider than anterior width; disk with shallow but complete longitudinal median sulcus crossing complete transverse subbasal sulcus that terminates in deep lateral foveae; each elytron with sutural and 3 lateral basal foveae, with sutural stria, and weakly impressed posterad of the outer two foveae; subhumeral fovea absent, but marginal stria present; male fourth visible abdominal tergite (Fig. 92D) with short, sinuate basal carina, depressed on either side of a low, blunt, setose median ridge, with long setae projecting in from sides as well as from posterior margin of preceding tergite; last visible tergite (pygidium) unmodified; legs and ventrites lacking other secondary sexual characters. Aedeagus (Fig. 91I, J) with large basal bulb, and broadly open dorsal diaphragm; tegmen with all parts curved slightly leftward distally; apical process extending from ventral edge of tegmen, forming narrow, obliquely truncate distal blade, secondary, narrow distal process curving up around right side; inner armature comprising two long, acute processes following curve of tegmen.

Etymology. This species' name mixes Spanish and Latin to say 'look at that pygidium!' It is used as a noun in apposition.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. This species seems to belong to Raffray's group III (based on non-transverse antennomeres IX–X). This is also where several other sexually dimorphic species fall out. For example, *E. procerus* (Reitter) also has the 4th male tergite with a median carina, as do *E. laevis* Raffray and *E. sexpunctatus* Raffray, as visible in photos of the types provided by Dr. Chris Carlton.

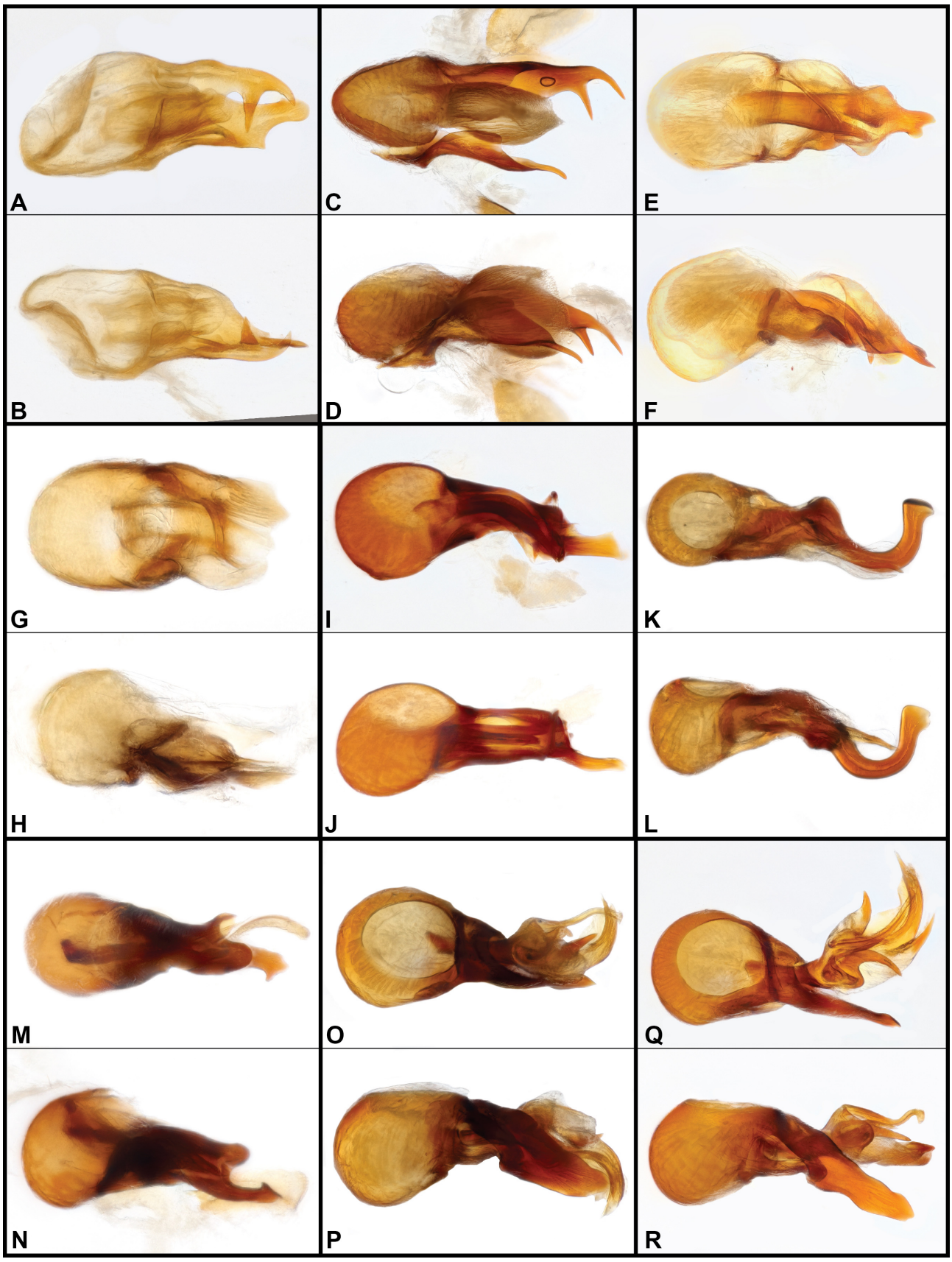

FIGURE 91. Aedeagus photos, *Eurhexius* spp., dorsal, lateral views **A, B** *E. profundus* **C, D** *E. pilosus* **E, F** *E. cavipygus* **G, H** *E. dentipes* **I, J** *E. mirapygus* **K, L** *E. sol* **M, N** *E. excavatus* **O, P** *E. unguifer* **Q, R** *E. napoensis*.

Eurhexius sol **sp. nov.**
DNA barcode: GenBank PX930374
Figs 91K–L, 92E–F

Type material. Holotype ♂ (ZSFQ-i16789)**:** "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 7.vi.2011, flowerfall sifting, AT1347, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12697, Morphosp. TBS.A.017" / "ZSFQ-i16789"; deposited in ZSFQ.

Diagnosis. (TL: 1.7mm) Body (Fig. 92E) small, light orange, densely covered with golden, semi-erect setae; head slightly wider posteriorly, subquadrate in front; vertexal margin with two small denticles; vertexal foveae deeply impressed, joined by complete, anteriorly arcuate sulcus; eyes moderately large, diameter about 2× post-ocular genal length, genae carinate behind lower margin of eye; head beneath with dense beard of longer, golden setae; antennae weakly geniculate, scape about as long as antennomeres II–V combined, antennae slightly bent at scape apex, antennomere II ovate, antennomeres III–VIII similar in size, weakly transverse, IX–XI larger, forming distinct three-segmented club; pronotal margins rounded, widest just behind middle, bearing 5–6 denticles, the anterior-most smaller, margin narrowing to short collar; lateral foveae distinct, joined by arcuate transverse basal sulcus; median longitudinal sulcus narrowly impressed from base nearly to apex; elytral sides slightly rounded, each with four distinct basal foveae, not longitudinally sulcate; subhumeral fovea absent, stria complete; 1st abdominal tergite about 1.25× length of 2nd; profemoral flange rather short; male pro- and metatrochanters dentate; venter otherwise lacking obvious secondary sexual characters. Aedeagus (Figs. 91K, L) with basal bulb broadly rounded, with large circular dorsal diaphragm, diaphragmatic sclerite weakly sclerotized; tegmen dominated by large, flattened, strongly curved and apically expanded apical process, strongly knobbed on right margin at its base; secondary setose, acute processes shorter and straighter.

Etymology. The species name refers to the shape of the dentate pronotum, somewhat like a rounded sun with radiating teeth.

Distribution. This species is known only from the Tiputini Biological Station in the western Amazon Basin, Orellana, Ecuador.

Remarks. This species is much smaller than most of those described here. The head is rather narrow, and the integument is smooth and shining. The pronotum is a bit closer to circular than many.

Eurhexius excavatus **sp. nov.**
DNA barcode: GenBank PX930235
Figs 91M–N, 92G–I

Type material. Holotype ♂ (MECN-EN 40763): "ECUADOR: Sucumbíos, -0.2074˚, -75.9269˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 2.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13108, Morphosp. Cu.025" / "MECN-EN 40763"; deposited in MECN. **Paratypes** (1♂): same data as type (MECN-EN-40512. **Other material**: 1♀ (only provisionally associated): same general locality as type, but -0.2049˚, -75.9266˚ (MECN-EN 40742).

Diagnosis. (TL: 1.5mm) This species (Fig. 92G–I) is nearly identical to the preceding, except: body setae individually thicker and slightly shorter, subrecumbent; male eyes slightly larger, diameter almost 1.5× postocular genal length; antennae compact, scape about as long as antennomeres II–IV, antennomere II globose, antennomeres III–VIII all transverse, antennomeres IX–XI forming distinct club, IX and X wider than long, XI about 3× length or X; all pronotal marginal denticles distinct, posterior 3 particularly prominent; median longitudinal sulcus of pronotum more distinctly widened anterad; 1st visible abdominal tergite nearly twice as long as 2nd; male 2nd and 3rd ventrites (Fig. 92H) with deep setose depressions at sides; last male ventrite shallowly depressed, finely punctate. Aedeagus (Fig. 91M, N) with large basal bulb tapered evenly to junction with tegmen; dorsal diaphragm indistinct; tegmen dominated by right-side process that extends apically and medially over median articulated process, its apex tripartite, a short, right, claw-like flange, a slightly longer rounded median lobe extending over dorsal midline, and a curved ventral process ending in obliquely lobed apical lobe with digitiform, subbasal projection on its left edge; left side of tegmen short, curved beneath; long articulated median rod extending from basal bulb, curving slightly toward bent apex, with long setiform process extending from right side beyond apex and long, weakly sclerotized lobe from its apex.

Etymology. This species' name refers to the lateral depressions on the sides of the abdominal ventrites.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. This species is unusual in the lateral depressions of the abdominal ventrites. While this is probably a secondary sexual character, the lack of a definitely associated female precludes certainty on this point. It is otherwise among the smaller species, and otherwise difficult to distinguish from other small species, like *E. dentipes*.

Eurhexius unguifer **sp. nov.**
DNA barcode: GenBank PX930376
Figs 91O–P, 92J–L

Type material. Holotype ♂ (ZSFQ-i16788)**:** "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12700, Morphosp. TBS.A.020" / "ZSFQ-i16788"; deposited in ZSFQ.

Diagnosis. (TL: 2.8mm) Body (Fig. 92J) dark reddish-orange, densely adorned with dark-golden semi-erect to erect setae; head broad posteriorly, emarginate at



FIGURE 92. Habitus photos, *Eurhexius* spp., dorsal, ventral, lateral views **A–D** *E. mirapygus* (**D** dorsal view of penultimate male tergite) **E, F** *E. sol* **G–I** *E. excavatus* **J–L** *E. unguifer* **M–O** *E. napoensis.* Scale bars = 1.0mm unless otherwise indicated.

base; vertexal foveae deeply impressed, with intermittent anteriorly arcuate sulcus between them; eyes rather small, but protruding, diameter about equal to post-ocular genal length, genae carinate behind lower margin of eye; venter of head with dense beard of long golden setae; antennae moderately elongate, scape slightly longer than antennomeres II–III combined, II a little longer than wide, III–VIII about as long as wide, weakly ovoid, IX–XI forming weakly differentiated club; pronotal margins rounded, widest just behind middle, bearing 6 denticles, all similar in size, margin narrowing anterad to short collar; lateral foveae distinct, joined by nearly straight transverse basal sulcus; median longitudinal sulcus narrowly impressed from base nearly to apex, widened slightly at front; elytral sides slightly rounded, each with four distinct basal foveae, not longitudinally sulcate; subhumeral fovea absent, stria complete; 1st abdominal tergite about 1.25× length of 2nd; male protrochanter weakly dentate; male metatrochanter with wide flange along posterior margin; venter otherwise lacking obvious

secondary sexual characters. Aedeagus (Fig. 91O, P) with basal bulb broadly rounded, with large circular dorsal diaphragm, diaphragmatic sclerite weakly sclerotized; left side of tegmen with long laterally compressed, angularly paddle-shaped, slightly ventrally-directed process; a mobile process emerges as single stem from distal foramen of basal bulb, branching into complex multifurcate apex, with several short acute teeth, one longer, thin, sinuate process, and one thicker, evenly curved and apically acute apical hook.

Etymology. This species' name means 'claw-bearer', referring to the toothed male metatrochanter.

Distribution. This species is known only from the Tiputini Biological Station in the western Amazon Basin, Orellana, Ecuador.

Remarks. The most distinctive character of this large species is the male's broad metatrochanteral teeth. This species and the following have a very distinctive type of aedeagus, with a large, free, median process, with a stem extending from the distal foramen that expands into a multidenticulate process.

Eurhexius napoensis **sp. nov.**
DNA barcode: GenBank PX930335
Figs 91Q–R, 92M–O

Type material. Holotype ♂ (MECN-EN 40896): "ECUADOR: Napo, -0.88973˚, -77.26821˚, Chontapunta, Bosque Minga. 370m. 22.I.2025. Winkler., D Díaz | Y. Tapuy" / "Caterino DNA voucher, Ext. MSC-13315, Morphosp. Ming.003"; deposited in MECN.

Diagnosis. (TL: 2.8mm) This species (Fig. 92M–O) is externally almost indistinguishable from the preceding (*E. unguifer*), differing only in the following characters: antennal scape slightly longer, about as long as antennomeres II–IV combined; antennal club a little more distinct, antennomere IX twice as long as VIII; anterior marginal pronotal teeth becoming indistinct; male trochanters not dentate, but all male trochanters rather densely setose along posterior margins; last male abdominal ventrite simply flattened, a little more densely setose and slightly translucent in apical half. Aedeagus (Fig. 91Q, R) with basal bulb broadly rounded, with large circular dorsal diaphragm, diaphragmatic sclerite weakly sclerotized; left side of tegmen with an elongate, laterally compressed, paddle-shaped, slightly ventrally-directed process; a mobile process emerges as single stem from distal foramen of basal bulb, branching into complex multifurcate apex, with several short acute teeth, one longer, thin, sinuate process, and one thicker, evenly curved and apically acute apical hook.

Etymology. This species is named for the Napo Province that contains its type locality.

Distribution. This species is known only from western Amazonia, in the region of Chontapunta in eastern Napo Province, Ecuador.

Remarks. This species is very similar to the preceding (*E. unguifer*), but may be as readily diagnosed on external characters as genitalic ones. *Eurhexius napoensis* has weaker pronotal marginal teeth, and the male trochanters are not at all dentate, but are densely setose along their posterior margins. The aedeagi are extremely similar, and slightly different viewing angles make them look more different than they may be. The most distinctive difference is that the fixed left-lateral flange is longer and narrower in *E. napoensis*. There seem to be some differences in the apical dentition of the mobile stemmed process, but these should be studied more closely with more material to solidify any observations.

Kapyatrog Caterino, **gen. nov.**
Figs 93–94

Type species. *Kapyatrog chevere* **sp. nov.**, by present designation.

Diagnosis. (TL: 2.6–3.7mm, Avg. 3.0mm) This genus is distinctly a member of Trogastrina, typical in most respects, large in body size, with a flattened head and beard of ventral genal setae, prolonged prothorax excavate beneath, and profemora with laterally flanged posterior margins. Among Trogastrina, it is distinguished prinicipally by having a laterally rounded pronotal margin that lacks marginal teeth, having 4 basal elytral foveae, lacking a subhumeral fovea, and having the 1st tergite about 1.3× as long as the 2nd. Its members have median and transverse pronotal sulci present but very weak. The antennae have a distinct three segmented club and slightly elongated scape. Tarsal claws are strongly asymmetrical. Males have weakly modified metatrochanters and symmetrical male genitalia, both generally uncommon in this subtribe. The lateral lobes of the aedeagus look as if they may be partially fused parameres, the retention of which would also be unusual in the tribe. No other authors seem to have addressed the possibility that any Trogastrina possess true parameres. They have been clearly lost (or fully fused) in most other Trogastrine genera.

Etymology. This generic name combines the Kichwa word 'Kapya', meaning smooth, or sometimes 'cute', with a stem from the tribe Trogastrini. The smooth refers to the untoothed pronotal margin, typical of this genus. It is masculine.

Distribution. This genus is known from Ecuadorian cloud forest and páramo habitats. Still undescribed species are also known from Costa Rica (Chandler, pers. comm.).

Remarks. *Kapyatrog* bears some resemblance to *Aboeurhexius* Park, a poorly characterized monotypic genus known only from a single female. Park (1952) principally emphasizes the much longer 4th abdominal segment and strongly crenulate lateral pronotal margins, neither of which could be said of any *Kapyatrog.* This new genus also shares a number of characters with *Anarmodius* Raffray, which, like *Kapyatrog*, lacks pronotal teeth. However, based on Raffray's description and illustrations, *Anarmodius* would differ most significantly by having the pronotum wider than the head, having a complete longitudinal sulcus on the pronotum, and having just 3

basal elytral foveae. Its male genitalia have never been illustrated.

The barcode-based tree presented below (Fig. 138) suggests a close relationship between this lineage and *Xerhius* (+ one *Eurhexius*), the whole being sister to most other *Eurhexius*.

Kapyatrog chevere **sp. nov.**
DNA barcode: GenBank PX930389
Figs 93A–C, 94A–B

Type material. Holotype ♂ (MECN-EN 41686): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol. Yanayacu, Piha Tr., 2397m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12929, Morphosp. Yn.A.004"; deposited in MECN. **Paratypes** (3♀): same data as type (MECN-EN 38745–38746, 41687).

Diagnosis. (TL: 3.3mm) Body (Fig. 93A) large, dark orange, smooth, densely covered with short semirecumbent setae; head broad, weakly flattened, evenly emarginate at base, vertexal ridge with pair of small denticles separated by just less than width of pronotal 'collar'; vertexal foveae deep; frons slightly depressed behind interantennal ridge; eyes rather small, diameter about equal to postocular genal length; anteroventrad eye is a small, carina-delimited cavity for reception of the maxillary palpi; venter of head with dense beard of setae; antennae moderately elongate, scape almost as long as antennomeres II–IV, III–VIII small, subquadrate, IX–XI forming a loose, slightly expanded club; pronotum with widely rounded margins, lacking subbasal or marginal teeth, widest at middle, narrowed anteriorly to short but distinct anterior collar, narrowed evenly to wider base; sublateral basal foveae deeply impressed, a shallow transverse basal sulcus connecting them; median longitudinal sulcus shallow, only distinct in anterior third; elytra widened from base, then subparallel to apex, each with sutural and three lateral dorsobasal foveae arranged in an arc; subhumeral fovea absent, stria complete; 1st abdominal tergite slightly longer than 2nd and 3rd; prosternum lacking median carina, with median pair of foveae distinct, shallow; meso- and metaventrites smooth; profemur with typical trogastrine flange on apical third; male meso- and metatrochanters expanded posterad, carinate along posterior margins. Aedeagus (Fig. 94A, B) symmetrical, basal bulb large, rounded, with small basal foramen and large dorsal diaphragm with weak diaphragmatic sclerite divided along midline; lateral arms of tegmen (parameres?) dorsoventrally flattened, bifurcate beyond middle with short, weak lateral lobe and longer, slightly sinuate apical lobe; inner flanges of lateral arms wrapping upward over base of median lobe and nearly meeting at midline; median lobe extended medially and divided into two upturned hooks with median acute, membraneous, setose process extending slightly beyond them.

Etymology. The species name comes from a Spanish word, very popular in Ecuador, used to mean 'cool'.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. The modified meso- and metatrochanters will help distinguish males of this species.

Kapyatrog saladero **sp. nov.**
Figs 93D–F, 94C–D

Type material. Holotype ♂ (QCAZ-280234/MECN-EN 40707): "ECUADOR: Carchi, 0.75587˚, -77.96642˚, El Angel, Saladero, 3301m, 26JUL2016, S. Muñoz & R.Tobar, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13052, Morphosp. Angel5"; deposited in QCAZ.

Diagnosis. (TL: 3.1mm) Extremely similar to the preceding, except: eyes (male) larger, slightly greater than postocular genal length; antennal club more distinct, antennomere IX about twice as wide and twice as long as VIII (in *K. chevere* IX is longer, but not nearly twice as wide as VIII), antennomeres IX and X with distal edges wider than basal, and sharp, rather than rounded; pronotum slightly longer, particularly more gradually tapered to anterior collar (Fig. 93D); elytral humeri subangulate, less rounded; male mesotrochanter not particularly modified, but metatrochanter with a distinct tooth (Fig. 93F); male 4th ventrite with distinct posterior 'tab', apically truncate (Fig. 93E). Aedeagus (Fig. 94C, D) also very similar to preceding, but differing as follows: narrower overall, with dorsal diaphragm slightly elongate oval, lateral arms of tegmen flattened and widened into hooked lateral flange; distal portion of lateral arm slightly divergent, expanded, rounded apically; median lobe more elongate, strongly elevated, narrowed to tip, gradually narrowed from base to apex (in lateral view).

Etymology. This species' name comes from the locality, meaning 'salter'.

Distribution. This species is known only from the Reserva Ecologica El Angel, near the Colombian border in Carchi, Ecuador.

Kapyatrog hirsutus **sp. nov.**
Figs 93G–I, 94E–F

Type material. Holotype ♂ (MECN-EN 40733): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13078, Morphosp. VS.017" / "MECN-EN 40733"; deposited in MECN. **Paratypes** (3♀): same data as type (MECN-EN 40605, 40613, 40633).

Diagnosis. (TL: 2.8mm) Very similar to *K. chevere*, but body setae (Fig. 93G–I) slightly sparser but much longer, erect, bushier; eyes smaller; antennomeres of club narrower, more elongate, IX and X with narrowed (not margined) apices; pronotum slightly flatter, almost becoming explanate near posterolateral corners; each elytron with sutural and only 2 lateral foveae; elytra short, brachypterous (in both sexes). As above, Aedeagus (Fig. 94E, F) very similar in general form to that of *K.*



FIGURE 93. Habitus photos, *Kapyatrog* spp., dorsal, ventral, lateral views **A–C** *K. chevere* **D–F** *K. saladero* **G–I** *K. hirsutus* **J–L** *K. mayu* **M–O** *K. pichi.* Scale bars = 1.0mm.

chevere, differing as follows: basal bulb slightly wider, with circular dorsal diaphragm; diaphragamatic sclerite divided along midline; lateral lobes of tegmen with broadly rounded, totally unhooked lateral flanges; inner/distal portion of lateral lobe more discretely sclerotized along inner margin, slightly converging, terminating in subquadrate, apically truncate apex; median lobe also elongate and elevated, but rather broad to tip, widening slightly at apex, and with strong basal knob (in lateral view).

Etymology. This species' name refers to its prominent, erect body setae.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is unusual in having only 3 dorsobasal foveae on each elytra, perhaps associated with its smaller elytra and brachyptery, at least in known specimens (of both sexes).

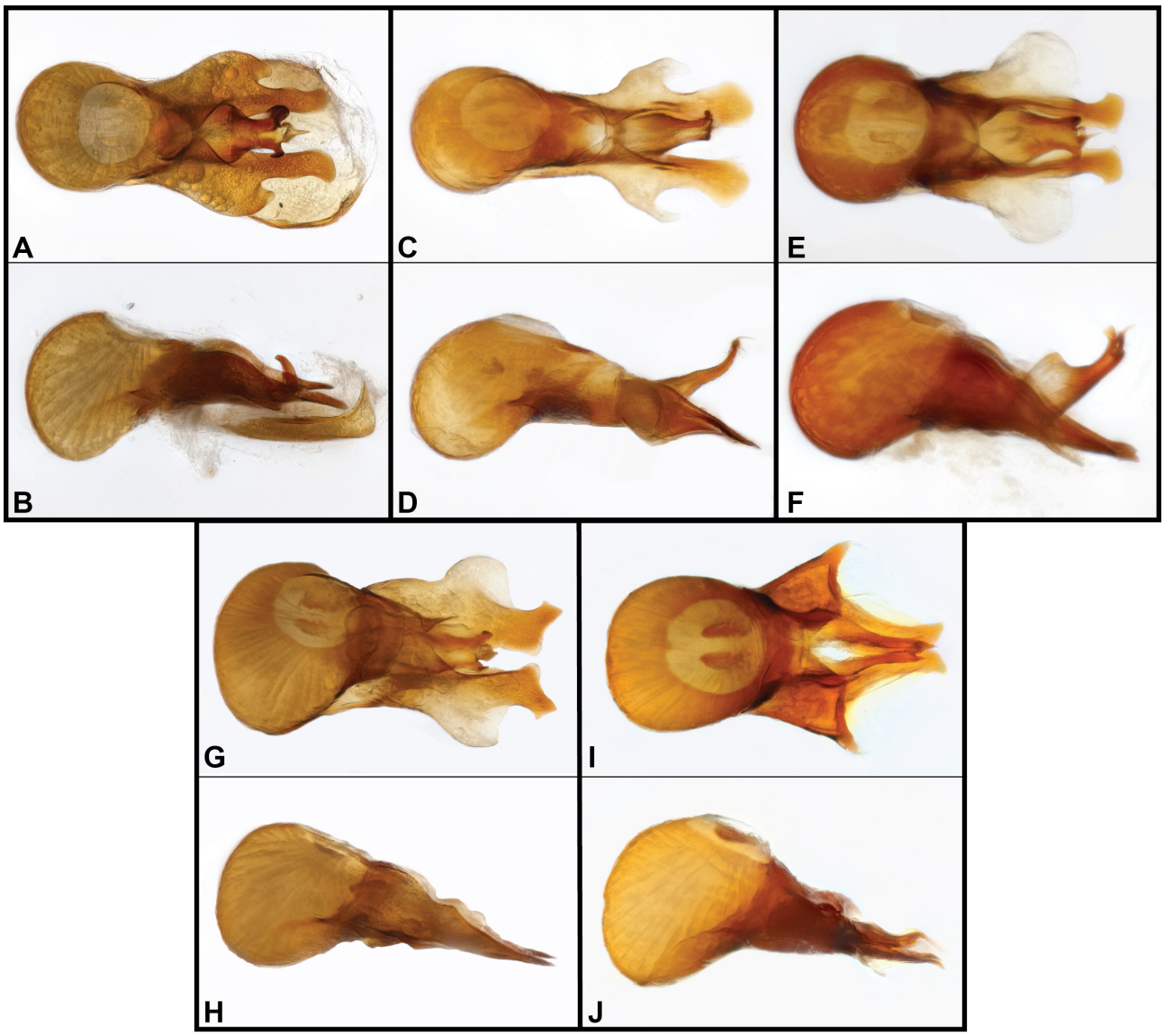

FIGURE 94. Aedeagus photos, *Kapyatrog* spp., dorsal, lateral views **A, B** *K. chevere* **C, D** *K. saladero* **E, F** *K. hirsutus* **G, H** *K. mayu* **I, J** *K. pichi*.

Kapyatrog mayu **sp. nov.**
Figs 93J–L, 94G–H

Type material. Holotype ♂ (MECN-EN 40863): "ECUADOR: Tungurahua, -1.4327˚, -78.3120˚, NaturetrekCandelariaRes, 2040m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13216, Morphosp. Cnd.032" / "MECN-EN 40863"; deposited in MECN. **Paratypes** (2♂, 2♀, same general locality and date as type): 3: same data as type; 1: -1.4361˚, -78.3105˚, 2241m (MECN-EN 40419, 40433, 40416, 40328).

Other material: 7♀: Ecuador: Tungurahua: Río Machay Reserve, 12.XI.2024 (3: -1.3921˚, -78.2932˚, 2100m; 2: -1.3895˚, -78.2929˚, 2239m; 2: -1.3968˚, -78.2929˚, 2304m; MECN-EN 40824, 40316, 40319, 40293, 40277, 40253, 40267).

Diagnosis. (TL: 3.3mm) This species is distinguishable from the very similar type, *K. chevere*, principally by the following characters: body (Fig. 93J) setae dense, fine, long, largely suberect, with numerous longer, erect setae intermingled; eyes small, diameter less than half length of postocular gena; antennomeres of club narrower, more elongate, IX and X with narrowed (not margined) apices; posterior portion of pronotal disk swollen on each side behind transverse sulcus; elytra shorter, though wings are present (in males), each elytron with three dorsobasal foveae; male metatrochanters weakly expanded at inner corners; male ventrites 2 and 3 with median comb of dense setae along apices, slightly more punctate than others; last ventrite simply but strongly depressed. Aedeagus (Fig. 94G, H) symmetrical, basal bulb large, rounded, with small basal foramen and large dorsal diaphragm with weak diaphragmatic sclerite divided along midline; lateral arms of tegmen (parameres?) dorsoventrally flattened, widely lobed at sides, narrowing to quadrately foot-shaped apices, the toes pointing apicolaterad; median lobe of tegmen rather

short, bifid, with upcurved hooks at apices, short, setose median process between.

Etymology. The species name comes from a Kichwa word meaning 'river', referring to the Río Pastaza watershed in which the species is found.

Distribution. This species is known only definitely from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador. A series of females from Río Machay, at a similar elevation on the north side of Río Pastaza, appears to be the same species. But a male would be necessary to support that suggestion.

Remarks. Based on both internal and genitalic characters, this species appears closely related to *K. chevere,* differing mainly in slightly larger size, the presence of only three foveae at the base of each elytron, and fine details of the lateral lobes of the aedeagus.

Kapyatrog pichi **sp. nov.**
Figs 93M–O, 94I–J

Type material. Holotype ♂ (MECN-EN 40889): "ECUADOR: Morona-Santiago, -3.02118˚, -78.58950˚, Limón Indanza, Área Ecológica de Conservación Municipal Tinajillas – Río Gualaceño, 2344m, 31.I.2025, M. Barreno | M. Basantes" / "Caterino DNA voucher, Ext. MSC-13308, Morphosp. Tin.001" / "MECN-EN 40889"; deposited in MECN.

Diagnosis. (TL: 3.1mm) This species is externally very similar to others of the genus, differing principally in the following characters: body (Fig. 93M) setae semierect; eyes small, diameter just over half postocular genal length; antennomeres of club elongate; pronotum widest behind middle, more gradually narrowed to anterior collar, disk slightly punctate; elytra narrow (wings present, but perhaps not fully developed); 1st abdominal tergite about 1.5× length of 2nd; profemur with trogastrine flange on apical fourth; male meso- and metatrochanters unmodified; Aedeagus (Fig. 94I, J) symmetrical, basal bulb large, rounded, with small basal foramen and large dorsal diaphragm, diaphragmatic sclerite divided along midline, distinct; lateral lobes of tegmen (parameres?) dorsoventrally flattened, strongly expanded, with acute lateral corners, wrapping over base of median lobe, almost meeting at middle, narrowing to approximate inwardly obliqely truncate apices below median lobe; with subacute lateral corners; median lobe of tegmen with pair of basally arcuate, apically acute median rods laying over parameral plates, a median, acute, asperate process just visible between them.

Etymology. This species' name comes from a term meaning 'red' in the Cañari language, a culture that inhabited the southern region of Ecuador prior to the spread of the Inca into the area.

Distribution. This species is known only from cloud forests east of Cuenca, in Morona-Santiago Province, Ecuador.

Remarks. This species is very similar to *K. mayu*, with a the basal region of the pronotal disk swollen. *Kapyatrog pichi*, does, however, have more slender and elongate antennomeres, while also having a slightly shorter scape. The male genitalia are quite dissimilar, with the angulate 'wings' of this species' parameres unique.

Mukirhexius Caterino, **gen. nov.**
Fig. 95

Type species. *Mukirhexius microps* **sp. nov.**, by present designation.

Diagnosis. (TL: 0.88–0.94mm, Avg. 0.91mm) Members of this genus are similar in many respects to those of *Allparhexius,* as detailed above. Species of *Mukirhexius*, however, exhibit a distinctive habitus, and differ in a number of significant characters: Body (Fig. 95A–F) smaller, flatter, with recumbent setae; head very small; eyes smaller, comprising no more than a few ommatidia; supraocular depression below antennal bases only weakly developed, with posterior carina; antennae shorter, antennomeres III–X strongly transverse; pronotum broader, more shieldlike, with distinct lateral margins, with shallow lateral foveae but lacking mediobasal fovea or transverse sulcus; abdomen flatter and narrowed to base; elytra very short, strongly narrowed, each with three dorsobasal foveae, a distinct basal carina, and dentate humeri (at dorsolaterally positioned subhumeral foveae), only weakly prolonged at posterior corners; subhumeral stria exaggerated as an epipleural sulcus; prosternum shorter, with precoxal foveae small and close; abdominal tergites similar in length; paratergites well-defined, narrow; femora swollen, profemur weakly carinate along anteroventral margin; metacoxae large and contiguous; male penultimate ventrite crescent shaped, simply depressed; small penial plate present; male secondary sexual characters not evident. Aedeagus (Fig. 95G–J) with large basal bulb; dorsal diaphragm large, diaphragmatic sclerite not evident; basal foramen located toward ventrodistal corner of bulb, beneath tegmen; tegmen with ventral plate extending ventrodistad from middle of basal bulb, broad, left side short, right wide and extended into broad apical lobe; articulated process extending above and between main tegmenal lobes, variously shaped.

Etymology. The name of this genus derives from the mythological Kichwa creature Muki, a small subterranean goblin, frequently portrayed as a miner, often blamed for unusual occurrences at night or underground, combined with a common ending for members of this tribe. It is masculine (as Muki is typically portrayed).

Remarks. While sharing a number of characters, and probably closely related, members of this genus are easily distinguished from those of *Allparhexius* on habitus alone. This would appear to be the more edaphic lineage, lighter in pigmentation, flatter, and with various other reductions.

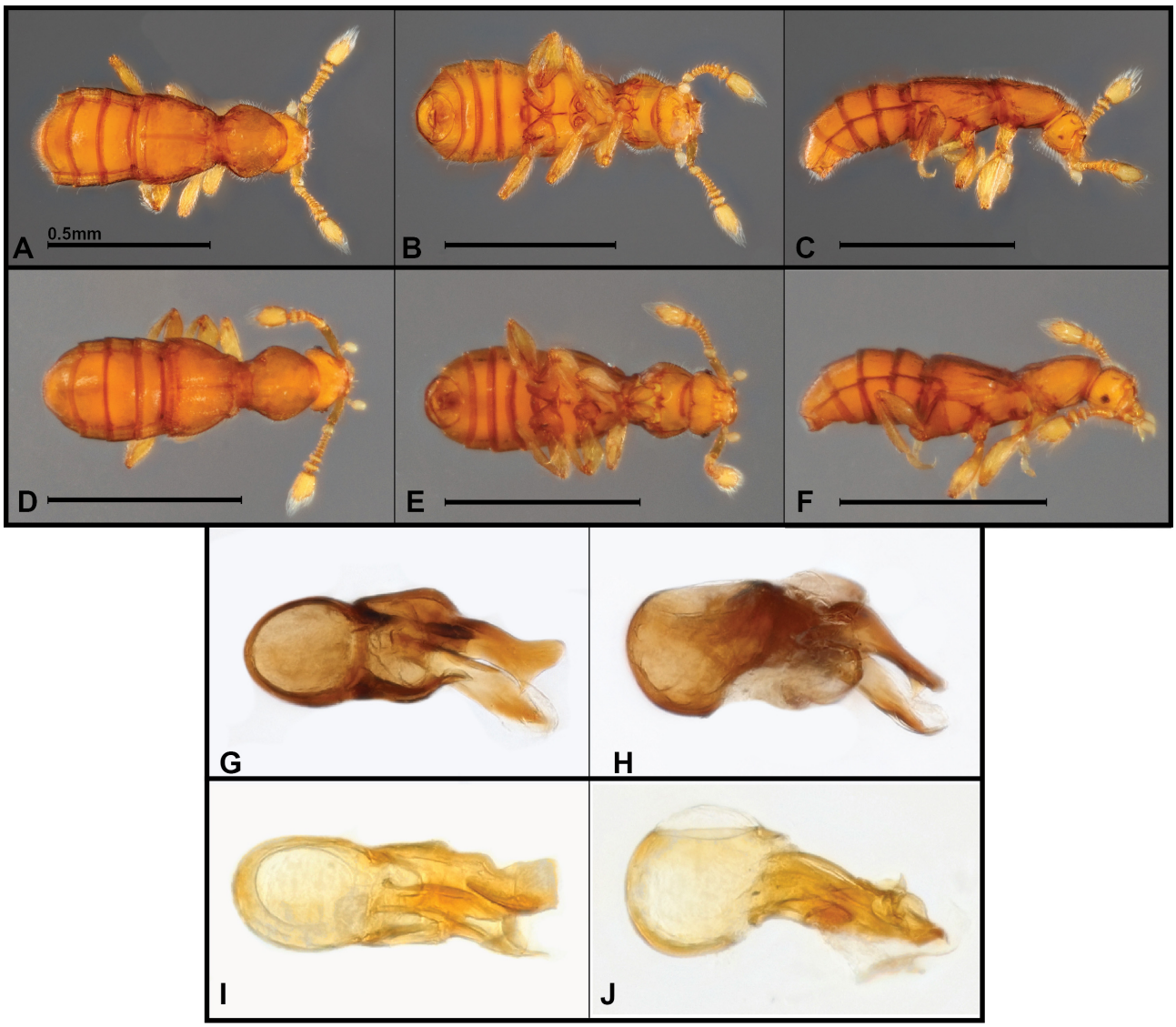

FIGURE 95. Photographs, *Mukirhexius* spp. **A–C, G, H** *M. microps* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *M. furtivus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 0.5mm.

Mukirhexius microps **sp. nov.**
DNA barcode: GenBank PX930218
Figs 95A–C, G–H

Type material. Holotype ♂ (MECN-EN 40807): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13160, Morphosp. Mch.023"; deposited in MECN. **Other material:** 1♂: "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, Naturetrek Candelaria Res, 2241m, 13.XI.2024, M.Caterino, sifted litter" (MECN-EN 40835).

Diagnosis. (TL: 0.9mm) Both species included here conform closely to the generic diagnosis, *M. microps* differing principally in the following characters: eyes (Fig. 95C) smaller, comprising ~1–2 ommatidia; 1st abdominal tergite (Fig. 95A, C) equal in length to 2nd. Aedeagus (Fig. 95G, H) with right side process elongate, broad, squared at apex, with subbasal notch on lateral margin; left side process very short; median articulated process bifid, with bluntly acute median tip and longer, more narrowly acute lateral one.

Etymology. The name of this species refers to its smaller eyes, relative to the other known species.

Distribution. This species is known only from cloud forests above the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. The two species of this genus differ considerably in (male) eye size and in pronotal shape, with the pronotum of this species broader, especially toward the base, and its eyes much smaller.

Mukirhexius furtivus **sp. nov.**
Figs 95D–F, I–J

Type material. Holotype ♂ (MECN-EN 41693): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Piha Tr., 2356m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12960,

Morphosp. Yn.A.029" / "MECN-EN 41693"; deposited in MECN. **Paratypes** (1♂,1♀, same general locality and data as type): 1: same data as type; 1: -0.5986˚, -77.8949˚, Stream Tr., 2185m (MECN-EN 38743, 38744).

Diagnosis. (TL: 0.9mm) Both species included here conform closely to the generic diagnosis, *M. furtivus* differing principally in the following characters: eyes (Fig. 95F) larger, comprising ~5 ommatidia; 1st abdominal tergite shorter than 2nd. Aedeagus (Fig. 95I, J) with right side process elongate, broad, squared at apex, with subbasal notch on lateral margin; left side process very short; median articulated process bifid, with bluntly acute median tip and longer, more narrowly acute lateral one.

Etymology. This species' name suggests 'hidden' or 'secretive' habits, likely for a nearly blind flightless beetle.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. Contrasted with the above, this species has larger eyes, and a pronotum that narrows more distinctly toward the base.

Rhexinia Raffray, 1890

Figs 96–97

Three species of *Rhexinia* are known, from Mexico, the Caribbean, Colombia and Argentina (Grigarick & Schuster 1975; Park 1952b). Five new species are described below.

Diagnosis. (TL: 1.1–1.9mm, Avg. 1.6mm) Among Trogastrini, *Rhexinia* is characterized by weak to absent median pronotal sulcus or fovea, along with possessing three to four basal elytral foveae, as well as a generally smaller body size (Park, 1952b). Several of the species have the anterior portion of the pronotum somewhat lengthened, similar though to a lesser degree than the distinct collar of *Rhexius* LeConte. The strongly rugose texture of the pronotum and head are shared by most of the species (distinguishing them from the otherwise similar and formerly congeneric members of *Rhexiola* Park, to which *Rhexinia versicolor* Raffray might yet be moved). Grigarick and Schuster (1980) elevated *Rhexiola* to full generic status due to its lack of anterior pronotal constriction (which would suggest *Rhexinia* s. str. to be more closely related to *Rhexius*), and the presence in *Rhexiola* of a median pronotal fovea.

While the species described here fit the above diagnosis, they are diverse, and probably yet subject to future separation. The three described species that remain in *Rhexinia* have a long 1st abdominal segment, while some below do not. The only described genitalia for *Rhexinia* are the aedeagus of *R. tucumanensis* Grigarick & Schuster (1975), which is symmetrical, like many other Trogastrina, and *R. plana* Park (1952), which is not. A couple of the species described here may be similar to the latter, although Park's drawing is difficult to interpret. But in general, much like *Eurhexius* above, there are multiple distinct genitalic forms in *Rhexinia*, which may have separate affinities outside of the genus, in particular within *Rhexius*. The barcode-based phylogeny presented below (Fig. 138) separates two of the new species (*Rhexinia asperata* and *R. spinipes*) widely from two others for which sequences are available (*R. seca* and *R. laloloori*). So, in short, there is more work to do here.

Rhexinia laloloori **sp. nov.**

DNA barcodes: GenBank PX930203, PX930295

Figs 96A–C, 97A–B

Type material. Holotype ♂ (MECN-EN 38560): "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12773, Morphosp. Bar.A.005" / "MECN-EN 38560"; deposited in MECN. **Paratypes** (1♀): 1: same data as type (MECN-EN 38559). **Other material:** 2♀: ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, M. Caterino, A. Tishechkin (ZSFQ-i23303–i23304)

Diagnosis. (TL: 1.1mm) Body (Fig. 96A) small; head and pronotum with reticulate sculpture and short, dense, erect setae; rest of body smooth, with sparser short dark only slightly recumbent setae intermingled with a similar density of finer, longer, more erect setae; head emarginate at base, vertex with fine median groove; vertexal foveae shallow, behind antennal insertions; frons slightly depressed between antennal insertions; antennae short, antennomere I about as long as next 5 antennomeres, II globose, III–VIII short, increasing slightly in width, IX–XI forming compact club, IX and X very short and transverse, XI rounded, about 5× as long as X; pronotum densely punctate, smooth within longitudinal median sulcus, widest near middle, strongly narrowed to short anterior collar, less strongly narrowed to base, margins finely and weakly serrate, not toothed; lateral subbasal foveae present close to sides; elytra widening slightly, impunctate, with four basal foveae in an arc; humeri weakly elevated, slightly prolonged posterad; first abdominal segment nearly as long as others combined, with straight lateral carinae; prosternum long, depressed in front of procoxae; male ultimate ventrite narrowly depressed in middle. Aedeagus (Fig. 97A, B) with large basal bulb, asymmetrical, with three apical processes; leftmost process short, bluntly, obliquely truncate, central process longest, broad, obliquely subquadrate, with fringe of short setae along half of distal margin, right process subacute, deflected 45° ventrad.

Etymology. This species' name honors Mr. Eudaldo 'Lalo' Loor, who, along with the Ceiba Foundation, ensured that one of the known homes of this species, in the threatened dry forests of the Ecuadorian coast would be protected.

Distribution. This species is known from lowland coastal dry forests of Manabí and Santa Elena Provinces, Ecuador.

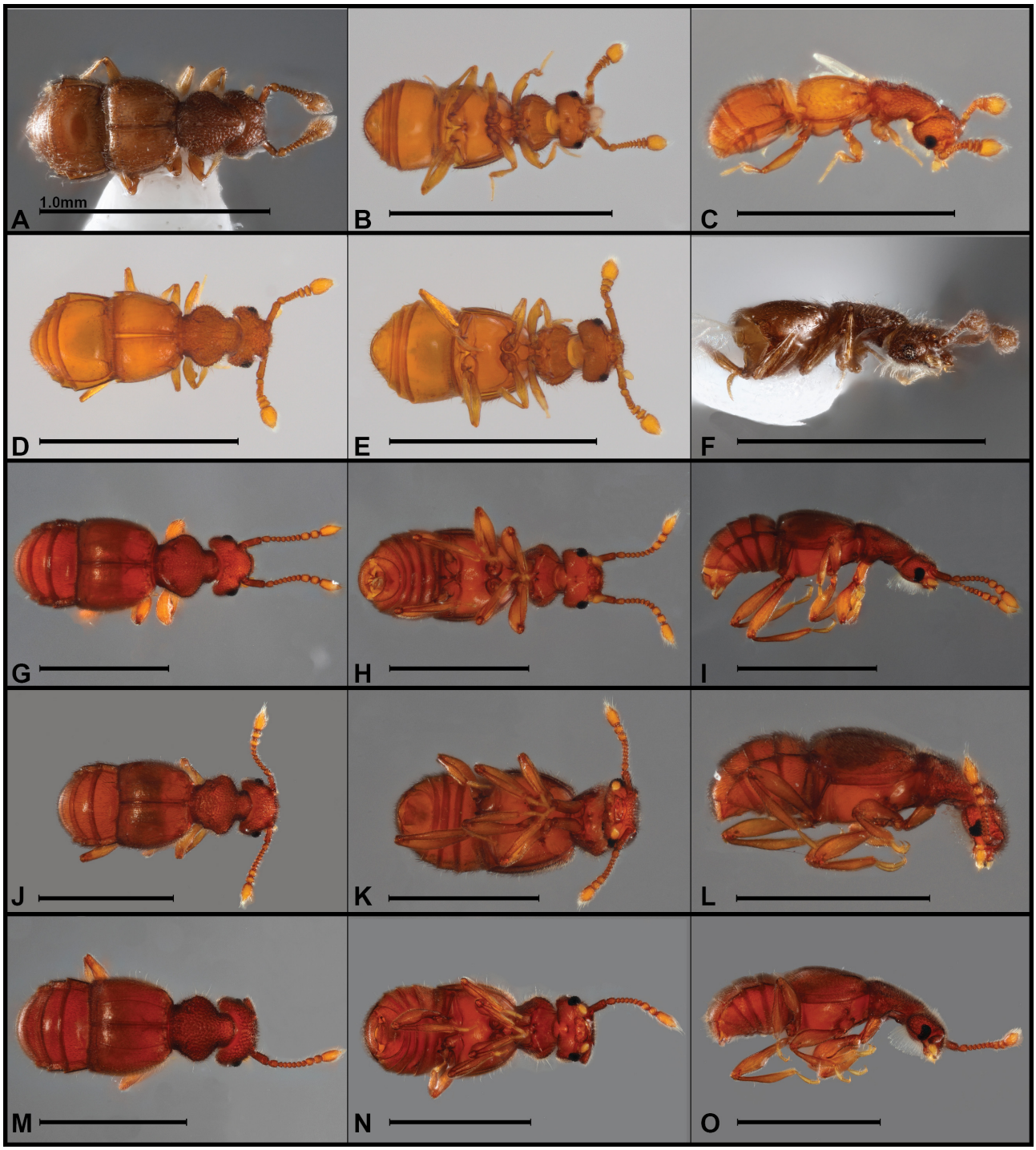

FIGURE 96. Habitus photos, *Rhexinia* spp., dorsal, ventral, lateral views **A–C** *R. laloloori* **D–F** *R. seca* **G–I** *R. purun* **J–L** *R. asperata* **M–O** *R. spinipes*. Scale bars = 1.0mm.

Remarks. This species and the one that follow more closely matches the type (*R. angulata*) than the one described below from Otonga, sharing a more compact antenna and an elongate first abdominal segment. This species differs from *R. angulata* in having the reticulate sculpturing of the head and pronotum less dense.

Rhexinia seca **sp. nov.**
DNA barcode: GenBank PX930296
Figs 96D–F

Type material. Holotype ♀ (ZSFQ-i23305): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 22–27.v.2011, AT1313, M. Caterino, A. Tishechkin, mid-canopy FIT" / "Caterino DNA voucher, Ext. MSC-12713, Trogastrini"; deposited in ZSFQ.

Diagnosis. (TL: 1.3mm) This species is extremely

similar to and sympatric with the preceding, but differs in the following characters: median pronotal impression slightly deeper and coarser (Fig. 96D); sides of pronotum more broadly rounded, serrate, while being more abruptly constricted near base and apex; antennal club more substantial, antennomeres IX–X especially thicker/longer; striae of 1st visible tergite curved inward (not straight).

Etymology. The name of this species refers to the occurrence of this species in seasonally 'dry' coastal forests.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks —Despite being very similar to the preceding species, and being known only from a female, both DNA and morphology indicate that these species are distinct.

Rhexinia purun **sp. nov.**
Figs 96G–I, 97C–D

Type material. Holotype ♂ (MECN-EN 41048): "ECUADOR: Cotopaxi, -0.4176˚, -79.0040˚, Bosque Integral Otonga, 13.VIII.2024, 2063m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12844, Morphosp. Ot.A.009" / "MECN-EN 41048"; deposited in MECN. **Paratypes** (11♂, 7♀): same general locality and date as type (MECN-EN 38597–38614).

Diagnosis. (TL: 1.9mm) Head and pronotum densely microspinose (Fig. 96G), with the setal bases slightly raised and the setae short and erect; integument of elytra and abdomen smooth, with dense, dark recumbent setae and few longer, finer, erect setae intermingled; head strongly emarginate posteriorly, eyes large and reniform (emarginate posteriorly); frons convex between antennal insertions; antennae elongate, with loose three segmented club; antennomere I as long as next four together, antennomere II almost twice as long as III, III–VIII similar in size, short, slightly wider than long, IX–X similar, wider and twice length of VIII, XI about 2.5× as long as X; head ventrally with dense beard of long setae; pronotum more or less evenly widened from base to widest point 2/3 to apex, narrowed anteriorly to short collar; lateral pronotal foveae well impressed, pronotum weakly impressed along longitudinal midline, but sulcus not well-defined; basal transverse pronotal sulcus absent; elytra each with 4 basal foveae, subhumeral fovea present; first abdominal segment only slightly longer than second; male metaventrite slightly depressed at middle, with denser, weakly scale-like setae; male penultimate abdominal ventrite deeply emarginate; male ultimate ventrite weakly depressed, apically with weakly convergent setae. Aedeagus (Fig. 97C, D) with large convex basal bulb, basal foramen small and at its distal edge, dorsal diaphragm present, small, immediately above tegmen; tegmen with several distal processes, a broad, bifid ventral plate underlies others, more strongly developed on right side, its apex irregularly stepped, with cluster of submarginal setae, left side simpler, shorter, with short apical setae and single longer subapical seta; short dorsal lip extends over basal half of inner armature, its apex obliquely truncate; inner armature comprising three long styles, two long, apically acute ones sinuately extending from left side, a slightly shorter one extending from middle is flat and wide basally, narrowing to short neck, then curves dorsad into expanded, laterally compressed rounded paddle.

Etymology. This species' name comes from a Kichwa word meaning 'wild' or 'rustic'.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. The frons of this species is unusually convex, and the body is generally larger than average for *Rhexinia* spp.

Rhexinia asperata **sp. nov.**
DNA barcode: GenBank PX930386
Figs 96J–L, 97E–F

Type material. Holotype ♂ (MECN-EN 40717): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13062, Morphosp. VS.001" / "MECN-EN 40717"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 40640).

Diagnosis. (TL: 1.9mm) This species is extremely similar in external morphology to *R. laloloori*, differing principally as follows: body setae, particularly that of pronotum slightly longer (Fig. 96J); rugosity of head and especially pronotum more granulate, like very coarse sandpaper; eyes slightly smaller; antennal club shorter, with antennomeres IX and X distinctly shorter than long; lateral pronotal margin with distinct acute tooth laterad basolateral foveae; dorsobasal foveae of elytra shallower; male metatrochanters dentate at inner corner. Aedeagus (Fig. 97E, F) only slightly asymmetrical, with large basal bulb, dorsal diaphragm broadly open; tegmen narrow at base, dorsoventrally compressed, mainly comprising widened pair of broad, apically subtruncate distal lobes, each with a fringe of long setae, the left lobe with a strong lateral marginal tooth; a sinuate articulated process arises within basal bulb, narrows, and winds upward, ending acutely between distal lobes of tegmen.

Etymology. The name of this species refers to the texture of the pronotum.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is distinctive in its asperate pronotal texture and having the pronotal margin slightly dentate within the posterior constriction.

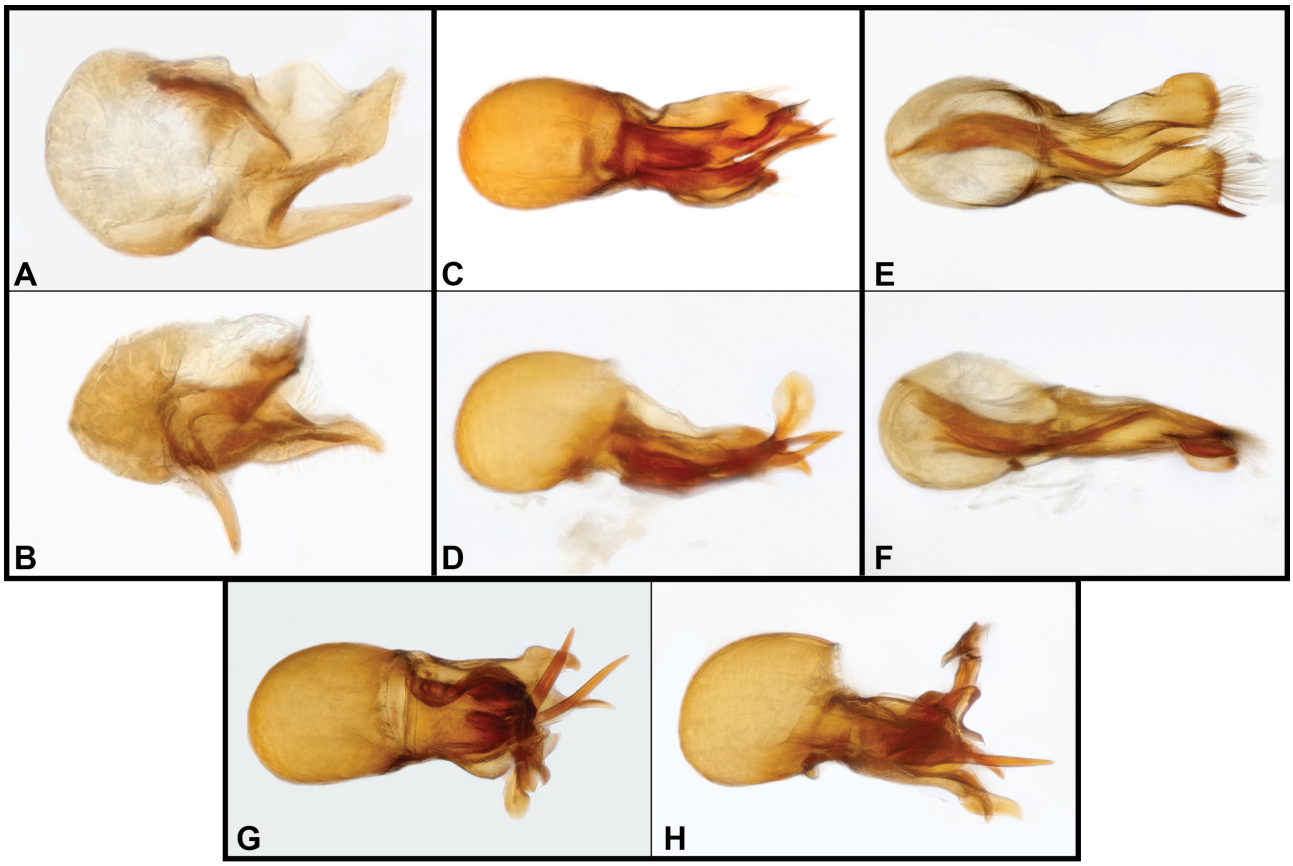

FIGURE 97. Aedeagus photos, *Rhexinia* spp., dorsal, lateral views **A, B** *R. laloloori* **C, D** *R. purun* **E, F** *R. asperata* **G, H** *R. spinipes*.

Rhexinia spinipes **sp. nov.**
DNA barcode: GenBank PX930320
Figs 96M–O, 97G–H

Type material. Holotype ♂ (MECN-EN 40816): "ECUADOR: Tungurahua, -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13169, Morphosp. Mch.032"; deposited in MECN. **Paratypes** (1♂, 8♀, same general locality and date as type): 8: same data as type; 1: -1.3895˚, -78.2929˚, 2239m (MECN-EN 40295, 40255, 40264, 40258, 40251, 40259, 40273, 40257, 40254). **Other material:** (1♂, 2♀): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, Naturetrek Candelaria Res, 2241m, 13.XI.2024, M.Caterino, sifted litter" (MECN-EN 40337, 40342, 40837).

Diagnosis. (TL: 1.8mm) Body (Fig. 96M) rusty orange, head and pronotum microrugose with erect setae, elytra and abdomen relatively smooth with sparser subrecumbent setae; head broadly emarginate posteriorly, dorsal edge weakly carinate; vertexal foveae not evident amidst rough texture; eyes large, slightly emarginate posteriorly; frons convex between antennal insertions; antennae moderately elongate, antennomere I as long as next four together, antennomere II subconical, almost twice as long as III, III–VIII similar in size, short, slightly wider than long, IX–XI forming loose club, IX–X similar, wider and twice length of VIII, XI about 2.5× as long as X; head ventrally with dense beard of long setae; pronotum more or less evenly widened from base to widest point near middle, weakly dentate at that point, narrowed anteriorly to short collar; lateral pronotal foveae well impressed, pronotum not impressed along longitudinal midline; elytra each with 4 basal foveae, with complete elytral stria arising from 2nd lateral fovea; subhumeral foveae very small, subhumeral stria complete; first abdominal segment only slightly longer than second, with very short, diverging basal carinae; male protrochanter triangular, dentate at middle; male metatrochanter (Fig. 96N) with strong, anteriorly curving spine at middle of posterior margin; male metafemur slightly stalked in basal half, abruptly widened at middle (Fig. 96O); male penultimate abdominal ventrite shallowly depressed. Aedeagus (Fig. 97G, H) with elongate, convex basal bulb, basal foramen small, opening behind small basal knob; dorsal diaphragm wide but short, opening distally over tegmen; tegmen with complex ventral lobe, apically with three lobes, left-most short and rounded, middle one laterally compressed and narrow, right-most blunt, with a few lateral setae at its outer base; articulated inner armature includes two long, acute rods that curve rightward; the extrusion of this inner armature appears to shift some dorsally articulated lobes upward, including one long, upwardly and leftwardly curved, apically rounded process.

Etymology. This species' name refers to the prominent metatrochanteral spine of the males.

Distribution. This species is known from cloud forests both north and south of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. This species is most distinctive among *Rhexinia* in its secondary sexual characters, the males having dentate pro-, and especially metatrochanters, the latter forming a large curved spine. The two known populations do not differ in any obvious morphological characters. The complicated aedeagus bears clear similarity in general structure to that of *R. purun*, in the form of the basal bulb and the presence of a free inner armature, but the details differ substantially. Similarities or homologies to genitalia of others described here are not apparent.

Rhexius LeConte, 1849
Fig. 98

Twelve species of *Rhexius* have been reported from tropical America (Asenjo *et al.* 2019), most from Panama and northward. Several additional species are known from the Nearctic (see Chandler 1989b). In South America there are only two reported from Brazil, and one from Venezuela. Three new species are described below.

Diagnosis. (TL: 1.5–3.7mm, Avg. 2.8mm) Like most Trogastrini, *Rhexius* has separate antennal insertions, an elongated scape, and a broad head with convex genae received beneath the pronotal hypomera when the head is retracted. Species of *Rhexius* have a particularly wide head, a markedly elongated, narrow prothoracic collar (which separates them into a separate subtribe Rhexiina), and distinctly denticulate lateral pronotal margins. Much of this is also true for the generally smaller, densely punctate *Rhexinia* (treated above), although its pronotal collar is typically not as well-developed, and some members of the latter may ultimately belong here. The asymmetrical aedeagus typically comprises a distinct basal bulb, an often flattened, blade-like ventral lobe, and a median lobe comprising a variable number of complex distal processes (see Park 1952 and Chandler 1989b). The position of the dorsal diaphragm is surprisingly variable, with the species described below having it distinctly dorsal, while several previously described species have it poorly defined (*R. sharpi* Park) or apical, above the distal foramen (*R. substriatus* LeConte, *R. stephani* Chandler).

As mentioned by Chandler (1989b), the species are mostly difficult to distinguish based on external characters. Sexual dimorphisms are relatively few and subtle, and reference to the aedeagus will generally be necessary to confirm identifications.

Rhexius collaris **sp. nov.**
DNA barcodes: GenBank PX930272, PX930273
Figs 98A–C, J–K

Type material. Holotype ♂ (ZSFQ-i23301): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res. 29.v.2011, 2100m, Forest litter sifting, AT1334 M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12712, *Rhexius* sp."; deposited in ZSFQ. **Paratypes** (1♀): same locality as type, understory fogging (ZSFQ-i23302).

Diagnosis. (TL: 3.67mm) Body (Fig. 98A) dark reddish-orange, densely covered with dark, semi-erect setae; head with small, coarsely faceted eyes; vertex with two small posterior denticles on either side of insertion of neck; vertexal foveae deep; antennal insertions bordered by inner carina, frons smooth, setose between antennal bases; antennomere I about as long as next four antennomeres combined; antennomeres III–VIII beadlike, antennomeres IX–XI enlarged, forming loose club; pronotum with sides broadly rounded, bearing strong basal tooth, widely separated from four smaller marginal teeth pronotal constricted posteriorly with basal fourth narrow; anterior pronotal collar about ¼ wider than long; pronotal disk weakly convex, with deep median furrow not reaching base or apex, shallow basolateral foveae present, with deeper lateral foveae just mediad largest marginal teeth; each elytron with four strong basal foveae, 3rd extended by stria reaching to elytral midpoint; subhumeral fovea and carinate subhumera stria present; 1st visible abdominal segment about 1.3× as long as 2nd; profemur with short, oblique carina on distal third of inner margin, bearing sparse comb of setae; female not distinct in any of the above characters. Aedeagus (Fig. 98J, K) with long but narrow basal bulb, ventral lobe wide, with outwardly arcuate inner and lateral margins, obliquely subtruncate apically, median lobe with shorter medial process bent, apically truncate, and longer lateral process bent inward, tapering to semimembraneous apex.

Etymology. This species is named for its long, 'collar'-like pronotal extension.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Rhexius acutigens **sp. nov.**
Figs 98D–F, L–M

Type material. Holotype ♂ (MECN-EN 41049): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Piha Tr., 2356m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12957, Morphosp. Yn.A.006"; deposited in MECN. **Paratypes** (2♂, 1♀): 2: same data as type; 1: same general locality as type, but -0.5939˚, -77.8980˚, 2368m (MECN-EN 41050, 38741, 38742).

Diagnosis. (TL: 3.3mm) This species is extremely similar to *Rhexius collaris*, differing in the following characters; pronotal marginal teeth (Fig. 98D) more evenly spaced, gap between basal two teeth only slightly greater than that between 2nd and 3rd basal teeth; median pronotal sulcus more narrowly impressed; sulciform stria from 3rd basal elytral fovea poorly developed; male metatrochanter with small apical tooth; male last ventrite shallowly depressed. Aedeagus (Fig. 98L, M) very similar, right side of tegmen narrower, rounded (rather

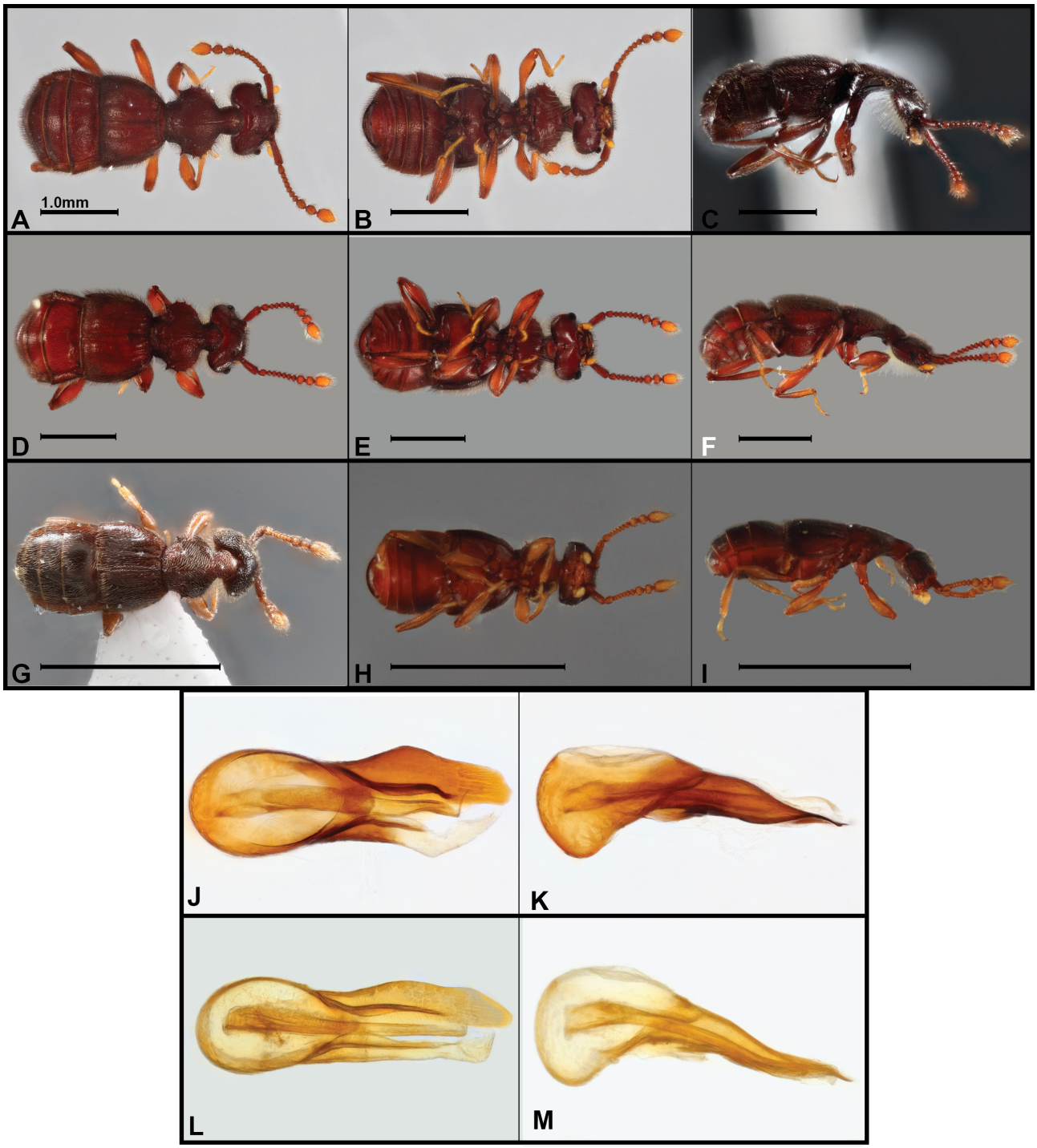

FIGURE 98. Photographs, *Rhexius* spp. **A–C, J, K** *R. collaris* (body: dorsal, ventral, lateral, detail of abdomen; aedeagus: dorsal, lateral) **D–F, L, M** *R. acutigens* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I** *R. micros* (body: dorsal, ventral, lateral). Scale bars = 1.0mm.

than subangulate), its apex more narrowly and gradually tapered; left lobe straighter, without outer angle, apex truncate and shorter than left; median lobe straight, only slightly narrowed at midpoint then parallel-sided to apex, without twisted apical process.

Etymology. This species' name is a reference to the sharply carinate gena behind the eyes (seen to varying degrees in other species as well).

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Rhexius micros **sp. nov.**
Figs 98G–I

Type material. Holotype ♀ (MECN-EN 41047): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol.

Yanayacu, Piha Tr., 2397m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12931, Morphosp. Yn.A.006"; deposited in MECN. **Paratypes** (1♀): same general locality as type, but -0.5986˚, -77.8949˚, Stream Tr., 2185m (MECN-EN 38740).

Diagnosis. (TL: 1.5mm) Body (Fig. 98G) small, dark reddish-brown, evenly and finely setose, setae subrecumbent; head emarginate at base, depressed and smooth at vertex beneath overhanging pronotal margin; vertex rugosely punctate along base, continued to genae, smoother at middle, without dorsal teeth, with fine median groove; vertexal foveae present, widely spaced, just posterolaterad antennal insertions, connected by broadly anteriorly arcuate sulcus; eyes small, almost indistinct amongst punctures, comprising 2–3 ommatidia; antennae short, geniculate, antennomere I cylindrical, about as long as next 6 antennomeres, II globular, III–VIII short, increasing in width slightly, IX–XI forming loose club, XI about 2.5× length of X; pronotum with single lateral tooth near base, margins otherwise smooth, widest just behind middle, narrowed strongly to anterior collar, collar widening slightly to apex; disk punctate at base, with wide but not deep median longitudinal sulcus; lateral subbasal foveae well-impressed, transverse sulcus absent; each elytron with 4 basal foveae, elytra weakly impressed behind; humerus slightly raised, with low carina extending posterad one-third elytral length; 1st abdominal tergite about 1.5× length of 2nd.

Etymology. This species' name refers to its small body size, and particularly to its strongly reduced eyes.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is remarkably small for a true *Rhexius* (although I have not been able to compare it to all described species). Even lacking a male specimen, it is worth describing, although it leaves a number of questions, if there is significant dimorphism. The inconspicuous eyes, in particular, seem likely to be a sexual character.

Tinkuna Caterino, **gen. nov.**

Figs 99–100

Type species. *Tinkuna gracilis* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.1–1.7mm, Avg. 1.4mm) Body (Figs 99A–R, 100A–C) elongate, yellow to dark orange, elongate, weakly flattened; head broad, flat, strongly constricted behind into distinct neck; (male) eyes protuberant; vertexal foveae well developed and widely separated, situated near dorsal margin of eyes; antennal insertions elevated; antennae strongly geniculate with scape as long as or longer than funicular antennomeres (II–VIII), last three antennomeres forming distinct, loose club; venter of head bearing beard of long setae (like most Trogastrina) and pair of gular foveae; pronotum narrow, distinctly longer than wide, flattened or often with two longitudinal carinae, variably depressed between; weakly impressed lateral pronotal foveae present, connected by transverse sulcus; elytra rather long in males (winged; shorter and wingless in known females), with slightly produced humeri, with from two to four dorsobasal foveae; sutural stria present; subhumeral fovea present, slightly distant from base, subhumeral stria present; abdominal tergites roughly similar in length; paratergites present and well defined; 1st visible ventrite with lateral longitudinal carina; prosternum long in front of coxae, not carinate, with close, shallowly impressed precoxal foveae; procoxae strongly projecting; profemur with well-defined sensory patch along apical portion of inner margin; all femora weakly clavate; tibiae slender; tarsi long; first abdominal sternite visible at sides, bearing large setose fovea; aside from eye size, male with last ventrite weakly depressed but otherwise without obvious secondary sexual characters; penial plate absent. Aedeagus (Fig. 100D–M) strongly dorsally curved, laterally compressed; basal foramen small; dorsal diaphragm small; tegmen comprising long, curved dorsal process and shorter ventral process, the latter with strong subapical arch.

Etymology. This generic name comes from a Kichwa term for 'drummer', also meaning 'to unite'. It is feminine.

Distribution. Species of this genus are known from a number of widely dispersed locations in the country, from Amazonian forest at Tiputini, to cloud forests on both eastern and western sides of the Andean crest.

Remarks. As reflected by a number of characters, this genus may be a distinctive offshoot of the Trogastrini (along with *Allparhexius* and *Mukirhexius*). All three retain a similarity in pronotal form and geniculate antennae with a three segmented club. It is possible that they are related to other Trogastrini with a markedly elongate scape such as *Aporhexius* Raffray. The conspicuous profemoral sensory area is, however, not known among other Trogastrini, but does appear in various Trimiina, as well as another new genus described here (*Ayapuna*), which does not appear otherwise similar. The significance of the profemoral sensory area as either a biological character or as a marker of relationship is unclear. The absence of a distinct penial plate argues against any relationship with Trimiina.

Unfortunately, all the species are known either from males or from females, but none from both. Nonetheless, it appears that they are dimorphic, with males possessing large eyes and flight ability (and therefore longer elytra), and females small-eyed and flightless (hence shorter elytra).

Tinkuna gracilis **sp. nov.**

Figs 99A–C, 100D–E

Type material. Holotype ♂ (ZSFQ-i23316): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12702, Morphosp. TBS.A.022"; deposited in ZSFQ. **Paratype** (1♂): same data as type (ZSFQ- i23317).

Diagnosis. (TL: 1.1mm) Body (Fig. 99A) orange, slightly flattened, densely covered with short, appressed

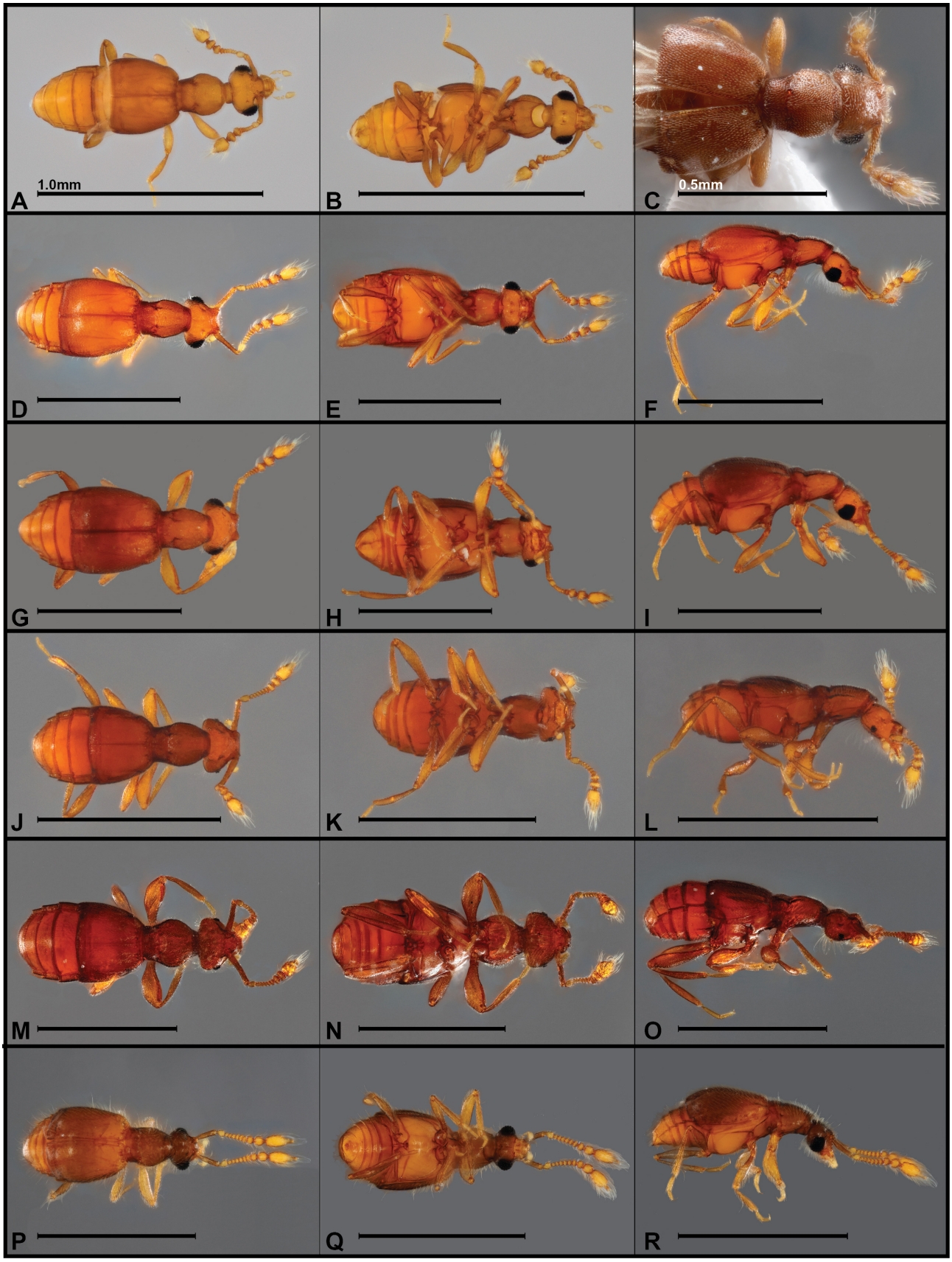

FIGURE 99. Habitus photos, *Tinkuna* spp., dorsal, ventral, lateral views **A–C** *T. gracilis* (**C** detail view of pronotum) **D–F** *T. josti* **G–I** *T. geniculata* **J–L** *T. jarrini* **M–O** *T. borea* **P–R** *T. inquisitor.* Scale bars = 1.0mm unless otherwise indicated.

setae; head broad, rounded posteriorly; eyes protuberant, coarsely faceted; antennal insertions only slightly elevated; labrum broadly rounded, apical margin finely serrate; maxillary palpi rather small; antennomere I very elongate, as long as combined antennomeres of funicle, antennomere II bulbous apically, III–VII short, beadlike, slightly transverse, VIII more transverse, IX–X forming distinct, loose club, IX–X slightly transverse, XI broader, acuminate apically, about 2.5× as long as X; venter of head with sparse beard of long setae; pronotum (Fig. 99C) narrow at base, widened to apical third, anteriorly rounded; laterobasal foveae weakly impressed, median fovea absent, transverse subbasal impression shallow and broad, poorly defined; each elytron with sutural fovea and one humeral fovea; elytra depressed along midline; prosternum lacking sternal foveae; profemur (Fig. 99B) with well-defined, elongate tomentose depression along apical half of inner margin. Aedeagus (Fig. 100D, E) strongly dorsally curved, laterally compressed; basal foramen small, framed by larger ventral bridge (formed from fused parameres?); dorsal diaphragm small, elongate oval; dorsal process of tegmen curved strongly downward, directed to left, tapered to apex; ventral process 'S'-shaped, hooked outward apically, short.

Etymology. This species' name refers to its elongated body form and appendages.

Distribution. This species is known only from the Tiputini Biodiversity Station in Amazonian Orellana, Ecuador.

Remarks. This species of this genus are all quite similar, in external as well as genitalic characters. The type species is distinct in the lack of longitudinal pronotal ridges, being slightly flattened along the midline, but otherwise not significantly modified. It also differs from some in having only three dorsobasal elytral foveae, and a rather short last male abdominal ventrite.

Tinkuna josti **sp. nov.**
Figs 99D–F, 100F–G

Type material. Holotype ♂ (MECN-EN 40817): "ECUADOR: Tungurahua, -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13170, Morphosp. Mch.033" / "MECN-EN 40817"; deposited in MECN.

Diagnosis. (TL: 1.5mm) This species is very similar to the preceding, differing principally in the following characters: Body (Fig. 99D) setae primarily semirecumbent, with sparser, interspersed erect setae; eyes very large, diameter about twice post-ocular genal length; antennal bases elevated; antennal scape narrowed toward apex, antennomere II almost twice as long as wide, weakly conical, antennomeres III–VIII distinctly transverse, antennal club more elongate, antennomere IX only slightly wider than long, X quadrate, XI about 2.5× as long as wide; pronotum narrow, widest and very weakly angulate just behind middle, narrowed evenly to front, distinctly punctate, especially in posterior constriction; longitudinal carinae well developed; median portion of transverse sulcus deep, glabrous; each elytron with four dorsobasal foveae; elytra with small, shallow, ocellate punctures. Aedeagus (Fig. 100F, G) strongly dorsally curved, laterally compressed; basal foramen small, framed by larger ventral bridge (formed from fused parameres?); dorsal diaphragm not evident; dorsal process of tegmen arched, not reaching apex of ventral process; median process thick, laying against cradling arm continuous with thinner dorsal process; ventral process sclerotized only along ventral margin until strongly and narrowly arched upward before descending to weakly acute apex.

Etymology. This species' name recognizes Lou Jost, a botanical specialist on tropical orchids, and a founder of EcoMinga, a conservation organization dedicated to protecting Ecuadorian biodiversity, including the Río Machay Reserve where this species is found.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. The elongate antennae, distinctly punctate pronotum (and to a lesser degree, head) with well developed longitudinal carinae, and elytra with four dorsobasal foveae will help distinguish this species.

Tinkuna geniculata **sp. nov.**
Figs 99G–I, 100H–I

Type material. Holotype ♂ (MECN-EN 41690): "ECUADOR: Napo, -0.5958˚, -77.8927˚, Est. Biol. Yanayacu, Ridge Tr., 2233m, 10.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12995, Morphosp. Yn.A.064" / "MECN-EN 41690"; deposited in MECN [entire specimen in genitalia vial].

Diagnosis. (TL: 1.7mm) This species is very similar to the preceding (*T. josti*), differing principally in the following characters: eyes very large (Fig. 99I), nearly reaching posterior margin of genae; antennomeres of the club slightly less elongate, both IX and X transverse; pronotum (Fig. 99G) more sparsely punctate, with basal transverse sulcus broad and deep; longitudinal pronotal carinae well developed; each elytron with four basal foveae; last male ventrite (Fig. 99H) large, nearly triangular. Aedeagus (Fig. 100H, I) with dorsal process nearly straight to apex, narrowing (dorsoventrally) in apical third; ventral process very strongly arched, apical flange deflexed distad, widened, paddle-shaped.

Etymology. The species name refers to the geniculate antennae, common to the genus.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is best distinguished by aedeagal shape, although a few of the minor differences listed above, including large eyes and presence of pronotal carinae can help in recognition.

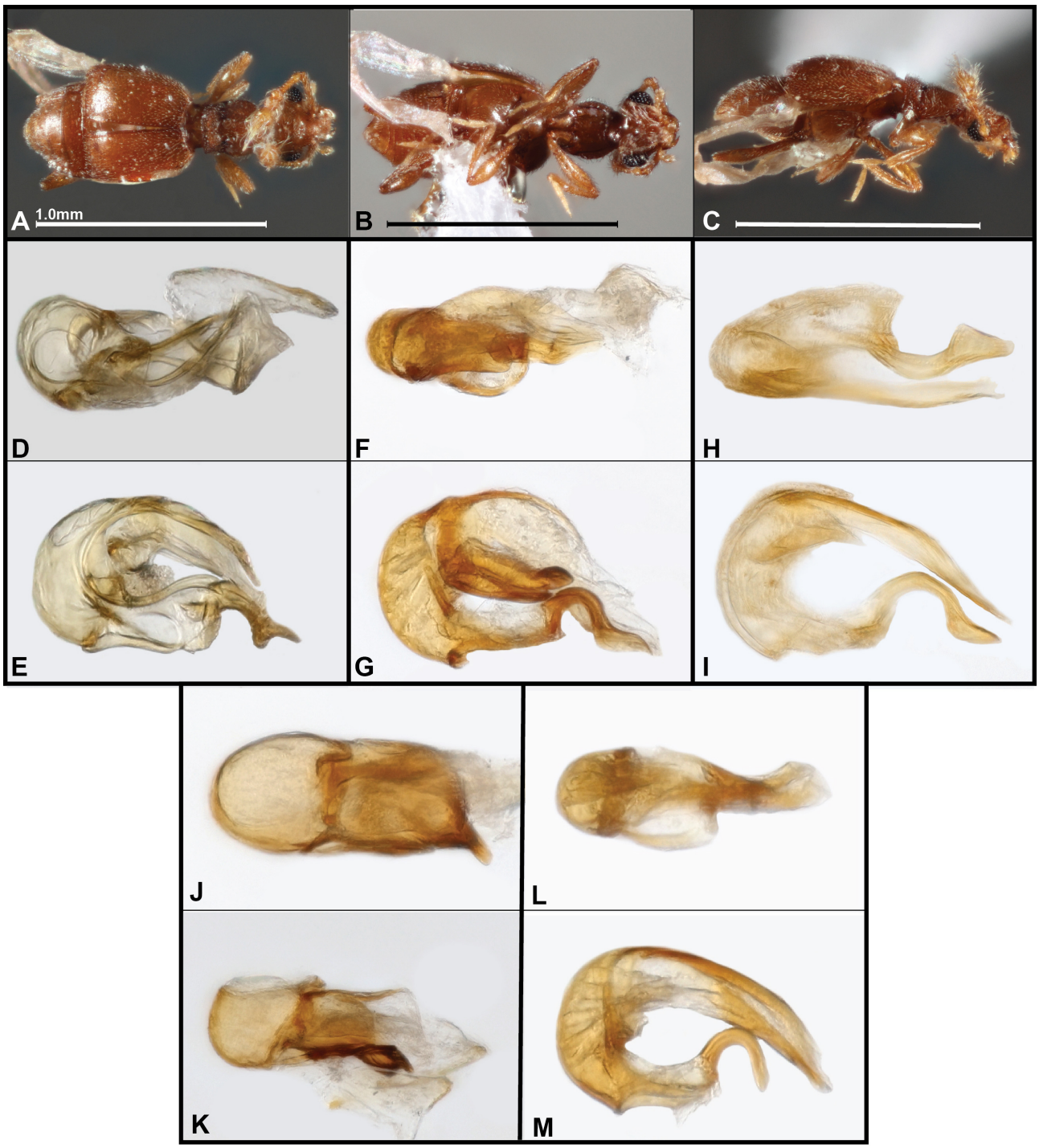

FIGURE 100. Habitus, dorsal, ventral, lateral (**A–C**) and aedeagus, dorsal, lateral (**D–M**) photos, *Tinkuna* spp. **A–C** *T. andina* **D, E** *T. gracilis* **F, G** *T. josti* **H, I** *T. geniculata* **J, K** *T. inquisitor* **L, M** *T. andina*. Scale bars = 1.0mm.

Tinkuna jarrini **sp. nov.**
Figs 99J–L

Type material. Holotype ♀ (MECN-EN 41691): "ECUADOR: Cotopaxi, -0.4167˚, -79.0047˚, Bosque Integral Otonga, 14.VIII.2024, 2102m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12905, Morphosp. Ot.A.070" / "MECN-EN 41691"; deposited in MECN. **Paratypes** (1♀): same locality, but -0.4191˚, -79.0039˚, 13.VIII.2024, 1990m (MECN-EN 38615).

Diagnosis. (TL: 1.3mm) This species is similar to the preceding (*T. josti*, *T. geniculata*) distinguishable principally in the following characters: body (Fig. 99J) slightly darker; vertex slightly depressed along midline; female with small eyes, antennal bases more evenly elevated across front, not depressed between; scape long, slender, about as long as antennomeres II–X combined,

IX–X very short, transverse; pronotum widest just behind middle, sides slightly rounded, disk with pair of strong longitudinal carinae, their ridges punctate; elytra shorter, apparently wingless (at least in female), each with only three dorsobasal foveae, the lateral two close together near humerus; humeri elevated, with low but distinct ridge continuing behind nearly to elytral apex; secondary, shorter elytral ridge extending posterad between sutural and lateral basal foveae; subhumeral foveae deep; metaventrite punctate in front of and between metacoxae; 1st abdominal ventrite with median longitudinal carina about half as long as segment, lateral longitudinal carinae about three-fourths length of segment.

Etymology. I am pleased to name this species for Dr. Pablo Santiago Jarrín Valladares, Director of Innovation with Ecuador's Instituto Nacional de Biodiversidad. As my principal host and facilitator at INABIO, Pablo made this work possible. He is also very familiar with the biota of this species' home, the Otonga Reserve, having written a book on its mammalian fauna (Jarrín-V. 2001).

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. Though known only from two females, it is worth putting this species on the map, and it differs especially in the evenly elevated interantennal shelf, sufficiently to justify the species. As discussed further below, it was initially considered that the following species (discovered later) represented the male of this one, but the differences are rather numerous and not among those typically associated with sexual differences.

Tinkuna borea **sp. nov.**
Figs 99M–O

Type material. Holotype ♀ (MECN-EN 40869): "Ecuador, Carchi, Tulcán, Sta. Martha de Cuba, Bos arrayanes. 0.64241, -77.75668, 2834m,Winkler, 14-dic-2024, J. Franco" / "Caterino DNA voucher, Ext. MSC-13256, Morphosp. Carchi1" / "MECN-EN 40869"; deposited in MECN.

Diagnosis. (TL: 1.7mm) This species, known from a single female, is distinct especially in the broader pronotum (Fig. 99M) than in any other species yet known. The pronotum is also rather well margined, unlike the others here. Other distinguishing characters include: antennal bases elevated; antennal scape very long, as long as antennomeres II–X together; antennomeres IX and X distinctly transverse, each about 2.5× as wide as long; pronotum with longitudinal ridges slightly arched laterad, the median depression rather broad; each elytron with three dorsobasal foveae; setose area of inner margin of profemur slightly oblique, narrow.

Etymology. This species' name refers to its 'northerly' origins relative to the others presently known.

Distribution. This species is known only from northern Ecuador, Carchi Province.

Remarks. Lacking a male, this species can only be so well characterized. It is however, distinct in pronotal shape, antennal length, and presence of three dorsobasal elytral foveae.

Tinkuna inquisitor **sp. nov.**
DNA barcode: GenBank PX930328
Figs 99P–R, 100J–K

Type material. Holotype ♂ (MECN-EN 40789): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13142, Morphosp. Mch.005"; deposited in MECN.

Diagnosis. (TL: 1.3mm) Body (Fig. 99P) elongate, dark orange to brown, head and prothorax darker, legs lighter; body setae moderately dense and long, most suberect, with longer, erect setae numerously interspersed; head about 1.2× wider than prothorax, smooth, posteriorly rounded; vertexal foveae distinct, about one-third eye diameter from each eye; frons flat; eyes (Fig. 99R) very large, protruding, extending onto ventral surface of head; antennae elongate, scape about as long as next 6 antennomeres combined, antennomere II conical, slightly wider than scape at apex, III–VIII gradually increasing in width, IX–XI forming loose, setose club, X about 1.25× longer and wider than IX, XI about 3× length of X, abruptly acuminate at apex; pronotum almost twice as long as wide, widest at middle, sides weakly rounded, narrowed slightly to base; lateral pronotal foveae distinct, connected by weakly angulate subbasal transverse sulcus; elytra long (flight wings present), widest behind middle, each with four dorsobasal foveae, the sutural more posterior than lateral 3; sutural stria complete; subhumeral fovea and stria present; 1st three abdominal tergites similar in length, 4th longest, pygidium flat; venter lacking obvious secondary sexual characters. Aedeagus (Fig. 100J, K) with large basal bulb, dorsal diaphragm occupying most of dorsal surface; diaphragmatic sclerite not evident; left paramere free, thin at base, articulated at lower corner of basal bulb, expanded toward apex, becoming more strongly sclerotized, bent inward and downward, apex obliquely subtruncate; median lobe with long, slightly sinuate dorsal process just off center to right; bulk of median lobe as wide as basal bulb, broadly rounded apically, broadly open to left side.

Etymology. The name of this refers to the inquisition required to decide its proper placement.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species is unusually narrow, particularly the head, compared to other members of the genus. There are a couple other characters suggest that it may be sister to the others described above. One, it appears to lack the profemoral sensory patches that the other species possess. I say 'appears' because the type is slightly teneral, and the femora collapsed after mounting; they are not visible in pre-mounting photos, but I cannot be 100% sure there is nothing there. The male genitalia are also atypical, longer and more 'normal' looking than

most, with a distinct dorsal diaphragm, apparently free parameres, and a long median lobe. It is placed here, however, based on numerous other characters, including the narrow, elongate thorax (including the prosternum), geniculate antennae with a long, three-segmented club, and general habitus.

Tinkuna andina **sp. nov.**
Figs 100A–C, L–M

Type material. Holotype ♂ (QCAZ-I-280362): "ECUADOR COTOPAXI OTONGA 2000m, 00°25'S, 79°00'W, 2AUG1997, L.Tapia&P.Ponce" / "ex. Monte b4" / "MSC-13369"; deposited in QCAZ. **Paratypes** (1♂): same data, but "Ex. Monte B3" (QCAZ-I-280361).

Diagnosis. (TL: 1.4mm) Body (Fig. 100A) light brownish-orange, rather densely setose; head about 1.5× broader than prothorax, narrowed to neck little more than one-third head width; vertex convex but with two small vertexal punctures; vertexal foveae separate, closer to eyes; frons raised over antennal bases, slightly depressed behind, with weak oblique ridges extending toward upper margin of eyes; male eyes very large, occupying entire gena; antennal scape as long as antennomeres II–IX combined, II elongate oval, III–V transversely globular, VI–VIII progressively wider, short, IX–XI forming loose club, IX and X similar in size, about twice as wide as long, XI almost 3× as long as X; pronotum elongate, widest just in front of middle, constricted at basal third; anterior two-thirds of disk with weak longitudinal ridges, finely rugose along their summits; basal third of disk weakly elevated, flat, rugose, set off from anterior portion by deep, glabrous, arcuate transverse sulcus, limited by thinner continuations of discal carinae; elytra weakly parallel-sided (winged), each with three small basal foveae, humeral corners weakly elevated with very poorly developed ridge behind, extending about two-thirds from base; subhumeral fovea present, fine, continuous with fine marginal stria; metaventrite smooth; 1st abdominal ventrite with median longitudinal carina less than half length of segment, lateral longitudinal carinae extending just over half length of segment. Aedeagus (Figs. 100L, M) strongly dorsally curved, laterally compressed; base rather wide, basal foramen small, elongate, with small, arched ventral hook at its apex; dorsal diaphragm not evident; dorsal process of tegmen arched, extending distad beyond ventral hook, narrowing to near apex, then widened slightly into obliquely subtruncate apex.

Etymology. This species' name refers to the Andes mountain range in which it is found.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species, known from the same locality as *T. jarrini*, was initially assumed to represent its male. However, the morphological differences are numerous, and constant in the few specimens known. Differences in pronotal and elytral sculpturing are not typically associated with sex in related genera, so it seems unlikely that the differences represent sexual dimorphism.

Xerhius Raffray, 1891
Figs 101–102

Previously, only a single species has been included in this genus, *X. cordicollis* Raffray, from Venezuela. (Asenjo *et al.* 2019). Six new species are described below.

Diagnosis. (TL: 2.4–3.8mm, Avg. 3.0mm) Among Trogastrini, *Xerhius* is distinguished by the barely prolonged anterior pronotal margin, lack of subhumeral elytral foveae, a distinctly elongated 1st abdominal tergite (compared to 2nd), a basal antennomere shorter than the next three combined, and the presence of a single small tooth anterior to the basal pronotal marginal constriction. Raffray (1891), on describing the genus, emphasized the non-geniculate antennae, as well (though acknowledging that the scape remains longer than the subsequent antennomeres). While I have only seen photographs of the type, the abruptness of the posterior pronotal constriction is overemphasized in Raffray's figure, and the genus is not quite as aberrant as it might have appeared. The genitalia of the lone species have never been illustrated, but the several new species assigned here share a similar and, for Trogastrina, rather unusual form (Fig. 102), being generally flattened, with a broad, weakly sclerotized basal bulb, loosely associated parameres, and an elongate, rather simple median lobe, associated with more membraneous distal pads.

Xerhius blanco **sp. nov.**
Figs 101A–C, 102A–B

Type material. Holotype ♂ (MECN-EN 40901): "ECUADOR: Carchi, 0.8050˚, -78.1711˚, El Goaltal, 1317m, 08.II.2025, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13320, Morphosp. Goal.004"; deposited in MECN.

Diagnosis. (TL: 2.4mm) Body (Fig. 101A) reddish-orange, smooth, densely covered with suberect (elytra) or fully erect (pronotum, head) dark setae; head wide, short, broadly emarginate, with two dorsal teeth at base; vertexal foveae shallow, at ends of 'U'-shaped anterior sulcus; eyes large, diameter slightly greater than genal length; genae narrowed but not carinate behind eyes; antennae moderately elongate, antennomere I about as long as next three together, II cylindrical, about as long as wide, III–VIII beadlike, IX–XI forming loose club, XI almost twice as long as X; pronotum campanuliform, widest at dentate basal corners, subparallel-sided anterad, curving inward, narrowed to short anterior collar; longitudinal sulcus complete, widening slightly anterad; transverse subbasal sulcus connecting lateral foveae; elytra widened to rear, each with four large basal foveae, with indistinct striiform depressions posterad; venter and legs lacking obvious secondary sexual characters; last male ventrite simply depressed. Aedeagus (Fig. 102A, B) flattened, concave

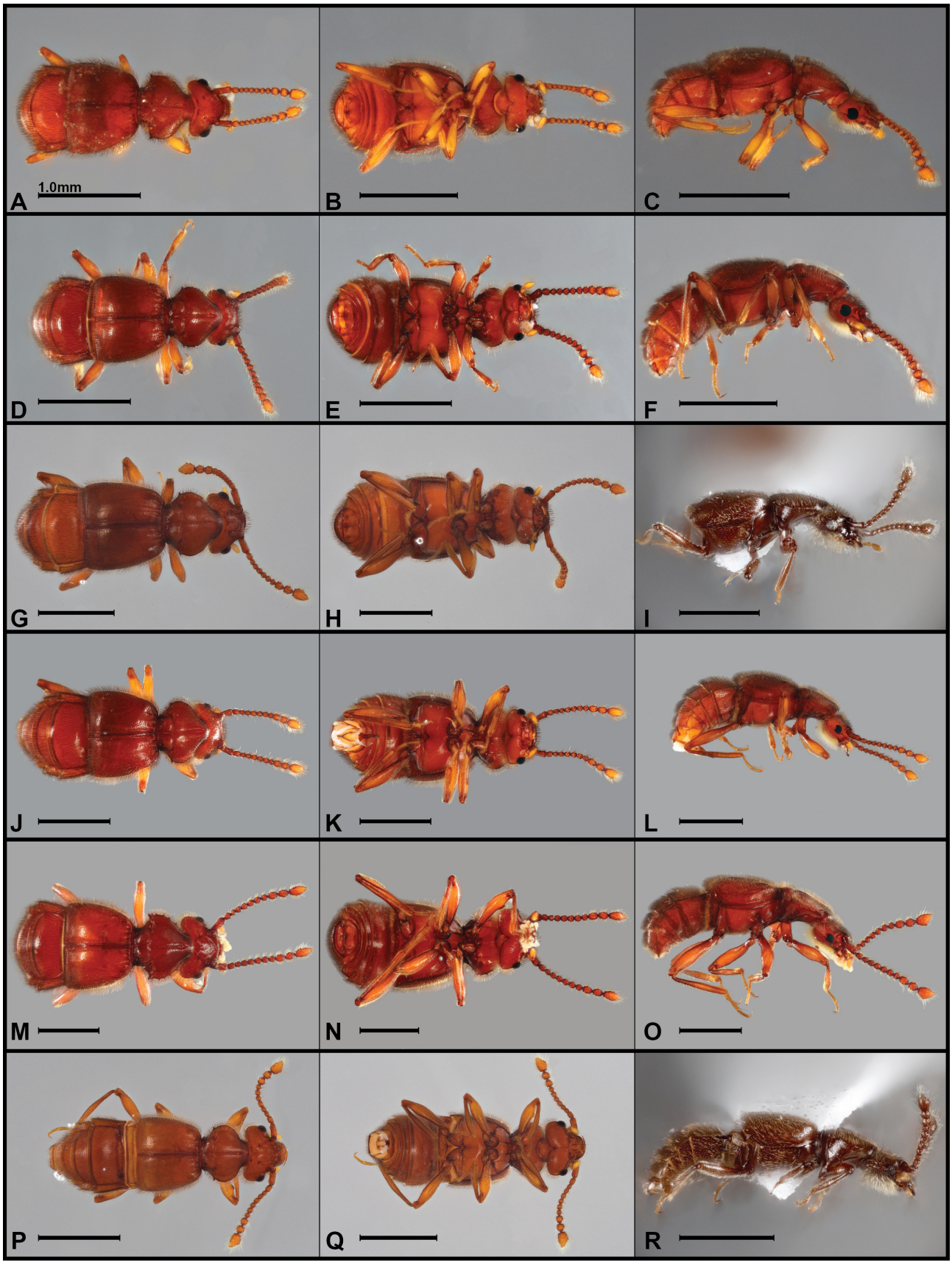

FIGURE 101. Habitus photos, *Xerhius* spp., dorsal, ventral, lateral views **A–C** *X. blanco* **D–F** *X. confundens* **G–I** *X. crucifer* **J–L** *X. flordelis* **M–O** *X. multidentatus* **P–R** *X. undulatus.* Scale bars = 1.0mm.

beneath, with broad, short, loosely associated parameres; basal bulb broad, sclerotized along either side of midline and around basal foramen; parameres widening from base to broad apices, rounded at outer corners, bluntly angulate at inner corners; median lobe narrow, sinuate from base, widened slightly to obliquely truncate apex.

Etymology. This species' name refers to the Río Blanco watershed, in whose upper reaches it occurs.

Distribution. This species is known from lower cloud forests of Carchi Province, in far northern Ecuador.

Remarks. This species is relatively small-bodied and smooth dorsally. The campanuliform prothorax, with the sides subparallel for much of their lengths will also help distinguish it.

Xerhius confundens **sp. nov.**
Figs 101D–F, 102C–D

Type material. Holotype ♂ (MECN-EN 40848): "ECUADOR: Tungurahua, -1.4357˚, -78.3111˚, NaturetrekCandelariaRes, 2218m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13201, Morphosp. Cnd.017"; deposited in MECN. **Paratypes** (2♀): 1: same data as type; 1: same general locality and date but -1.4327˚, -78.3120˚, 2040m (MECN-EN 40358, 40421).

Diagnosis. (TL: 2.6mm) Body (Fig. 101D) large, dark orange, densely setose, setae short and semierect; head emarginate posteriorly; vertex with small teeth along posterior edge, approximately as far apart as vertexal foveae; frons with weak transverse impression between antennal bases; eyes medium-sized, diameter slightly greater than postocular genal length; antennae with scape about as long as next two antennomeres together, antennomere II similar in width, only slightly longer than wide, III–VII globular, slightly wider than long, each slightly shorter than the preceding, IX–XI forming loose club, XI about 2× as long as X; pronotum broad, strongly rounded at sides, narrowed to front, with strong subbasal marginal tooth and series of about 5 spines anterad, decreasing in size and closer together toward front; median longitudinal sulcus deep and nearly complete from base nearly to apex; transverse subbasal sulcus separately arched on each side, running from lateral subbasal foveae to median sulcus, the junction in middle deep and 'V'-shaped, the posterolateral corners of pronotum swollen behind; elytra widened to rear, each elytron with four dorsobasal foveae; subhumeral fovea absent; abdomen with 1st visible tergite almost twice length of 2nd; (male?) profemur with typical flange of inner margin distinctly acute; (male?) mesotrochanter slightly dentate; venter and legs otherwise lacking obvious dimorphisms. Aedeagus (Fig. 102C, D) flattened, concave beneath, with broad, short, loosely associated parameres; basal bulb broad, strongly sclerotized around weakly defined dorsal diaphragm; tegmen with median lobe slightly widened and truncate apically, with raised left margin, a weakly sclerotized, broadly rounded ventral plate beneath it.

Etymology. This species' name refers to some conflicting characters with regard to generic placement.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. This species and *X. multidentatus* are difficult to place based on external characters, with the lateral pronotal margin bearing several small but distinct teeth anterad the large subbasal one. Such teeth are key characters of the closely related *Eurhexius.* However their male genitalia associate them clearly with other species herein assigned to *Xerhius*, all of which lack these pronotal teeth. The long first abdominal tergite is generally considered a *Xerhius* character, so there is some further basis for their placement here. These two species are probably closely related, but they differ significantly in the strength of those marginal pronotal teeth, much weaker here than in the *X. multidentatus*, and in the more distinctly and separately arcuate halves of the transverse pronotal sulcus of the present species. Male genitalia also distinguish them unambiguously, given this species' more rounded basal bulb and only weakly expanded median lobe apex.

Xerhius crucifer **sp. nov.**
DNA barcode: GenBank PX930264
Figs 101G–I, 102E–F

Type material. Holotype ♂ (ZSFQ-i23306): "ECUADOR: Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res. 30.v.2011, 2500m AT1331 understory fogging, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12648, Morphosp. ElP.A.047"; deposited in ZSFQ.

Diagnosis. (TL: 3.3mm) Body (Fig. 101G) large, dark orange, very densely setose, setae short, dark, and semierect; head with vertexal depression approximately 'V'-shaped, antennal bases weakly convex, rather densely punctate with setae pointing toward antenna; antennae with scape as long as next three antennomeres combined, antennomere II slightly longer than wide, III–VIII globular, increasingly transverse, IX–XI forming weak, loose club; pronotum with strong basal tooth, margins widened slightly anterad, then narrowed strongly to short anterior collar; median pronotal sulcus widened at base and slightly at apex; transverse subbasal sulcus arcuate on each side of mediobasal depression, ending in lateral foveae; each elytron with four basal foveae, the elytral disk briefly depressed behind each; 1st abdominal tergite about twice length of 2nd; male abdominal ventrites 3–4 relatively glabrous medially except towards posterior margins where there are transverse densely setose bands; (male?) mesotrochanter weakly dentate; last ventrite with a discrete broadly triangular median depression. Aedeagus (Fig. 102E, F) broad, flat, with rather short parameres; basal bulb concave below, with subquadrately sclerotized ventral basal foramen; tegmen with rather short, laminate ventral median lobe, narrowed then expanded apically, weakly broadly rounded at apex, with off-center median carina.

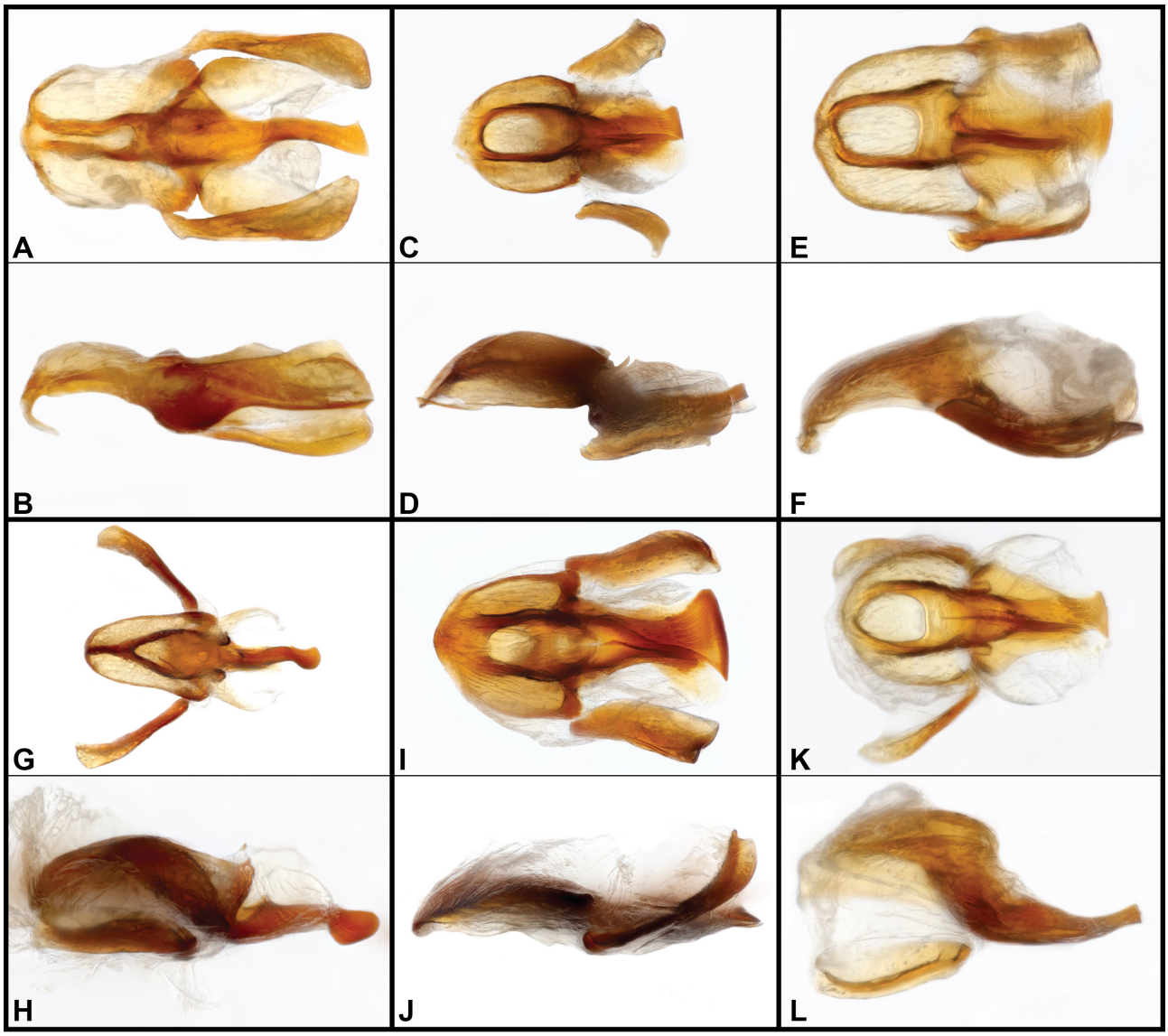

FIGURE 102. Aedeagus photos, *Xerhius* spp., dorsal, lateral views **A, B** *X. blanco* **C, D** *X. confundens* **E, F** *X. crucifer* **G, H** *X. flordelis* **I, J** *X. multidentatus* **K, L** *X. undulatus*.

Etymology. The name of this species refers to the pronotal cross formed by the longitudinal and transverse sulci.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species has a relatively elongate scape, as long as the next three antennomeres together, and a rather weakly biarcuate transverse subbasal pronotal sulcus.

Xerhius flordelis **sp. nov.**
Figs 101J–L, 102G–H

Type material. Holotype ♂ (MECN-EN 41051): "ECUADOR: Cotopaxi, -0.4191˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 1990m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12871, Morphosp. Ot.A.036" / "MECN-EN 41051"; deposited in MECN. **Paratypes** (3♀, same general locality as type): 1: -0.4157˚, -79.0046˚, 14.VIII.2024, 2132m; 1: -0.4176˚, -79.0041˚, 13.VIII.2024, 2062m; 1: -0.4194˚, -79.0033˚, 13.VIII.2024, 1963m (MECN-EN 38616–38618).

Diagnosis. (TL: 3.2mm) Body (Fig. 101J) large, dark orange, very densely setose, setae short and semierect; head emarginate posteriorly; vertex with small teeth along posterior edge, approximately as far apart as vertexal foveae; frons with weak, transverse impression between antennal bases; eyes small, diameter about equal to postocular genal length; antennae with scape about as long as next two antennomeres, antennomeres II, V, and VII with longer whorls of setae than others, antennomeres III–VIII roundly subquadrate, similar in size, IX–XI forming loose club, XI about 1.5× as long as X; pronotum broad, strongly rounded at sides, weakly margined, narrowed to front, with weak subbasal marginal tooth;

median longitudinal sulcus narrow, deep, and complete from base nearly to apex; transverse subbasal sulcus separately rounded on each side, running from lateral subbasal foveae to median sulcus; elytra widened to rear, each elytron with four dorsobasal foveae; subhumeral fovea absent; abdomen with 1st visible tergite almost twice length of 2nd, 3rd or 4th; male lacking obvious dimorphisms. Aedeagus (Fig. 102G, H) with elongate basal bulb, with strong 'Y'-shaped strengthening sclerotizations, widened distad, apex emarginate, with sides narrowly rounded; weakly sclerotized lateral lobes of tegmen incurved, with membraneous ventral velum between and beneath elongate, sinuate; sclerotized median lobe expanded and deflected ventrally at apex, rounded on left side, concave on right.

Etymology. The species name refers to the almost fleur-de-lis (en Español) shaped pronotal striae, all diverging from the basal stem. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of the Bosque Integral Otonga, in northwestern Cotopaxi Province.

Remarks. While not particularly distinctive among *Xerhius* species based on external characters, this species is something of an outlier in genitalic characters, with the basal bulb less distinctly flattened, more elongate, and having a strong basal stem to the sclerotizations that surround the dorsal diaphragm. The parameres are also more elongate and seemingly articulated differently (although it is difficult to tell how much of that is an artifact of dissection). The median lobe is also considerably more elongate than the typically short truncate one of other *Xerhius*. Externally, it is very similar to the following species, aside from lacking secondary marginal pronotal teeth and having smaller eyes.

Xerhius multidentatus **sp. nov.**
Figs 101M–O, 102I–J

Type material. Holotype ♂ (MECN-EN 40814): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13167, Morphosp. Mch.030"; deposited in MECN. **Paratypes** (1♂, 1♀): same data as type (MECN-EN 40236, 40250).

Diagnosis. (TL: 3.8mm) Body (Fig. 101M) large, dark orange, densely setose, setae short and suberect; head broad and somewhat flattened, emarginate posteriorly; vertex with small teeth along posterior edge, closer together than vertexal foveae; frons with weak arcuate impression between antennal bases; eyes small, diameter slightly less than postocular genal length, gena carinate behind; antennae with scape about as long as next two antennomeres together, antennomere II similar in width, only slightly longer than wide, III–VII globular, about as long as wide (VIII just slightly shorter), IX–XI forming loose club, XI about 1.5× as long as X; pronotum broad, with strong subbasal marginal tooth and series of 5 spines anterad, the basal-most close to subbasal tooth; median longitudinal sulcus narrow and nearly complete from base nearly to apex; transverse subbasal sulcus diverging from deep median depression, weakly arched anterad to deep lateral foveae; posterolateral corners of pronotum weakly swollen; elytra widened to rear, each with four dorsobasal foveae; subhumeral fovea absent, subhumeral carina weak; abdomen with 1st visible tergite about twice length of 2nd; male last ventrite discretely depressed in apical two-thirds, prominent along basal margin of depression, slightly bidentate at apex. Aedeagus (Fig. 102I, J) flattened, concave beneath, with broad, short, loosely associated parameres; basal bulb broad, weakly narrowing to base, strongly sclerotized around small, weakly defined dorsal diaphragm, and at distal corners; tegmen with median lobe strongly widened and obliquely subtruncate apically, strongly pointed on left side, with raised left margin, a weakly sclerotized, broadly rounded ventral plate beneath it.

Etymology. The name of this species refers to the unusually (for this genus) denticulate margin of the pronotum.

Distribution. This species is known only from cloud forests on the north side of the Río Pastaza valley, Tungurahua, Ecuador.

Remarks. This species, like *X. confundens*, cannot be easily placed in *Xerhius* based on external characters, having even stronger *Eurhexius*-like marginal teeth on the pronotum. It is only the long 1st abdominal segment that would place it here. But the male genitalia, again, are unmistakeable. This species is distinguished from the former by its stronger (though fewer) marginal pronotal teeth, longer antennae (the intermediate antennomeres not becoming distinctly transverse before the club), and non-acute inner marginal flange on the male profemur.

Xerhius undulatus **sp. nov.**
DNA barcode: GenBank PX930270
Figs 101P–R, 102K–L

Type material. Holotype ♂ (ZSFQ-i23307): ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, AT1324, 1900–2100m, Misc. hand collecting, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12654, Morphosp. ElP.A.053"; deposited in ZSFQ.

Diagnosis. (TL: 3.2mm) Body (Fig. 101P) large, light orange, densely setose, setae short, dark, and suberect; head broad, emarginate posteriorly; vertex with small teeth along posterior edge, slightly closer than vertexal foveae; frons with weak impression between antennal bases; eyes small, diameter slightly less than postocular genal length, antennae with scape slightly curved, about as long as next two antennomeres together, antennomere II cylindrical, slightly longer than wide, III–VII globular, about as long as wide (VIII just slightly shorter), IX–XI forming distinct, loose club, XI about 1.5× as long as X; pronotum broad, with subbasal marginal tooth, sides distinctly rounded anterad, very weakly crenulate; median longitudinal sulcus narrow and nearly complete from base

nearly to apex; transverse subbasal sulcus diverging from median depression, weakly arcuate to lateral foveae; posterolateral corners of pronotum weakly swollen; elytra widened to rear, each with four dorsobasal foveae; subhumeral fovea absent, subhumeral carina weak; abdomen with 1st visible tergite almost twice length of 2nd; male last ventrite broadly depressed, with pair of small rounded flanges on apical margin. Aedeagus (Fig. 102K, L) flattened, broadly rounded at base, with free, apically expanded parameres; tegmen with apicoventral plate narrowed, then abruptly and asymmetrically widened to subtruncate apex, its left margin raised.

Etymology. The name of this species refers to the weakly 'undulating' lateral margin of the pronotum.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species is somewhat distinctive in its relatively close-set lateral pronotal foveae. The lateral margin of the pronotum appears very weakly crenulate in front of the subbasal teeth, perhaps related to the more distinct marginal denticles in some of the species that follow.

EUPLECTITAE: *INCERTAE SEDIS*

FORMIVAGUS CATERINO, gen. nov.

Fig. 103

Type species. *Formivagus bullatus* **sp. nov.**, by present designation.

Diagnosis. Body (Fig. 103A) antlike, strongly constricted at base of pronotum and at base of abdomen, smooth, shining, and almost entirely glabrous; male head with secondary modifications; vertexal foveae present, small, situated along inner edge of lateral vertexal elevations; eyes low on head; apical maxillary palpomere asymmetrically elongate subtriangular, widest at rounded base, narrowed to acute apex; gula flat, with pair of gular foveae; antennae inserted beneath slightly projecting frontal corners, short; antennae compact, with one-segmented club, may have antennomere VIII modified in males; pronotum convex, constricted near base; lateral foveae shallow, connected by arcuate transverse basal sulcus; elytra with sides and humeri continuously rounded; sutural fovea present, no lateral or subhumeral elytral foveae; sutural stria complete; humerus slightly elevated; flight wings apparently present, though potentially reduced; abdomen with 1st visible tergite twice as long as 2nd, 3rd, or 4th; sides of basal four abdominal segments with narrow paratergites; prosternum smooth at sides, lacking precoxal foveae; mesoventrite short; metaventrite with median postmesocoxal foveae close; mesocoxae very narrowly separated by mesoventral process; metacoxae approximate, separated by only very narrow process of 1st abdominal ventrite; male mesotibia may be dentate; 1st visible abdominal ventrite with short longitudinal carinae at base, depressed at sides. Aedeagus (Fig. 103D, E) with large basal bulb; dorsal diaphragm present; parameres present, fused at base, asymmetrical; a free, articulated, narrow inner process extending through apical foramen of basal bulb.

Remarks. This beetle exhibits an antlike and somewhat 'reductive' (sensu Parker & Owens 2018) morphology, with rounded humeri, reduced foveae, and a largely glabrous surface. This makes assessing its position difficult, and hinders the search for synapomorphies with other genera and tribes. The habitus is somewhat batrisoid, with the abdominal constriction echoing that seen in a group of *Arthmius* (*A. orbis* and allies). The laterally margined abdomen and scape with entire apical margins would be inconsistent with that placement, however. Its generally elongate habitus, retention of abdominal paratergites, single segmented antennal club, and short swollen femora are most consistent with Euplectitae, and more particularly Trimiine Trichonychini. The general form of the aedeagus, with a dorsally open basal bulb and asymmetrical parameres is also consistent with this latter possibility. For the present, however, it is left unassigned to tribe and subtribe.

The generic name is a contraction of the Latin words for 'ant' and 'rove', for this ant-like rove beetle.

Formivagus bullatus sp. nov.

DNA barcode: GenBank PX930331

Fig. 103

Type material. Holotype ♂ (MECN-EN 41954)**:** "ECUADOR: Pichincha, 0.0472˚S, 78.7631˚W, Mindo, 18.VII.2024, Sifted leaf litter, M. Caterino" / "Caterino DNA voucher, Ext. MSC-12794, Morphosp. Min.A.026" / "MECN-EN 41954"; deposited in MECN.

Diagnosis. (TL: 1.2mm) Body (Fig. 103A) dark orange, antlike, strongly constricted at base of pronotum and at base of abdomen, smooth, shining, and almost entirely glabrous; male (presumably) head with vertex strongly projecting on each side, convex and smooth, depressed at middle, with short, slightly transverse median frontal projection; frons flat, rounded in front; eyes large, low on head; apical maxillary palpomere asymmetrically elongate subtriangular, widest at rounded base, narrowed to acute apex; gula flat, with pair of gular foveae; antennae inserted beneath slightly projecting frontal corners, short; antennomere I cylindrical, 1.1× as long as wide, II globular, III weakly conical, IV–VII short, rounded, male antennomere VIII enlarged, widest at outer margin, antenna slightly bent, IX–X smaller than VIII, transverse, XI forming single segmented club, widest at base, tapered to narrowly rounded, apex, about 6× as long as X; genae longitudinally sulcate beneath eye; pronotum widest near front, strongly convex, anterior opening low, sides rounded, constricted near base; lateral foveae shallow, connected by arcuate transverse basal sulcus; elytra with sides and humeri continuously rounded; sutural fovea present, no lateral or subhumeral elytral foveae; sutural stria complete; humerus slightly elevated; flight wings present but reduced; abdomen with 1st visible tergite twice as long as 2nd, 3rd, or 4th; sides of

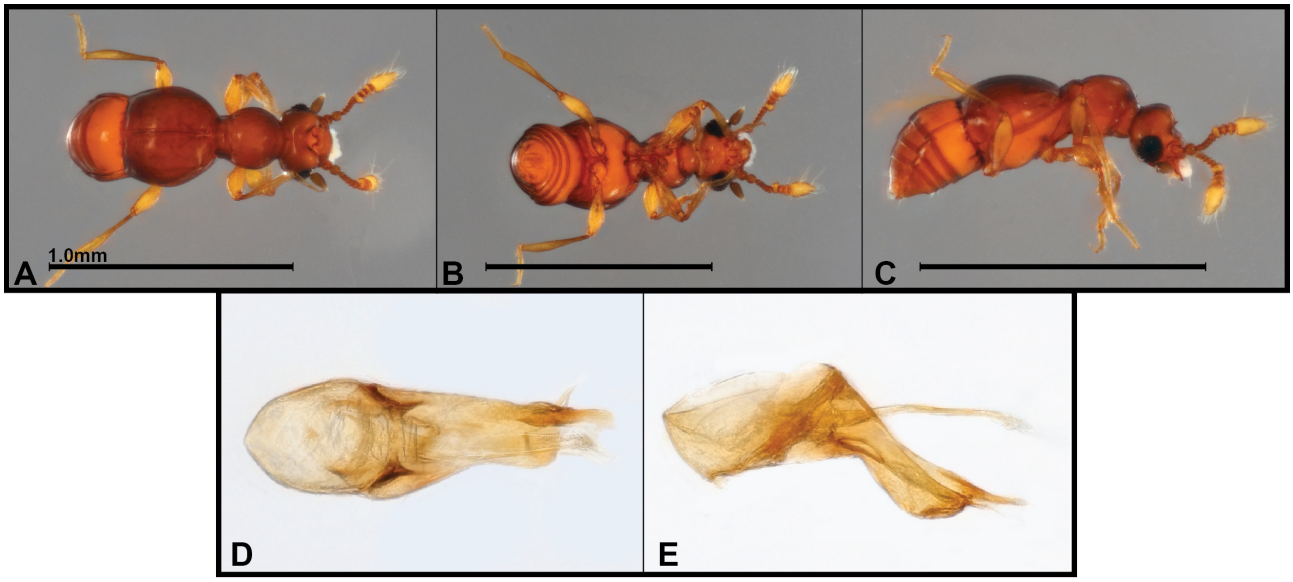

FIGURE 103. Photographs, *Formivagus bullatus* **A–C** Body: dorsal, ventral, lateral, **D, E** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm.

basal four abdominal segments with narrow paratergites; male mesotibia (Fig. 103B) with distinct tooth at basal third of inner edge, tibia slightly outwardly arcuate, setose beyond; 1st visible abdominal ventrite with short longitudinal carinae at base; last male abdominal ventrite shallowly depressed. Aedeagus (Fig. 103D, E) with basal bulb long and low, dorsal diaphragm accounting for most of dorsal surface, lacking distinct diaphragmatic sclerite; small basal knob present basad ventral foramen; parameres apparently present, fused at base, asymmetrical, both directed apicoventrad; left paramere shorter, wider, flattened, emarginate along outer margin, rounded at apex, bearing a couple of apical setae; right paramere longer, narrower, straighter, with slight subapical constriction, then widened, then narrowed again to bluntly rounded apex, a pair of lateral subapical setae on outer margin; a free, articulated narrow inner process extends through apical foramen of basal bulb over ventral processes, apex weakly sclerotized and obliquely truncate.

Etymology. This species' name refers to the males' bilateral vertexal projections.

Distribution. This species is known only from a single collection in the lower cloud forests near Mindo, Pichincha, Ecuador.

Kunkashka Caterino, **gen. nov.**

Fig. 104

Type species. *Kunkashka sumaco* **sp. nov.**, by present designation.

Diagnosis. Body (Fig. 104A–E) moderately large, rather broad, elytra and abdomen wider than prothorax and head; head about as wide as prothorax, short, subquadrate, slightly elevated over antennal bases, with pair of vertexal foveae; male vertex modified; epistoma recessed below frontal shelf; labrum wide, sides rounded, apical margin very weakly emarginate; maxillary palpi small, apical palpomere elongate oval; gula weakly convex, with few elongate setae; antennae elongate, with narrowly elongate four-segmented club; pronotum lacking lateral and median foveae, without median or transverse sulci, sides margined; elytra parallel-sided, lacking dorsobasal foveae and carinae; sutural stria present; flight wings apparently present; subhumeral fovea absent, but subhumeral stria complete; 1st three abdominal tergites subequal in length, 4th longer, 5th short, lacking any basal carinae; paratergites distinct on first four segments; prosternum short; procoxae moderately projecting; mesoventrite smooth, without anterior carinae; mesocoxae contiguous; metaventrite with small median foveae close together; lateral metaventral fovea inconspicuous; metacoxae contiguous, moderately projecting; 1st abdominal ventrite with posteriorly projecting fringe of setae along most of either side; male last ventrite about 4× as long as penultimate, weakly depressed; male metatrochanter with small basal denticle; pro- and mesofemora weakly swollen, metafemur more slender; all tibiae slender and setose, apical spurs indistinct; tarsi 3 segmented, slender, basal segment very short, 2nd segment longest; pair of slightly asymmetrical tarsal claws present, the outer/anterior stronger. Aedeagus (Fig. 104F–H) slightly asymmetrical, with rounded, flat-topped basal bulb with large dorsal diaphragm, diaphragmatic sclerite present but not strongly sclerotized; no free parameres; tegmen comprising flattened, bilateral processes simply tapering off apex of basal bulb; inner armature comprising two long, parallel, strongly sclerotized rods.

Etymology. The name is a Kichwa word meaning 'forgotten', a distinctive lineage known only from an isolated volcano, and without obvious close relatives. I am using it as masculine.

Remarks. This is a very puzzling genus. Several characters suggest it belongs to Euplectitae, based on free

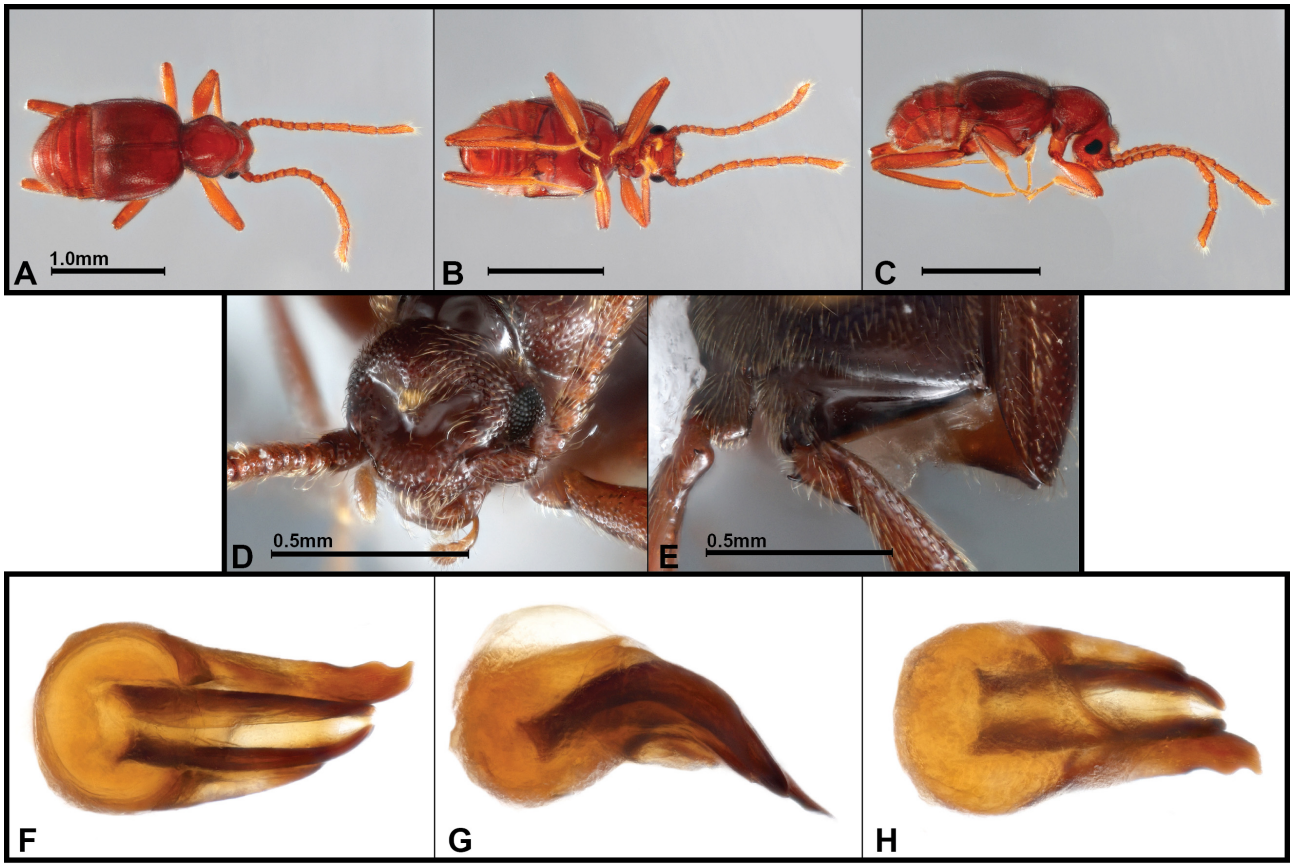

FIGURE 104. Photographs, *Kunkashka sumaco* **A–E** Body: dorsal, ventral, lateral, head, male metatrochanter **F–H** Aedeagus: dorsal, lateral, ventral views. Scale bars = 1.0mm unless otherwise indicated.

abdominal paratergites, short trochanters, and contiguous metacoxae. But it cannot be keyed to any tribe of Euplectitae, lacking a rostrum (eliminating Metopiasini), lacking gular carinae (ditto Jubini), having a short, non-depressed prosternum (not Trogastrini), 3 tarsomeres (not Dimerini or Mayetiini), 'normal' maxillary palpi (not Bythinoplectini), having the body broad and lacking subhumeral foveae (not Euplectini), and the male lacking a penial plate (ruling out Trichonychini). One reviewer suggested placement in Goniaceritae: Iniocyphini. The almost symmetrical male genitalia would not be out of place there, although the wide, contiguous metacoxae and well-developed abdominal paratergites are in conflict with that placement. In whichever supertribe, it probably merits a new tribe, although I would not erect such a high level taxon based on a single specimen/species/genus, and hope that more material comes to light that allows a new taxon, if agreed necessary, to be better characterized.

Kunkashka sumaco **sp. nov.**
Fig. 104

Type material. Holotype ♂ (MECN-EN 42046): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13341, Morphosp. PS.B.006"; deposited in MECN.

Diagnosis. (TL: 2,3mm) Most characters necessary to recognize this species are covered in the generic diagnosis, above. A few additional, possibly interspecifically variable, characters are as follows: body (Fig. 104A) light reddish-brown, legs and antennae slightly lighter, head, thorax, and elytra moderately densely punctate, uniformly covered with semi-erect setae; male head (Fig. 104D) with vertex convex over deeply impressed vertexal foveae, with projecting setose ridge over converging sulci; antennae elongate, scape about twice as long as wide, curving slightly upward from insertions, antennomere II subconical, slightly wider than long, III conical, slightly shorter and narrower than II, IV–VII progressively longer, sides subparallel, VIII slightly narrower than VII, IX–XI forming very elongate, parallel-sided club, IX and X 3× longer than wide, XI 4× longer than wide, apex obliquely truncate; pronotum widest just anterad middle, sides narrowly rounded, narrowing more or less evenly to apex and base; elytra longer than wide, sides weakly rounded, nearly subparallel, humeri abruptly narrowed; sutural stria complete; subhumeral stria complete, parallel to margin; male with only weak secondary sexual characters as above. Aedeagus (Fig. 104F–H) as for generic description; weakly asymmetrical, left-side process of tegmen shorter, simple, curving slightly ventromediad, apex obliquely truncate; right-side process of tegmen longer, curving very weakly laterad, apicolateral margin with two shallow emarginations, apex narrowed slightly and truncate; rods

of inner armature long, subparallel, gradually narrowing towards apices, bowed outward slightly before nearly converging at tips.

Etymology. This species is named for its type locality. It is a noun in apposition.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species, as a member of a distinctive monotypic genus is unmistakable.

Goniaceritae: Brachyglutini: Baradina

Euphalepsus Reitter, 1883

Figs 105–109

= *Tetrasemus* Jeannel, 1962
= *Barada* Raffray, 1891
= *Euphalespus* Raffray, 1887

This genus includes 27 described species, from Mexico (questionably the southeastern US) to Argentina. Most are known from Brazil; one, *E. humeralis* Raffray, is known from Colombia, but none have been previously reported from Ecuador. Nineteen new species are described below.

Diagnosis. (TL: 1.4–4.1mm, Avg. 2.1mm) Available diagnoses of *Euphalepsus* have emphasized the presence of a humeral swelling or callus, which is only weakly developed in some of the species described below. Other characters to diagnose the genus have been the presence of 3 or 4 basal elytral foveae, small maxillary palpi, and an ecarinate metaventrite. Furthermore, secondary sexual characters have been frequently observed on the male legs (trochanters, femora, and tibiae, generally of meso- or metathoracic legs). The species described here broaden the definition of the genus further, and some subdivision beyond Park's (1942—largely Raffray's from 1904) informal groups may become desirable. At the same time, I have noted a number of other commonalities that help delineate the group, at least in the male sex. The ventral surface of the head (both sexes) typically bears apically modified, clubbed, bent, or subdivided setae. These may be evenly distributed or concentrated in clusters at the anterolateral genal corners. The mesoventrite typically bears a distinctive subvertical 'shelf' for reception of the elongate procoxae. The male mesofemora are generally prolonged basally beyond the anterobasal corner of the mesotrochanter. Many species have a conspicuous ocular fovea between the anterior margin of the eye and the antennal base. And in many species the heads of the males also have secondary modifications, generally some sort of transverse setose sulcus or impressions between the vertexal foveae. The antennae are highly variable in length and thickness, but they all have the last three antennomeres forming a variably elongate club. In most species, males and females have the last labial palpomere long and bearing a long apical style.

The aedeagus of no *Euphalepsus* species has ever been illustrated or described to any meaningful degree. Those described here have a reasonably consistent general form, with a more or less evenly rounded basal bulb, typically with a ventral keel, bearing a smallish, well-defined dorsal diaphragm, with a small diaphragmatic sclerite within. The tegmen is prolonged into a ventral paddle-like process, often bearing a ventral keel, particularly at the base. An articulated dorsal process extends distad above the ventral process, and is variously modified, typically with a deeply convoluted internal sac extrusible through the side of a subapical foramen (extruded in many preserved specimens).

Remarks. *Euphalepsus* is very diverse in size and form and hard to characterize, and consequently hard to place in Pselaphine higher classification. Chandler (1999, 2023) has refined its placement somewhat, separating Baradina (including *Euphalepsus* and *Phalespoides*) from Eupseniina, while maintaining both with some question in the Brachyglutini. Kurbatov & Sabella (2015) have explicitly disavowed placement of Baradina in Brachyglutini, but have not yet proposed an alternative.

There are two more or less distinct groupings based on male genitalia form, and the species within each are ordered alphabetically. In the first series the basal bulb is relatively low, and the diaphragm is more apicodorsal, opening immediately above the uppermost tegmenal process. In the latter, the basal bulb is more upright oval, with the diaphragm more distinctly dorsal, separated from the uppermost distal tegmenal process. *Euphalepsus abrazero* **sp. nov.** is somewhat transitional between the forms, and the latter group is probably derived from within the former. Three species known only from females but with otherwise distinctive morphological characters are treated after these.

Euphalepsus is likely to prove one of the most species-rich neotropical genera of Pselaphinae. At least 15 additional species from Ecuador were documented towards the end of this study, too late to include, among the collections at QCAZ.

Euphalepsus disobediens **sp. nov.**

DNA barcode: GenBank PX930206
Figs 105A–C, 106A–B

Type material. Holotype ♂ (MECN-EN 40844): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13197, Morphosp. Cnd.013"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 40348).

Diagnosis. (TL: 1.6mm) Body (Fig. 105A) rather small, dark brown with legs and antennal apices lighter; dorsum with rather sparse but long suberect setae; head and pronotum conspicuously punctate, elytra smoother; male head transversely impressed in front of slightly protruding vertex; eyes moderately large, comprising about 55 ommatidia, set low on genae; genae weakly carinate, bearing linear series of about 8 close-set, long setae immediately below eye, setae slightly flattened apically;

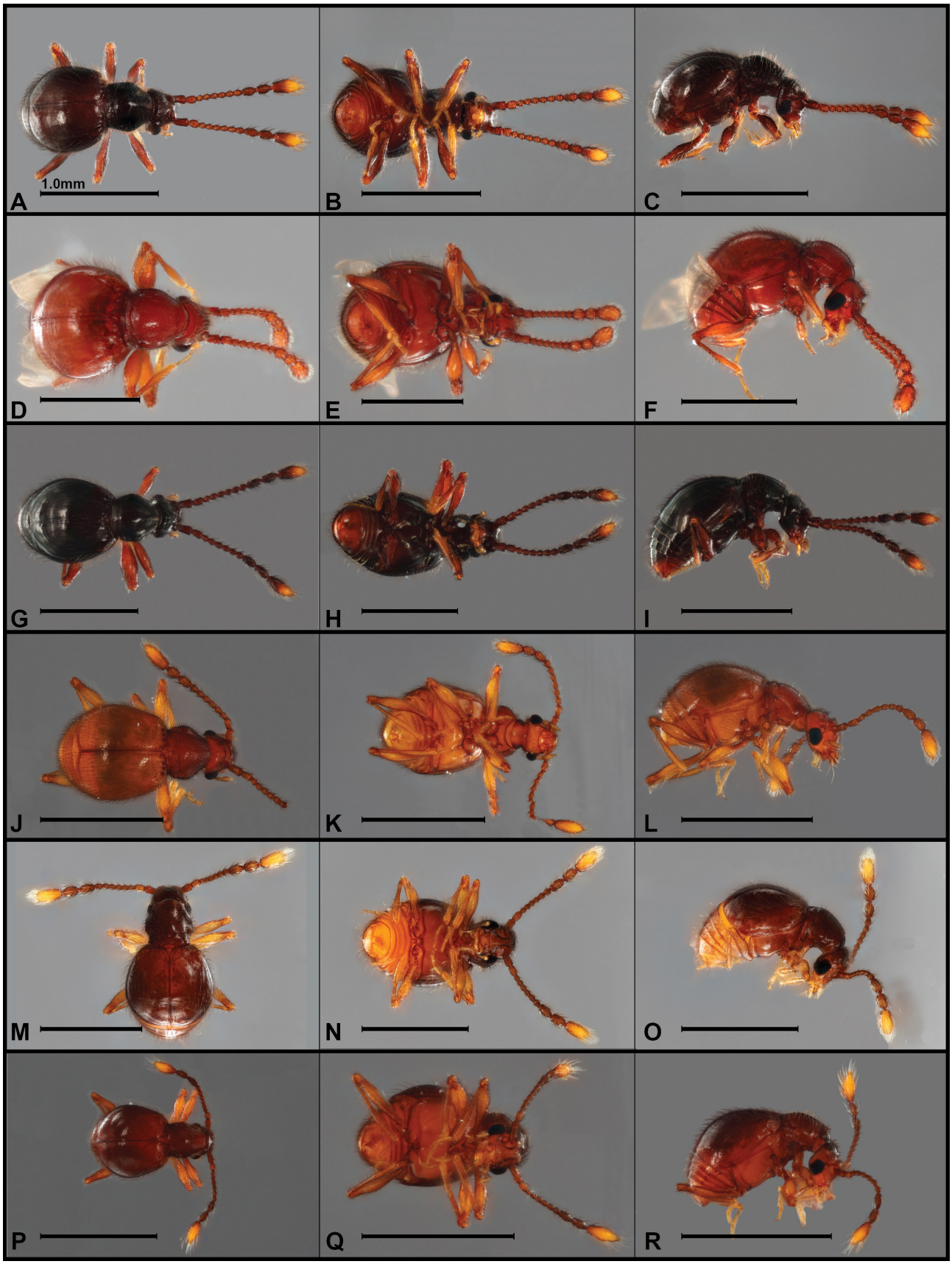

FIGURE 105. Habitus photos, *Euphalepsus* spp., dorsal, ventral, lateral views **A–C** *E. disobediens* **D–F** *E. foedus* **G–I** *E. gemellus* **J–L** *E. inclani* **M–O** *E. lopezi* **P–R** *E. obediens.* Scale bars = 1.0mm.

ocular fovea present between base of antennae and eye; antennae moderately elongate, antennomere I weakly curved, cylindrical, about 3× as long as wide, II similar in width, about 1.25× as long as wide, III–VIII narrower, roundly subquadrate, IX–XI forming distinct club, IX about 1.25× as wide as VIII and just over twice as long, X and XI progressively larger, XI about 3× as long as X, apical half much lighter, apically subacute; pronotum weakly widened from base to middle, narrowed more rapidly to apex, sides of disk with short longitudinal sulci, almost rugosely punctate along basal half of margin below; lateral subbasal foveae deep, connected by complete, arcuate transverse sulcus; elytra with sides rounded, each with four dorsobasal foveae, the lateral three closer to each other than inner is to sutural; humerus swollen behind lateral-most dorsal fovea; subhumeral fovea present, with complete subhumeral stria extending posterad, converging to posterolateral elytral corner; abdominal tergites all similar in length; legs not markedly elongate; male mesotibia with tooth on inner margin, about one-third from apex; male last abdominal ventrite weakly depressed. Aedeagus (Fig. 106A, B) with subspherical basal bulb, small ventral basal foramen and small anterodorsal diaphragm; dorsal lobe about two-thirds length of ventral lobe, knobbed at middle on right side, markedly narrowed and twisted slightly toward apex, apicomedian edge rounded and outer edge truncate, a denticulate inner sac extruded from its apex; ventral lobe with short ventrobasal keel, flattened toward obliquely and weakly truncate apex.

Etymology. The name of this species is meant to contrast with the similar-appearing species, *E. obediens*, described below.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. This species is similar to and appears closely related to *E. obediens*. Both have long dorsal setae, moderately elongate antennae, weak male frontal modifications, and an inner mesotibial tooth in the male. Aedeagal morphology is also similar between them. On the latter point, the apex of the ventral process of the median lobe is more distinctly dentate in *E. obediens*, as well as longer and flatter, while the dorsal process is less abruptly narrowed. Externally, the head and pronotum of *E. obediens* are not as distinctly punctate, and the antennomeres of its antennal club are more elongate.

Euphalepsus foedus **sp. nov.**
Figs 105D–F, 106C–D

Type material. Holotype ♂ (MECN-EN 42055): "ECUADOR: Napo, -0.65822˚, -77.59197˚, Archidona, Pacto Sumaco, 26.X.2025, 1568m, A. Pazmiño, Winkler" / "Caterino DNA voucher, Ext. MSC-13350, Morphosp. PS.B.015"; deposited in MECN. **Paratype** (1♀): same data as type (MECN-EN 42009).

Diagnosis. (TL: 2.1mm) This species is very similar to *E. vibrissus*, distinguishable principally by the following characters: head (Fig. 105F) shorter, narrowing slightly toward front, somewhat elevated longitudinally, both behind and in front of transverse vertexal crease; preocular fovea large and conspicuous; eyes large but more vertically oval, posterior edge aligned with posterior margin of gena; antennae more slender, basal antennomeres more globular, only slightly transverse, club antennomeres shorter, antennomeres IX and X only slightly longer than wide; pronotum (Fig. 105D) with transverse sulcus distinctly arcuate, approaching the basal margin at middle; each elytron with four stronger dorsobasal foveae; male mesotrochanter with small tooth; male mesotibia with distinct inner marginal tooth just short of apex. Aedeagus (Fig. 106C, D) with subspherical basal bulb, small ventral basal foramen and small anterodorsal diaphragm; subacute ventral keel present beyond ventral foramen; dorsal lobe of tegmen nearly the length of ventral lobe, curving rightward apically with internal sac extruded through its right margin; ventral lobe slightly sinuate, apically flattened and strongly obliquely truncate.

Etymology. This species name is a Latinization of 'Pacto', or 'pact', from the name of the local community near the type locality. It is used as a noun in apposition.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. *Euphalepsus foedus* is similar and hard to distinguish from several other smaller, globular species. Its somewhat less pronounced antennal club, large preocular foveae, and relatively short head can help distinguish it, but examination of the aedeagus will probably be necessary for a confident identification.

Euphalepsus gemellus **sp. nov.**
Figs 105G–I, 106E–F

Type material. Holotype ♂ (MECN-EN 40790): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13143, Morphosp. Mch.006"; deposited in MECN. **Paratype** (1♀): same data as type (MECN-EN 40203).

Diagnosis. (TL: 2.0mm) This species is very similar *E. sinchi*, differing principally in the following characters: transverse frontal sulcus of male (Fig. 105G, I) narrower at middle, widening laterally at vertexal foveae; pronotum slightly less rounded at sides, with more distinct, albeit weak longitudinal lateral sulcus consisting of a short dense series of connected punctures; elytra with four dorsobasal foveae; concavity of inner margin of mesotibia limited to apical third, with more distinct tooth at its base; male metatrochanter with apical tooth a longer fold over most of distal half of its posterior margin. Aedeagus (Fig. 106E, F) with basal bulb more convex; ventral keel with straight linear connection to ventral edge of basal bulb; dorsal process of tegmen convex at base, shorter and with a narrower basal neck, and with distal hooked process narrower and curved more gradually, not quite becoming perpendicular to longitudinal axis of aedeagus.

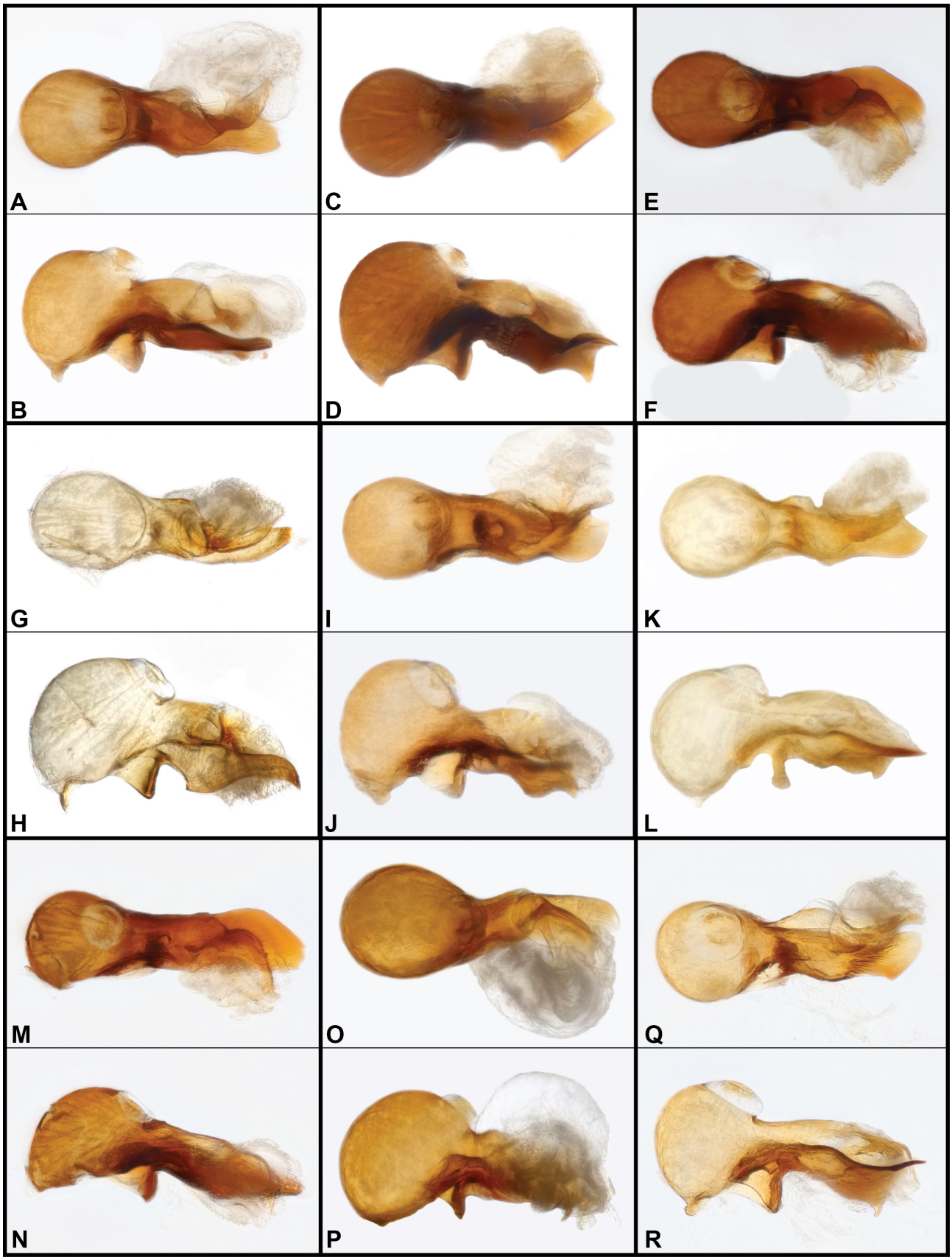

FIGURE 106. Aedeagus photos, *Euphalepsus* spp., dorsal, lateral views **A, B** *E. disobediens* **C, D** *E. foedus* **E, F** *E. gemellus* **G, H** *E. inclani* **I, J** *E. lopezi* **K, L** *E. obediens* **M, N** *E. sinchi* **O, P** *E. supercilius* **Q, R** *E. syrbatoides*.

Etymology. The name of this species is Latin for 'twin', referring to its close relationship and similarity to *E. sinchi.*

Distribution. This species is known only from cloud forests north of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. See remarks under *Euphalepsus sinchi* for the few, but seemingly substantial differences that separate them.

Euphalepsus inclani **sp. nov.**
Figs 105J–L, 106G–H

Type material. Holotype ♂ (MECN-EN 40998): "ECUADOR: Cotopaxi, -0.4194˚, -79.0033˚, Bosque Integral Otonga, 13.VIII.2024, 1963m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12850, Morphosp. Ot.A.015"; deposited in MECN. **Paratypes** 1♂: "ECUADOR: Cotopaxi, -0.4165˚, -79.0041˚, Bosque Integral Otonga, 13.VIII.2024, 1963m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12888, Morphosp. Ot.A.053" (MECN-EN 40999).

Diagnosis. (TL: 1.7mm) Body (Fig. 105J) globose, moderately densely clothed with dark, short, semirecumbent setae; head narrowed anterad, with large, hemispherical, coarsely faceted eyes; vertexal foveae distinct, male vertex with shallow, glabrous, transverse impression between foveae; frons weakly convex below; genal corners with dense cluster of apically bent and spatulate setae; antennae moderately elongate, antennomeres III–VIII slightly longer than wide, antennomeres IX–XI forming distinct, loose club, with ultimate antennomere paler, wider, and about 2.5× as long as penultimate; pronotum widened slightly from base to midpoint, then narrowed to apex, sides slightly incurved; lateral basal foveae well developed, connected by shallowly curved transverse sulcus, median fovea absent; weak longitudinal crease extending anterad along lateral margin, slightly rugose below; elytra with 4 well-developed basal foveae, humeral callus well-developed, oblique, narrow; subhumeral fovea present, extended posterad by subhumeral stria; male mesotrochanter with fine tooth; male mesotibia with well-developed tooth about ¾ from base of inner margin. Aedeagus (Fig. 106G, H) with large basal bulb with ventral tooth at base of basal foramen; distinct small anterodoral diaphragm with diaphragmatic sclerite; ventral process of tegmen strongly keeled beneath, notched at base, process flattened and narrowing distallly, curved ventrad at apex; dorsal tegmenal process laying immediately dorsad ventral process, short, apically truncate, with right-curving blade at bottom nearly length of ventral process, deeply infolded and rough internal sac extrusible through dorsal process.

Etymology. I am pleased to name this species for Dr. Diego J. Inclán Luna, specialist in tachinid fly biology and taxonomy, and current director of Ecuador's Instituto Nacional de Biodiversidad. His assistance and support throughout this study helped make it possible.

Distribution. This species is known only from El Bosque Integral Otonga, in the cloud forests of northwestern Cotopaxi Province, Ecuador.

Remarks. This species is closely related to *E. vibrissus*. Differences include the frontal crease being narrower and shallower, with leading edge more protuberant, not reaching the vertexal foveae at sides. The setae of the elytra and abdominal dorsum are shorter and denser. The pronotum has its sides more angulate and the disk less convex. And all antennomeres, including those of the club, are more elongate.

Euphalepsus lopezi **sp. nov.**
DNA barcode: GenBank PX930285
Figs 105M–O, 106I–J

Type material. Holotype ♂ (MECN-EN 40899): "ECUADOR: Carchi, 0.8060˚, -78.1723˚, El Goaltal, 1420m, 07.II.2025, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13318, Morphosp. Goal.002" / "MECN-EN 40899"; deposited in MECN. **Paratypes** (1♂, 1♀), same general locality and date, but 0.8050˚, -78.1711˚, 1317m, 07.II.2025 (MECN-EN 41974–41975).

Diagnosis. (TL: 1.7mm) Body (Fig. 105M) small, light brown with lighter abdomen and legs, strongly convex, rounded, dorsum with sparse, long setae; head mostly convex in front, but vertexal foveae deeply impressed, connected by broad transverse sulcus with carinate dorsal edge and a few posteriorly directed setae anteromedially; eyes large, protruding; small preocular fovea present immediately in front of upper edge of eye; small cluster of long, apically flattened and bent setae present at anterior corners of gena; antennae moderately elongate, scape almost as long as next three antennomeres combined, antennomere II globose, III–VIII slightly longer than wide, IX–X forming loose club, each with sides rounded, slightly larger than the preceding, XI lighter in color and about twice length of X, densely setose; pronotum slightly longer than wide, widest just in front of middle, sides anterad slightly concave, sides posterad rounded, base constricted; lateral foveae present, not too deep; no transverse or longitudinal sulci; elytra with sides rounded, widest behind middle, each with four very small dorsobasal foveae, with very short scratch-like impressions behind; humerus slightly and narrowly swollen; subhumeral fovea present, small; inner margin of male mesotibia with sharp tooth about one-fourth from end; penultimate male abdominal ventrite long and very shallowly depressed. Aedeagus (Fig. 106I, J) with basal bulb large, dorsal diaphragm rather small and dorsoapical, with small diaphragmatic sclerite; strong ventral keel present distal to basal foramen; dorsal lobe cylindrical, straight, nearly as long as ventral lobe, articulated to right distally, with large extruded sac; ventral lobe diagonally compressed, median/lower edge strongly sinuate, rounded to apex, weakly angulate at apicolateral corner, with small subbasal tooth on right margin.

Etymology. I am naming the species for Mr. Bryan

Efrain Lopez Recalde, a UCE student who worked with me on staphylinid projects for his undergraduate thesis, and assisted with fieldwork on the Goaltal trip on which this species was found.

Distribution. This species is known from lower cloud forests of Carchi Province, in far northern Ecuador.

Remarks. This species is similar to several other smaller, globular *Euphalepsus* species, perhaps most closely, *E. sinchi*, from Napo Province. Some of the more useful distinguishing characters of *E. lopezi* are the relatively large eyes and distinctly basally constricted pronotum, in combination with the male's shallow transverse vertexal sulcus, and the presence in the male of a distinct mesotibial tooth.

Euphalepsus obediens **sp. nov.**
Figs 105P–R, 106K–L

Type material. Holotype ♂ (MECN-EN 41008): "ECUADOR: Cotopaxi, -0.4167˚, -79.0047˚, Bosque Integral Otonga, 14.VIII.2024, 2102m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-13014, Morphosp. Ot.A.072"; deposited in MECN. **Paratypes** (1♀): same general locality as type but: -0.4157, -79.0046, 2132m (MECN-EN 41009).

Diagnosis. (TL: 1.2mm) Body (Fig. 105P) compact, rather sparsely setose, castaneus; head subquadrate (in lateral view); male vertex transversely depressed, glabrous within, setose on anterior and posterior edges; eyes convex, moderately coarsely faceted, those of male slightly larger; supraocular fovea prominent, located between eye and antennal insertions; antennal insertions dorsally bulbous; antennae elongate, scape about twice length of antennomere II, cylindrical, III–VIII similar, slightly longer than wide, expanded toward apices, with single whorl of setae, antennomeres IX–X about twice length of VIII, oval; antennomere XI paler than others, twice length of X, narrowed at base, subacute apically; genae with sublinear cluster of about 7 long, distinctly spatulate setae; pronotum impunctate, widest at middle, weakly tapered to base, more strongly to apex, lateral foveae present but small, transverse basal sulcus absent; each elytron with weak basal carina interrupted by sutural and 3 small basolateral foveae; humeral callus distinct in male, weak in female; subhumeral fovea present, small; subhumeral stria complete; male with subapical mesotibial tooth and small posterior flange on metatrochanters. Aedeagus (Fig. 106K, L) with subspherical basal bulb, small ventral basal foramen and small anterodorsal diaphragm; dorsal lobe about two-thirds length of ventral lobe, twisted slightly inward and rightward apically; ventral lobe with strong ventrobasal keel, sinuate, apically flattened and subacute, with very blunt, subbasal tooth along left margin, larger one subapically on right margin; large internal sac present, expanding from apex of dorsal lobe.

Etymology. This species' name refers to the 'bowing' of its head, as if in subservience.

Distribution. This species is known only from El Bosque Integral Otonga, in the cloud forests of northwestern Cotopaxi Province, Ecuador.

Remarks. This species is similar to several smaller very rounded species (e.g. *E. vibrissus*, *E. gemellus*). Externally, it is separable principally by the more elongate antennal club, as well as details of the aedeagus.

Euphalepsus sinchi **sp. nov.**
DNA barcode: GenBank PX930352
Figs 106M–N, 107A–C

Type material. Holotype ♂ (MECN-EN 41010): "ECUADOR: Napo, -0.65822, -77.59197 Archidona, Pacto Sumaco, 22.I.2024, 1468m, Winkler, A. Pazmiño | M. Barreno" / "Caterino DNA voucher, Ext. MSC-12767, Morphosp. PS.A.001"; deposited in MECN. **Paratype** (1♂): same data as type (MECN-EN 41011).

Diagnosis. (TL: 2.0mm) Body (Fig. 107A) dark, compact, uniformly but sparsely clothed with elongate, suberect setae; head subtriangular, vertex with widely separated foveae connected by an arcuate, transverse sulcus behind distinctly swollen antennal bases; eyes large, hemispherical, finely faceted; ocular fovea well-developed, large, with a few erect setae between it and eye; anterolateral genal corners with short, sublinear cluster of about 5 apically spatulate setae; antennae moderately elongate, antennomere II cylindrical, III–VII narrow at base, cylindrical apically, VIII more cylindrical, IX–XI forming elongate loose club, antennomere XI with apical half paler; pronotum convex, widest at midpoint, narrowed to base and apex, lateral foveae small but distinct, connected by shallow, complete, 'V'-shaped basal sulcus; each elytron with sutural and two lateral foveae; humeral corner narrowly, obliquely swollen; subhumeral fovea absent, subhumeral stria weak, stronger posteriorly; male prolegs unmodified; male mesotrochanter with small tooth on posterior margin; male mesofemur (Fig. 107B) swollen, slightly arched, weakly prolonged basad, reaching mesocoxa in front of trochanter; male mesotibia with weak denticle just basad inner midpoint, shallowly concave beyond; male metatrochanter apically prolonged with short apical flange; penultimate male abdominal ventrite deeply emarginate, depressed at middle. Aedeagus (Fig. 106 M, N) with basal bulb accounting for basal one-third of aedeagal length, diaphragm located anteriorly just above dorsal lobe; dorsal lobe low, appresed to ventral lobe, with left curving hook at apex; ventral lobe broadly paddlelike, with strong, short basoventral keel, apex widened slightly to rounded, obliquely truncate apex.

Etymology. This species' name comes from the Kichwa for 'strong', referring to the enlarged mesofemora.

Distribution. This species is known from the eastern side of the Andes, in lower cloud forest at around 1500m on the southern slopes of Volcán Sumaco.

Remarks. This species is closely related to *E. gemellus*, but they differ in several characters, most distinctly in the width of the male transverse frontal sulcus, in this species uniformly wide from fovea to fovea, as well

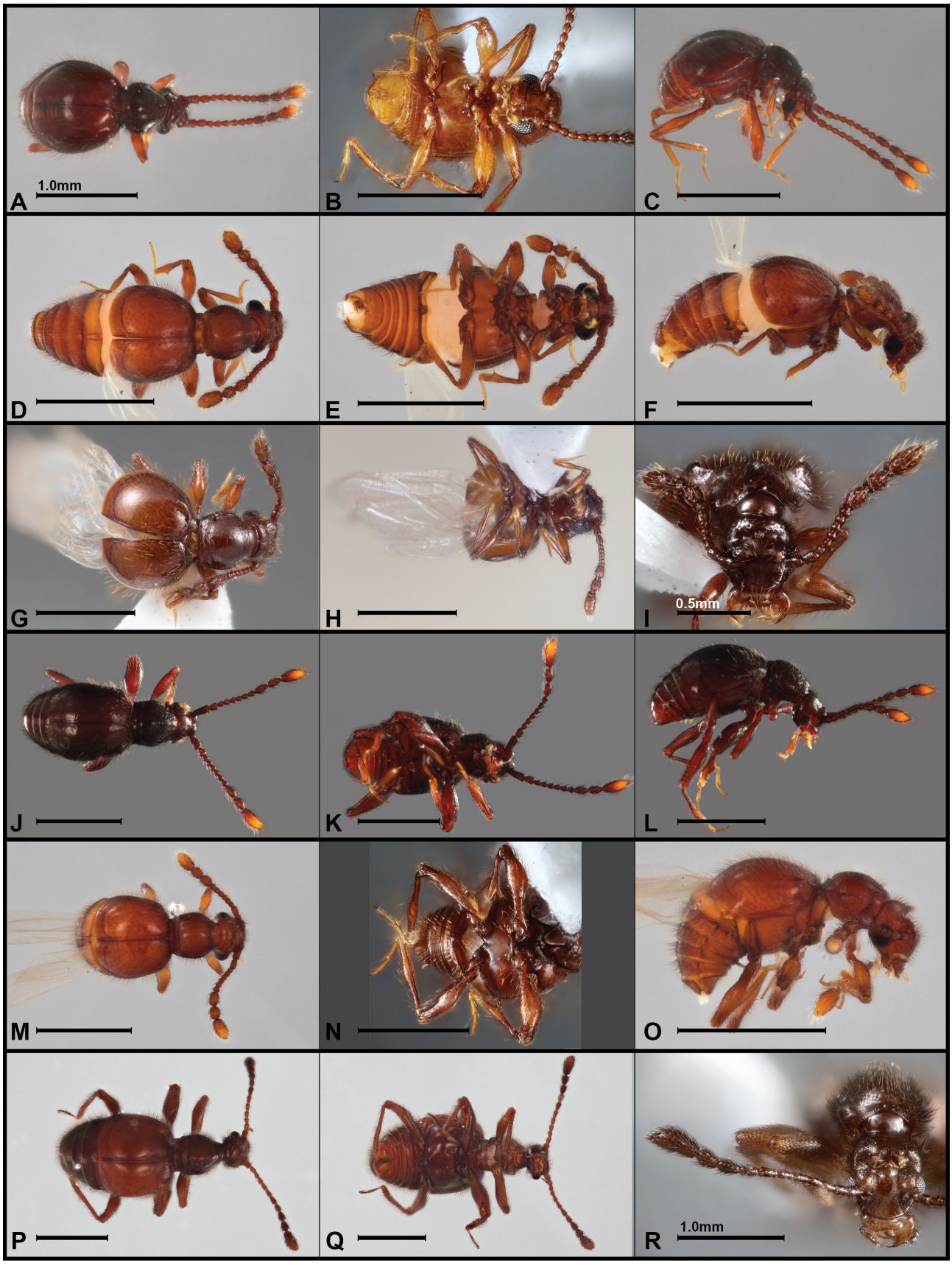

FIGURE 107. Habitus photos, *Euphalepsus* spp., dorsal, ventral, lateral views **A–C** *E. sinchi* **D–F** *E. supercilius* **G–I** *E. syrbatoides* (**I** head, detail view) **J–L** *E. tuberculigens* **M–O** *E. vibrissus* **P–R** *E. abrazero* (**R** head, detail view). Scale bars = 1.0mm unless otherwise indicated.

as the possession in this species of only three dorsobasal elytral foveae, and the very weakly, almost imperceptible lateral longitudinal pronotal sulci. Aedeagal differences between the two are, surprisingly, more subtle, with the aedeagus of this species slightly more compact, having a deeper division between the basal bulb and the ventral keel of the tegmen (Figs 106F vs. 106N), and having the apical hook of the dorsal process wider and more abruptly curved (Figs 106E vs. 106M).

Euphalepsus supercilius **sp. nov.**
DNA barcode: GenBank PX930379
Figs 106O–P, 107D–F

Type material. Holotype ♂ (ZSFQ-i23344)**:** "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12705, Morphosp. TBS.A.025"; deposited in ZSFQ.

Diagnosis. (TL: 2.3mm) Vertex of head with transverse incision between lateral foveae (Fig. 107F), dorsal edge with erect medial setae and anteriorly directed lateral setae; frons with truncate process in front of incision; eyes large, moderately coarsely faceted; small fovea present immediately anterad eye; antennal bases weakly elevated, smooth, frons punctate between; antenna rather compact, with distinct, elongate three segmented club; anterior corners of genae with long cluster of apically bent, ventrally directed setae; pronotum widest just behind midpoint, narrowed basally and moreso apically, with shallow lateral foveae connected by posteriorly cariniform impression, with short, weakly cariniform impressions along each lateral margin; elytra each with sutural and three lateral foveae dorsally, weak crease extended posterolaterad from lateralmost, delimiting weak humeral swelling; subhumeral stria present but lacking basal fovea; prolegs unmodified; mesotrochanter dentate, with setae apically (Fig. 107E); mesofemur slightly prolonged basad, weakly arched; mesotibia short, with strong tooth on inner margin at apical fourth; metatrochanter prolonged (Fig. 107E), with recurved distal flange; first abdominal ventrite with long, broad shelf between metacoxae. Aedeagus (Fig. 106O, P) with subspherical basal bulb with ventral basal foramen and anterodorsal diaphragm; dorsal lobe immediately below diaphragm, broad at base, forming a twisting lateral blade, narrowed, prolonged, and curving right over ventral lobe apically; ventral lobe straight, flattened, apically rounded on outer edge, angulate on inner (left) edge, inner margin with a strong, acute subbasal tooth; voluminous internal sac bearing elongate inner sclerotized strut.

Etymology. The name of this species refers to 'eyebrows' suggested by the setal fringe above the vertexal sulcus.

Distribution. This species is known only from the Tiputini Biodiversity Station in the western Amazon basin, Orellana, Ecuador.

Remarks. This species is distinguished by the strong male vertexal depression, distinct lateral longitudinal sulci of the pronotum, relatively short antennae with a distinct 3-segmented club, and strong male mesotrochanteral tooth opposite a mesotibial tooth.

Euphalepsus syrbatoides **sp. nov.**
DNA barcode: GenBank PX930383
Figs 106Q–R, 107G–I

Type material. Holotype ♂ (ZSFQ-i23345)**:** "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 4–9.vi.2011, FIT, K.Riley" / "Caterino DNA voucher, Ext. MSC-12729, Morphosp. TBS.A.032"; deposited in ZSFQ.

Diagnosis. (TL: 2.3mm) Body (Fig. 107G) small, globular, with sparse erect setae; vertex of head with shallow transverse depression between lateral foveae and continuing to eyes, with short medial arc of flattened setae within, dorsal edge with sparse fringe of anteriorly directed setae; frons (Fig. 107I) swollen, but not dentate, epistoma with complete, transverse anterior carina; eyes protuberant, rather finely faceted; paralabial area of gena with tubercles on either side bearing dense cluster of long, apically bent setae, with similarly long setae along submentum; antennae moderately large and elongate, reaching the middle of the elytra posteriorly, antennomere I simple and cylindrical, II shorter and cylindrical, III–VIII beadlike, similar, IX–XI forming a long loose club, IX and X similar in length, narrowed basally and apically, roughly setose, XI almost twice as long as X, apically narrowed; pronotum strongly convex, smooth with long, sparse setae; antebasal pronotal impression complete, continuous with lateral longitudinal impression on basal half, the lateral pronotal disc coarsely punctate along its lower margin; median basal fovea absent, lateral foveae impressed but not setose; elytra strongly convex and strongly rounded laterally, basal foveae small, with sutural fovea almost obsolete, three other dorsobasal foveae increasing in size to humerus; humeri swollen, set off by oblique humeral crease; epipleuron with short vertical stria above distinct subhumeral fovea; subhumeral stria complete, converging to lower epipleural margin apically; male profemur slightly bent near base, with short, setose carina along basal inner margin; male mesotrochanter with acute apical tooth, obliquely subparallel to femur; male mesotibia with small, acute tooth on inner margin one-third from its apex; male metatrochanter with blunt, weakly twisted apical process; abdominal tergites with large basolateral fovea; male second abdominal ventrite with short apical comb of setae in the middle; last male abdominal ventrite with narrow triangular median emargination. Aedeagus (Fig. 106Q, R) with subspherical basal bulb; with ventral basal foramen and anterodorsal diaphragm; dorsal lobe with basal neck, widening subapically, then narrowed to oblique, left-curving digitiform distal process; ventral lobe, flattened, undulating toward apex, widening, obliquely subtruncate apically, with broad, acute tooth on outer (right) edge; voluminous internal sac expanding outward from apex of dorsal lobe.

Etymology. This species' name refers to the *Syrbatus*-like lateral longitudinal pronotal sulci.

Distribution. This species is known only from the Tiputini Biodiversity Station in the western Amazon basin, Orellana, Ecuador.

Remarks. This species is very similar to the sympatric *E. supercilius* and *E. vibrissus*, with relatively short antennae, a deeply, transversely sulcate male vertex, distinct lateral longitudinal pronotal sulci, and male mesotibial teeth. *Euphalepsus syrbatoides* also has male mesotrochanteral teeth, but instead of a small cluster of long setae on the second abdominal ventrite, the males have a short median comb of setae there. The lateral margin of the pronotum is also coarsely punctate below the lateral sulci.

Euphalepsus tuberculigens **sp. nov.**
Figs 107J–L, 108A–B

Type material. Holotype ♂ (MECN-EN 40804): "ECUADOR: Tungurahua, -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13157, Morphosp. Mch.020"; deposited in MECN. **Paratypes** (3) 2♂: same data as type; 1♀: same general locality and date, but: -1.3838˚, -78.2918˚, 2345m (MECN-EN, 40238, 40266, 40269).

Diagnosis. (TL: 2.4mm) Body (Fig. 107J) elongate, dark reddish-brown, legs and antennal apex lighter; dorsum sparsely covered with rather thick, semi-erect setae; pronotum distinctly punctate, head less so, elytra slightly shagreened; head narrowed slightly to front, male vertex unmodified; male eyes small, comprising only about 25 ommatidia; genal carina well developed, posterior corners of gena strongly produced, with small posterior notch; anterior corners of gena with linear series of about 6 long, ventrally directed setae, flattened at their tips; subantennal depression large and delimited by carinae, with large fovea above anterior edge of eye; antennae moderately elongate, antennomere I weakly curved, cylindrical, about 3× as long as wide, II similar in width, about 1.25× as long as wide, III–VIII narrower, subquadrate, just slightly longer than wide, IX–XI forming distinct club, IX–X about 1.25× as wide as VIII and just over twice as long, XI about 3× as long as X, apical half lighter, apically subacute; pronotum weakly widened from base to middle, narrowed more rapidly to apex, sides of disk only weakly longitudinally impressed, longitudinal midline elevated as weak ridge; lateral subbasal foveae deep, connected by complete, sinuate transverse sulcus; elytra with sides evenly widening to about apical third, then narrowed, each with four dorsobasal foveae, the lateral-most with short impression behind setting off distinct humeral callus; subhumeral fovea small, with complete subhumeral stria extending posterad, converging to posterolateral elytral corner; abdominal tergites all similar in length; legs not markedly elongate; male mesofemur prolonged at base over mesocoxa, swollen at middle, inner edge emarginate in apical half; male mesotibia (Fig. 107K) strongly excavate along inner margin, slightly bowed outward; male metatrochanter distally prolonged, with small apical hook; male last abdominal ventrite weakly depressed. Aedeagus (Fig. 108A, B) with large basal bulb, diaphragm dorsoapical, with strong medioventral keel; dorsal process of tegmen widened from base to middle, narrowed and bearing a right-curved distal process from which internal sac extrudes; ventral process becoming flattened from base, apex broad, obliquely truncate, with lateral tooth on right margin and small subapical ventral tooth.

Etymology. The name of this species refers to the distinctly tuberculate posterior genal corners.

Distribution. This species is known only from cloud forests north of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. This species is distinctive in numerous characters, including its elongate, narrow body form, its relatively small male eyes, and its markedly swollen genal processes. While it lacks male frontal modifications, the bowed male mesotibiae (Fig. 107K) are also unusual.

Euphalepsus vibrissus **sp. nov.**
DNA barcode: GenBank PX930380
Figs 107M–O, 108C–D

Type material. Holotype ♂ (ZSFQ-i23335)**:** "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, FIT, AT1342, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12706, Morphosp. TBS.A.026"; deposited in ZSFQ. **Paratype** 1♂**:** same data as type (ZSFQ- i23336).

Diagnosis. (TL: 2.1mm) Body (Fig. 107M) rather small, compact, orange and densely setsoe; male vertex (Fig. 107O) weakly transversely incised between lateral foveae, middle of upper edge carinate, sparsely setose, middle of anterior margin weakly tuberculate, bearing few conspicuous setae; antennal bases swollen, laterally but not medially punctate; frons smooth anterad antennal insertions; antennae with antennomere I and II cylindrical, 1st 1.5× as long as 2nd, antennomeres III–VIII similar, short, slightly wider than long, antennae IX–XI forming a distinct club, XI about twice length of X; eyes large, finely faceted; small fovea present immediately anterad eye; anterior corners of genae with long, anteroventrally directed, apically palmate setae; pronotum widest at anterior third, narrowed basally and moreso apically, with shallow lateral foveae connected by arcuate, posteriorly cariniform impression, with distinct, weakly cariniform impressions along each lateral margin; each elytron with only single dorsal fovea near humeri, basal margin of elytra with uneven carina; humeral callus low but distinct; subhumeral fovea and stria distinct, with small vertical stria ascending humeri from fovea; prolegs not distinctly modified, profemur with short comb of setae at base of inner margin; mesotrochanter with small apical tooth; mesofemora weakly prolonged basally, swollen apically; mesotibia (Fig. 107N) with strong tooth on inner margin just beyond midpoint, tibia densely setose beyond; metatrochanter with apex

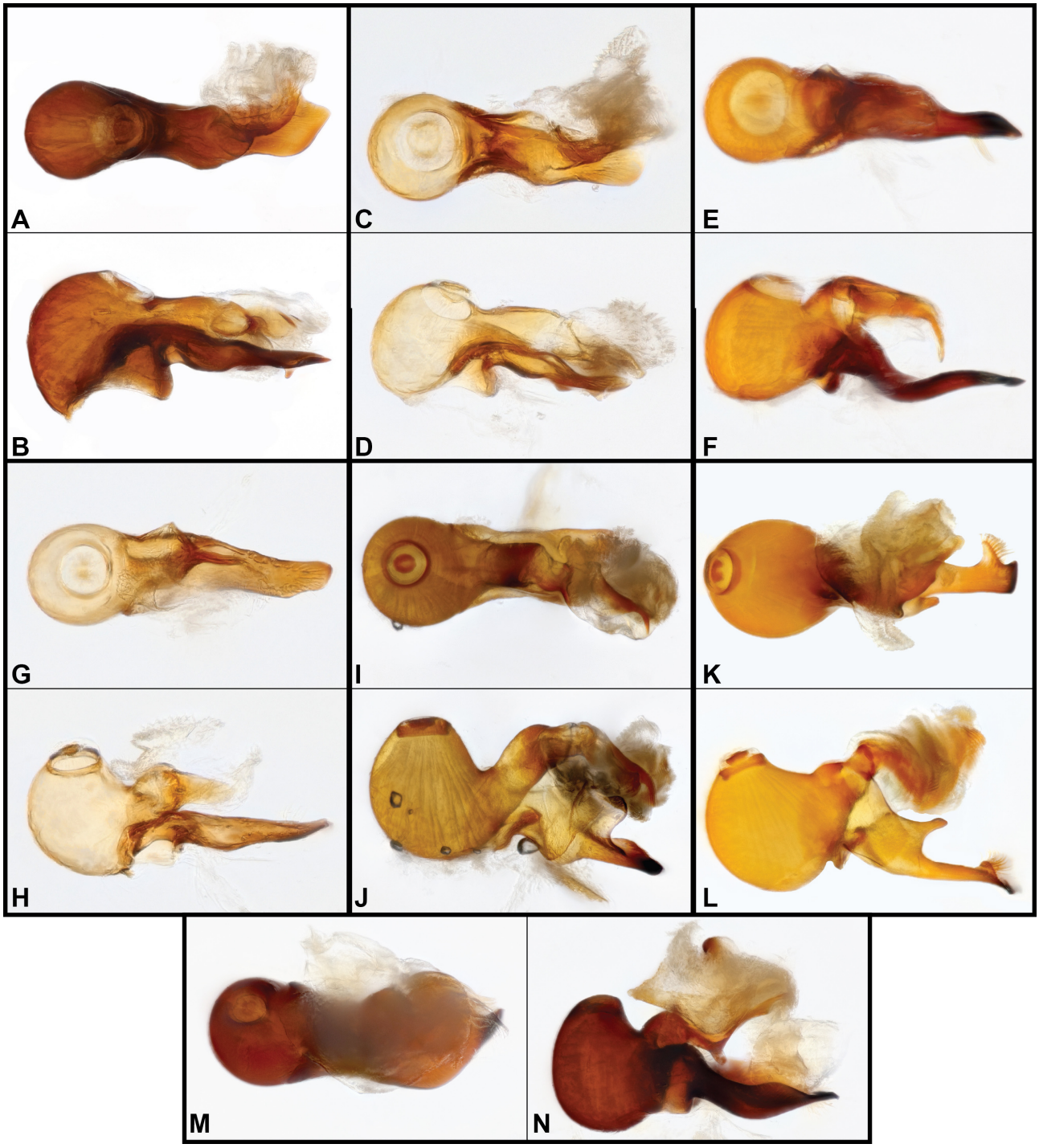

FIGURE 108. Aedeagus photos, *Euphalepsus* spp., dorsal, lateral views **A, B** *E. tuberculigens* **C, D** *E. vibrissus* **E, F** *E. abrazero* **G, H** *E. bidens* **I, J** *E. gigas* **K, L** *E. illuminatus* **M, N** *E. yunkaruna*.

prolonged, with recurved apical flange; metafemur and metatibia unmodified; 1st abdominal ventrite with dense comb of setae laterad metacoxa; 2nd abdominal ventrite with small but long erect cluster of setae at middle; abdominal tergites III–XVI with setose foveae above lateral marginal carina. Aedeagus (Fig. 108C, D) with subspherical basal bulb, small ventral basal foramen and small anterodorsal diaphragm; dorsal lobe about two-thirds length of ventral lobe, twisted slightly inward and rightward apically; ventral lobe sinuate, apically flattened and rounded, with two teeth along inner (right) margin, basal one low, apical one larger and acute; large internal sac present, expanding from apex of dorsal lobe.

Etymology. This species' name refers to the cluster of anterolateral genal 'whiskers' behind the mouth.

Distribution. This species is known only from the Tiputini Biodiversity Station in the western Amazon basin, Orellana, Ecuador.

Remarks. This species is closely related and similar to *E. supercilius*, sharing relatively compact antennae and

a similar male vertexal sulcus. *Euphalepsus vibrissus*, however, completely lacks the male mesotrochanteral tooth, having just a small cluster of mesotrochanteral setae, and the pronotum is less distinctly punctate. The small cluster of elongate setae at the middle of the male second abdominal ventrite appears unique.

Euphalepsus abrazero **sp. nov.**
DNA barcodes: GenBank PX930242, PX930243, PX930284
Figs 107P–R, 108E–F

Type material. Holotype ♂ (ZSFQ-i23337): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12619, Morphosp. ElP.A.018"; deposited in ZSFQ. **Paratypes** (6): 1♂: same data as type; 5♀: same locality as type, understory fogging (ZFSQ-i23338–i23343).

Diagnosis. (TL: 3.1mm) Head (Fig. 107R) slightly longer than wide; eyes protruding but finely faceted; vertex with irregular transverse impression between deep foveae on each side, with dense fringe of anteriorly directed setae on dorsal edge, frons with short, blunt median horn beneath; antennae elongate, most antennomeres longer than wide, apical antennomeres enlarged but not forming a distinct club, gradually enlarged to apex; antennomere XI large and bluntly pointed apically; genae projecting, with dense cluster of long setae projecting ventrad, setae apically plumose; prontoum campanuliform, widest at base, with complete, sinuous antebasal sulcus connecting distinct lateral foveae; elytra each with sutural and three lateral foveae dorsally, plus deep subhumeral fovea and stria; humeral swelling delimited by shallow, oblique dorsal sulcus and vertical crease dorsad subhumeral fovea; prolegs simple; mesofemur swollen and strongly arched forward, anterior edge with distinct basal projection beyond base of trochanter, posterior margin of mesofemur with small, blunt basal tooth; mesotibia (Fig. 107Q) with strong tooth on inner margin just beyond midline; male metatrochanter with tooth surrounded by stiff setae; abdominal tergites III–VI with setose foveae above lateral marginal carina; ventrite 1 with deep setose depression laterad metacoxa. Aedeagus (Fig. 108E, F) with subspherical basal bulb, with small ventral basal foramen and small dorsal diaphragm; dorsal lobe basally articulated, flattened, short, and bent downward at tip; ventral lobe more strongly sclerotized, with short ventrobasal keel, sinuate, narrowed to subacute apex, right edge bearing small, discrete series of ~5 long setae projecting laterally.

Etymology. This species takes its name for the Spanish for 'hugger', which the long curved legs suggest. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of El Pahuma Orchid Reserve, Pichincha Province, Ecuador.

Remarks. This and moreso the next several species represent a distinctive grouping within *Euphalepsus*, as recognized by the genitalic characters of a dorsally located diaphragm that is distinctly separated from the distal tegmenal armature. They also tend to be larger in body size, less globular, and generally have the head flattened to varying degrees. This species is somewhat intermediate between the preceding group and the rest of those that follow in the relatively slight dorsal displacement of the aedeagal diaphragm.

The swollen and arched mesofemur of *E. abrazero*, in combination with the internally toothed mesotibia strongly recalls Raffray's *E. cruralis* (see his 1890c plate VI, Fig. 2), described from Venezuela. In Raffray's figure, the mesotibial tooth is clearly located in the basal half of the inner tibial margin, and is less projecting, while the body of the tibia itself is swollen at that point. The more strongly projecting tooth located beyond the midpoint in *E. abrazero*, on a more slender tibia distinguishes it. Raffray goes on to compare *E. cruralis* to *E. ovipennis* Reitter, but the latter was described to have a mesofemoral spine, lacking in this new species, as well as an 'abrupt three-segmented antennal club', which could not be said of *E. abrazero*.

A single female, collected in Napo Province (~13km southwest on opposite side of Andean crest), shares a number of characters, in particular the lack of distinct antennal club. It is, on the other hand, considerably smaller. It probably represents a closely related but distinct species.

Euphalepsus bidens **sp. nov.**
DNA barcode: GenBank PX930246
Figs 108G–H, 109A–C

Type material. Holotype ♂ (ZSFQ-i23346): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12622, Morphosp. ElP.A.021"; deposited in ZSFQ. **Paratypes** (2♂, 2♀): same locality as type, 1900–2100m, understory fogging (ZSFQ-i23347–i23350).

Diagnosis. (TL: 1.8mm) Body (Fig. 109A) elongate, gracile, sparsely covered with long setae; head narrowed and rounded posteriorly; eyes protuberant, rather finely faceted; ocular fovea absent; vertex with single, weak median fovea; antennal bases protuberant, epistoma smooth, anteriorly rounded and margined; antennae long, antennomeres I and II short, cylindrical, antennomeres III–VIII small and beadlike, slightly elongate, antennomeres IX–XI forming elongate club, IX & X each as long as three preceding antennomeres combined, XI as long as III–VIII combined, acuminate apically; maxillary palpi small, apical palpomere swollen, only about twice length of penultimate; venter of head, including genal corners, with sparse, long, ventrally projecting setae, each finely spatulate; pronotum longer than wide, narrowed from middle to apex, posterior sides parallel; disk with pair of lateral foveae joined by broad, shallow transverse impression; each elytron with sutural fovea and three dorsobasal foveae, the outermost two closely

conjoined; humerus obliquely elevated; subhumeral fovea and stria well developed; metathoracic wings well developed; prosternum with precoxal fovea; procoxae long, mesoventrite with vertical shelf for reception of procoxae; metaventrite with densely setose foveae behind and laterad mesocoxae; legs long, thin; male mesofemur (Fig. 109B) prolonged basally beyond trochanter, with strong, setose tooth on inner margin one-third from base; male mesotibia with small tooth on inner surface just beyond midpoint; abdomen not margined laterally, without paratergites, each tergite with setose lateral fovea; basal abdominal ventrite with deep lateral fovea. Aedeagus (Fig. 108G, H) with subspherical basal bulb, basal foramen small, facing distad below ventral plate; small dorsal diaphragm present; ventral plate prolonged, strongly sclerotized, slightly asymmetrical in dorsal view, with trio of short setae along one edge; dorsal lobe of basal bulb with short, laterally flattened distal blade.

Etymology. This species' name refers to the possession of teeth on both the mesofemur and the mesotibia.

Distribution. This species is known only from the cloud forests of El Pahuma Orchid Reserve, Pichincha Province, Ecuador.

Remarks. This species is unique in its slightly flattened head bearing scattered long ventral setae, its single median vertexal fovea, elongate antennae with asymmetrical apical antennomere, and the males' possessing strong teeth on both the mesofemur and mesotibia.

Euphalepsus gigas **sp. nov.**
Figs 108I–J, 109A–C

Type material. Holotype ♂ (MECN-EN 41004): "ECUADOR: Cotopaxi, -0.4176˚, -79.0041˚, Bosque Integral Otonga, 13.VIII.2024, 1963m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12873, Morphosp. Ot.A.038"; deposited in MECN.

Diagnosis. (TL: 4.1mm) Body (Fig. 109D) large, rather slender (at least anteriorly), densely clothed with short, erect setae; head (Fig. 109F) generally flattened, and male vertex further broadly, transversely depressed, with posterior and anterior edges carinate, two small setose tubercles on the posterior edge, dense setose patches on either side within the anterior part of the depression; eyes convex, rather finely faceted; a distinct fovea present above eye and behind antennal insertion; sides of genae with elevated setal bases, each bearing a long, finely spatulate seta; antennae elongate, each of antennomeres III–VIII slightly longer than wide, IX–XI slender but each as long as 3 funicular antennomeres, the ultimate slightly wider, lighter in color; pronotum elongate, sides subparallel in basal half, narrowed anterad to about half basal width; lateral basal foveae well developed, connected by a deeply impressed, curved basal sulcus, its posterior edge distinctly carinate; each elytron with four deep dorsobasal foveae, the lateralmost with oblique impression setting off strong humeral callus; subhumeral fovea present, extended posterad by subhumeral stria; anterior margins of male mesofemora prolonged basally, nearly meeting above mesoventrite; posterior edge of male mesofemur with short setose tooth; male mesotibia (Fig. 109E) with blunt tooth near middle of inner margin, densely setose apically. Aedeagus (Fig. 108I, J) with basal bulb taller than wide or long, with small diaphragm on dorsalmost edge, diaphragmatic sclerite present; dorsal lobe of tegmen cylindrical, extended upward from ventral half of basal bulb, narrowed slightly, bent distad, with endophallus extruded from apex, endophallus with prominent, hooked sclerite; ventral lobe of tegmen keeled, with sclerotized distal process extending from ventral edge of keel.

Etymology. This species is named for its relatively large body size, at least within the genus.

Distribution. This species is known only from El Bosque Integral Otonga, in the cloud forests of northwestern Cotopaxi Province, Ecuador.

Remarks. This species is distinctive in many respects, particularly in its large size, basally depressed head (at least in the male), numerous capitate ventral genal setae, very elongate antennal club segments, and rather narrow and elongate pronotum. A photograph of a probably conspecific specimen from Pacific slope cloud forests of Pichincha (~2200m) was posted on Flickr by Jim McClarin (https://flic.kr/p/QiqBLm).

Euphalepsus illuminatus **sp. nov.**
DNA barcode: GenBank PX930286
Figs 108K–L, 109G–I

Type material. Holotype ♂ (MECN-EN 40903): "ECUADOR: Carchi, 0.8040˚, -78.1710˚, El Goaltal, 1282m, 08.II.2025, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13322, Morphosp. Goal.006" / "MECN-EN 40903"; deposited in MECN. **Other material:** 2♂: Ecuador: Los Rios, Centro Cientifico Río Palenque, 4-Jan-1996 & 29-Dec-1980 (QCAZ-I-280332, 280330).

Diagnosis. (TL: 3.0mm) This species is very similar to the preceding (*E. gigas*), differing principally in the following characters; male head less strongly flattened, shorter, simply depressed between vertexal foveae; intermediate antennomeres more elongate, but club antennomeres slightly shorter and thicker; pronotum (Fig. 109G) broader at base, lateral margin more nearly angulate one third from base, evenly narrowing anterad; basal pronotal sulcus shallower; base of male mesofemur only weakly dentate; male mesotibia with tooth at middle; male metacoxa not prolonged basal to trochanteral insertion. Aedeagus (Fig. 108K, L) with shorter, less dorsally deflected dorsal process; ventral lobe simpler, more elongate, with distinct dorsal, subbasal tooth, apex fist-shaped, with right-pointing 'thumb' bearing dense row of stiff setae.

Etymology. This species is named for the 'headlight'-like pale apical antennomere.

Distribution. This species is described from lower cloud forests of Carchi Province, in far northern Ecuador.

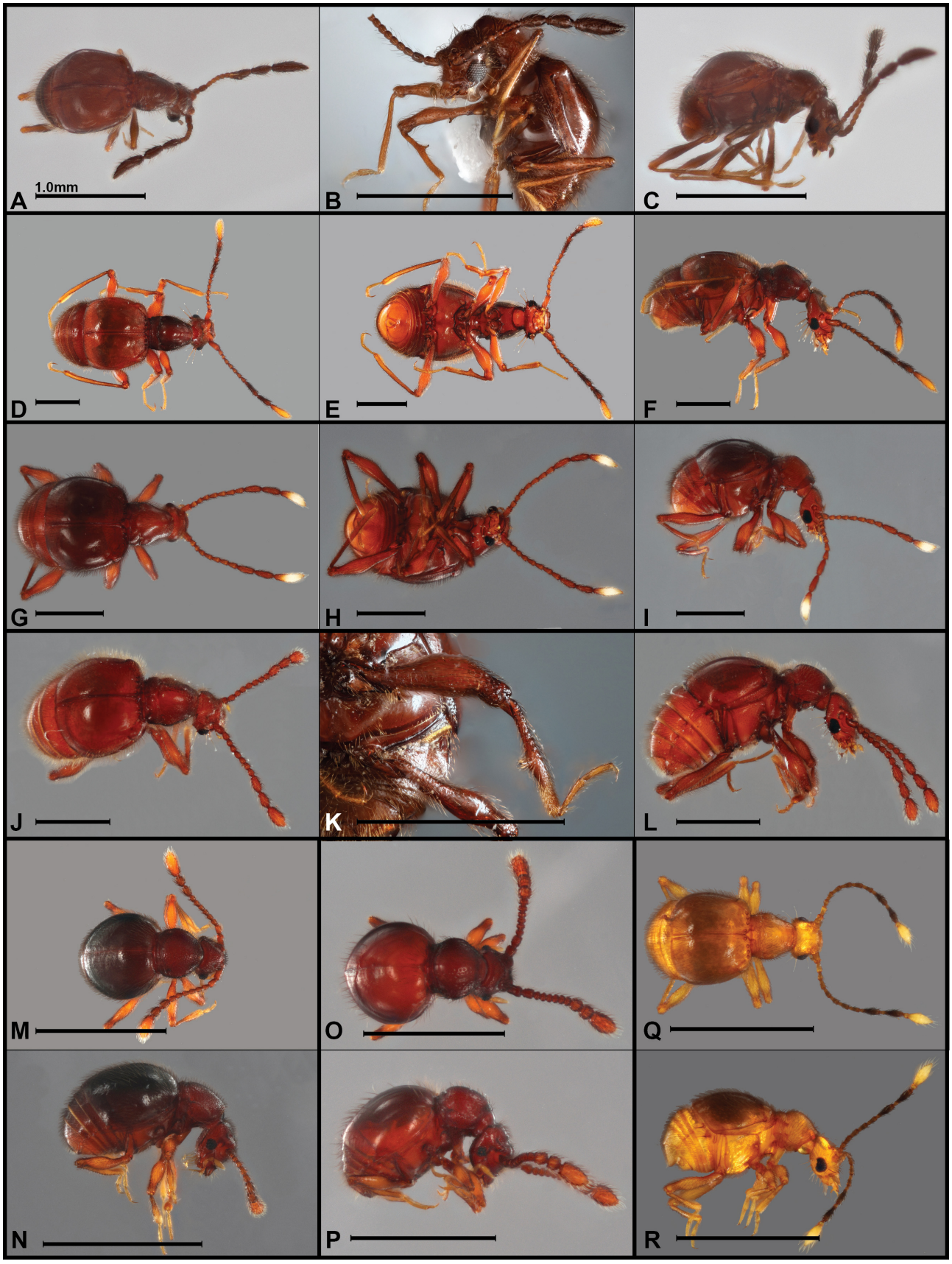

FIGURE 109. Habitus photos, *Euphalepsus* spp., dorsal, ventral, lateral views **A–C** *E. bidens* **D–F** *E. gigas* **G–I** *E. illuminatus* **J–L** *E. yunkaruna* **M, N** *E. arguelloi* (dorsal, lateral only) **O, P** *E. globosus* (dorsal, lateral only) **Q, R** *E. tactus* (dorsal, lateral only). Scale bars = 1.0mm.

The two specimens cited under 'other material' are from the Río Palenque station, 200km to the southwest. These were not dissected, but appear identical in external characters.

Remarks. While superficially this species and *E. gigas* share many similarities (and are likely relatively closely related), they differ in numerous details of male secondary sexual morphology, particularly head shape, as well as aedeagal morphology. The most significant non-sex-linked difference is the pronotal shape, broader and with basally subangulate sides in *E. illuminatus*.

Euphalepsus yunkaruna **sp. nov.**
Figs 108M–N, 109J–L

Type material. Holotype ♂ (MECN-EN 41012): "ECUADOR: Guayas, -2.160995˚, -79.974517˚, Bosque Protector Cerro Blanco, Ductos, 8.V.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12805, Morphosp. CrBl.A.003"; deposited in MECN. **Paratypes** (5♂, 3♀, same general locality as type): 4♀: 2.12579˚, -80.08328˚, Quebrada Guitarra, 12.IV.2022; 1♂: -2.14427˚, -80.08553˚, Quebrada Condor, 10.IV.2022; 1♂: -2.173485˚, -79.979409˚, Antennas, 06.V.2022; 2♂: -2.156511˚, -80.059402˚, Quebrada Hugo, 24.V.2022 (MECN-EN 41013–41020).

Diagnosis. (TL: 3.1mm) Body (Fig. 109M) strongly convex, globose; head somewhat broad and flat, with distinct genal corners; vertex with pair small, distinct foveae, not sexually dimorphic; eyes hemispherical, finely faceted; ocular fovea well developed, posterodorsad and slightly separated from eye; venter of head with numerous long, apically spatulate setae, with several clustered on genal corner, each borne on a distinct tubercle; antenna long, antennomeres II–VIII cylindrical, slightly longer than wide, IX–XI forming an elongate club, IX–X similar in size, XI about 1.5× as long and wide, bluntly acute apically; pronotum parallel-sided in basal half, apically narrowed, lateral foveae well-developed, connected by shallowly 'V'-shaped basal sulcus, median fovea absent; pronotal disk weakly elevated longitudinally along midline; each elytron with sutural and three lateral basal foveae, an oblique posterolateral crease setting off distinct humeral swelling; subhumeral fovea well-developed, with short dorsal stria and complete subhumeral stria; male prolegs unmodified; male mesofemur (Fig. 109K) produced basad beyond trochanter, femur also bearing small basal tooth on posterior margin; male mesotibia with strong tooth on inner margin just beyond midpoint; penultimate male abdominal ventrite deeply emarginate, depressed at middle. Aedeagus (Fig. 108M, N) with large, upright, strongly sclerotized basal bulb, with small, well-defined dorsal diaphragm on its uppermost surface; main distal process of tegmen dorsoventrally compressed and convex below, with only short basoventral keel, widening subapically before narrowing to off-center, right-pointing, acute apex; dorsal process of tegmen arising immediately above ventral process, thick at base, thinning and dorsoventrally sinuous, its apex ascending and narrowing, its entire dorsal surface continuous with extrusible internal sac, which bears at least one superficial sclerite.

Etymology. This species' name comes from a Kichwa word meaning 'person of the coast'.

Distribution. This species is known only from the seasonal coastal forests of the Bosque Protector Cerro Blanco, just west of Guayaquil, Guaymas, Ecuador.

Remarks. This species appears to be closely related to *E. liljebladi* Park (described from Costa Rica), sharing the general head shape and distribution of genal capitate setae which are borne on slight tubercles, as well as the elongate and asymmetrical terminal antennomere. The strong vertexal sulci present in *E. liljebladi* are only minimally evident in *E. yunkaruna*, however, and the head of *E. liljebladi* is generally less flattened. The dense cluster of setae at the posteromedial margin of the *E. liljebladi* metaventrite are not at all evident in *E. yunkaruna.*

Euphalepsus arguelloi **sp. nov.**
Figs 109M–N

Type material. Holotype ♀ (MECN-EN 41003): "ECUADOR: Cotopaxi, -0.4194˚, -79.0033˚, Bosque Integral Otonga, 13.VIII.2024, 1963m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-12851, Morphosp. Ot.A.016"; deposited in MECN. **Paratype** (1♀): same general locality as type, except 0.04172˚, -79.0040˚, 2073m (MECN-EN 41004).

Diagnosis. (TL: 1.4mm) Body (Fig. 109M, N) dark, globose, densely covered with dark setae, those of pronotum and head more erect than subrecumbent setae of elytra and abdomen; head of female longitudinally convex medially between strongly impressed vertexal foveae; eyes (of female) small; supraocular fovea present; sides of genae with longitudinal row of elongate, spatulate, apically bent setae; antennae moderately elongate, antennomeres III–VIII each slightly longer than wide, antennomeres IX–XI larger, forming loose club, terminal antennomere paler, about 2.5× as long as penultimate; pronotum with sides rounded, widest just behind middle, slightly narrowed to base and moreso to apex, disk coarsely punctate; lateral pronotal foveae well-developed, connected by curved basal sulcus, lateral longitudinal sulcus weakly impressed anterad lateral foveae; elytra strongly convex, lacking dorsobasal foveae, lacking any indication of a humeral callus; subhumeral fovea and stria present.

Etymology. I name this species in appreciation for the assistance of Mr. Francis Israel Arguello Hidalgo, student at La Universidad Central del Ecuador, who participated in its initial collection.

Distribution. This species is known only from El Bosque Integral Otonga, in the cloud forests of northwestern Cotopaxi Province, Ecuador. This area is a hotspot for *Euphalepsus* diversity, with five distinctive species described here from a very small area.

Remarks. This species and the two following are known only from females. Regardless, *E. arguelloi* is distinctive among *Euphalepsus* in lacking elytral foveae.

Such a character is not known to vary between males and females of other *Euphalepsus* species, so it should be expected that the male will exhibit a similar condition. In most other characters it is similar to many of the globular species of the genus, such as *E. sinchi*, *E. vibrissus*, and *E. mucronatus* (Raffray).

Euphalepsus globosus **sp. nov.**
Figs 109O–P

Type material. Holotype ♀ (MECN-EN 41005): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12759, Morphosp. SK.A.020"; deposited in MECN.

Diagnosis. (TL: 1.6mm) Body (Fig. 109O, P) rather short, subglobular, sparsely covered with long, erect setae; head short, quadrate (in lateral view), shallowly, transversely impressed across vertex (even in female); vertexal foveae widely separated and deeply impressed; eyes small but prominent, about equal in diameter to scape; ocular foveae present between eye and antennal base; about four elongate, apically bent subgenal setae present at anterolateral corners of gena; antennal bases elevated; antennae with scape robust, slightly expanded at apex, antennomere II cylindrical, III–VIII similar, short, slightly wider than long, antennae IX–XI forming a short but distinct club, XI about twice length of X; pronotum broad, with sides rounded, disk distinctly punctate; lateral foveae impressed, connected by narrow but distinct, arcuate subbasal sulcus; median fovea absent; longitudinal lateral sulci extending anterad from foveae along pronotal margin; elytra broadly rounded, with no vestiges of any dorsobasal foveae or basal carina; subhumeral fovea also absent, though subhumeral stria is complete; legs rather short, femora swollen.

Etymology. This species' name refers to its short, rounded body form.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. Known only from females, it is possible to distinguish this species from close relatives, like *E. disobediens,* having a very short and rounded body form, by the very compact antennae, with distinctly transverse antennomeres III–VIII (and even IX–X to a lesser degree), and the strongly carinate lateral longitudinal sulci, continuous with the basal pronotal sulcus.

Euphalepsus tactus **sp. nov.**
Figs 109Q–R

Type material. Holotype ♀ (MECN-EN 41006): "ECUADOR: Cotopaxi, -0.4167˚, -79.0047˚, Bosque Integral Otonga, 14.VIII.2024, 2102m, M. Caterino & A. Pazmiño, Sifted litter" / "Caterino DNA voucher, Ext. MSC-13013, Morphosp. Ot.A.071"; deposited in MECN.

Paratypes (1♀), same general locality and date, but -0.4169˚, -79.0042˚, 2086m (MECN-EN 41007).

Diagnosis. (TL: 1.5mm) Body (Fig. 109Q, R) globular; head somewhat flattened, not strongly depressed; vertexal foveae widely separated, situated immediately behind strongly tuberculate antennal insertions; no ocular fovea present; venter of head with about 6 weakly spatulate genal setae, setal bases not elevated; supraocular fovea absent; eyes situated low and forward, smallish but finely faceted; antennae elongate, all antennomeres distinctly longer than wide, antennomeres IX–X tapered basally and distally, terminal antennomere sparsely (not densely) setose, lighter in color than others, wider but only slightly longer than penultimate; pronotum elongate, parallel-sided in basal half, tapered to front; lateral foveae deeply impressed, transverse basal sulcus of pronotum complete, its posterior edge smooth, not carinate; each elytron with four distinct basal foveae and distinct humeral callus. It is used as a noun in apposition.

Etymology. This species' name refers to the seemingly 'tactile' setae extending alongside and beneath the head. It is used as a noun in apposition.

Distribution. This species is known only from El Bosque Integral Otonga, in the cloud forests of northwestern Cotopaxi Province, Ecuador.

Remarks. This species is similar in many characters to *E. gigas* (flattened head, anteriorly narrowed pronotum, elongate antennae, distinct humeral callus), and the fact that one is known only from a male, while this one is known only from two females, was intially suggestive of conspecificity. However, the number of differences is also substantial, and it seems much more likely that the corresponding sexes of each one simply remain undiscovered. In particular, this species is half the size, has fewer genal setae not borne on tubercles, has a simple post-antennal fovea dorsally, not below antennal insertion, and has both longer basal antennomeres and shorter, differently shaped club antennomeres.

Eupsenina Raffray, 1909
Fig. 110

Three species are included in this genus from Panama to Paraguay (Asenjo *et al.* 2019, Chandler 2023). One new one is described here.

Diagnosis. *Eupsenina* has never been characterized in much detail. Although included in the tribal diagnosis of Baradina by Chandler (2023), it was called out as an exception to a number of characters. Park (1942) characterized it principally by its superficial similarity to *Eupsenius* (being largely glabrous), 'subgeniculate' antennae, large last antennomere, subcordate pronotum, and minute apical maxillary palpomere. The metacoxae are widely separated, unlike other Baradina, but like some larger-bodied *Eupsenius* (Chandler 2023). Male secondary modifications have not received much attention, but modifications of the male pedicel and profemur are common to at least a couple of species (including the one described below).

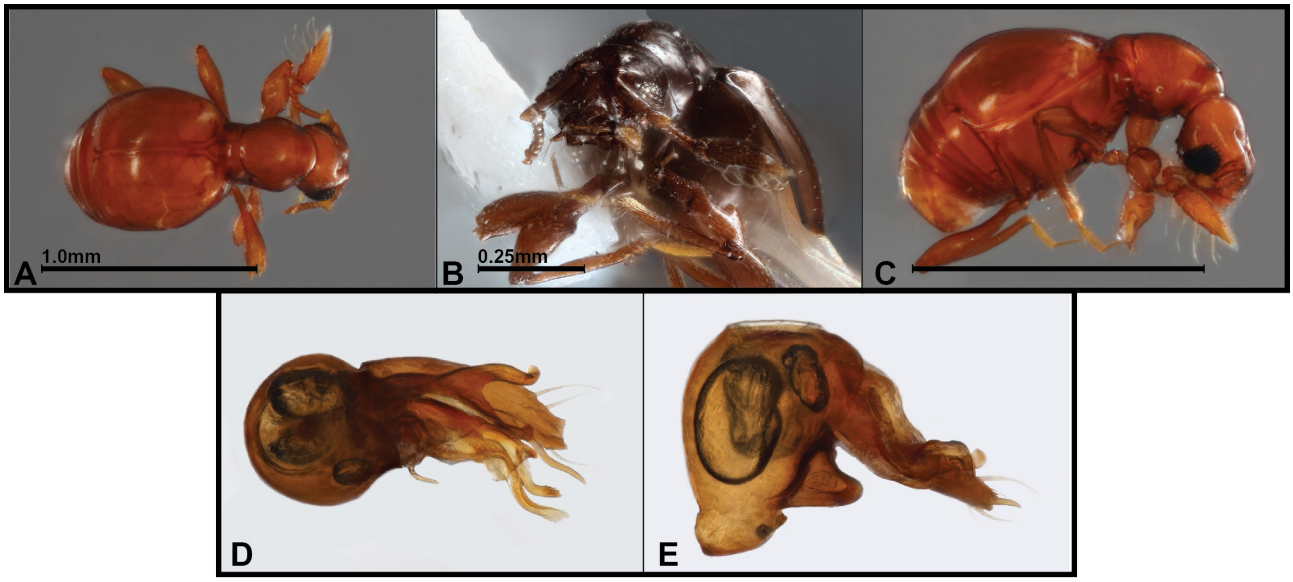

FIGURE 110. Photographs, *Eupsenina guayasensis* **A–C** Body: dorsal, anterior (showing male profemoral modification), lateral, **D, E** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm unless otherwise indicated.

Eupsenina guayasensis **sp. nov.**
DNA barcode: GenBank PX930220
Fig. 110

Type material. Holotype ♂ (MECN-EN 41805): "ECUADOR: Guayas, -2.159579˚, -80.02109˚, Bosque Protector Cerro Blanco, Q. Cusumbo, 25.IV.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12815, Morphosp. CrBl.A.013"; deposited in MECN.

Diagnosis. (TL: 1.6mm) Head with vertexal foveae moderately impressed; genae with about 6 long, capitate ventral setae beneath; antennal scape elongate, about as long as antennomeres II–V together, male antennomere II triangular (Fig. 110A, B), with angulate process on outer edge; antennomeres III–IX small, beadlike, slightly transverse, X–XI forming loose club, X much larger, ovoid, acute apically, bearing several long, apically curved setae on posterior surface (Fig. 110A); pronotum narrowed at base, widest anterad middle, basolateral foveae weakly impressed, the darkened internal ridge between them arcuate; scutellum rather large and conspicuous; elytra with sides rounded, lacking dorsal foveae, few setae evident posteriorly, humeri slightly elevated; 1st abdominal tergite only slightly longer than 2nd; male last two tergites unmodified, simply convex; male profemur expanded apically and obliquely depressed along upper margin (Fig. 110B), longitudinally excavate and rugose along basal third of inner margin; male protibia with small tooth at apical third of inner margin. Aedeagus (Fig. 110D, E) with strong, upright basal bulb with well-defined dorsal diaphragm and small, circular diaphragmatic sclerite; basal foramen small and ventral, with strong basal apodeme/keel at its distal edge; tegmenal 'tongue' divided into wide, curving right half, bearing three strong setae near its wide, weakly emarginate apex, left side shorter, also weakly curved, with an obliquely truncate apex; median armature complex, with three elongate, sinuate processes on left side, two ending in weakly widened, multidenticulate paddles, one narrow and acute, on the right side a strongly forked process extends most of the way to the tegmenal apex, with its apices curved ventrad.

Etymology. The species is named for the province in which it occurs, Guayas, Ecuador.

Distribution. This species is known only from the type locality in coastal Ecuador, at around 300m above sea level in the mountains west of Guayaquil.

Remarks. This species expands the scope of the genus somewhat, showing not only male modifications of the antennal pedicel, but also exhibiting a modifed male profemur and protibia. The male genitalia are the first described for *Eupsenina*, bearing some similarity to other Baradina, including the upright basal bulb with a prominent basal keel, and a distinct dorsal diaphragm. The tongue-like tegmen is also similar, but this species has a more complex inner armature than other known Baradina. Also supporting placement in Baradina is the presence of sparse, long capitate setae on the venter of the head, very much like those of most *Euphalepsus* Reitter.

Nanocephalus Caterino, **gen. nov.**
Fig. 111

Type species. *Nanocephalus chinchin* **sp. nov.**, by present designation.

Diagnosis. (TL: 0.89–1.2mm, Avg. 1.0mm) Body (Fig. 111A–E) very small; head narrow; vertex short, lacking foveae; frons perpendicular to vertex, prolonged, strongly depressed in front, with median longitudinal carina; venter of head bearing long capitate ventral setae; antennal bases produced, inserted high on frons; antennae geniculate, with only 8 or 9 total antennomeres, scape nearly as long as other antennomeres combined, pedicel

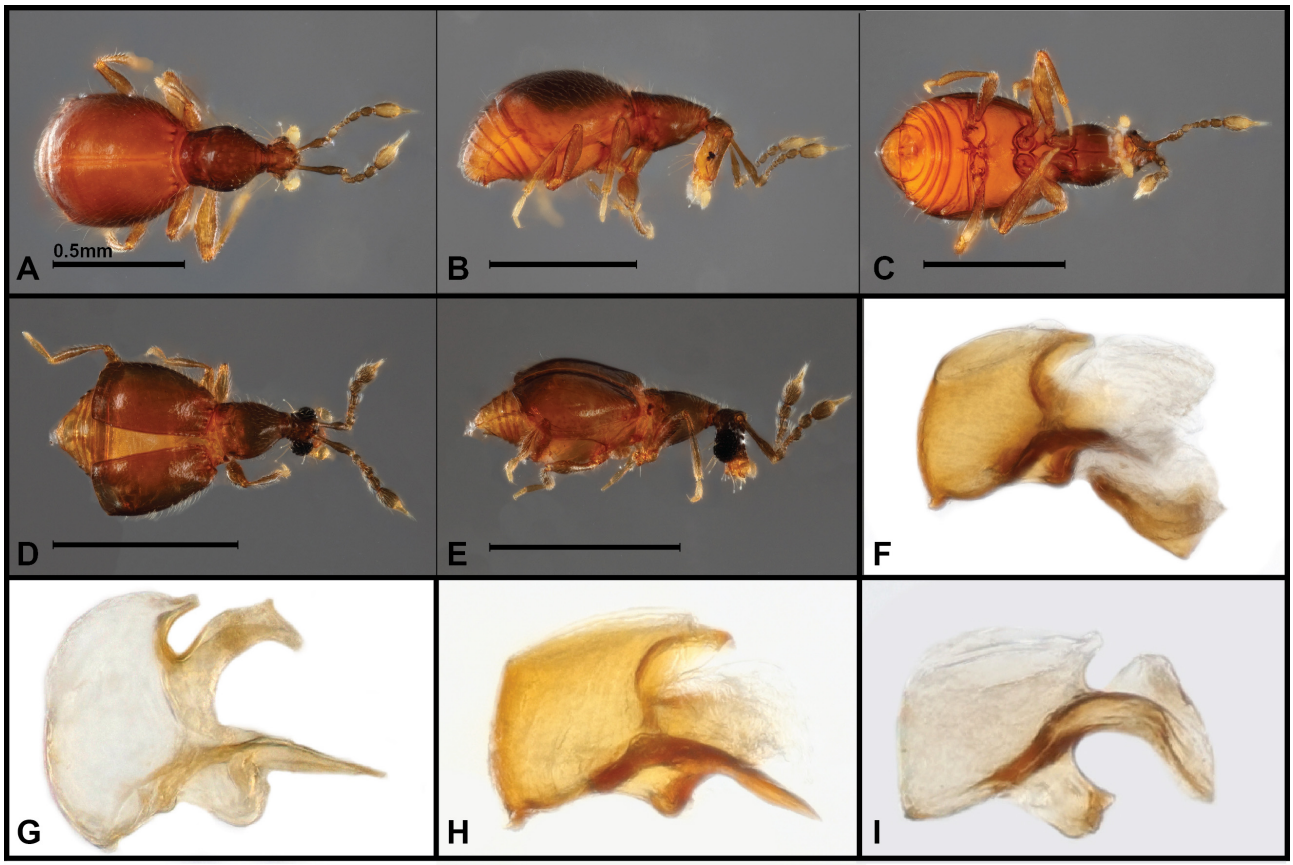

FIGURE 111. Photographs, *Nanocephalus* spp. **A–C** *N. chinchin*, dorsal, lateral, ventral **D, E** *N. macrops*, dorsal, lateral views **F–I** Aedeagi, lateral view **F** *N. chinchin* **G** *N. tenuis* **H** *N. timens* **I** *N. macrops.* Scale bars = 0.5mm.

large, bulbous, as long as next three antennomeres, widened to apex, intermediate antennomeres (III–V or III–VI) very short, terminal three antennomeres forming distinct club, the last antennomere about 3× as long as penultimate, strongly acuminate, with narrow cluster of apical setae; eyes fully developed to strongly reduced (in most species males, and always in females); labrum rather elongate, widened to front; apical maxillary palpomere cultriform; prothorax prolonged in front of coxae, gradually narrowed anteriorly, smoothly constricted posteriorly at strong, transverse basal sulcus; pronotum and prosternum fused, without hypomeral suture; lateral pronotal foveae present; elytra long (some species' males winged), sides strongly rounded; usually with sutural and two lateral dorsobasal foveae, although one of the lateral foveae occasionally absent; subhumeral elytral fovea and stria present; abdomen without free paratergites, each segment with lateral carina between tergites and sternites; 1st–4th tergites short, approximately equal in lenth; prosternum elongate, with fine median carina, lacking foveae; procoxae long, projecting; profemora wide, with well-defined sensory patch on apical 2/3 of inner surface; second tarsomeres swollen, considerably larger than basal or distal; mesoventrite with lateral foveae and usually median postcoxal foveae; posterior coxae contiguous; first abdominal sternite widened at sides, bearing large oblique lateral fovea. Aedeagus (Fig. 111F–I) with large, upright basal bulb with large dorsal diaphragm, diaphragmatic sclerite indistinct; dorsal distal edge of basal bulb usually projecting; ventral keel present distad basal foramen; tegmen comprising fairly simple, tongue-like lobe, variously shaped; articulated inner armature lacking.

Etymology. The generic name refers to the very narrow, reduced head of all the species. It is masculine.

Distribution. This genus is known from at least four species, from cloud forests (~2000m) southwest and southeast of Quito, Ecuador. While the species described below all come from the eastern slope of the Andes, an additional probable species is known from the Otonga reserve on the western slope. It is only known from a female, however, and is not being formally named now.

Remarks. This unusual genus is assigned to Baradina, sharing the capitate ventral setae of the head as well as male genitalia morphology with members of *Euphalepsus*. With other Goniaceritae it shares the only weakly margined abdomen. I had initially considered the possibility that it might represent a very aberrant Trogastrini (Euplecititae), retaining some similiarities in prothoracic and antennal form, and some generally similar male genitalia can be found in other Euplectites. Its placement will need further review as more taxa come to light. The prolonged and narrow head suggests some sort of specialized feeding behavior.

Nanocephalus chinchin **sp. nov.**
Figs 111A–C, F

Type material. Holotype ♂ (MECN-EN 40861): "ECUADOR: Tungurahua, -1.4328˚, -78.3121˚, NaturetrekCandelariaRes, 2054m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13214, Morphosp. Cnd.030"; deposited in MECN. **Paratypes** (3♂, 2♀): 1: same data as type; 4: same general locality and date, -1.4322˚, -78.3120˚, 2040m (MECN-EN 40394, 40438, 40431, 40412, 40422).

Diagnosis. (TL: 1.2mm) All of the new species follow the generic description closely. This species' principally distinctive characters include: Body (Fig. 111A, B) dark orange to light brown, sparsely clothed subrecumbent setae, with a few longer setae interspersed; venter of head with about 4 elongate, capitate setae on each side; male eyes comprising ~3 ommatidia; antennae with 8 antennomeres, antennomere III very small and pale; pronotum lacking mediobasal carina, transverse subbasal sulcus deeply impressed, biarcuate; basal region shallowly but distinctly punctate; elytra with small sutural fovea and two slightly larger lateral dorsobasal foveae that are closer to each other than inner is to sutural fovea; sutural stria weakly impressed. Aedeagus (Fig. 111F) with basal bulb large, small basal apodeme present; basal foramen small; dorsal diaphragm large, apicodorsal edge of bulb prolonged over tegmen; ventral keel quadrate, not extended ventrad below margin of basal bulb; tegmen short, only weakly curved ventrad, narrow, directed slightly rightward.

Etymology. This species name refers to the river that runs through the valley immediately west of and below this type locality.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. It was initially considered possible that this might represent only a microphthalmous form of *N. macrops*, found in some of the same samples, and with males present of each. There are, however, a number of clear differences, including in male genitalia, that indicate they are distinct species. In external morphology, the most distinctive character is found in the sculpturing of the pronotum, this species lacking a mediobasal longitudinal carina.

Nanocephalus tenuis **sp. nov.**
Fig. 111G

Type material. Holotype ♂ (MECN-EN 41694): "ECUADOR: Napo, -0.5945˚, -77.9003˚, Est. Biol. Yanayacu, Piha Tr., 2397m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13003, Morphosp. Yn.A.072" / "MECN-EN 41694"; deposited in MECN. **Paratypes** (2♀): same general locality as type, 1: -0.5983˚, -77.8954˚, Stream Tr., 2192m; 1: -0.5935˚, -77.8982˚, Piha Tr., 2356m (MECN-EN 41695–41696).

Diagnosis. (TL: 1.0mm) As for genus, as well as: body dark orange, sparsely clothed with short, subrecubent setae; eyes small, comprising only a few ommatidia; antennae 8-segmented, with antennomeres III–V very short, IV and V transverse, basal two club antennomeres (VI–VII) shorter than wide, inner margins shorter than outer (asymmetrical); pronotum with distinct mediobasal carina; transverse subbasal sulcus weakly angulate; elytra with small sutural fovea close to first lateral, second lateral fovea more distantly separated. Aedeagus (Fig. 111G) with large basal bulb, basal foramen small, dorsal diaphragm large; rounded ventral keel projects from distal bottom of bulb; distal edge of basal bulb tall and concave; tegmen extending from lateral sclerotization above ventral keel, bent immediately downward, length about equal to bulb basal to it; secondary tegmenal process extends distad below dorsal projection.

Etymology. The species' name refers to the narrowed pronotum and head.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is best distinguished by its male genitalia, with its rounded ventral keel and unique secondary tegmenal process dorsad the main ventral lobe.

Nanocephalus timens **sp. nov.**
Fig. 111H

Type material. Holotype ♂ (MECN-EN 40256): "ECUADOR: Tungurahua, -1.3868˚, -78.2929˚, Río Machay Reserve, 2304m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13307, Morphosp. Mch.003"; deposited in MECN. **Paratypes** (2♂, 11♀): 2: same data as type; 3: same general locality and date, -1.3801˚, -78.2889˚, 2434m; 4: -1.3829˚, -78.2909˚, 2382m; 1: -1.3838˚, -78.2918˚, 2345m; 2: -1.3921, -78.2932˚, 2100m; 1: -1.3895˚, -78.2929˚, 2239m (MECN-EN 40192, 40205, 40228, 40231, 40232, 40234, 40240, 40265, 40268, 40286, 40322, 40323, 40787).

Diagnosis. (TL: 1.0mm) This species is very similar to the preceding, differing principally in the following characters: basal elytral foveae very large, lateral two foveae distinctly larger than sutural; pronotum with median carina basad and almost dividing arched, subbasal transverse sulcus (shared with *N. macrops*). Aedeagus (Fig. 111H) with basal bulb large, small basal apodeme present; basal foramen small; dorsal diaphragm large, apicodorsal edge of bulb prolonged over tegmen; ventral keel quadrate, extended slightly ventrad below margin of basal bulb; tegmen rather prolonged, bent ventrad and toward the right, apex narrowly rounded.

Etymology. This species name means 'shy', as one who likely remains in the depths of the litter.

Distribution. This species is known only from the Río Machay Reserve, on the north side of the Río Pastaza valley in Tungurahua Province, Ecuador.

Remarks. This species is extremely similar to *N.*

chinchin, differing mainly in the shape and length of the apical lobe of the tegmen, and in the shape of its ventral keel.

Nanocephalus macrops **sp. nov.**
Figs 111D–E, I

Type material. Holotype ♂ (MECN-EN 40832): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13185, Morphosp. Cnd.001"; deposited in MECN. **Paratypes** (1♂): same general locality and date as type, -1.4327˚, -78.3120˚, 2040m (MECN-EN 40429).

Diagnosis. (TL: 0.9mm) This species is similar in most respects to *N. chinchin*, differing principally in the following characters: eyes very large, occupying entire sides of head (Fig. 111D, E); pronotum with mediobasal carina, projecting slightly into arcuate subbasal transverse pronotal sulcus; elytra with fine sutural fovea but distinct sutural stria; lateral dorsobasal elytral foveae slightly larger, evenly spaced; profemora slender, sensory area rather small, confined to distal half of inner margin. Aedeagus (Fig. 111I) with basal bulb large, basal foramen small, dorsal diaphragm large; ventral keel quadrate, extended ventrad from distal edge of basal bulb; tegmen arched strongly dorsad, then downward, broad, short, slightly channeled on dorsal surface, with elevated flange on right edge.

Etymology. This species' name refers to its unusually large eyes.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. The known male of this species may be immediately distinguished by its very large eyes. However, it is not known whether there is intraspecific polymorphism in this character; though no indication of intraspecific variation has yet been seen, series have mostly been small, and it is certainly conceivable. *Nanocephalus macrops* is otherwise distinguished by the basal pronotal carina, and a very fine sutural elytral fovea, as well as by differences in aedeagal shape.

Goniaceritae: Brachyglutini: Brachyglutina

Globa Raffray, 1887
Figs 112–117

Globa so far has included three species from Central and South America (Asenjo *et al.* 2019). The type of the genus is *G. longipes* Raffray, described from Colombia. The other two are known only from Venezuela and Bolivia. Fifteen new species are described below.

Diagnosis. (TL: 1.4–1.9mm, Avg. 1.6mm) This brachyglutine genus is characterized by a particularly convex, globose body form, with the prothorax short, the elytra strongly convex and broadly rounded, lacking basal foveae, the head broad and dorsally more or less flat, ventrally with the lateral margins carinate, the carinae continuous with a median gular carina, the abdominal paratergites completely reduced to fine lateral carinae, and the first abdominal ventrite not bearing a posteriorly directed fringe of setae at the sides. The 11-segmented antennae are not particularly elongate, and have a loose, three-segmented club, with the ultimate antennomere much larger than any of the preceding. Males of most of the species have the penultimate, and often the antepenultimate abdominal tergites modified, generally with a swollen and/or dentate process on the former, and often an emargination on the latter. Many also exhibit sexual dimorphism in the hind tibia, which may be simply or markedly expanded toward the apex. An additional character of most of the species' males can be confusing—most have the fourth maxillary palpomere expanded and flattened and densely setose on the outer surface. Having such a condition of the *third* maxillary palpomere is characteristic of the closely related *Bythinogaster* Schaufuss.

No male genitalia have previously been described for any member of *Globa*. Based on the species described here, it may be characterized generally as having a large, rather weakly sclerotized basal bulb usually bearing a short ventral knob; setose, usually thin and curving parameres present; tegmenal armature complex, usually comprising one dominant hooked distal process, and two or more secondary hooks, all apparently articulated within the basal bulb to be deployed upon extrusion.

Globa angulipes **sp. nov.**
Figs 112A–C, 113A–B

Type material. Holotype ♂ (MECN-EN 40845): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13198, Morphosp. Cnd.014"; deposited in MECN. **Paratypes** (2♂): 1: same data as type (MECN-EN 40333); 1: same general locality and date as type, but -1.4349˚, -78.3113˚, 2178m (MECN-EN 40373).

Diagnosis. (TL: 1.7mm) Body (Fig. 112A) globose, smooth, head, pronotum and legs darker than elytra; head with fine vertexal foveae, slightly depressed on either side mediad antennal bases; eyes prominent, coarsely faceted; male ultimate maxillary palpomere unmodified; femora distinctly rugose; male metatibia (Fig. 112B) weakly angulate at apical fourth, outer margin weakly excavate beyond, delimited on inner edge by weak carina; male metaventrite slightly swollen in front of metacoxae, with longer, convergent setae; 3rd male abominal tergite (Fig. 112C) very weakly emarginate at middle; 4th male tergite low, broadly triangular, process barely elevated above main surface. Aedeagus (Fig. 113A, B) with large basal bulb, narrowed basally, humped at middle; median foramen small, with ventrally hooked basal apodeme at its anterior edge; parameres weak, asymmetrical, outwardly



FIGURE 112. Habitus photos, *Globa* spp., dorsal, lateral, pygidial views **A–C** *G. angulipes* **D–F** *G. armada* **G–I** *G. ascia* **J–L** *G. dientita* (**L** ventral view) **M–O** *G. falx* **P–R** *G. herniata.* Scale bars = 1.0mm unless otherwise indicated.

arcuate, apically setose; distal armature comprising three processes: on the right side is a well-sclerotized, obliquely truncate post, with a rounded swelling on its median edge, and an abrupt ventral hook at its apex; from the middle and arched strongly laterad is a strong distal hook with a distinct subapical tooth; between them is a weakly sclerotized, straight, apically bifid projection with a wide lobe on its left inner edge.

Etymology. The name of this species refers to the male metatibial shape.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua Province, Ecuador.

Remarks. There are two very similar species at Candelaria, *G. angulipes* and *G. pernix*, with very similar male metatibial modifications, and similar aedeagal morphology. However, this species has the pygidial process (Fig. 112C) wider and much flatter, whereas in the other (Fig. 114R) it is narrower and distinctly more convex. *Globa pernix* is fully winged, at least in the type, whereas the present species is brachypterous. The genitalia of the two are almost identical, but the main terminal hooked process has a secondary tooth in this species (Fig. 112A), and only a blunt secondary swelling in the next (Fig. 115K). DNA barcodes cluster them closely together, and further work is needed to assess the significance of their morphological differences.

Globa armada **sp. nov.**
DNA barcode: GenBank PX930327
Figs 112D–F, 113C–D

Type material. Holotype ♂ (MECN-EN 40831): "ECUADOR: Tungurahua, -1.3921˚, -78.2932˚, Río Machay Reserve, 2100m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13184, Morphosp. Mch.047"; deposited in MECN.

Diagnosis. (TL: 1.7mm) Body (Fig. 112D) globular, rather reddish, smooth; head with finely impressed vertexal foveae; eyes prominent and coarsely faceted; frons transversely shallowly impressed; male ultimate maxillary palpomere slightly expanded, but not flattened or setose on outer surface; male 3rd abdominal tergite weakly bituberculate just laterad middle; male 4th tergite (Fig. 112F) with narrow, bluntly rounded median tubercle; male metatibia (Fig. 112E) widest at middle, gradually narrowed to apex. Aedeagus (Fig. 113C, D) with basal bulb large, largely membraneous on dorsobasal surface, with simple, tonguelike basal apodeme distad small basal foramen; parameres thick at base, asymmetrical, divergent, obliquely truncate on left side, curved laterad and narrowly rounded on right, both with few apical setae; tegmen with three dominant apical processes, in addition to several shorter straight spikes at middle; on left side is a basally narrow, strongly recurved acute hook; on right side is a thicker, ventrally directed stem that widens and bends mediad into wide flat, spatulate plate; at middle is a more or less straight, well sclerotized rod that bends right to acute apex.

Etymology. This species' name refers to the seemingly excessive male aedeagal armature, from the Spanish 'armed'.

Distribution. This species is known only from cloud forests north of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. The gently widened male metatibia of this species is unusual. This combined with the modestly modified 3rd tergite and prominently tuberculate 4th tergite should distinguish it from most others.

Globa ascia **sp. nov.**
Figs 112G–I, 113E–F

Type material. Holotype ♂ (MECN-EN 41860): "ECUADOR: Napo, -0.5952˚, -77.8994˚, Est. Biol. Yanayacu, Piha Tr., 2386m, 9.IX.2024,sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12948, Morphosp. Yn.A.017"; deposited in MECN. **Paratypes** (13♂, same general locality as type): 3: same data as type; 2: -0.5935˚, -77.8982˚, Piha Tr., 2356m; 5: -0.5939˚, -77.8980˚, Piha Tr., 2368m; 2: -0.5958˚, -77.8927˚, Aburrian Tr., 2238m; 1: -0.5934˚, -77.8922˚, Aburrian Tr., 2198m; (MECN-EN 41861–41870, 41901–41903).

Diagnosis. (TL: 1.7mm) Body (Fig. 112G) dark reddish, smooth; head with finely impressed vertexal foveae; eyes moderately prominent and coarsely faceted; frons transversely shallowly impressed; male ultimate maxillary palpomere expanded, flattened, and setose on outer surface (Fig. 112H); male 3rd abdominal tergite concave at base, transversely bituberculate; male 4th tergite (Fig. 112I) with low transverse carinae at sides, not continuous with rounded, slightly taller median process; male metatibia (Fig. 112H) strongly expanded subapically, apical margin distinctly emarginate. Aedeagus (Fig. 113E, F) with basal bulb large, weakly sclerotized; parameres strongly asymmetrical, one (right) thin, sinuate, apically setose, left more or less broad and dorsoventrally flattened at base, then narrowing and curved inward to setose apex; tegmen with three main distal processes: the most prominent, dorsomedial process, extends narrowly from top of basal bulb, narrows very slightly, then is abruptly expanded and bent ventrad, then narrowed again to subacute apex; second major process continuous with deep, curved arm within basal bulb, narrow, somewhat 'S'-shaped, ending in subacute hook; third major process emerges between the other two, narrows and is abruptly bent ventrad near acute apex.

Etymology. This species' is named in reference to its 'hatchet-like' metatibia. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species is best recognized by the abruptly expanded male mesotibia, which is close enough to the apex to make the apical margin of the tibia appear emarginate. Its male abdominal modifications are also unique in the tripartite propygidial modification.

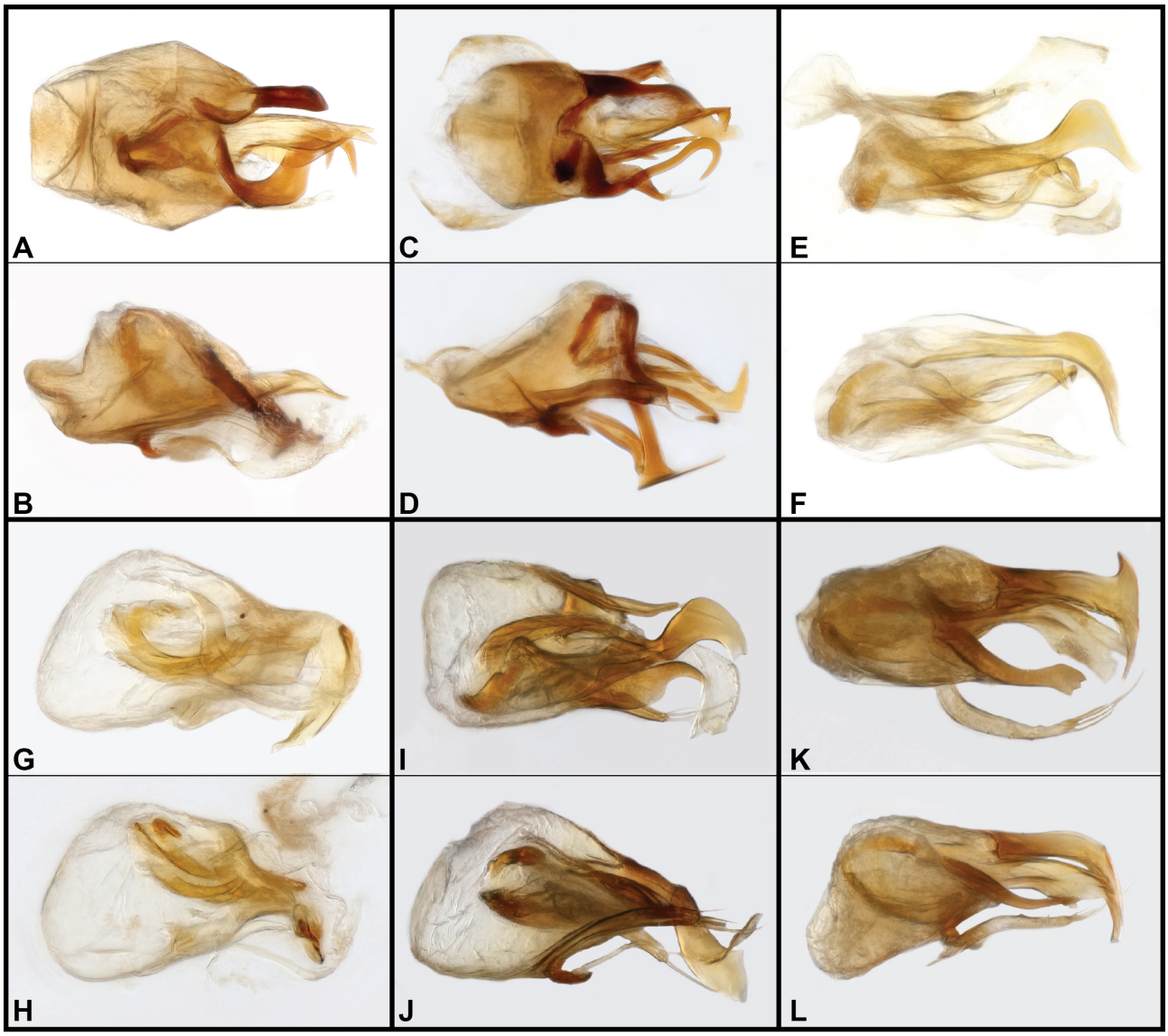

FIGURE 113. Aedeagus photos, *Globa* spp., dorsal, lateral views **A, B** *G. angulipes* **C, D** *G. armada* **E, F** *G. ascia* **G, H** *G. dientita* **I, J** *G. falx* **K, L** *G. herniata*. Scale bars = 1.0mm unless otherwise indicated.

Globa dientita **sp. nov.**
Figs 112J–L, 113G–H

Type material. Holotype ♂ (MECN-EN 41844): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13019, Morphosp. Can.A.005" / "MECN-EN 41844"; deposited in MECN [entire specimen in glycerin in genitalia vial].

Diagnosis. (TL: 1.5mm) Body (Fig. 112J) globose, smooth, dark orange; head with very fine vertexal foveae; frons flat; eyes almost hemispherical, coarsely faceted; male ultimate palpomere expanded, flattened, and setose on outer surface; elytra with fairly prominent humeral carinae; male 3rd abdominal tergite moderately densely setose; male 4th abdominal tergite with small median tooth (as seen in lateral view; Fig. 112K); male metatibia unmodified. Aedeagus (Fig. 113G, H) with large, weakly sclerotized basal bulb; parameres present, thin, divergent then curved inward, narrowly rounded apices setose; tegmen with two prominent apical processes: a shorter dorsal one dorsoventrally flattened, curved downward then distad, widening to an obliquely truncate apex; longer process extends distad from right side, abruptly curving strongly leftward, narrowing to subacute, slightly pleated apex; within basal bulb inner armature comprises three shorter, narrow, curved, acute rods.

Etymology. This species' name comes from the Spanish, referring to the small propygidial tooth. It is used as a noun in apposition.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species is distinguished by its combination of a small, almost inconspicuous male propygidial process with unmodified male metatibiae.

Globa falx **sp. nov.**
Figs 112M–O, 113I–J

Type material. Holotype ♂ (ZSFQ-i23379): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12625, Morphosp. ElP.A.024"; deposited in ZSFQ. **Paratypes** (4♂): 2: same data as type; 1: same locality, FIT; 1: same locality, understory fogging (ZSFQ-i23380–i23383). 1: same general locality, 2200–2600m, 8-Aug-2008, AKT1046 (LSAM 0216779).

Diagnosis. (TL: 1.6mm) Body (Fig. 112M) short, globular, dark orange, glabrous; head broad, flat, sparsely setose, with very fine vertexal foveae; eyes protuberant, coarsely faceted; antennae short, antennomere V very slightly enlarged, with longer setae, compared to IV and VI, antennomeres IX–X enlarged, forming very slightly asymmetrical loose club; maxillary palpomere IV slightly flattened, finely rugosely textured on basal half of outer surface; pronotum convex, slightly widened to anterior third, lacking basal foveae or antebasal impression; elytra convex, lacking dorsal and subhumeral basal foveae; male metaventrite slightly tuberculate and setose along basal margin on either side of midline; metatibia (Fig. 112O) angulate near apex of outer margin; male with third visible abdominal tergite (Fig. 112O) more densely setose toward middle; fourth tergite depressed basally, with discrete, small circular impression at middle, elevated at middle of posterior half into low, bluntly triangular process. Aedeagus (Fig. 113I, J) with broad basal bulb; basal foramen ventral and small, with short transversely rounded anterior shelf; parameres free, sinuate and trisetose; dorsal margin of tegmen simple; inner armature complex with two prominent processes, median process long, with wide distal scythe-like hook, left-side process shorter, broad at base, narrowing to small apical hook.

Etymology. This species' name refers to the 'sickle-shaped' distal aedeagal process.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species' males' bitumid metaventrite, distally angulate metatibiae, and rather simply dentate median propygidial process will distinguish it from other species.

Globa herniata **sp. nov.**
DNA barcode: GenBank PX930207
Figs 112P–R, 113K–L

Type material. Holotype ♂ (MECN-EN 41884): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" / "Caterino DNA voucher, Ext. MSC-12756, Morphosp. SK.A.017" / "MECN-EN 41884"; deposited in MECN.

Diagnosis. (TL: 1.5mm) Body (Fig. 112P) globose, smooth, dark reddish-brown; head qudarate, with very fine vertexal foveae; antennomere I slightly expanded to apex; eyes prominent, coarsely faceted; male terminal palpomere nearly circular, with densely setose plaque on outer surface; male 3rd tergite not emarginate but slightly more densely setose at middle; male 4th tergite (Fig. 112R) with doubled apical process, narrowly rounded along outer edge, with closely associated inner portion that is more broadly rounded; male metatibiae slightly expanded, weakly angulate at apical third of outer margin. Aedeagus (Fig. 113K, L) with large, slightly elongate basal bulb, with small ventral median foramen bearing distinct basal apodeme at its distal edge; parameres present, thin, broadly outwardly arcuate, apically multisetose; apex of median lobe with three distal processes: left-side process curved, short, apically subquadrate and tridentate; right side process longest, thick at base, weakly sinuate, abruptly and asymmetrically expanded at apex; median process curving, apically broad and truncate, medially narrowly emarginate.

Etymology. The name of the species refers to the appearance of the male 4th tergite modification, somewhat resembling an extruded polyp.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. The form of this species' propygidial process is distinct, with an arcuate furrow separating its setose outer rim from an almost spherical inner swelling.

Globa inflexa **sp. nov.**
Figs 114A–C, 115A–B

Type material. Holotype ♂ (ZSFQ-i13681): "ECUADOR: Pichincha 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v.2011, 2000–2100m, AT1339, mid-canopy FIT" / "Caterino DNA voucher, Ext. MSC-12497" / "ZSFQ-i13681"; deposited in ZSFQ. **Paratypes** (3♂): same locality as type; 1: same data as type; 1: same locality, understory fogging; 1: same general locality, higher elevation, 0. 0264˚N, 78.6344˚W, 2500m, misc. hand collecting (ZSFQ-i23384–23386).

Diagnosis. (TL: 1.5mm) Externally very similar to *G. falx*, but: base of maxillary palpomere IV not flattened, only slightly more setose; antennae more compressed, but antennomere V also very slightly enlarged and with longer peripheral setae; mesotibia densely setose at apex, slightly curved outward in apical one-fifth; male metatibia (Fig. 114B) slightly sinuate, outwardly expanded on outer margin just beyond middle, with fine, distinct tooth at base of swelling on inner side, arched on inner margin, strongly narrowed apically; metaventrite not particularly swollen on each side; 3rd and 4th visible male abdominal tergites (Fig. 114C) modified, 3rd emarginate at middle, 4th depressed along base, with long quadrate, apically acute, marginally serrate, process elevated toward emargination of 3rd from posterior half. Aedeagus (Fig. 115A, B) similar to that of *G. falx*: major scythe-like hook similarly well-developed; minor process of median armature narrower,

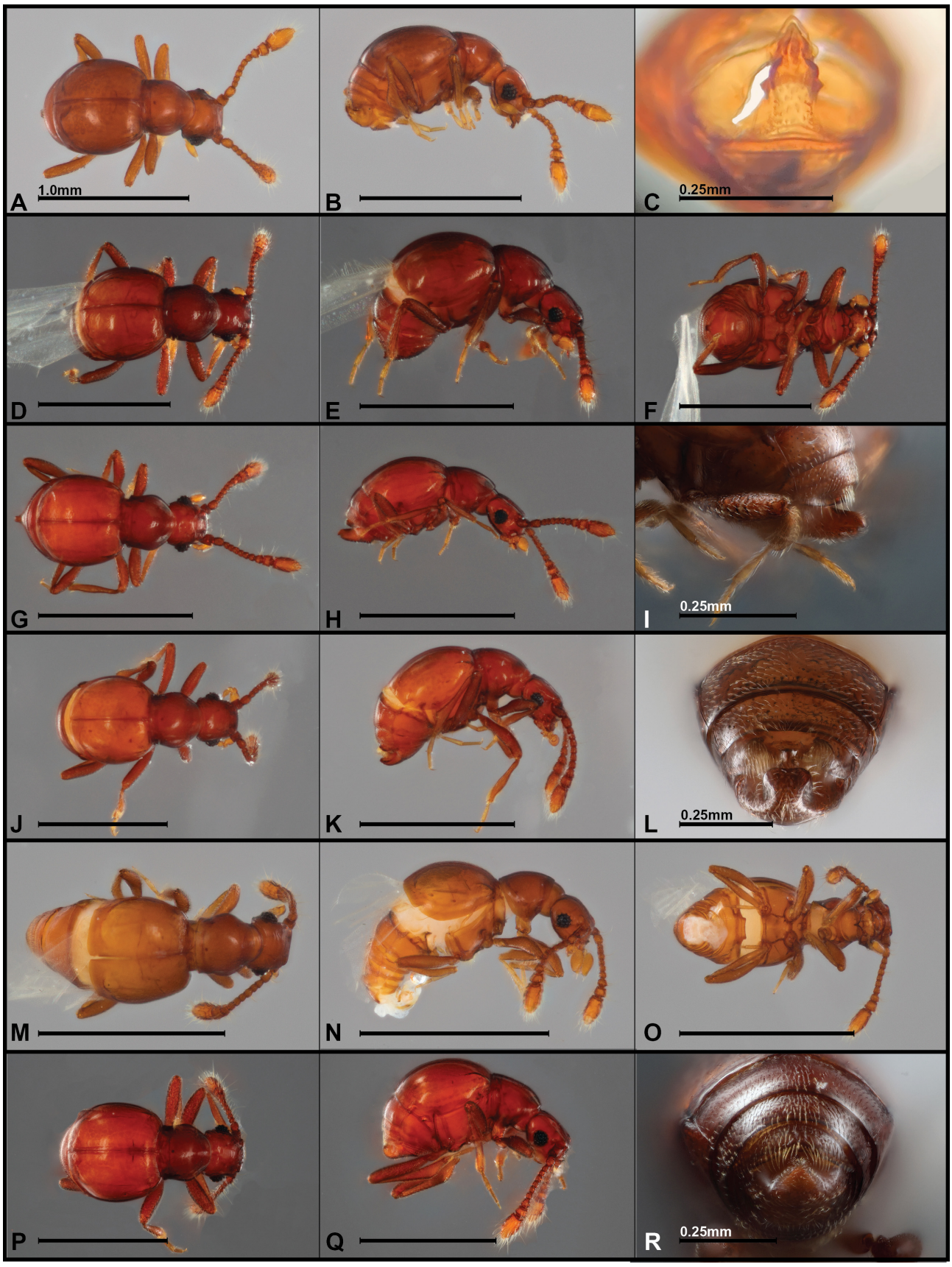

FIGURE 114. Habitus photos, *Globa* spp., dorsal, lateral, pygidial views **A–C** *G. inflexa* **D–F** *G. mola* (**F** ventral view) **G–I** *G. nauta* **J–L** *G. orbifer* **M–O** *G. pantex* (**O** ventral view) **P–R** *G. pernix.* Scale bars = 1.0mm unless otherwise indicated.

more strongly curved and evenly sinuate to abruptly bent tip; additional median rod straighter, similar in length to strongly curved process; at least two shorter, straight and acute rods present within basal bulb.

Etymology. This species' name refers to the 'bent' male metatibia.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. The strong modification of the penultimate and antepenultimate male abdominal tergites, the anterior deeply emarginate, and the posterior with a strong, serrate tooth in the middle of a broad, smooth depression, will distinguish it from most others.

Globa mola **sp. nov.**
DNA barcode: GenBank PX930366
Figs 114D–F, 115C–D

Type material. Holotype ♂ (MECN-EN 40770): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13115, Morphosp. RAn.006"; deposited in MECN.

Diagnosis. (TL: 1.6mm) Body (Fig. 114D) globose, dark reddish-orange, with extremely short, erect setae, most surfaces very finely and shallowly dimpled, not quite smooth; head quadrate, slightly depressed between antennal bases; vertexal foveae very weakly impressed; male last maxillary palpomere enlarged, setose on outer surface; elytral humeri weakly elevated; male 3rd abdominal tergite unmodified; male 4th tergite with small, quadrate (in posterior view; Fig. 114F) median tooth; male protrochanter with very small median denticle; male metatibia unmodified. Aedeagus (Fig. 115C, D) with large, humped, basal bulb; parameres present, asymmetrical, apically setose, articulated from basal prominence just distad ventral foramen; median lobe with narrow, apically bent sclerotized process on left side; right side process cylindrical at base, apically dorsoventrally flattened and widened into a broad, hammer-like lobe wider than rest of aedeagus; inner articulated armature evident, with curving basal arm and distal cluster of long spines, probably everted through lower distal opening of basal bulb.

Etymology. I name this species in reference to its 'molar-like' propygidial process. It is used as a noun in apposition.

Distribution. This species is known only from lower part of the Río Pastaza Watershed, in the foothills of Pastaza Province, Ecuador.

Remarks. This species can be distinguished by the very inconspicuous modification of the male 4th tergite and unmodified 3rd tergite and metatibiae. It is resolved as sister to all the other *Globa* species in the barcode-based tree below.

Globa nauta **sp. nov.**
Figs 114G–I, 115E–F

Type material. Holotype ♂ (MECN-EN 41853): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13021, Morphosp. Can.A.006"; deposited in MECN. **Paratypes** (3♂, 3♀): same data as type (MECN-EN 41854–41859).

Diagnosis. (TL: 1.3mm) Body (Fig. 114G) globose, smooth, dorsum glabrous; head with vertexal foveae finely impressed; frons slightly depressed; eyes prominent, coarsely faceted; male ultimate maxillary palpomere moderately expanded, flattened and setose on outer surface; male 4th abdominal tergite with thick, prominent median tooth (Fig. 114G, H), basal width about one-third tergite posterior margin, narrowing to blunt, slightly posteriorly indented apex; male metatibia not modified, slender. Aedeagus (Fig. 115E, F) with basal bulb large, weakly sclerotized; parameres present, slightly sinuate, apically setose; main apical tegmenal process curving strongly downward, ending in flat, truncate ventral plate; thinner dorsoapical process sinuate near apex, subacute; inner armature within basal bulb comprising two long, thin curved, apically acute rods.

Etymology. This species' name comes from the Latin for 'sailor', referring both to its keel-like propygidial process and to its living along the coast. It is used as a noun in apposition.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. This species is distinguished by its very prominent propygidial process in combination with a lack of male metatibial modifications.

Globa orbifer **sp. nov.**
Figs 114J–L, 115G–H

Type material. Holotype ♂ (MECN-EN 41883): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" " / "Caterino DNA voucher, Ext. MSC-12755, Morphosp. SK.A.016" / "MECN-EN 41883"; deposited in MECN. **Paratypes** (1♂): same data as type (MECN-EN 41885).

Diagnosis. (TL: 1.6mm) Body (Fig. 114J) relatively elongate (for the genus), glabrous; head smooth, finely setose; eyes protuberant, diameter about two-thirds postocular genal length; vertexal foveae fine, widely separated; frontal shelf broad, rounded; male terminal maxillary palpomere with small raised, circular plaque at its outer basal third (just visible in Figs 114J, K); antennae short, antennomere I bent at base, apically cylindrical, II shorter, subquadrate, slightly longer than wide, III–VIII shorter, each slightly widened to apex, IX–XI forming compact club, VIII little larger than VII, X larger, XI about 2.5× as long as X, apically narrowly rounded; pronotum about as wide as long, widest just anterad middle, lacking

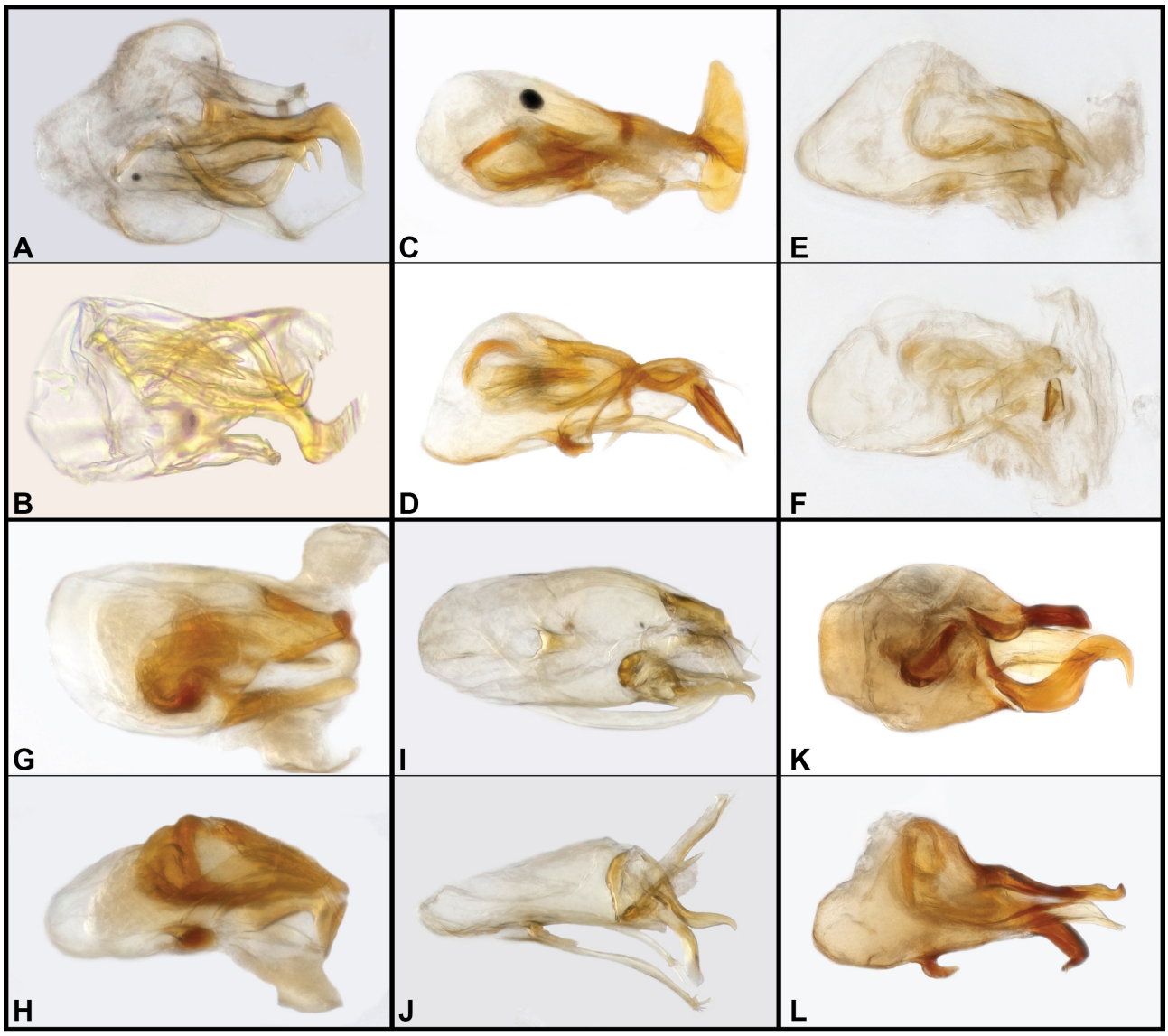

FIGURE 115. Aedeagus photos, *Globa* spp., dorsal, lateral views **A, B** *G. inflexa* (**B** ventral view) **C, D** *G. mola* **E, F** *G. nauta* **G, H** *G. orbifer* **I, J** *G. pantex* **K, L** *G. pernix*.

foveae or impressions; elytra lacking basal foveae; male tergites 3 and 4 modified (Fig. 114K, L), 3rd setose at sides, depressed at middle, 4th transversely depressed along base, apically with dentate process narrowed from base, widened slightly, tip truncate; male metaventrite slightly depressed and setose medially between oblique lateral carinae; male metatibia (Fig. 114K) slender at base, widening to weakly angulate process at apical fourth of outer margin, narrowed to apex. Aedeagus (Fig. 115G, H) with basal bulb large, elongate, basal foramen small, with narrowly rounded basal apodeme at its distal margin; parameres divergent, paddle-shaped, narrow at base, broadly rounded apically; median armature complex, with three distal processes: left-side process long, bent ventrad, acute, median process shorter, apically acute; right-side process curved from base, rather wide, curved inward and apically rounded; within basal bulb lie ~4 shorter, weakly curved spines.

Etymology. The name refers to the 'orb-bearing' apical male palpomere having a distinct sensory plaque.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. This species is best distinguished by the setose male 3rd tergite and medianly dentate 4th, along with a male metatibia that is rather simply subangulate near apex. The raised sensory plaque at the outer base of the terminal male palpomere is unique.

Globa pantex **sp. nov.**
DNA barcode: GenBank PX930257
Figs 114M–O, 115I–J

Type material. Holotype ♂ (ZSFQ-i23250): "ECUADOR:

Pichincha, 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12638, Morphosp. ElP.A.037"; deposited in ZSFQ.

Diagnosis. (TL: 1.4mm) Body (Fig. 114M) narrowly globose, orange with only inconspicuous recumbent setae; head broad, flat, smooth, and sparsely setose, with very fine vertexal foveae; eyes large and coarsely faceted; antennae with loose three segmented club very slightly asymmetrical, antennomere XI about 2.5× as long as X; entire outer surface of maxillary palpomere IV truncate and densely setose; pronotum convex, with only darker spots to mark the median and lateral subbasal foveae; elytra convex, more distinctly setose, lacking basal foveae dorsally or on subhumeral region; male propygidium and metatibiae unmodified; male metaventrite slightly tumid, more densely setose on each side along posterior margin; abdominal ventrites mostly unmodified; last male ventrite with shallowly oval posteromedian depression. Aedeagus (Fig. 115I, J) with large basal bulb, a short, acute spike associated with the ventrobasal foramen; parameres present, long, thin, curved inward and setose at apex; inner armature with four conspicuous processes, two bent upward, one longer and less strongly sclerotized, one descending from upper apex, curving distad then inward, ending acutely, one bent ventrad, bluntly rounded apically.

Etymology. This species name refers to the male metaventral swelling, or 'paunch'. It is used as a noun in apposition.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. The lack of dimorphisms of the male abdominal tergites and metatibiae are themselves noteworthy in this species, and the setose metaventral swelling of the males helps to diagnose it with external characters.

Globa pernix **sp. nov.**
DNA barcode: GenBank PX930208
Figs 114P–R, 115K–L

Type material. Holotype ♂ (MECN-EN 40846): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13199, Morphosp. Cnd.015"; deposited in MECN. **Paratypes** (7♂, same general locality and date as type): 3: same data as type; 1: -1.4349˚, -78.3113˚, 2178m (MECN-EN 40368); 3: -1.4357˚, -78.3111˚, 2218m (MECN-EN 40334–40337, 40353–54, 40356, 40368).

Diagnosis. (TL: 1.7mm) External morphology is essentially identical to that of *G. angulipes*, except fully winged (at least in type); the apical narrowing of the male metatibia (Fig. 114Q) is slightly more convex, without any marginal carinae; male 3rd abdominal tergite not emarginate, setose along posterior edge; male 4th abdominal tergite (Fig. 115R) depressed at base, with distinctly swollen, narrowly subtriangular swelling extending slightly above apex of 3rd; flight wings present. Aedeagus (Fig. 115K, L) with large basal bulb, narrowed basally, humped at middle; median foramen small, with ventrally hooked basal apodeme at its anterior edge; parameres weak, asymmetrical, outwardly arcuate, apically setose; distal armature comprising three processes: on the right side is a well-sclerotized, obliquely truncate post, with a rounded swelling on its median edge, and an abrupt ventral hook at its apex; from the middle and arched strongly laterad is a strong distal hook with a distinct subapical tooth; between them is a weakly sclerotized, straight, apically bifid projection with a wide lobe on its left inner edge.

Etymology. This species' name comes from the Latin for 'nimble' or 'active'.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua Province, Ecuador.

Remarks. The differences between this species and *G. angulipes* are adequately detailed in the diagnoses and in the remarks under that species.

Globa pustulifer **sp. nov.**
DNA barcode: GenBank PX930341
Figs 116A–C, 117A–B

Type material. Holotype ♂ (MECN-EN 41806): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Misc. hand collecting" / "Caterino DNA voucher, Ext. MSC-12827, Morphosp. Ot.A.007" / "MECN-EN 41806"; deposited in MECN. **Paratypes** (27♂, 11♀, same general locality as type): 18: same data as type; 2: , -0.4165˚, -79.0047˚, 14.VIII.2024, 2107m; 3: -0.4194˚, -79.0033˚, 13.VIII.2024, 1963m; 5: -0.4168˚, -79.0043˚, 14.VIII.2024, 2094m; 1: -0.4191˚, -79.0039˚, 13.VIII.2024,1990m;1:-0.4167˚,-79.0043˚,13.VIII.2024, 2097m; 1: -0.4164˚, -79.0046˚, 13.VIII.2024, 2109m; 1: -0.4172˚, -79.0040˚, 13.VIII.2024, 2073m; 4: -0.4176˚, -79.0041˚, 13.VIII.2024, 2062m; 1: -0.4192˚, -79.0031˚, 13.VIII.2024, 1966m (MECN-EN 42807–41843, 41900).

Diagnosis. (TL: 1.7mm) Very similar to *G. pantex* with the following exceptions: antennomere XI longer, about 3× as long as X (Fig. 116A); male maxillary palpomere IV larger, almost fully circular (Fig. 116B); male with conspicuous propygidial process (Fig. 116C), a subacute projection with small, depressed oval area on its dorsal surface; male metatibia not notably modified. Aedeagus (Fig. 117A, B) with large, parallel-sided basal bulb, a short, acute spike assocated with the ventrobasal foramen; parameres present, asymmetrical with left longer than right, sinuate, multisetose at apex; tegmen with three prominent distal processes, one thick arm extending from right side of dorsum, narrowing and bent ventrad to acute apex, a strongly sinuous arm extending from right upper edge, curving downwards before semi-spiraling to acute, ventrolaterally directed apex, a third straight process

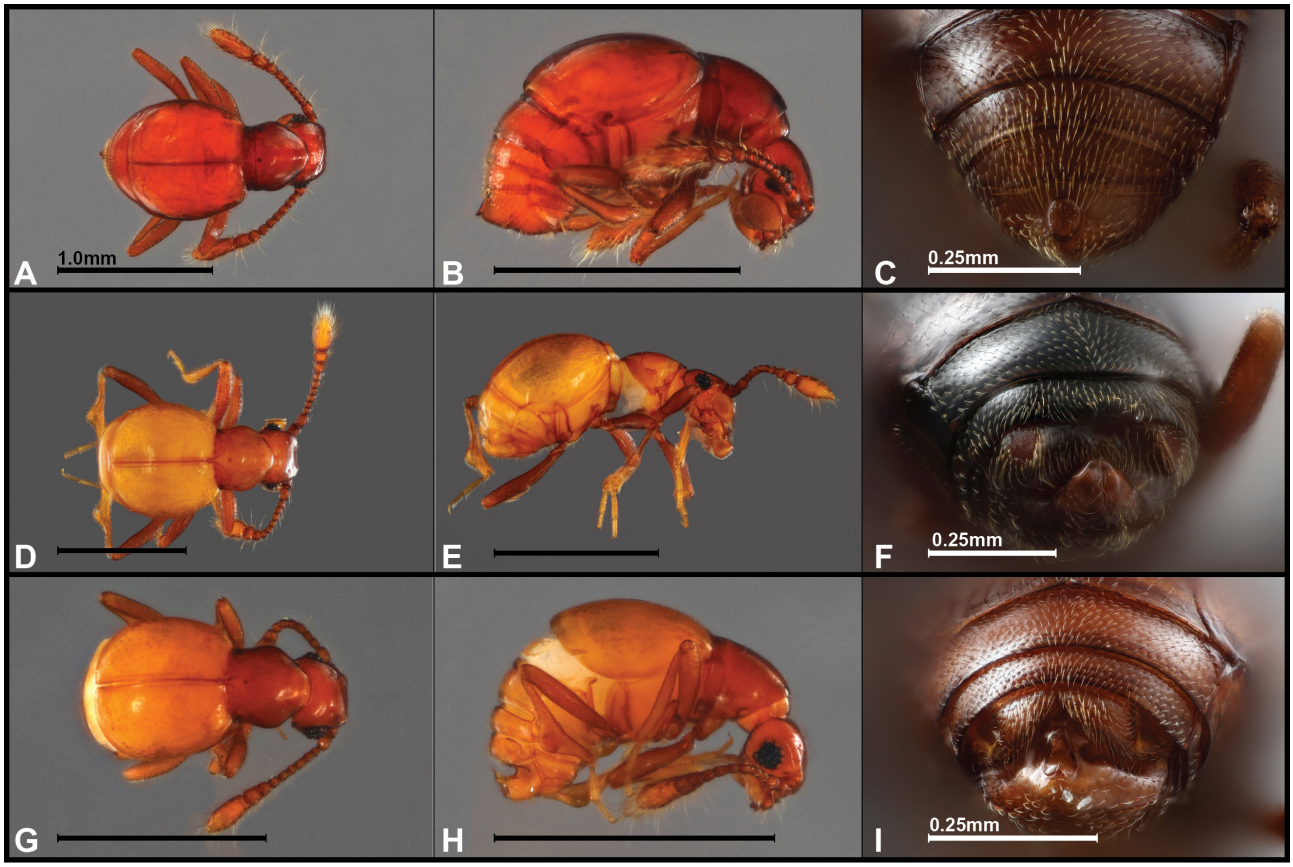

FIGURE 116. Habitus photos, *Globa* spp., dorsal, lateral, pygidial views **A–C** *G. pustulifer* **D–F** *G. vex* **G–I** *G. wira.* Scale bars = 1.0mm unless otherwise indicated.

arising between and ventrad the other two, extending and narrowing straight to subacute apex between them.

Etymology. This species named for the male abdominal modifications, meaning 'pustule-bearing'.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species small male pygidial modification in combination with its elongate last antennomere and large terminal maxillary palpomere will distinguish it from most other species.

Globa vex **sp. nov.**
DNA barcode: GenBank PX930311
Figs 116D–F, 117C–D

Type material. Holotype ♂ (MECN-EN 40786): "ECUADOR: Tungurahua, -1.3801˚, -78.2889˚, Río Machay Reserve, 2434m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13139, Morphosp. Mch.002"; deposited in MECN. **Paratypes** (1♂, 4♀, same general locality as type): 2: same data as type; 2: -1.3812˚, -78.2895˚, 2416m; 1: -1.3821˚, -78.2902˚, 2402m (MECN-EN 40197, 40208, 40211, 40200, 40221).

Diagnosis. (TL: 1.9mm) Body (Fig. 116D) globular, head, pronotum and legs darker than elytra; elytra distinctly sparsely punctate; vertexal foveae finely impressed; frons with narrrow transverse depression between antennal bases; male ultimate maxillary palpomere expanded, flattened and setose on outer surface; male third tergite swollen and projecting posterad on each side of wide, double-crested process of 4th tergite (Fig. 116F); male metatibia (Fig. 116D, E) weakly arched from base, strongly swollen and setose at apical fourth. Aedeagus (Fig. 117C, D) with large, slightly elongate basal bulb, with small ventral median foramen bearing distinct, distally curved basal apodeme at its posterior edge; parameres present, thin, asymmetrical, the left longer, bending outward, the right shorter and curving inward, both apically setose; apex of median lobe with four distal processes: right side process longest, thick at base, abruptly and asymmetrically expanded at apex, pick-axe-like; one median process narrower, 'S'-shaped, ending in narrow acute apical hook; median process broad, weakly sclerotized, apex indistinct; a final short process is a short, straight spike emerging from left-side of basal bulb.

Etymology. This species' name is based on the Latin vexillum, referring to the 'flag-like' male metatibial expansion. It is used as a noun in apposition.

Distribution. This species is known only from cloud forests north of the Río Pastaza, Tungurahua Province, Ecuador.

Remarks. The pick-axe-like apical process of the aedeagus is similar to that of *G. herniata*, but the secondary

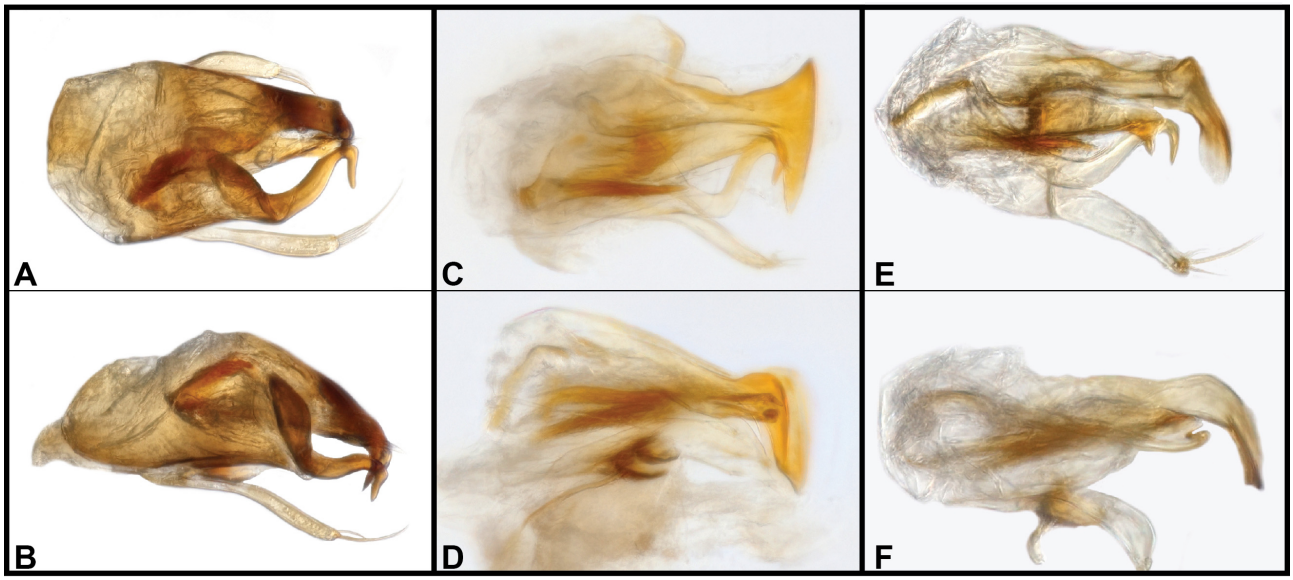

FIGURE 117. Aedeagus photos, *Globa* spp., dorsal, lateral views **A, B** *G. pustulifer* **C, D** *G. vex* **E, F** *G. wira*.

process, here 'S'-shaped, is very different. Externally this species is distinct in having the 3rd male tergite with strong bilateral swellings.

Globa wira **sp. nov.**
DNA barcode: GenBank PX930340
Figs 116G–I, 117E–F

Type material. Holotype ♂ (MECN-EN 41852): "ECUADOR: Cotopaxi, -0.4157˚, -79.0046˚, Bosque Integral Otonga, 14.VIII.2024, 2132m, M. Caterino & A. Pazmiño, Misc. hand collecting" / "Caterino DNA voucher, Ext. MSC-12826, Morphosp. Ot.A.006"; deposited in MECN. **Paratypes** (14♂, same general locality as type): 9: same data as type; 1: -0.4168˚, -79.0043˚, 14.VIII.2024, 2094m; 1: -0.4168˚, -79.0044˚, 14.VIII.2024, 2093m; 1: -0.4191˚, -79.0039˚, 13.VIII.2024, 1990m (MECN-EN 41886–41899).

Diagnosis. (TL: 1.5mm) Body (Fig. 116G) globular; head flattened, umodified, with widely separated vertexal foveae; apical palpomere not setose externally, slightly cultriform with rounded lateral edge; antennae moderately elongate, scape short, antennomere II globose, III–VIII subquadrate, IX–XI gradually expanded into distinct club; pronotum widest at middle, sides rounded, slightly narrowed to base, strongly narrowed to apex, basolateral foveae weak, median fovea absent; elytra lacking basal foveae, sides rounded, abdomen weakly margined laterally; base of 2nd and 3rd visible tergites sulcate; male 4th tergite (Figs. 116H, I) strongly, transversely depressed, apical portion swollen, produced dorsally into thornlike median process (the tip of which is usually concealed within the emargination of the 3rd tergite); pygidium simple; male metatibia (Fig. 116H) expanded just beyond middle, with rather deep concavity on inner surface. Aedeagus (Fig. 117E–H) with narrow, weakly sclerotized basal bulb; parameres present, narrowed to weakly clubbed apex, with long apical setae; tegmen with four distal processes: major one arising from right side, strongly 'L'-shaped, bent ventrad, with outer tooth at bend and apical surface flattened and becoming more weakly sclerotized; second process from left-most side sinuous and terminating in acute ventrolateral hook; third, medial process shorter, narrowed to apex with short, ventrally directed spike; fourth process shortest, arising at left base of preceding, narrow and simply acute, its apex directed distad.

Etymology. This species' name comes from a Kichwa word meaning 'fat', referring generically to the widely rounded body form common to *Globa* species.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species has very similar male genitalia to *G. inflexa*, having an abruptly bent distal process, and a shorter lateral median process, and long sinuous hook whose apex emerges between them. Neither have the apical male maxillary palpomere modified. Nevertheless, they are easily distinguished based on their abdominal modifications. In *G. wira* the 3rd tergite has very discrete depressions at the sides and is acutely incised at the middle, where *G. inflexa* lacks the lateral depressions (or has them covered by an entire apical margin to the tergite), and an arcuately emarginate middle. The main process of the 4th tergite is also larger and more upright in *G. inflexa*.

Muyu Caterino, **gen. nov.**
Fig. 118

Type species. *Muyu huambulae* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.7–1.8mm, Avg. 1.75mm) While quite typical in general appearance among Brachyglutina, and keying to *Globa* in most existing keys, *Muyu* exhibits a number of unusual characters that justify its recognition.

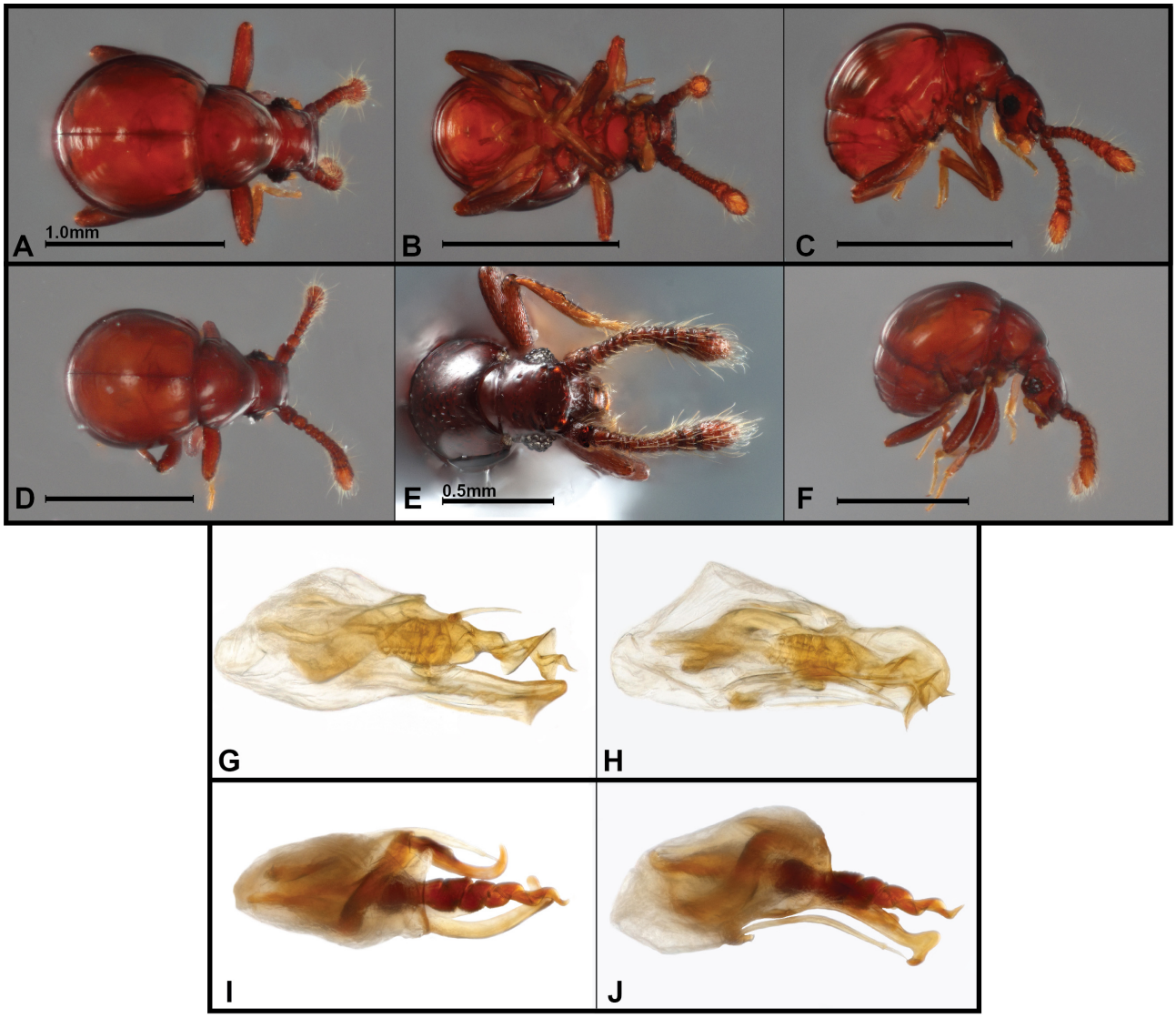

FIGURE 118. Photographs, *Muyu* spp. **A–C, G, H** *M. huambulae* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *M. merae* (body: dorsal, head detail, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm unless otherwise indicated.

It shares with some others the lack of any traces of pronotal or elytral foveae, possession of a longitudinally carinate metaventrite with raised median plateau, and complete lateral genal carinae. As to characters that appear to be specific to the genus, at least in combination, these would include the large, setose prothoracic hypomeral foveae, very compact antennae, a distinct frontal puncture on each side just behind the antennal bases, posteriorly abbreviated median gular carina, vertical postocular groove between the eye and genal carina, oblique metaventral carina and laterally displaced lateral metacoxal fovea, and a 1st abdominal tergite that is longer than the 2nd or 3rd. The male genitalia of the genus (Fig. 118G–J) possess an elongate, sac-like basal bulb, with asymmetrical parameres, a long distal process emerging from the left side of the basal bulb, variously bent downward at the apex, a crossing-over inner process that emerges from the right side of the basal bulb, and a variously coiled, spear-like median armature.

Etymology. The name of this genus is a Kichwa word meaning 'seed' or 'grain', appropriate for its minute, round, smooth appearance. It is feminine.

Remarks. Two species are described from moderate to higher elevations of western Napo and Pastaza Provinces. Two additional populations have been seen of this genus, females only, from the Cuyabeno region of Sucumbíos Province, and from the Río Anzu region of western Napo Province. It is possible that the latter population represents one of these described species.

Muyu huambulae **sp. nov.**
Figs 118A–C, G–H

Type material. Holotype ♂ (MECN-EN 41874): "ECUADOR: Napo, 0.8363˚S, 77.83834˚W, Archidona, Huambula, VIII–IX.2024, Sifted leaf litter, 710.9mm," / "Caterino DNA voucher, Ext. MSC-13008, Morphosp. Ach.A.003" / "MECN-EN 41874"; deposited in MECN. **Paratypes** (2♂, 6♀): 1: same data as type; 7: same

general locality, Santa Rita, -0.89270˚, -77.83948˚, 752m (MECN-EN 41874–41882).

Diagnosis. (TL: 1.7mm) Body (Fig. 118A) globose, dark reddish-brown, smooth, shining, with only very sparse, very fine depressed setae; head deflexed, about as long as pronotum; distinct occipital ridge present, at sides parallel to post-ocular carina, vertically sulcate between; vertex weakly convex, vertexal foveae fine but distinct, sides of head narrowed toward antennal bases, then widened slightly about distinct supra-antennal puncture; sides of frons with weak, oblique striae; epistoma vertical, setose; labrum short, corners projecting slightly; eyes, small, protuberant, coarsely faceted, with ~11 ommatidia; maxillary palp with palpomere 2 stemmed, curved, and clavate, 3rd very small, triangular; terminal palpomere irregularly oval, outer weakly convex, inner margin moreso, wider toward middle; venter of head with complete longitudinal lateral carinae, median carina present in distal half only; antennae robust, scape thick, cylindrical, deeply emarginate at upper distal margin, antennomere II slightly narrower, subquadrate, III–VIII transverse, V very slightly larger and bearing longer setae, IX–XI forming loose club, IX and X transverse and slightly increasing in width and length, XI rounded, about 3× as long as X, apex bluntly acute; pronotum wider than long, widened toward front, basal sides concave, distinct marginal carina present, but low, and not visible from above; marginal carina and lower hypomeral carina meeting anteriorly at distinctly setose fovea; pronotal disk lacking dorsal foveae; elytra strongly convex, sides rounded, lacking any foveae or striae; brachypterous; 1st abdominal tergite about as long as 2nd and 3rd together; pygidium weakly convex; prosternum very short, lacking distinct foveae; metaventrite with short longitudinal carinae immediately behind mesocoxae, and oblique carina extending along posterior margin of mesocoxa anterolaterad to laterally displaced, large, setose lateral metaventral fovea; middle of metaventral disk convex, setose; 1st abdominal venrtite sulcate at sides, covered by fringe of setae; male protrochanter with small denticle at inner corner; legs slender, metatibia slightly curved near apex. Aedeagus (Fig. 118G, H) elongate, basal bulb weakly sclerotized, without well-defined dorsal diaphragm, with long, narrow, apically setose parameres; main body of tegmen thick, extending along left side, curved downward and narrowed to acute apex; dorsal inner process obliquely crossing over median armature inside basal bulb, bending distad toward its tip, ending in a strong but thin weakly curved spine; inner armature with arcuate stem within basal bulb, becoming tightly coiled for about 7 coils before opening up to elongate, more loosely coiled, and marginally carinate apical corkscrew.

Etymology. This species is named for the community near the type locality, Huambula, also the vernacular name of a local tree with medicinal properties.

Distribution. This species is known only from the eastern Andean foothills in the Napo region, Ecuador.

Remarks. This species has very few external characters by which it can be easily recognized. Males are only distinguished by a very small denticle at the inner corner of the protrochanter, and are otherwise indistinguishable from females. The species described below has more a distinctive sexual character in the male protibial marginal tooth, but, in general, these species will probably have to be dissected to confidently identify.

Muyu merae **sp. nov.**
Figs 118D–F, I–J

Type material. Holotype ♂ (MECN-EN 41845): "ECUADOR: Pastaza, 1.40721˚S, 78.06576˚W, Mera, Sumak Kawsay In Situ, 24.I.2024, 1437m, A. Pazmiño *et al.*, Winkler" " / "Caterino DNA voucher, Ext. MSC-12758, Morphosp. SK.A.019"; deposited in MECN. **Paratypes** (2♂, 4♀): same data as type (MECN-EN 41846–41851).

Diagnosis. (TL: 1.8mm) This species is externally almost identical to the preceding, differing principally in the following characters: pronotum (Fig. 118D) slightly narrowed toward the base; male protibia with a tooth at the middle of the outer margin (Fig. 118E). Aedeagus (Fig. 118I, J) with main left-side process thinner, curving inward before apical ventral bend, apex narrowly rounded; armlike inner process crossing obliquely over central armature within basal bulb before bending perpendicularly distad, then curving laterad; median coiled process narrower, with fewer coils of a wider, flatter, strap-like base material.

Etymology. The species is named for the canton of Mera in which it lives.

Distribution. This species is known only from El Centro de Investigacion Sumak Kawsay In Situ, in the Amazonian foothills of far western Napo Province, Ecuador.

Remarks. This species shares with the type of the genus most of the characters cited in the generic diagnosis. Externally it is distinguished by a laterally dentate male protibia and a pronotum that widens slightly from the base before narrowing anterad. The genitalia of the two species share a similar basic form, with a downturned left-side median lobe process, and a coiled inner armature. *Muyu merae*, however, has fewer tight basal coils, and more and tighter apical coils of a flatter main process.

Panabachia Park, 1942

Only two described species have been historically included in this genus, both from Central America (Asenjo *et al.* 2019). *Panabachia vulnerata* (Sharp) was described from Panama, and *P. impressicollis* (Sharp) from Guatemala. Muñoz-Tobar & Caterino (2025) have recently treated this genus in detail, describing 22 new species from Ecuador, and reporting others not yet described from Colombia and Venezuela. Most are restricted to high elevations, predominantly páramo habitats, and are distinguished in nearly all species by distinctive male pronotal modifications.

Pelota Caterino, **gen. nov.**
Fig. 119

Type species. *Pelota astada* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.3–1.4mm, Avg. 1.3mm) Among Brachyglutina, this genus can be distinguished by its complete lack of basal elytral foveae or punctures, the lack of a setal fringe at the sides of the 1st abdominal ventrite, the lack of a longitudinal carina behind the lateral metaventral fovea, the lack of enlarged male maxillary palpomeres, and the lack of discal carinae on the 1st abdominal tergite. This combination of characters eliminates nearly all other Brachyglutina genera. In an unpublished key (Chandler, unpub.) this genus would key to *Globa*, but it lacks many discovered characters of that genus, including modifications of the male metatibiae, terminal maxillary palpomeres, and 3rd and 4th abdominal tergites. Each of these has exceptions among *Globa* species, however, so they do not provide unambiguous identifications either way. While being described from just two species limits generalizations, *Pelota* may be more positively characterized by its large head, with median frontal carina and raised frontal margin, vestigial vertexal foveae, pronotum that is evenly narrowed from the base to the apex, and, in the males, unique secondary sexual characters of the antennal shaft (antennomere V enlarged), the epistoma (dentate), and the terminal antennomere (flattened on the inner surface). The specific form of the male secondary characters is likely to vary among close relatives, but beyond all that, a symmetrical aedeagus with strongly reduced parameres is very unusual in the subtribe, and even the broader tribe (though some Eupseniina are somewhat similar).

Remarks. The name of this genus comes from the Spanish word for 'ball', in reference to its globular form. It is feminine.

Pelota astada **sp. nov.**
Figs 119A–C, J–K

Type material. Holotype ♂ (MECN-EN 40720): "ECUADOR: Napo, -0.61523˚, -77.59071˚, Archidona, Pacto Sumaco, 1805m, 27.IX.2024, A.Pazmiño & D.Díaz, Winkler" / "Caterino DNA voucher, Ext. MSC-13065, Morphosp. VS.004"; deposited in MECN. **Paratypes** (2♂, 1♀): same data as type (MECN-EN 40846, 40848, 40850).

Diagnosis. (TL: 1.3mm) Body (Fig 119A) globose, dark reddish-brown, smooth, shining, with only very sparse, very fine depressed setae; head large, deflexed, longer than pronotum, rounded at base, vertex weakly convex; vertexal setae very fine; frons with median carina in anterior half, elevated between antennal bases, projecting slightly anterad over deep subantennal depression, epistoma with median dorsal tooth (Fig. 118A), apical margin sinuately projecting; labrum short, rounded; eyes medium-small, protuberant, coarsely faceted, with about 12 ommatidia; maxillary palp with 2nd palpomere with longish basal stem, clavate, 3rd palpomere short, rounded, terminal palpomere narrowly pear-shaped, sides more or less evenly narrowed to apex, unmodified in male; gula with median and lateral longitudinal carinae; antennae short, antennomere I about as long as next four antennomeres together, slightly expanded to apex, in male with strong dentate projection on inner corner (Fig. 119A); antennomere II subquadrate, slightly rounded, antennomeres III–IV and VI–VIII beadlike, V slightly larger, bearing long setae, IX–XI forming compact, setose club, IX only slightly larger than VIII, X wider, transverse, XI bulbous and about 5× length of X, in males distinctly flattened on inner surface; pronotum narrowed evenly from base to apex, sides very weakly rounded, without foveae or carinae; elytra strongly convex, sides rounded, without striae or foveae, but a very fine puncture visible at sutural base; abdominal tergite I slightly longer than II, which is slightly longer than III or IV; pygidium weakly convex, unmodified in male; prosternum very short, without distinct foveae, hypomeron slightly depressed in lower anterior corner, immediately laterad hypomeral carina; metaventrite weakly punctate around mesocoxae, without median foveae but slightly elevated between mesocoxae; no carina posterad lateral mesocoxal fovea; disk of male metaventrite weakly tuberculate and setose in front of metacoxae; male abdominal ventrites unmodified; male protrochanter with small apical tooth; femora and tibiae mostly slender, metatibia curved near apex. Aedeagus (Fig. 119J, K) symmetrical, with parameres very short, blocky, not extending far from base, with broadly open basal foramen; tegmen arched strongly upward, widening, flattening, then bent ventrad, subdivided into inwardly bent apical arms that meet at apices.

Etymology. This species' name comes from a Spanish adjective for 'horned' or 'antlered', referring to the modified male antennal scape.

Distribution. This species is known only from the isolated Volcán Sumaco, in the western Amazonian basin, Ecuador.

Remarks. This species is distinctive in its suite of male secondary characters, especially the prolonged scape and the dentate epistoma.

Pelota riparia **sp. nov.**
Figs 119D–F, L–M

Type material. Holotype ♂ (MECN-EN 41873): "ECUADOR: Napo, -0.5983˚, -77.8954˚, Est. Biol. Yanayacu, Stream Tr., 2192m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13002, Morphosp. Yn.A.071"; deposited in MECN. **Paratypes** (1♀, same general locality as type): 0.5952, -77.8994, Piha Tr, 2386m, MSC-12949 (MECN-EN 41871).

Diagnosis. (TL: 1.4mm) This species conforms to the description of the preceding in most respects, differing principally in the following: body (Fig. 119D) color lighter, reddish brown; head of male narrowing slightly to front, median carina shorter and less conspicuous, vertex surrounding fine vertexal

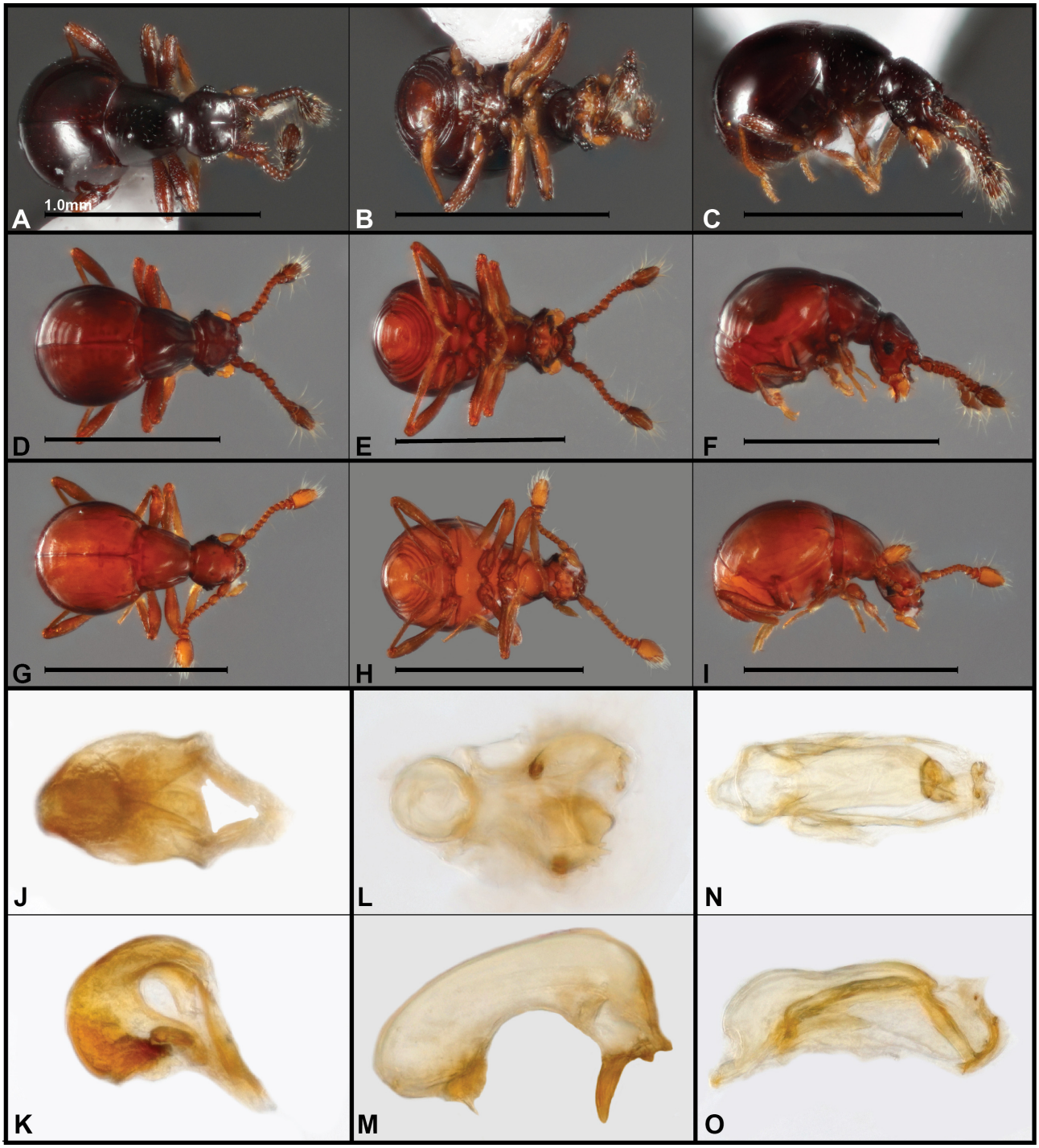

FIGURE 119. Photographs, *Pelota* spp. **A–C, J, K** *P. astada* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *P. riparia* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *P. monocera* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

foveae slightly depressed on each side; frontal margin raised; epistoma depressed below frontal margin, but with smaller, acute tooth (Fig. 119F), with short carina in front of it; eyes smaller, comprising only about 15 ommatidia; male scape not modified, simply cylindrical, male antennomere V more distinctly enlarged (Fig. 119D, E), nearly twice as long as IV or VI, antennomere X narrower, only slightly wider than IX; pronotal disk slightly depressed on either side of midline in anterior half; pronotal sides weakly angulate at middle. Aedeagus (Fig. 119L, M) with basal bulb shorter, basal foramen smaller; parameres indistinct; median lobe less strongly humped, longer, extending upward and widening distad, bent ventrad close to apex, apex emarginate, with transversely serrate arrays extending distad from sides, and with more strongly sclerotized apicoventral teeth on either side pointing downward.

Etymology. This species' name refers to its having been found close to a stream.

Distribution. This species is known only from the

cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species seems to be slightly lighter in color than *P. astada*, but most differences relate to male secondary characters, particularly *P. riparia* having no hint of male scape modification, and having a smaller, acute epistomal denticle, but having antennomere V more distinctly expanded.

Pelota monocera **sp. nov.**
Figs 119G–I, N–O

Type material. Holotype ♂ (MECN-EN 41872): "ECUADOR: Napo, -0.5958˚, -77.8927˚, Est. Biol. Yanayacu, Aburrian Tr., 2233m, 10.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12998, Morphosp. Yn.A.067" / "MECN-EN 41872"; deposited in MECN.

Diagnosis. (TL: 1.1mm) This species is extremely similar to the preceding (*P. riparia,* with which it is sympatric), differing principally in the following character: body color lighter; frontal shelf less prominent, middle of epistoma slightly bilobed; epistoma denticle larger, more vertical and apically narrowly rounded; antennomere V barely enlarged, antennomere X wider, more strongly transverse; pronotal sides almost straight (converging evenly from base to apex; Fig 119G). Aedeagus (Fig. 119N, O) elongate, basal bulb barely differentiated, narrow basal knob evident; parameres free, long, apically each with several long setae; apex of median lobe becoming flatter apically, bent ventrad subapically, with upturned distal process.

Etymology. This species' name refers to its single, upright epistomal denticle. It is based on the Greek for 'one-horn'. It is used as a noun in apposition.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, western Napo Province, Ecuador.

Remarks. While almost indistinguishable externally from a co-occurring congener, this species has quite different male genitalia, with a complex apical process suggesting relationships to *Scalenarthrus*.

Reichenbachia Leach, 1826
Figs 120–121

Ninety-three species are included in this genus from Central and South America (Asenjo *et al.* 2019) (with more in the Nearctic). Collectively they cover nearly the whole region. Yet, none have been specifically reported from Ecuador. Colombia is home to species from several species groups (groups LIII, LIV, XLI, XXXV, XXI, *sensu* Park 1942), and two other groups are known from Peru (groups VI and LXIV). Five new species are described below.

Diagnosis. (TL: 1.7–2.9mm, Avg. 2.5mm) One of South America's most diverse but generic brachyglutine genera, *Reichenbachia* are distinguished from other members of the tribe by having a rather broad, not globose body form, lacking an antebasal pronotal impression, having basal elytral foveae, distinct lateral and smaller median basal pronotal foveae, distinct vertexal foveae, 11 segmented antennae (as opposed to the 10 of *Decarthron* Brendel and a few others), at least one distinct elytral discal striae (at least from the 2nd lateral basal fovea), narrowly spaced metasternal foveae, and body setae that tend to be appressed. Many species exhibit modified male intermediate antennomeres, although those do not appear in any of the species described below. Many species' male genitalia have been illustrated, for Honduran species by Becker and Sanderson (1953a), for one Costa Rican species (Park 1946b), for a West Indian species (Park *et al.* 1976), and for eastern Nearctic species by Chandler (1989b) and Carlton (2003). The aedeagus was best characterized by Carlton (2003) as having a globose basal bulb, flexible dorsal diaphragm, non-articulated, occasionally asymmetric parameres, with a closing apparatus concealing a variable internal sac. The aedeagus of most species is symmetric except for the internal armature, which is typically not.

Reichenbachia anka **sp. nov.**
DNA barcode: GenBank PX930269
Figs 120A–C, 121A–B

Type material. Holotype ♂ (ZSFQ-i23392): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, AT1324, 1900–2100m, Misc. hand collecting, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12653, Morphosp. ElP.A.052"; deposited in ZSFQ. **Paratypes** (1♀): same locality as type, 2500m, 29.V.2011 (ZSFQ-i23393).

Diagnosis. (TL: 2.7mm) Body (Fig. 120A) with dorsum, especially vertex and pronotal disk, densely punctate, elytra less so; vertex with three (two lateral one medial) deep, setose foveae; antennae elongate, antennomeres III–V about three times as long as wide, VI and VII shorter, only about twice as long as wide, VIII shorter still, antennomeres IX–XI progressively enlarged, forming loose club; maxillary palpomere IV very large, swollen basally; pronotum with distinct, setose lateral foveae, median basal fovea smaller, nonsetose; pronotum widened anterad, widest anterad midline, subangulate laterally, then narrowed to neck; each elytron with two small dorsobasal foveae, one at suture, one laterally, sutural stria complete, lateral stria extending just to elytral midpoint; no subhumeral fovea or stria; posterior margin of mesotrochanter carinate, slightly enlarged as a flange. Aedeagus (Fig. 121A, B) symmetrical, with large basal bulb; parameres ascending and converging to apex, broad and apically obliquely truncate; tegmen very short and apically rounded; inner armature weakly sclerotized (possibly due to teneral type).

Etymology. The name of this species is a Kichwa word meaning 'eagle', or 'raptor'.

Distribution. This species is known only from the cloud forests of El Pahuma Orchid Reserve, Pichincha Province, Ecuador.

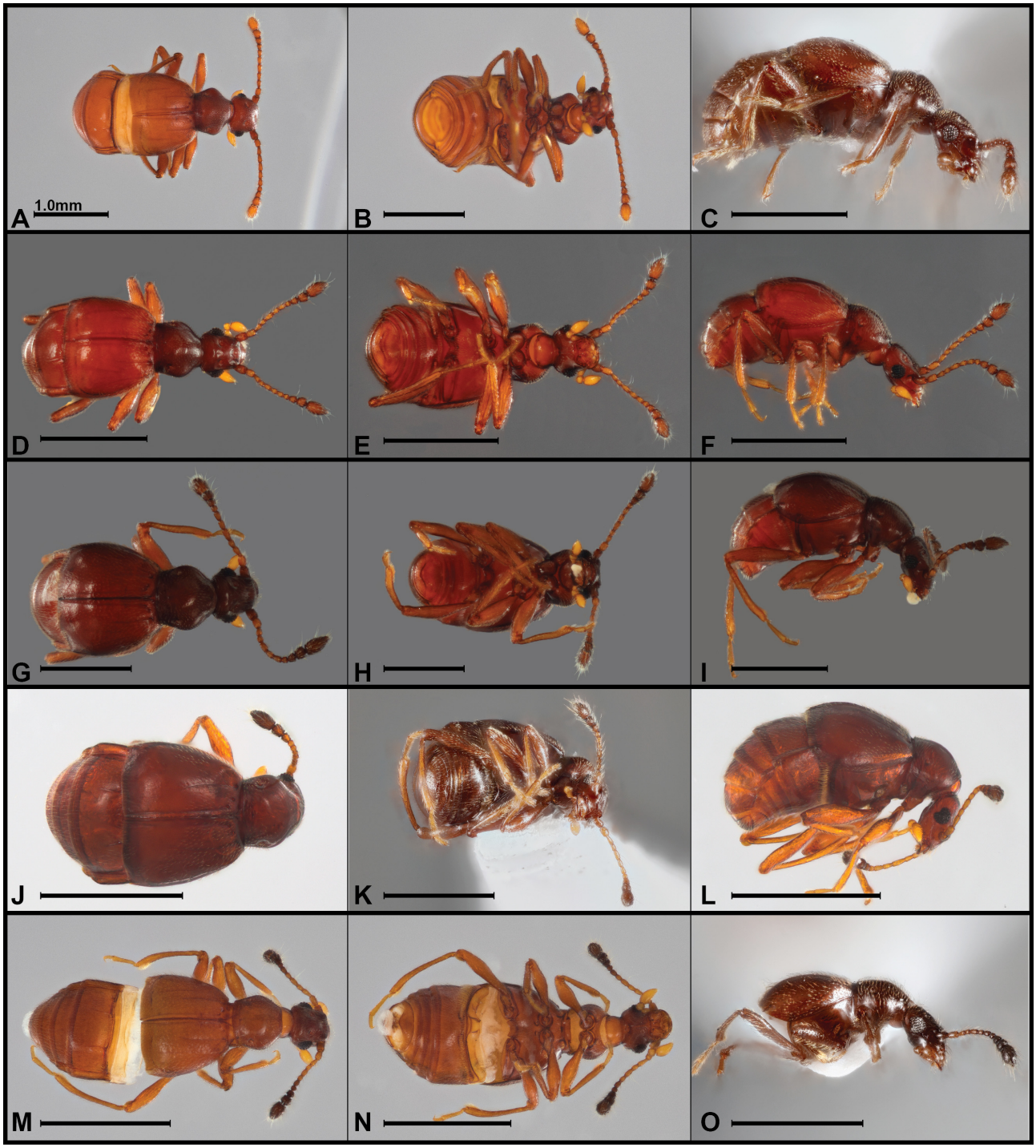

FIGURE 120. Habitus photos, *Reichenbachia* spp., dorsal, ventral, lateral views **A–C** *R. anka* **D–F** *R. anxia* **G–I** *R. cosangae* **J–L** *R. garciae* **M–O** *R. atricornis.* Scale bars = 1.0mm.

Reichenbachia anxia **sp. nov.**
DNA barcode: GenBank PX930314
Figs 120D–F, 121C–D

Type material. Holotype ♂ (MECN-EN 40810): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13163, Morphosp. Mch.026"; deposited in MECN. **Paratype.** 1♂: same general locality as type, -1.3829˚, -78.2909˚, 2382m (MECN-EN 40235).

Diagnosis. (TL: 2.3mm) Body (Fig. 120D) dark reddish-brown, uniformly sparsely setose, most setae short, recumbent; head rather elongate, posterior corners rounded; vertexal foveae deep, closer to eyes than to each other; median fovea shallower; eyes large, protuberant; antennae elongate, scape about twice as long as wide, cylindrical, antennomere II slightly shorter and narrower

than I, cylindrical, III–VII all longer than wide, III and V longest, IV intermediate in length, VI–VII shorter, VIII about 2/3 length of VII, IX–XI forming darker, loose club, IX a little larger than VIII, X a little larger than IX, and XI twice length of X; pronotum transverse, widest in front of middle, lateral foveae about one-third from base, deep, setose; median basal fovea present but shallow; each elytron with small sutural and two lateral basal foveae; sutural stria complete, stria behind outer lateral fovea reaching middle third of elytron, curved inward at apex; male lacking obvious secondary sexual characters. Aedeagus (Fig. 121C, D) symmetrical, with large, short parameres bent strongly downward, apically rounded on outer edge, weakly dentate at inner apical corner, with one strong subapical and one short seta on lateral margin; basal bulb broad, with large oval dorsal diaphragm, diaphragmatic sclerite weakly sclerotized; median lobe with trapezoidal (apically truncate) dorsal flap over extruded inner armature; inner armature with two rather strong median rods, each with strong, ventrally bent apex, flanked by curved lateral rods, fimbriate along outer edges, apically bifid with subacute apices, the whole armature with a multispinose basal fringe.

Etymology. The name of this species recalls the author's anxious mood during the seemingly vertical, back-of-a-pickup-truck, switchbacked ride to the trailhead leading into the Machay reserve.

Distribution. This species is known only from the cloud forests of the Río Machay Reserve, Tungurahua Province, Ecuador.

Remarks. This is a very generic species of *Reichenbachia* based on external characters, lacking secondary sexual characters. It appears closely related to *R. cosangae* **sp. nov.** (described below) based on male genitalia, but in that species the median rods of the inner armature are longer and more gradually curved ventrad at the apices. The lateral rods of the armature also appear shorter in that species, and there are minor differences in the apical shape of the parameres.

Reichenbachia cosangae **sp. nov.**
Figs 120G–I, 121E–F

Type material. Holotype ♂ (MECN-EN 41792): "ECUADOR: Napo, -0.5935˚, -77.8982˚, Est. Biol. Yanayacu, Ridge Tr., 2356m, 9.IX.2024, sifted litter, M.Caterino" / "Caterino DNA voucher, Ext. MSC-12958, Morphosp. Yn.A.027"; deposited in MECN. **Paratypes** (1♂): same general locality as type, -0.5986˚, -77.8949˚, Stream Tr., 2185m, 10.IX.2024 (MECN-EN 41793).

Diagnosis. (TL: 2.7mm) Body (Fig. 120G) smooth, setae dense, short, and appressed; vertexal foveae deep; median vertexal fovea present above and between antennal bases; antennae of intermediate length, antennomeres I and II short and cylindrical, III and IV weakly conical, V longer, slightly swollen along inner margin and bearing a couple longer supernumary setae, VI and VII slightly shorter than V, VIII quite short, IX–XI forming loose club, each segment larger than preceding, IX and X slightly conical (wider at apex than base), XI about 2.5× as long as X; pronotum widest just beyond middle, with small median fovea and slightly larger lateral foveae; each elytron with three dorsobasal foveae, sulciform stria from outermost extending almost half elytral length, curving slightly toward suture; last male ventrite slightly depressed; legs and venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 121E, F) with basal bulb broad, dorsal diaphragm well developed; parameres thin, short, divergent; apical lobes of tegmen forming flattened, semicircular lobes, rounded on outer edges; inner armature with long, approximate median rods diverging at apices as rounded tips, along each side with descending flattened blades with long, comblike projections along distal margin.

Etymology. This species is named for the Río Cosanga watershed, in which the Yanayacu Biological Station was established.

Distribution. This species is known only from the cloud forests of Yanayacu Biological Station, at about 2000m in the Napo Province of Ecuador.

Remarks. This species appears to belong to Raffray's group IX (as keyed in Park, 1942), having three simple foveae on the head, three simple foveae on the pronotum, three basal elytral foveae, and short carinae on the first abdominal tergite. The three species assigned to this group were known at Park's time only from females, and have few other mentions in the literature. But this species would therein key to *R. boliviensis* Raffray, having the 5th antennomere longer than the 4th and 6th. That species was described only from Bolivia, and, known only from a female, will thus never be directly comparable to anything known from both sexes. The fact that *R. cosangae* exhibits few obvious external dimorphisms may be meaningful (or perhaps even indicating that some of the previously described 'females' may be cryptic males).

Reichenbachia garciae **sp. nov.**
DNA barcode: GenBank PX930245
Figs 120J–L, 121G–H

Type material. Holotype ♂ (ZSFQ-i23396): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12715, Pselaphinae"; deposited in ZSFQ. **Paratypes** (4♀): same data as type (ZSFQ-i23397–i23400).

Diagnosis. (TL: 2.2mm) Body (Fig. 120J) smooth, setae short and appressed; vertexal foveae deeper and more distinctly setose; median vertexal fovea absent; antennomeres III and V longer, antennomere VIII quite short; each elytron with three dorsobasal foveae, stria from outermost curving mediad toward suture, ending with short recurve about three-fourths from base; mesotrochanters dentate, but more like a broad tooth than a spine. Aedeagus (Fig. 121G, H) with basal bulb broad, dorsal diaphragm well developed; parameres strongly convergent, strongly quadrate apically with notch basad outer corner; inner armature comprising pair of straight thin rods.

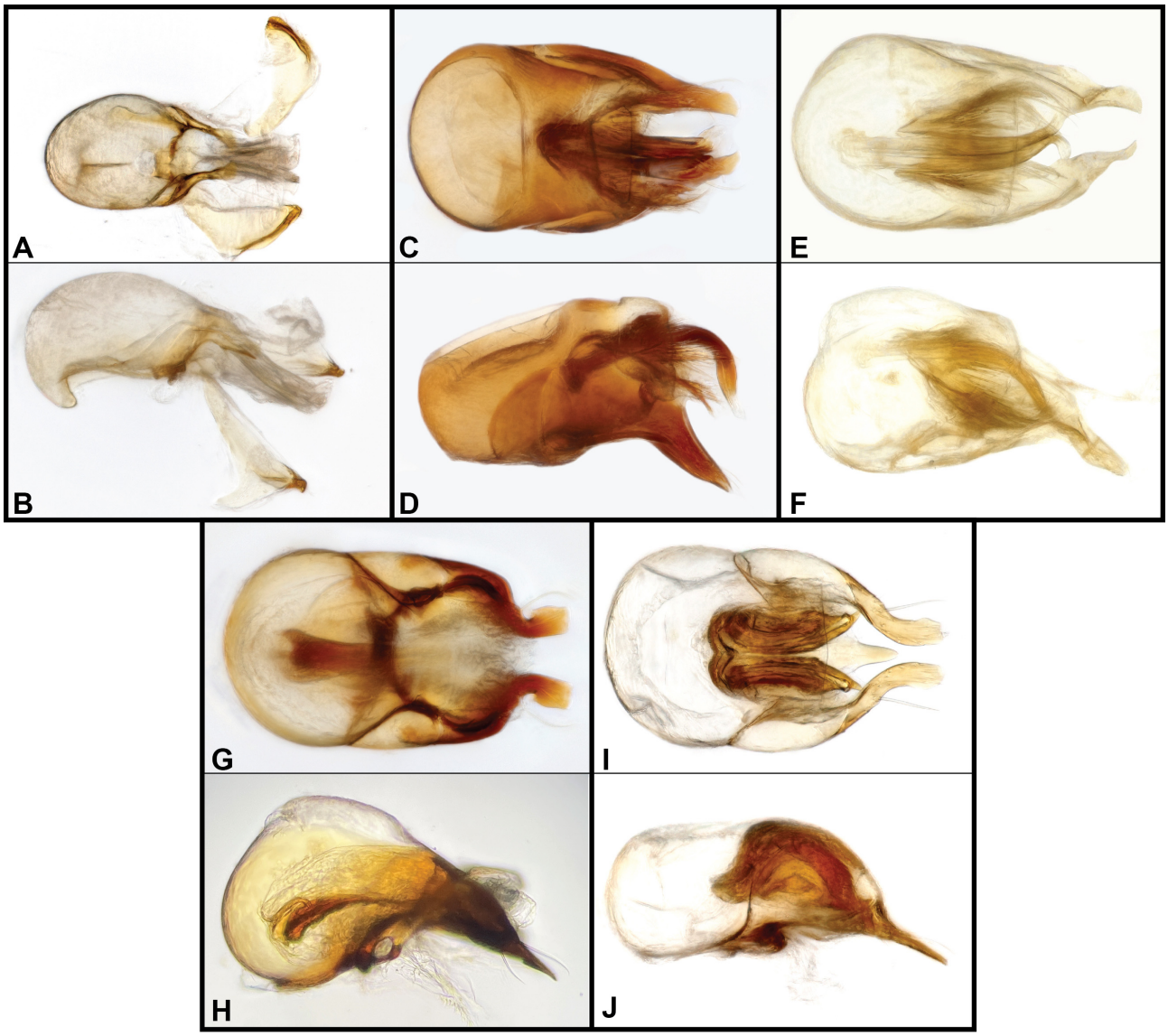

FIGURE 121. Aedeagus photos, *Reichenbachia* spp., dorsal, lateral views **A, B** *R. anka* **C, D** *R. anxia* **E, F** *R. cosangae* **G, H** *R. garciae* **I, J** *R. atricornis*.

Etymology. I name this species in thanks for the assistance and friendship of Ms. Ana B. García Ruilova, curator at the Instituto Nacional de Biodiversidad in Quito, over the year of my sabbatical.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Reichenbachia atricornis **sp. nov.**
DNA barcode: GenBank PX930244
Figs 120M–O, 121I–J

Type material. Holotype ♂ (ZSFQ-i23394): "ECUADOR: Pichincha 0.0182°N, 78.6372°W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337" / "Caterino DNA voucher, Ext. MSC-12620, Morphosp. ElP.A.019"; deposited in ZSFQ.

Diagnosis. (TL: 2.3mm) Body (Fig. 120M) with rather long erect setae; lateral foveae of vertex impressed, but rather small and non-setose; median vertexal fovea absent; antennae compact, antennomere III longest of funicle, IV slightly shorter, III, V, and VI distinctly shorter, little longer than wide, VIII very short, wider than long, IX–XI darker, forming a distinct loose club; pronotal sides rounded, less distinctly angulate, widest just slightly in front of middle; lateral pronotal foveae well developed, median fovea nearly obsolete, only a small, shallow impression; each elytron with three dorsobasal foveae, discal stria straight, converging slightly to suture, ending near midline; mesotrochanter with small, acute posterior spine. Aedeagus (Fig. 121I, J) symmetrical, with broad basal bulb, weakly constricted at middle; parameres converging, flat and ventral, incurved and narrowly subquadrate apically, with prominent seta on outer edge, weaker seta on ventral edge; tegmen with ventromedial point; internal armature comprising paired, dorsally arched, outcurved processes.

Etymology. This species' name refers to the darkened apical antennomeres.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Scalenarthrus LeConte, 1880
Fig. 122

Scalenarthrus contains 27 species from North to South America (Asenjo *et al.* 2019). The closest locality for any described species is Bolivia, but most have been described from Mexico. None have previously been reported from Ecuador. Two new species are described below, both from coastal localities.

Diagnosis. (TL: 1.3–1.6mm, Avg. 1.4mm) Park (1942) characterizes *Scalenarthrus* as having a short, globular body, median longitudinal carina on the ventral surface of the head, simple maxillary palpi, pronotum lacking foveae, elytral foveae vestigial, with only basal points, at least 2 abdominal segments laterally margined, the mesocoxae separated by a truncate mesoventral process, and the metacoxae widely separated. The antennae are often sexually dimorphic. Male genitalia have been illustrated for a few Honduran species (Becker & Sanderson 1953a), but never characterized at the generic level. Those that have been illustrated share with those described below a somewhat laterally compressed basal bulb, without an obvious dorsal diaphragm, but bearing an articulated dorsal process at its upper apex. Parameres appear to be present, borne on a variously extended distal process of the ventral edge of the basal bulb. The 'ventral lobe' (sensu Becker & Sanderson, 1953; possibly a modifed paramere) may have remarkable apical elaborations, including some apparently clasping structures. In others this process may bear a convoluted apical style (see, e.g., *S. globosus* Fletcher or *S. olanchitus* Becker & Sanderson). They are remarkably varied among species.

Scalenarthrus calix **sp. nov.**
Figs 122A–C, G–H

Type material. Holotype ♂ (ZSFQ-i15250): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 23–27.v.2011, AT1307, M. Caterino, A. Tishechkin, under bark, rotting wood" / "Caterino DNA voucher, Ext. MSC-12423, Pselaphinae" / "ZSFQ-i15250"; deposited in ZSFQ. **Paratypes** (3♂): 2: same data as type; 1: same locality, 22.v.2011, leaf/rotting stick litter (ZSFQ-i23401–i23403).

Diagnosis. (TL: 1.6mm) Head broad, with lateral impressions, but without fully formed foveae, antennal bases slightly elevated; eyes large, coarsely faceted; antennae slightly elongate, antennomeres III–VII all slightly longer than wide, antennomeres IX–XI enlarged into loose club, bases and apices of IX and X carinate and tightly appressed, XI long and indented at inner apex; maxillary palpomere IV long, evenly tapered to apex, without any modification of outer surface; pronotum (Fig. 122A) convex, slightly widened to anterior third, lacking basal foveae or antebasal impression but slightly impressed at sides of base; elytra convex, lacking in dorsal and subhumeral basal foveae; last male abdominal tergite (Fig 122C) depressed at middle of apical margin; metaventrite (Fig. 122C) slightly tumid on either side at base; male 4th and 5th abdominal ventrites depressed at middle, with medially directed setae, a distinct fovea on either side; metatibiae elongate, slender. Aedeagus (Fig. 122G, H) elongate, basal bulb laterally compressed; basal foramen elongate, ventral; elongate, dorsally curved process articulated with ventral edge of basal bulb; median armature comprising extensible, trilobed, wrench-like process, articulated at base with dorsal edge of tegmen.

Etymology. The name of this species refers to the 'cup-like' pygidial depression. It is used as a noun in apposition.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. This species strongly resembles members of *Globa.* In addition to other generic differences enumerated above, it has the male pygidium only weakly modified, with a simple transverse depression along the apical margin. The male maxillary palpus is unmodified. Its male metatibia are elongate, but not otherwise modified. The male genitalia are distinctive, having a short, distally closed basal bulb, and having a large, articulated, wrench-like apical process extending from the dorsal end of the tegmen. The aedeagus somewhat resembles that illustrated for *S. inflatus,* which also appears to have an apical clasping structure (see Fig. 69 in Becker & Sanderson 1953a). Their antennae, however, are nothing alike, with the terminal male antennomeres of *S. inflatus* being highly modified, and those of *S. calix* showing no modifications. So the aedeagal similarity may reflect convergence to some common mating pressures.

Scalenarthrus umina **sp. nov.**
DNA barcodes: GenBank PX930308, PX930309
Figs 122D–F, I–J

Type material. Holotype ♂ (ZSFQ-i23404): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12716, Globa sp.[sic]"; deposited in ZSFQ, **Paratypes** (1 of undetermined sex): same locality as type, leaf/rotting stick litter (MSC-12676; ZSFQ-i23405).

Diagnosis. (TL: 1.3mm) Head smooth, finely setose; eyes weakly protuberant, diameter about half length of gena; vertexal foveae very shallow, widely separated; frontal shelf broad, rounded, delimited by posterior submarginal stria; antennae short, antennomeres I and II cylindrical, similar in length, III–VIII shorter, narrower, beadlike, IX–X widened slightly more transverse, XI forming asymmetrical club, notched on apicoventral surface; pronotum (Fig. 122D) wider than long, widest in

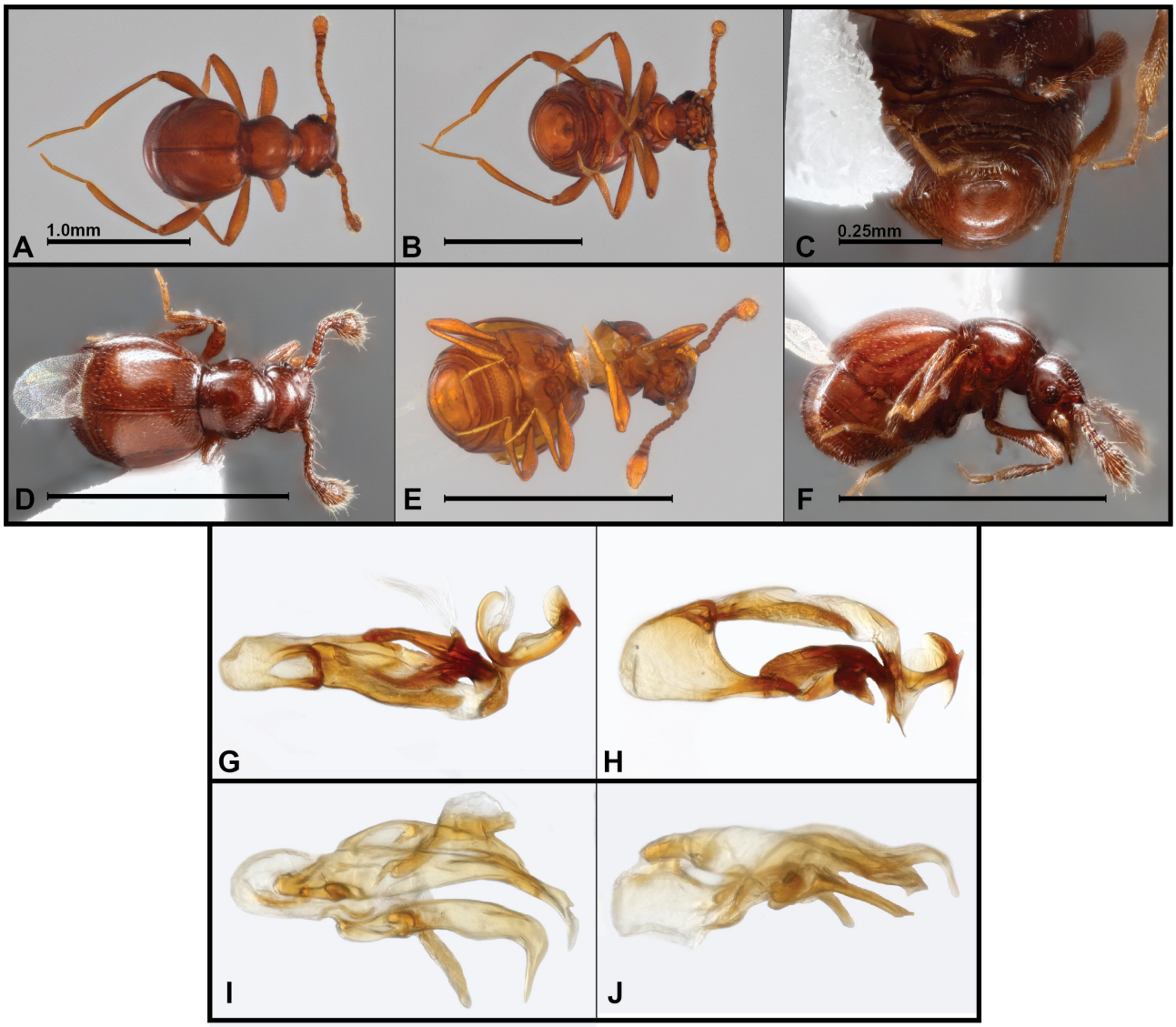

FIGURE 122. Photographs, *Scalenarthrus* spp. **A–C, G, H** *S. calix* (body: dorsal, ventral, detail view of abdomen; aedeagus: dorsal, lateral) **D–F, I, J** *S. umina* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm unless otherwise indicated.

apical half, lacking foveae or impressions; each elytron with three very small dorsobasal foveae, subhumeral fovea absent; legs slender; legs and abdomen without obvious secondary sexual characters. Aedeagus (Fig. 122I, J) elongate, basal bulb laterally compressed; parameres large, articulated with sides of basal bulb, divergent; longest median process articulated with apex of basal foramen, narrowing and sinuate, apex abruptly expanded, with inner notch; tegmen with pair of articulated apical processes, left side with abruptly bent apical hook, right side slightly shorter, more gently curved, bluntly rounded apically.

Etymology. This species name is based on the Kichwa word umiña, which means 'precious stone' or 'gem'. Umiña is also the name of a Goddess of health and fertililty associated with Ecuador's coastal Manteña culture. The name is used as a noun in apposition.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Goniaceritae: Brachyglutini: Decarthrina

Decarthron Brendel, 1865

Fig. 123

Decarthron constitutes one of the largest genera of Brachyglutini and Pselaphinae in the neotropics, with 81 reported species, from Mexico to Argentina (Asenjo *et al.* 2019), not counting additional species in the Nearctic. No species have been definitely reported from Ecuador previously, while 5 have been reported from neighboring Colombia (Newton *et al.* 2005). I encountered only a single species during my sampling, described below. This species is from relatively low wet forests in the eastern Andean foothills, and the genus is

apparently not going to be a significant element of cloud forest faunas.

Diagnosis. Males of this brachyglutine genus are generally easily recognized by the 10-segmented antennae (shared with females) in conjunction with sexual modifications of the pro- and/or mesofemora and antennae. Other genera with 10-segmented antennae (*Euteleia* Raffray, *Drasinus* Raffray) have unusual maxillary palpi and/or gular modifications (see Park, 1942 for details).

Although specific characters of some of the described species have been illustrated in reasonable detail, including illustrations of the male genitalia (e.g. Park 1942, 1944, 1945, Becker & Sanderson 1953a, Park *et al.* 1976), they are scattered and inconsistent and of limited value for identifying the species, especially outside the specific areas many of those papers treat. At the same time, due to their relatively high apparent mobility, and seeming widespread distributions of at least some of the species, the potential for encountering known species in new areas may be reasonably high. A thorough treatment of the group is badly needed. Consistent presentation of the aedeagi of the species, in particular, will be essential to their identification.

Decarthron varita **sp. nov.**
Fig. 123

Type material. Holotype ♂ (MECN-EN 40769): "ECUADOR: Pastaza, -1.4267˚, -78.0536˚, Río Anzu Reserve, 1344m, 11.XI.2024, M.Caterino" / "Caterino DNA voucher, Ext. MSC-13114, Morphosp. RAn.005"; deposited in MECN.

Diagnosis. (TL: 1.8mm) Body (Fig. 123A) rather dark reddish-orange, legs, palpi, and distal antennomeres lighter; entire dorsum with conspicuous, erect dark setae; head subquadrate, lacking secondary sexual modifications; vertexal foveae widely separated, continued anteromediad by short, curving vertexal sulci; eyes prominent, nearly hemispherical, occupying most of sides of head, coarsely faceted; antennae rather compact, male antennae weakly modified, with antennomeres IV–VII together outwardly arcuate, antennomeres IV and V in particular slightly asymmetrical, with inner apices prominent and apically setose; antennomeres VIII–X forming weak three segmented club; pronotum simple, widest just anterad middle, narrowed to neck with anterior corners of disk weakly impressed; median and lateral basal foveae weak, with very weak impression along basal margin; elytra with sides rounded, each with sutural and one lateral basal fovea, both continued posterad by shallow sulci about one-fourth elytral length; 1st abdominal tergite long, with short longitudinal carinae about one-fourth from each side, with setose basal depression between them; male profemur triangular, anterior edge expanded toward apex, narrowed just before 'knee'; male mesofemur (Fig. 123D) similarly but more extremely expanded, with apical corner of triangle extended to blunt point above 'knee'. Aedeagus (Fig. 123E, F) with weakly developed basal bulb, short and broadly open distally; parameres well-developed, comprising much of the sides of the genitalia, curving upward and distad, tipped with several elongate setae; tegmen with two median lobes, a shorter laterally compressed, sail-like dorsal lobe and a longer, flattened, dorsoventrally sinuous ventral lobe, which terminates in a distal point; a pair of weakly sclerotized lateral lobes extend from the sides of the tegmen immediately beneath the extended parameres; lastly, two articulated, curving rods extend from the base of tegmen, one on the left side curving mediad over the mediobasal lobe, and one on the right that curves laterad.

Etymology. This species name is a Spanish word for 'drumstick', referring to the profemoral shape. It is used as a noun in apposition.

Distribution. This species is known only from the Río Anzu Preserve, in the lower part of the Río Pastaza

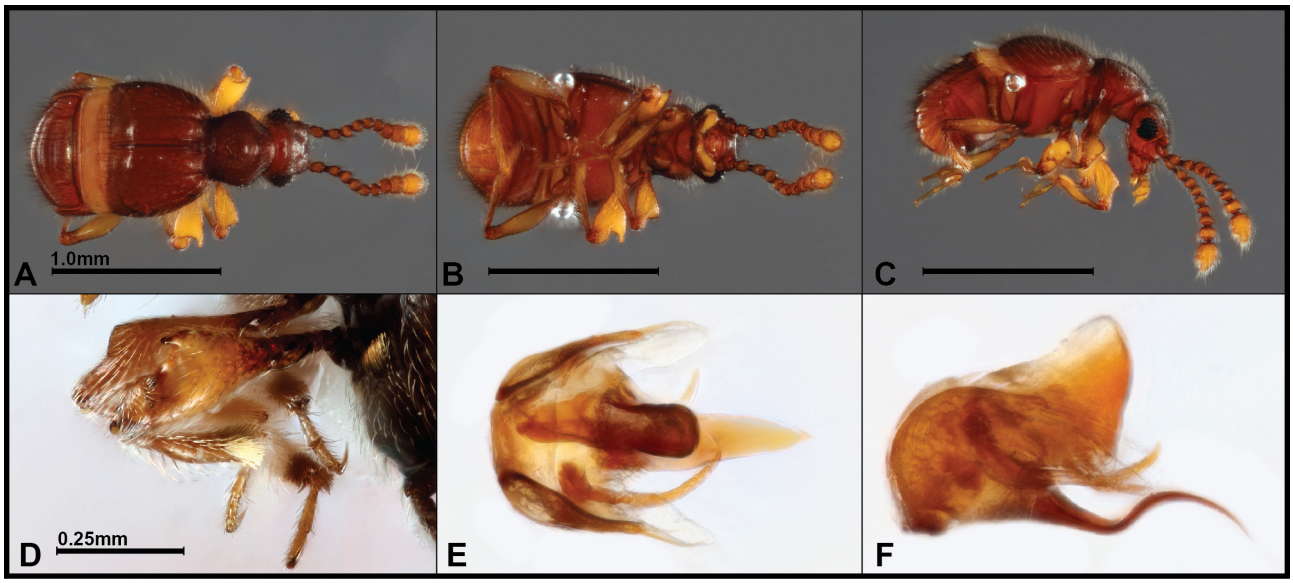

FIGURE 123. Photographs, *Decarthron varita* **A–D** Body: dorsal, ventral, lateral, pro- and mesofemora (posterior view, showing male modifications) **E, F** Aedeagus: dorsal, lateral views. Scale bars = 1.0mm unless otherwise indicated.

Watershed in the Andean foothills of Pastaza Province, Ecuador.

Remarks. The male modifications of this species are relatively simple, with pro- and mesofemoral expansions lacking complex foldings or spines, and the intermediate antennomeres being only weakly asymmetrical. It would key to Raffray's group VI in Park (1942), but then only to a group of Central American species, none of which fits this species, although it is somewhat similar in male genitalic form to some illustrated in Becker and Sanderson (1954b), such as *D. yaguale* Becker and Sanderson or *D. confrente* Becker and Sanderson.

Goniaceritae: Brachyglutini: Eupsenina

Eupsenius LeConte, 1849

Fig. 124

Eleven species have been documented in this genus from tropical America (Asenjo *et al.* 2019, Chandler 2023). Most species have been described from Mexico and the Caribbean. The nearest known species to Ecuador is *E. longicollis* (Raffray), which has been described from Colombia, although not sufficiently characterized to compare with any of the species described below. Three new species are described here.

Diagnosis. (TL: 1.4–1.8mm, Avg. 1.6mm) Chandler (2023) recently addressed the classification of this group, restricting the subtribe Eupseniina to only the genus *Eupsenius,* with *Eupsenina* Raffray removed to Baradina. The genus (and thus tribe) is generally distinguished among Brachyglutini by its glabrous, polished dorsum, prominent antennal base, elongate last antennomere, and strongly reduced (sometimes absent) basal pronotal foveae and antebasal impression. It lacks the long scape and geniculate antennae of *Eupsenina*, and lacks the pygidial dimorphisms of the otherwise similar new genus, *Tumbaga* gen. nov. (below).

Eupsenius crassus **sp. nov.**
DNA barcode: GenBank PX930274
Figs 124A–C, J–K

Type material. Holotype ♂ (ZSFQ-i23408): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v-2011, 1900–2100m. Understory fogging, M.Caterino, A.Tishechkin, AT1330" / "Caterino DNA voucher, Ext. MSC-12658, Morphosp. ElP.A.057"; deposited in ZSFQ.

Diagnosis. (TL: 1.5mm) Head (Fig 124C) smooth, with only very fine vertexal foveae; eyes large, coarsely faceted; antennae stout, antennomere I quadrate with few scale-like setae on anterior surface, antennomere II oval, antennomeres III–VIII small, beadlike, IX–X more strongly transverse, XI forming a large setose club; frontal shelf with thin, translucent laminate median process; pronotum smooth, narrowed posteriorly, lacking foveae, lacking any indication of transverse basal impression; each elytron with a single prominent basal fovea near humerus (Fig. 124A), continuous with basal and sutural striae; sutural and subhumeral foveae absent; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 124J, K) strongly arched, with large basal foramen; tegmen flattened distally, asymmetrical, cutout on left side of apex trisetose.

Etymology. This species' name refers to its chubby appearance.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species is most similar to *E. riley* Chandler, sharing the relatively wide basal foramen and generally squat aedeagal shape. Although well supported as a *Eupsenius* by most characters, it is unusual in the lack of a sutural elytral fovea. The head is also only weakly depressed at the vertexal foveae.

Eupsenius deflexus **sp. nov.**
DNA barcode: GenBank PX930276
Figs 124D–F, L–M

Type material. Holotype ♂ (ZSFQ-i23407): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 29.v-2011, 2000–2100m, Mid canopy FIT, AT1339, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12665, Morphosp. ElP.A.064"; deposited in ZSFQ.

Diagnosis. (TL: 1.8mm) Head small, smooth, transversely depressed across pair of well-developed vertexal foveae; eyes very protuberant, encompassing most of genae, coarsely faceted; antennae inserted below elevated frontal shelf, epistoma recessed beneath, bisetose along distal margin; sides rounded, apex truncate and setose; maxillary palpi relatively long, apical palpomere swollen and densely setose; antenna with scape short and cylindrical, antennomere II elongate oval, antennomere III narrow, slightly elongate, antennomeres IV–VII small and beadlike, VIII–X increasing in width and increasingly transverse, XI enlarged and setose; pronotum (Fig. 124D) smooth, constricted basally, lacking dorsal foveae, basal transverse impression faint, scratchlike; each elytron with deep sutural fovea and dorsobasal fovea with short depression extending distad; subhumeral fovea absent; last abdominal ventrite with shallow emargination (Fig. 124E). Aedeagus (Fig. 124L, M) strongly curved, with broadly open basal foramen; tegmen with strong, bidentate ventral blade; tegmen asymmetrical from dorsal view, finely dentate at apex and with broad subapical tooth on right side.

Etymology. The name of this species refers to its deflexed head.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species is highly distinct from any species illustrated by Chandler (2023) in aedeagal form. While sharing the generally elongate curved tubular

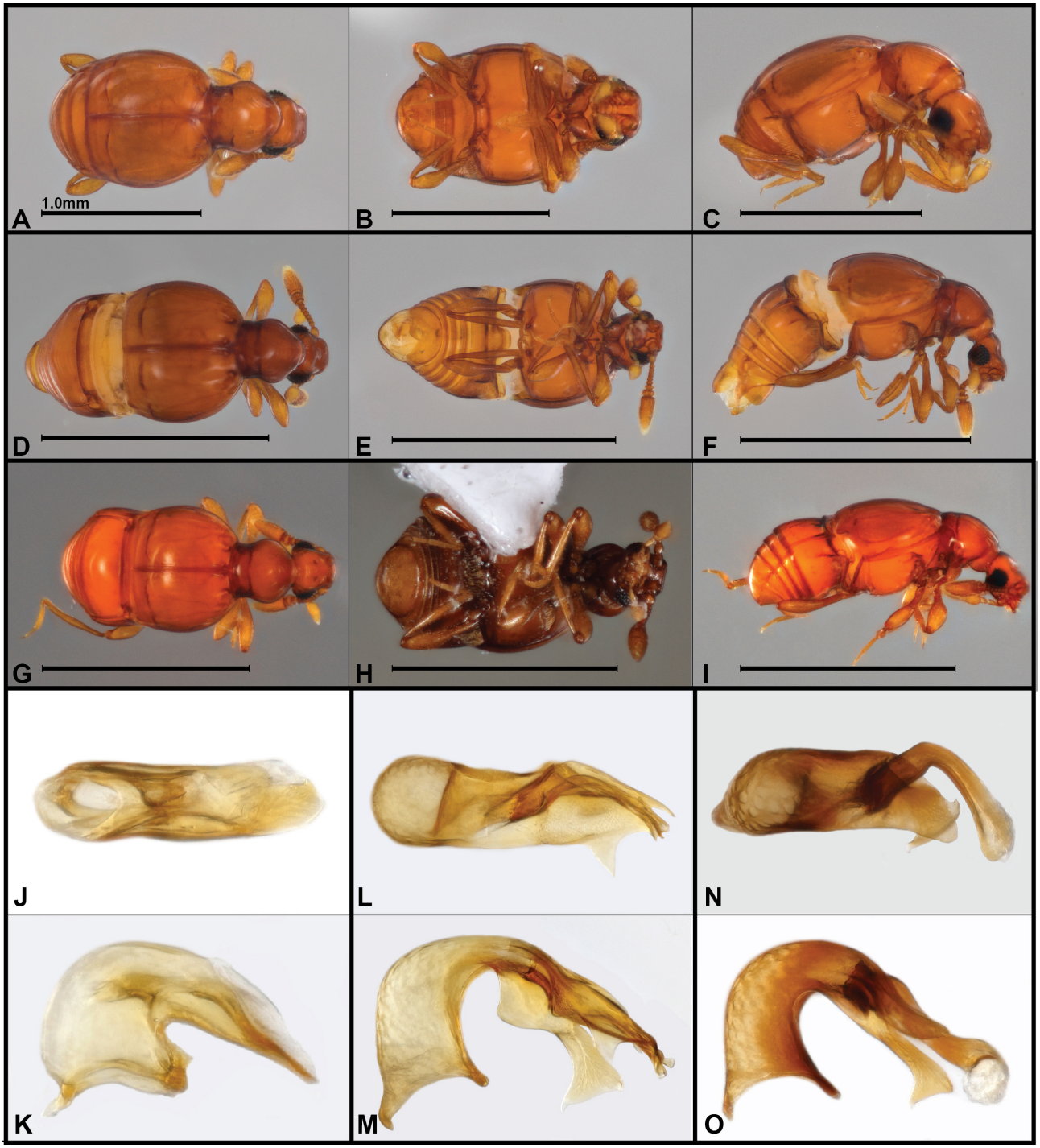

FIGURE 124. Photographs, *Eupsenius* spp. **A–C, J, K** *E. crassus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *E. deflexus* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *E. quil* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

form with several North and Central American species, it exhibits a prominent ventral lamina (Fig. 124M) seen in none of those species.

Eupsenius quil **sp. nov.**
DNA barcodes: GenBank PX930219, PX930222
Figs 124G–I, N–O

Type material. Holotype ♂ (MECN-EN 41794): "ECUADOR: Guayas, -2.156511˚, -80.059402˚, Bosque Protector Cerro Blanco, Q. Hugo, 24.IV.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12819, Morphosp. CrBl.A.017" / "MECN-EN 41794"; deposited in MECN. **Paratypes** (2): 1♂ (MECN-EN 41795): "ECUADOR: Guayas, -2.159579˚, -80.02109˚, Bosque Protector Cerro Blanco, Cosumbo, 25.IV.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12813, Morphosp. CrBl.A.011"; 1♀ (MECN-EN 41796): "ECUADOR: Guayas, -2.144013˚, -80.043602˚, Bosque

Protector Cerro Blanco, Laguna, 26.IV.2022, Winkler, C. Cujigualpa".

Diagnosis. (TL: 1.4mm) Body (Fig. 124G) globose, constricted between pronotum and elytra and between thorax and abdomen; head smooth, with moderately well-impressed vertexal foveae; eyes large, coarsely faceted; antennae stout, antennomeres I subquadrate, II oval, III–VIII transversely beadlike, IX–X more strongly transverse, IX–XI forming club, XI about 6× as long as X, setose; pronotum smooth, strongly narrowed posteriorly, lacking foveae, with dark, biarcuate transverse subbasal thickening; each elytron with large sutural and one lateral basal fovea; subhumeral foveae absent; abdomen with 1st paratergite extremely narrow, others absent, with simple carina separating tergites from ventrites; venter and legs lacking obvious secondary sexual characters. Aedeagus (Fig. 124N, O) very strongly arched, with large, deeply emarginate basal foramen; tegmen bent ventrad, split into dorsal and ventral processes, dorsal one shorter and broadly rounded apically, ventral process flat, expanded to weakly rounded truncate apex, each lateral corner prominent; extending from right side between the distal lobes is a large, articulated, elbow-shaped process, weakly expanded into rounded apex.

Etymology. This species is named for the Huancavilca princess Quil, who according to legend, fought alongside chief Guayas against the early Spanish conquistadors in the Guayaquil (named for the pair) region.

Distribution. This species is known only from the type locality in coastal Ecuador, situated about 300m above sea level in the coastal mountains west of Guayaquil.

Remarks. This species is a fairly typical *Eupsenius*, differing mainly in its rather shallowly impressed vertexal foveae, strongly constricted abdomen, and especially in the large articulated process of the aedeagus. It shares a prominent ventral tegmenal blade with the preceding species.

Tumbaga Caterino **Gen. nov.**

Figs 125–126

Type species. *Tumbaga montana* **sp. nov.**, by present designation

Diagnosis. (TL: 1.0–1.3mm, Avg. 1.1mm) Body small, glabrous, lacking obvious dorsal setae; head subquadrate, convex above, narrowed behind; eyes moderately large, protuberant; vertexal foveae finely impressed, about as far apart as each is from upper margin of eye; venter of head without lateral or median carinae; maxillary palpi with last palpomere widest near base, tapered to acute apex; antennae compact, with 2-segmented club, the terminal antennomere about 8× as long as penultimate, densely setose; pronotum rather narrow and elongate, lacking basal foveae; transverse basal stria visible, but mostly as internal darkening/strengthening ridge, only weakly or not at all impressed; elytra with sides rounded, each with fine sutural fovea and sutural stria, other dorsobasal or subhumeral foveae absent; 1st abdominal tergite about 2× as long as 2nd; abdomen lacking paratergites or lateral marginal carinae; prosternum about 2/3 as long as procoxal diameter, without median carina or precoxal foveae; mesocoxae nearly or fully continguous (some spp. with narrow metaventral process between them); metacoxae transverse, continguous, 1st abdominal ventrite with triangular process between them; most species' males with modifications of the last two abdominal tergites; legs only moderately elongate, slender. Aedeagus (Fig. 126) with rather large, upright basal bulb, largely desclerotized on dorsobasal surface (an ill-defined basal diaphragm); parameres not evident; basal foramen ventral, with basal apodeme directed distad; tegmen usually an arched flattened tongue extending from mid- to upper edge of basal bulb; complex inner armature of one or more rods and often several spikes present.

Remarks. The species of this genus exhibit a number of characters in common with both *Eupsenius* and *Eupsenina*; all appear glabrous and shining, largely lacking setae, with a broad smooth head, and convex elytra and abdomen. All generally lack basal pronotal foveae while having a dark, transverse basal thickening instead of a sulcus. And they all share an elongate terminal antennomere that has numerous elongate setae. The two described genera have been assigned to two different subtribes of Brachyglutini, Eupseniina and Baradina, respectively. *Eupsenina* is an awkward fit in Baradina (see Chandler 2023) and remains to be fully characterized. This new genus differs from both in several characters, while probably more closely related to *Eupsenius*, and therefore assigned to Eupseniina.

The pronotal shape of most described species of either *Eupsenius* or *Eupsenina* is narrow basally and expanded anterad, while in most of the species assigned to *Tumbaga* it is wider at the base, and more or less parallel-sided from the base to the midpoint, thence narrowed anterad. Most *Eupsenius* and *Eupsenina* species have a pair of strongly impressed vertexal foveae, depressing the middle of the head, while *Tumbaga* species have only finely impressed points. Antennae differ among the three, with the club of *Eupsenius* species distinctly three segmented. In both *Eupsenina* and the new genus, the club is just two segmented. However, the scape is markedly elongate and the antennae thereby geniculate in *Eupsenina*, while the scape is no longer than antennomere II in *Tumbaga*. *Eupsenius* exhibits two strong dorsobasal elytral foveae, and *Eupsenina* also has two, smaller and less strongly impressed foveae, while species of *Tumbaga* have at most a very fine sutural fovea. Species of *Eupsenius* have the abdomen distinctly margined laterally, with paratergites on the first three segments. Abdominal tergites of *Eupsenina* have lateral carinae on the basal segments, but no paratergites. In *Tumbaga* the abdominal sides are smoothly rounded lacking either paratergites or carinae.

There appear to be some important differences in sexual characters as well. No conspicuous dimorphisms have been described for species of *Eupsenius*. In *Eupsenina* previous descriptions have noted male modifications of the antennal pedicel, while in the new species described above (*Eupsenina guayasensis*), in addition to a triangular

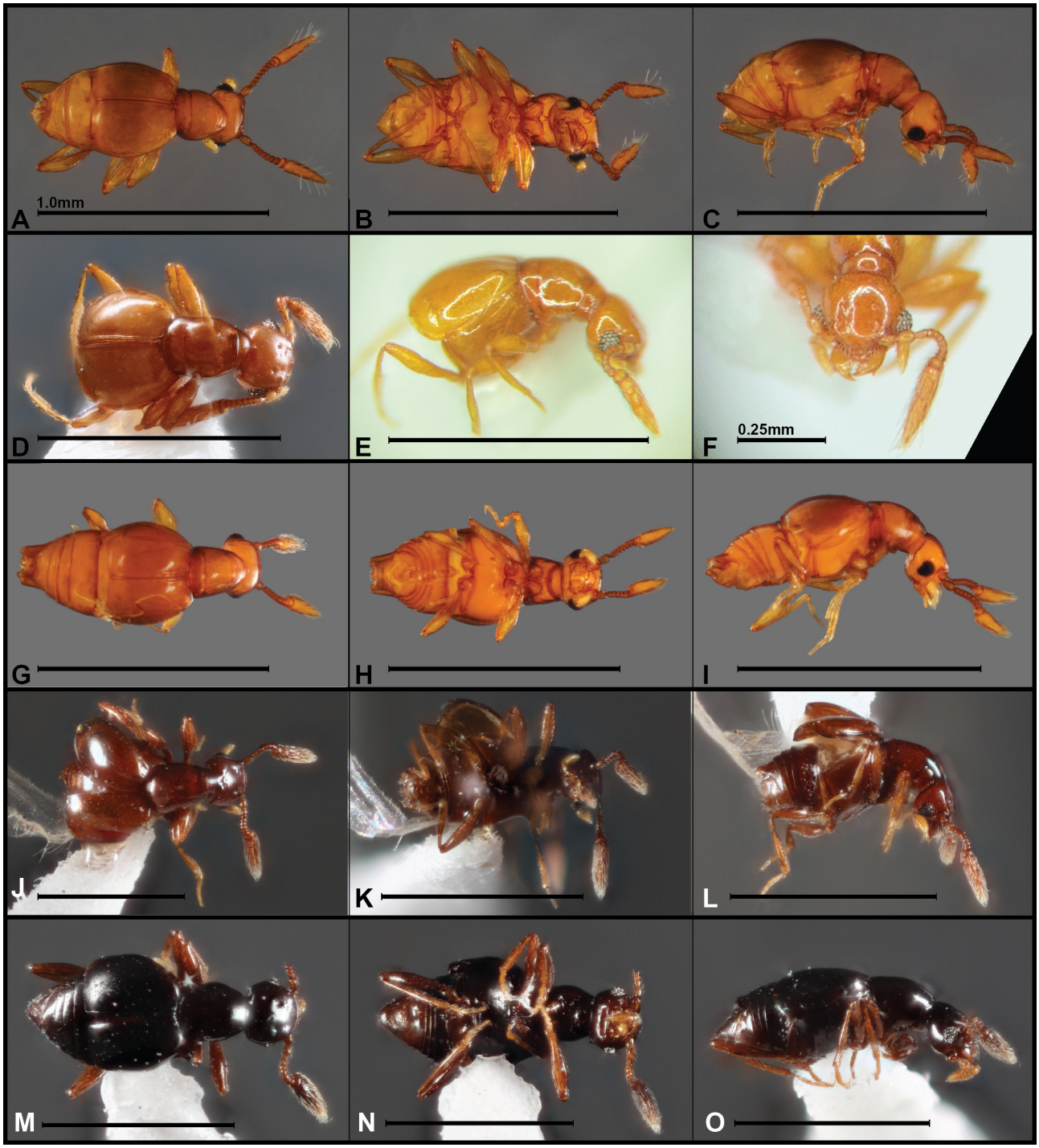

FIGURE 125. Habitus photographs, *Tumbaga* spp., dorsal, ventral, lateral views **A–C** *T. montana* **D–F** *T. ukumari* **G–I** *T. esmeralda* **J–L** *T. chiruisla* **M–O** *T. guandera*. Scale bars = 1.0mm unless otherwise indicated.

pedicel, the male exhibits *Decarthron*-like modifications on the profemur, with an oblique dorsal crease and a basal excavation on the inner edge. Park (1942) describes potentially comparable secondary sexual characters in *Eupsenina patricia,* but no such modifications are indicated in descriptions or available photographs of other known species. In *Tumbaga*, all the species also have conspicuous modifications of the last two male abdominal tergites, much like those observed in *Globa,* but not known in other Eupseniina or Baradina.

Male genitalia are quite different among the three genera. In *Eupsenius*, the basal bulb is distinct from the tegmen, lacks a dorsal or basal diaphragm, and the whole aedeagus is strongly arched and gradually tapered. Those of *Eupsenina* have not previously been illustrated or characterized in any detail, but in the species described here the aedeagus does show Baradina affinites, as suggested by Chandler (2023), with an upright basal bulb with distinct dorsal diaphragm, small, ventral basal foramen, and a strong basal keel below the tegmen. The aedeagus of *Tumbaga* is clearly more similar to the latter, but lacks a distinct dorsal diaphragm, and has a simpler

basal apodeme, not a well developed ventral keel. The differences among all these are rather substantial, and it remains to be seen whether any of the three in fact belong together or represent externally convergent forms.

Four of the *Tumbaga* species discovered so far are from the Pacific side of the Andes, from the cloud forests on slopes draining to the coast, while a fifth is Amazonian. The name of the genus is a Spanish term for an alloy of gold and copper used by native peoples of the region for ceremonial objects, including masks, jewelry, and figurines. Its smooth, golden, shining appearance suits members of this genus well.

Tumbaga montana **sp. nov.**
Figs 125A–C, 126A–C

Type material. Holotype ♂ (MECN-EN 41798): "ECUADOR: Cotopaxi, -0.4191˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 1990m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12883, Morphosp. Ot.A.048"; deposited in MECN. **Paratypes** (1♀): same data as type (MECN-EN 41799).

Diagnosis. (TL: 1.1mm) Body (Fig. 125A) smooth, glabrous; head broad, frons somewhat quadrate; eyes protuberant, diameter about 2/3 length of postocular gena, coarsely faceted; vertex weakly convex, with distinct pair of vertexal foveae; antennomeres I and II short, cylindrical, III slightly longer than wide, widened to apex, IV–IX transverse, X wider and slightly setose, XI nearly as long as all other antennomeres combined, acute, with dense short and sparse long setae; maxillary palpi moderately long, apical palpomere widest near base, as long as penultimate and antepenultimate combined, moderately setose; pronotum only slightly narrowed from middle to base, more strongly narrowed anteriorly; lateral pronotal foveae absent, complete transverse basal impression present, rather narrow and shallow; elytra with only fine sutural foveae; subhumeral fovea absent; 1st visible abdominal tergite about twice as long as second; male penultimate abdominal tergite (Fig. 125A, 126A) deeply emarginate, projecting on either side; male pygidium (last visible tergite) with strong, basally directed, elongate triangular process, elevated over deep basal depression, extending basad into emargination of penultimate tergite; last visible male ventrite depressed, arcuately projecting into apex of last tergite; venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 125B–C) with large subspherical basal bulb; basal foramen small and ventromedial; tegmen prolonged into flattened, apically rounded, tongue-like distal process with small acute tooth on left margin; internal armature with straight, asymmetrically acute median rod, left side with multispinose process (perhaps extensible), situated basad broader apically rugose process.

Etymology. The species is named for its occurrence in the mountains (in weak opposition to one below that is coastal in distribution).

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. The species of this genus are mostly very similar, externally differing mainly in details of the male pygidial modifications. In this species the emargination and lateral projections of the penultimate tergite are relatively modest. The *Eupsenius*-like basal narrowing of the pronotum is also more pronounced in this species than most others.

Tumbaga ukumari **sp. nov.**
Figs 125D–F, 126D–F

Type material. Holotype ♂ (ZSFQ-i13683): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 1900–2100m, Window traps S. Smith" / "Caterino DNA voucher, Ext. MSC-12399, Brachyglutini"; deposited in ZSFQ.

Diagnosis. (TL: 1.3mm) Body (Fig. 125D) smooth, glabrous; head (Fig. 125F) broad, posterior corners rounded, eyes protuberant, diameter half length of gena, coarsely faceted; vertex convex, with fine pair of vertexal foveae; antennomeres I and II short, cylindrical, III narrow and elongate, IV–IX subquadrate, X wider and slightly setose, XI very elongate, as long as all other antennomeres combined, acuminate, setose; maxillary palpi moderately long, apical palpomere widest near base, as long as penultimate and antepenultimate combined, moderately setose; pronotum only slightly narrowed from middle to base, more strongly narrowed anteriorly; lateral pronotal foveae absent, complete transverse basal impression present but shallow, scratchlike; elytra lacking basal foveae; venter lacking obvious secondary sexual characters; male (Fig. 126D) pygidium (last visible tergite) with strong, basally directed, elongate triangular process, elevated over deep basal depression, extending basad into emargination of penultimate tergite; last visible male ventrite with shallow emargination on either side of midline. Aedeagus (Fig. 126E, F) with large subspherical basal bulb; basal foramen small and ventromedial; parameres small, ascending sides, curving distad and with two terminal setae; basal bulb also with pair of stout ventrobasal processes; tegmen prolonged into flattened, curved, tongue-like distal process; internal armature with curved, narrow, apically blunt median rod, right side with cylindrical pouch terminating in 5 very strong parallel spines, medially with short, denticulate, membraneous structures.

Etymology. The name of this species is a Kichwa name for the spectacled bear, which shares territory with this species.

Distribution. This species is known only from the cloud forests of El Pahuma Orchid Reserve, Pichincha Province, Ecuador.

Remarks. The emargination of the male penultimate tergite is relatively deep and narrow in this species, with the sides only moderately projecting. The process of the pygidium is itself correspondingly narrow, though projecting fairly strongly.

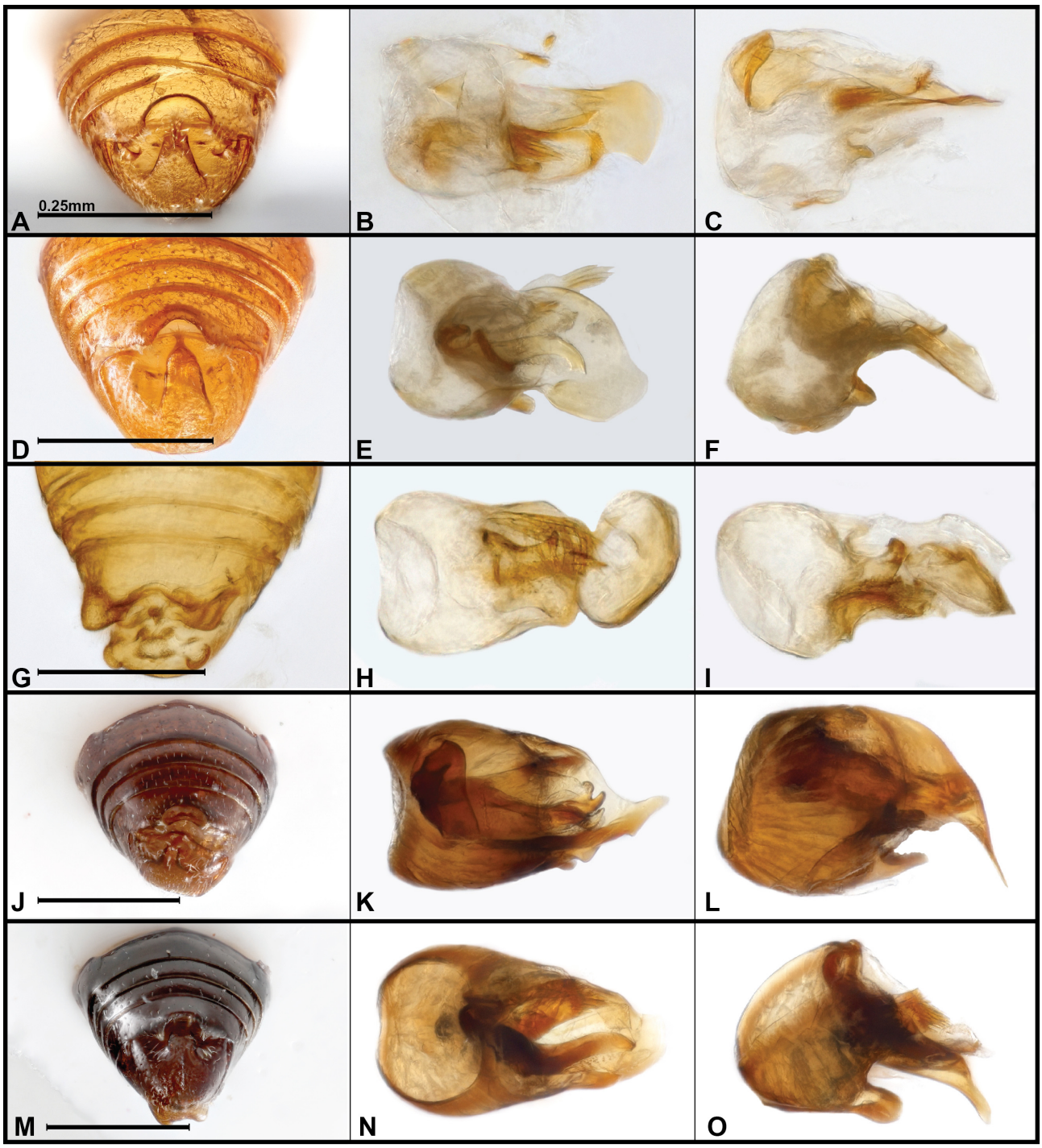

FIGURE 126. Photographs, *Tumbaga* spp., pygidium, dorsal and lateral views of aedeagus, respectively **A–C** *T. montana* **D–F** *T. ukumari* **G–I** *T. esmeralda* **J–L** *T. chiruisla* **M–O** *T. guandera*. Scale bars = 0.25mm.

Tumbaga esmeralda **sp. nov.**
Figs 125G–I, 126G–I

Type material. Holotype ♂ (MECN-EN 41800): "ECUADOR: Esmeraldas, 0.56759˚, -79.06351˚, Quinindé. Reserva Biológica Canandé. 400m. 14-oct-2022. Winkler., A Pazmiño | D Diaz." / "Caterino DNA voucher, Ext. MSC-13023, Morphosp. Can.A.007"; deposited in MECN. **Paratypes** (4♀): same data as type (MECN-EN 41801–41804).

Diagnosis. (TL: 1.2mm) Body (Fig. 125G) smooth, glabrous; head broad, flat, eyes protuberant, diameter about two-thirds length of post-ocular gena, coarsely faceted (female eyes smaller); fine pair of vertexal foveae present; antennomere I short, cylindrical, II slightly longer and wider, III subconical, about 2/3 length of II, IV–IX transverse, X–XI forming club, wider and setose, XI as long as III–X combined, acuminate; pronotum only slightly narrowed from base to apex; subbasal pronotal foveae absent, complete transverse basal line present but barely impressed; elytra lacking basal foveae, short basal carina present at middle; 1st visible abdominal tergite about

twice as long as second, lacking lateral carinae; male 4th tergite (Fig. 126G) flattened, broad, deeply emarginate, with broadly conical tubercles on either side; male last tergite depressed at base, with broad, setose median tubercle and two rounded disk-like projections laterally, apical third simply convex below; last visible male ventrite depressed at middle, apical margin projecting into emargination of pygidium on either side of midline. Aedeagus (Fig. 126H, I) with large subspherical basal bulb, broadly desclerotized on upper basal surface; parameres inconspicuous; basal foramen small and ventromedial, basal apodeme projecting from in front; tegmen short, with broad tongue-like process curved down from median surface of basal bulb, apically broadly rounded; upper edge projecting as strongly sclerotized plate, about one-third ventral process's width, weakly emarginate at apex, with rounded tooth at right apical corner; projecting from right side of basal bulb is a complex of about 5 thin, articulated, elongate rods, 3 of them strongly curving mediad, the others only weakly curved at apex; an additional sinuate, articulated, and apically acute rod emerges from center of basal bulb, similar in length to others.

Etymology. The name of the species refers to the province from which it is being described.

Distribution. This species is known only from the coastal forests of Esmeraldas, Ecuador.

Remarks. The complex pygidial and propygidial modifications of this species easily distinguish it from others of the genus. The nearly parallel-sided pronotum is also unusual.

Tumbaga chiruisla **sp. nov.**
Figs 125J–L, 126J–L

Type material. Holotype ♂ (QCAZ-I-280394): "Ecuador, F.co Orellana, Chiruisla, Km0,2 218m, 75°52'34"W 00°36'50"S, 08–13DEC 2005 J.Vieira" / "Ex. Winkler trap primary forest" / "MSC-13370"; deposited in QCAZ.

Diagnosis. (TL: 1.2mm) Male: Body (Fig. 125J) dark reddish-brown, smooth, with only few inconspicuous setae; head subquadrate, narrowing slightly anterad; vertex weakly convex, vertexal foveae distinctly impressed, about equidistant from each other as from eye; eyes moderately large, with about 38 ommatidia, diameter about twice post-ocular genal length; antennomere I–II cylindrical, I shorter than II, III conical, IV–IX shorter, weakly expanded to apex, X–XI forming elongate, setose club, X cupuliform, XI about 5× as long as X; pronotum widest near base, approximately parallel-sided in basal half, slightly narrowed anterad, disk lacking subbasal foveae; elytra convex, with sides weakly rounded; flight wings well-developed; male penultimate tergite (Fig. 126J) deeply emarginate, with small setose tufts at distal corners of emargination, excavate beneath; male terminal tergite (pygidium) with broad setose depression near base, partially divided along posterior margin by distal process, this mostly hidden at rest appearing as two distinct depressions. Aedeagus (Fig. 126JK, L) with basal bulb large, basal surface membraneous, weakly concave; apically directed basal knob present distad basal foramen; tegmen very short, curved downward, apically subacute; internal armature comprising curved bifid arm near middle with subsidiary hook beneath, and straighter rod on right side.

Etymology. This species is named for the community near to the type locality.

Distribution. This species is known only from Amazonian forests along the Río Napo, Orellana, Ecuador.

Remarks. The deep emargination of the male penultimate abdominal tergite, in combination with the partially divided transverse depression of the pygidium, adequately distinguish this species from the others of the genus.

Tumbaga guandera **sp. nov.**
Figs 125M–O, 126M–O

Type material. Holotype ♂ (QCAZ-I-280402): "ECUADOR: Carchi, San Gabriel, apporox. 15 km E R. B. Guandera, 3300m, 0°35'11"N, 77°44'37"W, 1 NOV 1999, R. Anderson, ECU1A99 220exc, ex. mixed riparian forest litter" / "SM0362419 KUNHM-ENT" / "QCAZ-I-280402" / "MSC-13375"; deposited in QCAZ. **Paratypes** (2♀): same data as type (QCAZ-I-280392–280393).

Diagnosis. (TL: 1.5mm) Body (Fig. 125M) dark reddish-black, smooth, with only few inconspicuous setae; head roundly subquadrate, narrowing to base and anterad; vertex weakly convex, vertexal foveae distinctly impressed, about equidistant from each other as from eye; eyes medium-sized, each with about 18 ommatidia, diameter slightly shorter than post-ocular genal length; antennomeres I–II cylindrical, similar in size, III subconical, IV–VIII shorter, each weakly expanded to apex, X–XI forming elongate, setose club, X cupuliform, XI about 5× as long as X; pronotum widest near middle, weakly campanuliform (basal margin widened slightly), narrowed anterad, disk lacking subbasal foveae; elytra convex, with sides rounded; flight wings well-developed; male penultimate tergite (Fig. 126M) shallowly emarginate, with small setose tufts at distal corners of emargination, excavate beneath; male terminal tergite (pygidium) with wide but short setose depression near base, partially divided along posterior margin by bifid process; distal half of pygidium flattened, rugose, with weak median longitudinal carina. Aedeagus (Fig. 126N, O) with basal bulb large, dorsobasal surface membraneous, forming large diaphragm lacking sclerite; apically directed basal knob large, extending distad from basal foramen; tegmen extending apicoventrad, curving slightly, apex broadly rounded, tonguelike; internal armature comprising sinuous rod along left side, and shorter, bladelike process on right side, its apex truncate and bearing numerous distally directed spines.

Etymology. The species is named for the Biological Reserve near which it was collected. It is used as a noun in apposition.

Distribution. This species is known only from Carchi Province, northern Ecuador.

Remarks. The complex pygidial and propygidial modifications of this species easily distinguish it, especially the textural modifications and median carina of the distal portion of the pygidium.

Goniaceritae: Goniacerini

Andre Comellini (Comellini 1979, 1981a; b, 1990a; b) has revised most of the non-monotypic Neotropical genera of Goniacerini (in French), and included a key to the genera in his 1979 paper. The genera nonetheless remain somewhat complicated to distinguish, based on reductions in antennal segmentation and subtle differences in abdominal and antennal shapes. In the larger genera the species are distinguished by complex inner structures of the aedeagus (some of which have been considered to show intraspecific variation; Comellini 1990a, b) and subtle variations in male antennal dimorphisms, which will require more careful preparation and study than I have the opportunity to do here, although likely new species of *Goniacerus, Goniastes,* and *Heptameron* have been collected. Two species of the tribe have been previously reported from Ecuador, both in the genus *Goniacerus* (*G. incostatus* Comellini and *G. peckorum* Commelini).

Goniaceritae: Iniocyphini

Batriphysis Park, 1942
Figs 127A–C, 128A–B

This genus contains a single described species, *B. epicranus* Park, from Panama (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. Among Iniocyphini, which lack a distinct subhumeral elytral sulcus, *Batriphysis* is characterized by a lack of dorsobasal elytral foveae, lack of a subhumeral elytral fovea but with a subhumeral carina, a first abdominal tergite that is approximately twice as long as the second, a basally constricted pronotal margin, and the male showing frontal modifications. Male genitalia have not been previously described. In the species described here, the basal bulb is large, not too strongly sclerotized, emarginate at the base and diffusely desclerotized above, lacking a discrete dorsal diaphragm. There appears to be a single broad (fused?) paramere extending beyond the ventrobasal foramen. The tegmen is not particularly well developed, short and broadly rounded apically, with strong setae along sides.

Batriphysis constrictus **sp. nov.**
DNA barcode: GenBank PX930348
Figs 127A–C, 128A–B

Type material. Holotype ♂ (MECN-EN 41955): "ECUADOR: Cotopaxi, -0.4169˚, -79.0042˚, Bosque Integral Otonga, 14.VIII.2024, 2086m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12894, Morphosp. Ot.A.059"; deposited in MECN.

Diagnosis. (TL: 2.0mm) Body (Fig. 127A) elongate, somewhat cylindrical, darker orange with dense semirecumbent setae; head (Fig. 127A) subquadrate, somewhat dimpled; vertexal foveae widely separated, in male on either side of deep, glabrous frontal impression, vertex projecting slightly above, frons carinate across front and convex below; eyes moderate sized, low on sides of head, weakly convex; antennae inserted beneath frontal corners, scape elongate cylindrical, about 3× length of antennomere II, antennomeres III–VIII subquadrate, IX slightly enlarged, X–XI forming setose club; pronotum with strong basal constriction, sides very weakly dentate before constriction, rounded in front; basal foveae and basal sulcus indistinct; elytra rather long, widest in posterior half, lacking basal foveae; epipleura with stria but no fovea; abdominal tergites 1 and 4 longer than 2 and 3; legs and venter unmodified in male. Aedeagus (Fig. 128A, B) with broad, somewhat flattened basal bulb, emarginate at base, largely membraneous above; parameres not evident; tegmen weakly prolonged, a dorsal lobe with internal, curved, 'T'-shaped sclerotization, with pair of long, curved setae on each side, ventral process (possibly the fused parameres?) strongly sclerotized, flattened, rather narrow, but apically expanded and subtruncate.

Etymology. This species is named for its strongly basally constricted pronotum.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. While sharing most generic-level characters, this species differs from the one described species, *B. epicranus*, in several respects. Perhaps most notably, the pronotum of the new species is more strongly constricted posteriorly, with the posterior portion of the disk more distinctly depressed. In fact the transverse basal sulcus is mostly subsumed in the depression, whereas a sinuate basal sulcus is evident in *B. epicranus*. The antennae of *B. epicranus* are more robust, with most antennomeres slightly transversely subquadrate, while in the new species they are about as long as wide. The elytral shape is quite distinct in the new species, with a greater length/width ratio, and more distinctly widened toward the apex.

Batrisobryaxis Schaufuss, 1887
Figs 127D–F, 128C–D

=*Insulomodes* Park, 1976; Chandler 2002

Batrisobryaxis contains 6 described species (Asenjo *et al.* 2019), from the West Indies and Brazil. No species have been reported from Ecuador. One new species is described below.

Diagnosis. *Batrisobryaxis* differs from other Iniocyphini by having the first two visible abdominal tergites similar in length (unlike *Batriphysis* and *Dalmophysis* Raffray), the lateral pronotal margins

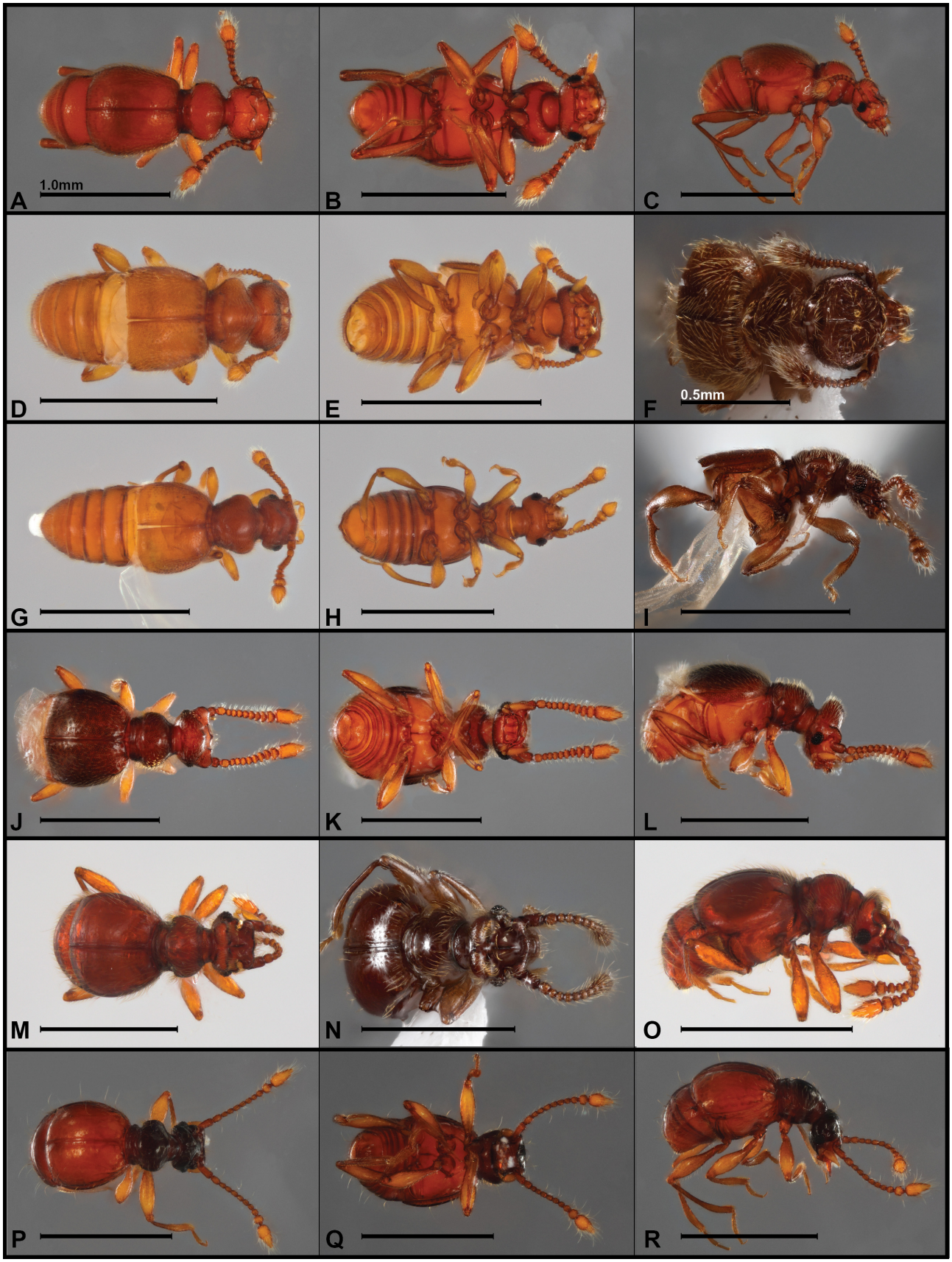

FIGURE 127. Habitus photos, Iniocyphini **A–C** *Batriphysis constrictus* (dorsal, ventral, lateral) **D–F** *Batrisobryaxis bipox* (dorsal, ventral, detail of head) **G–I** *Dalmoburis amator* (dorsal, ventral, lateral) **J–L** *Dalmonexus bellator* (dorsal, ventral, lateral) **M–O** *Trimicerus fenestratus* (dorsal, detail of head, lateral) **P–R** *Trimicerus horarius* (dorsal, ventral, lateral). Scale bars = 1.0mm unless otherwise indicated.

converging more or less evenly from the widest point to the base (not abruptly constricted), and having 2–4 distinct dorsobasal elytral foveae. They do have a subhumeral elytral fovea (unlike some Iniocyphini), but the subhumeral carina does not have a deep sulcus along its dorsal edge, as is seen in Proterini. The male genitalia were illustrated though not described for Park's (1976) Tobagoan species *B. tobagoensis* (originally in the synonymous *Insulomodes*), appearing to have distinct, setose parameres, a broadly rounded basal bulb, a short tegmen, and internal armature, similar to the species described below.

Batrisobryaxis bipox **sp. nov.**
Figs 127D–F, 128C–D

Type material. Holotype ♂ (ZSFQ-i23238): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 7.vi.2011, flowerfall sifting, AT1347, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12696, Morphosp. TBS.A.016"; deposited in ZSFQ.

Diagnosis. (TL: 1.6mm) Body (Fig. 127D) orange, weakly parallel-sided, uniformly rather densely setose, setae subrecumbent, those of head and pronotum, especially, convergent toward midline; head broadly subtriangular, narrowed to front, flattened above, weakly emarginate posteriorly; vertex (of male only?) with short, thin median carina (Fig. 127F), with pair of small setose tubercles at its anterior end; vertexal foveae present, shallow, located rather far forward, just dorsad antennal bases, connected by depressed, anteriorly arcuate transverse sulcus; eyes weakly protuberant, diameter about equal to post-ocular genal length; antennae short, scape elongate pill-shaped, antennomere II globular, III–VI bead-like, slightly transverse, VII–VIII becoming more distinctly transverse, with narrowed edges, IX wider & disk-like, X strongly transverse, XI about 4× length of X, sides rounded, apex narrowly subacute; pronotum wider than long, widest at about midpoint, sides narrowly rounded, more or less evenly convergent anteriorly and basally; lateral subbasal foveae present, shallow, connected by weakly 'V'-shaped transverse sulcus; elytra conjointly wider than long; flight wings present; each elytron with four dorsobasal foveae; subhumeral fovea present, with subhumeral carina behind; abdominal tergites approximately equal in length; abdomen rounded at sides, but with carinae where paratergal sutures would be; legs and venter lacking obvious secondary sexual characters. Aedeagus (Fig. 128C, D) with basal bulb well-developed, weakly sclerotized, with small ventral basal foramen, broadly membraneous dorsally; parameres present, originating on either side of apex of basal bulb, outwardly arcuate, flattened and widened to weakly emarginate apices, each with small denticle at its outer margin, and a single strong seta on its dorsum that extends beyond its apex; median portion of tegmen bluntly triangular, shorter than parameres; complex inner armature present within basal bulb, comprising at least one long, sinuate rod nearly as long as median portion of aedeagus, a second slightly shorter, narrower and simply curved rod, and a very short blunt basal rod.

Etymology. This species' name refers to the setose tubercles of the frons. It is used as a noun in apposition.

Distribution. This species is known only from the Tiputini Biodiversity Station in the Ecuadorian Amazon.

Remarks. Relative to the described species, this new species is perhaps most distinctive in the shape of the head, which here is quite broad, with a distinct median longitudinal carina, and a more nearly transverse vertexal sulcus (more arcuate in the described species. The pair of small setose tubercles on the new species' frons is unique. And the pronotum of this new species is also shorter and more transverse.

Dalmoburis Park, 1942
Figs 127G–I, 128E–F

In current catalogs, *Dalmoburis* Park includes just 1 species, *D. petrunkevitchii* Park from Panama (Asenjo *et al.* 2019). Park (1942) had also included '*Dalmoburis brevicollis'* (Sharp), though this species presently is back in *Dalmodes* Reitter where it was described. One new species is described below.

Diagnosis. Among Iniocyphini, *Dalmoburis* is distinguished by a lack of dorsobasal or subhumeral elytral foveae, evenly convergent (not posteriorly constricted) lateral pronotal margins, and abdominal tergites that are approximately equivalent in length. Male genitalia have never been described or illustrated. In the species described below, the basal bulb is broadly rounded, weakly desclerotized above, and with distinct, broad parameres fused to the basal bulb. The tegmen is poorly developed, and a complex articulated inner armature is present.

Dalmoburis amator **sp. nov.**
DNA barcodes: GenBank PX930300, PX930304
Figs 127G–I, 128E–F

Type material. Holotype ♂ (ZSFQ-i15249): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 23–27.v.2011, AT1307, M. Caterino, A. Tishechkin, under bark, rotting wood" / "Caterino DNA voucher, Ext. MSC-12499, Pselaphinae" / "ZSFQ-i15249"; deposited in ZSFQ. **Paratypes** (3♀): same locality as type (ZSFQ-i23243–i23245).

Diagnosis. (TL: 1.9mm) Body (Fig. 127G) elongate, orange, weakly and inconspicuously covered with short, semirecumbent setae; head broad, smooth, with sparse erect setae; eyes moderately protuberant; vertexal foveae distinct, in male joined by shallow, 'V'-shaped sulcus; sides of frons with narrow, shallow emargination just above antennal corners; labrum narrow at base, slightly widened to truncate, setose apex; antennal bases weakly elevated; antennae short, scape cylindrical, male antenna bent, antennomere II subquadrate, edges rounded, III–V short, weakly transverse, edges rounded, antennomere VII narrower on inner edge than outer, antennomeres VIII–X

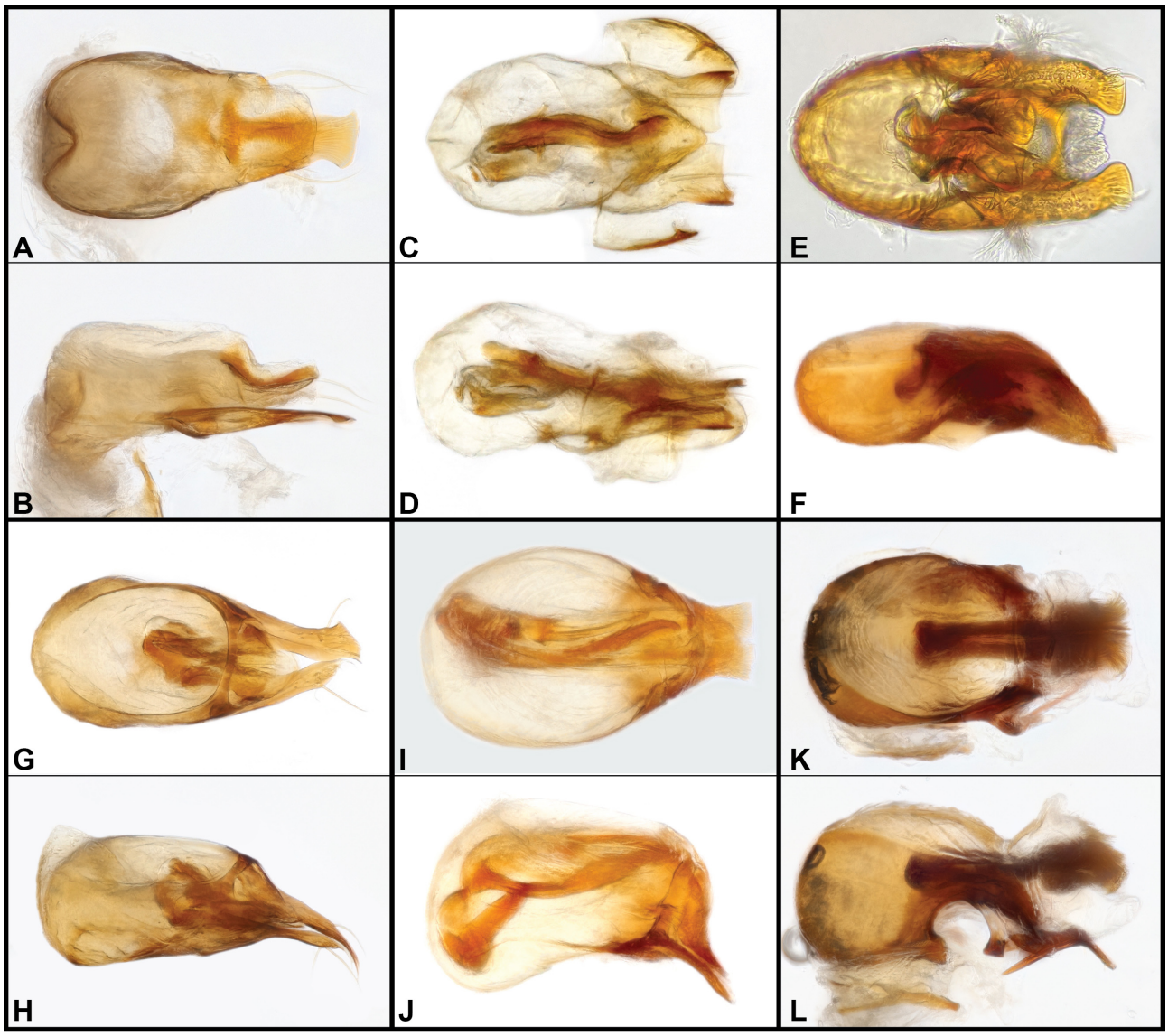

FIGURE 128. Aedeagus photos, Iniocyphini., dorsal, lateral views **A, B** *Batriphysis constrictus* **C, D** *Batrisobryaxis bipox* **E, F** *Dalmoburis amator* **G, H** *Dalmonexus bellator* **I, J** *Trimicerus fenestratus* **K, L** *Trimicerus horarius*.

slightly asymmetrical, wider along medial margin than outer; pronotum wide, rounded widened from base to apex; lateral foveae present, not too deep; median pronotal fovea absent, lateral foveae joined by distinct, sinuately 'V'-shaped transverse impression; elytra lacking dorsobasal and subhumeral foveae; male profemur (Fig. 127I) slightly pinched near apex of inner margin; male protibia abruptly thickened in apical half; male metatibia (Fig. 127I) strongly curved, with tooth near base of inner margin; last visible abdominal ventrite shallowly transversely depressed. Aedeagus (Fig. 128E, F) with basal bulb well developed, somewhat dorsoventrally flattened, membraneous above; parameres apparently fused, arched upward then down, flattening, bent inward to broadly subtruncate apices, with prominent setae just basad outer corner; tegmen shorter than parameres, weakly emarginate at apex; inner armature asymmetrical, with short curved acute processes dorsally, one with outer marginal denticles, and short broad laminate plates ventrally.

Etymology. The name of this species ('lover' in Latin) refers to the grasping male legs and the cordate pronotum.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. This species is generally similar to the one described species, *D. petrunkevitchii*, sharing an overall habitus and pronotal shape, in addition to particular defining generic characters. An interesting character they share, not previously mentioned, is the fine, vertical indentation of the lateral margin of the frons, perhaps homologous with the deeper incision seen in species of *Trimicerus* Motschulsky. *Dalmoburis amator* differs from the described species in having a shallower basal pronotal sulcus, which is further forward than in *D. petrunkevitchii*. The arcuate depression of the head is shallower in the new species, while the sides of the head are slightly more parallel (not convergent). The body setae of the new

species are denser and shorter. The modifications of the metatibia in the new species, which it may meaningfully share with *Dalmodes brevicollis* (Sharp) (for a time also considered to belong to *Dalmoburis*) are not present in *D. petrunkevitchii*.

Dalmonexus Park, 1942

Figs 127J–L, 128G–H

This genus contains two described species, from Panama and Tobago (Park 1976; Asenjo *et al.* 2019). One new species is described below.

Diagnosis. *Dalmonexus* shares with other Iniocyphini a lack of subhumeral fovea, with a relatively weak subhumeral stria, and, as Goniaceritae, partial fusion of the abdominal tergites and sternites. It is distinguished from other members of the tribe by the swollen male vertex, bearing a median longitudinal carina that is observed in both sexes. They have the pronotum abruptly constricted at the base, and, though not mentioned in Park's (1942) diagnosis, both the described species have relatively short antennae with a fairly compact three-segmented club. The described species also exhibit oblique setose incisions on the sides of the frons, shared with *Trimicerus* Motschulsky and *Phybytharsis* Park, and the metatibiae, especially of the males, are curved at the apex. Park (1942) states that *Dalmonexus* lacks dorsal elytral foveae, but a sutural fovea and one lateral fovea are visible in photos of both types. They share with many Proterini a similarly-shaped apical maxillary palpomere, which is swollen at the base, then tapers asymmetrically curving to a narrow, subacute apex, underscoring a close relationship between the two tribes. No male genitalia have previously been described or illustrated for the genus. The aedeagus of the species described here has a large, elongate basal bulb with large dorsal diaphragm, and a small ventral foramen. The parameres are present, though apparently mostly fused with the basal bulb, wide and setose apically. There is no fixed median lobe, as such, but a free armature may be extruded through a distal foramen above the parameres, few details of which can be made out in the single available specimen.

The new species described below fits this diagnosis in nearly all respects. One major difference, however, is that it lacks the setose lateral incisions in front of the eyes. Instead it has prominent lateral shelves that extend over the antennal bases. Whether the incisions have been covered up by these extensions, or have been otherwise lost is impossible to say. It does indicate that these genera are still only roughly characterized, and need more comprehensive study.

Dalmonexus bellator **sp. nov.**

DNA barcode: GenBank PX930209

Figs 127J–L, 128G–H

Type material. Holotype ♂ (MECN-EN 40847): "ECUADOR: Tungurahua, -1.4357˚, -78.3111˚, NaturetrekCandelariaRes, 2218, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13200, Morphosp. Cnd.016" / "MECN-EN 40807"; deposited in MECN.

Diagnosis. (TL: 1.9mm) Body (Fig. 127J) dark reddish-orange, moderately clothed with long, subrecumbent golden setae, the integument beneath smooth and shining, but mottled due to a seemingly punctate intraintegumental texture; male head (Fig. 127L) strongly inflated dorsally, bearing a median longitudinal carina along the crest; vertexal foveae displaced anterolaterad, situated at the bases of widened frontal 'wings' that extend over the antennal bases; epistoma finely and acutely projecting over labrum; eyes oval, moderately large, comprising about 30 ommatidia; antennae compact, scape short, cylindrical, about 1.75× as long as wide, antennomere II truncate at base, rounded apically, III–VI globular, slightly transverse, VII–IX progressively wider, transverse, almost hemispherical being truncate basally and rounded apically, XI about 4× as long as X, narrowed in apical third to bluntly acute apex; pronotum widest just behind middle, rounded anteriorly, abruptly constricted posteriorly; lateral pronotal foveae at extreme sides, surrounded by converging setae, connected by deep, arcuate transverse sulcus; elytra short, rounded at sides, each with sutural fovea and one lateral fovea, sutural stria weak; subhumeral fovea absent, stria fine, present in apical two-thirds; 1st abdominal segment about twice as long as 2nd; male last tergite (pygidium) slightly concave (Fig. 127K); prosternum with anterior margin smooth (not serrate); mesocoxae narrowly separated by mesoventral process (Fig. 127K); metacoxae separated by abdominal process about the width of one mesocoxa; metaventrite short; male last ventrite shallowly impressed; legs and venter lacking any obvious sexual dimorphisms. Aedeagus (Fig. 128G, H) with large, elongate basal bulb, with entire dorsal surface constituting dorsal diaphragm; diaphragmatic sclerite weak, diffuse; pair of ventral parameres extending distad from bottom third of basal bulb, dorsoventrally flattened, slightly asymmetrical, apices obliquely truncate, median lobe shorter than parameres, poorly defined; internal armature obscured, basally rounded, with 2 or 3 distal rods.

Etymology. The name of this species comes from a Latin term for 'warrior' referring to the helmeted appearance of the head.

Distribution. This species is known only from cloud forest on the south side of the Río Pastaza watershed, in the Cerro Candelaria Reserve, Tungurahua, Ecuador.

Remarks. This species has a much more strongly inflated vertex than either of the described species (or than the one known species of *Phybytharsis*), and it is easily recognized on that basis alone.

Trimicerus Motschulsky, 1885

Figs 127M–R, 128I–L

=*Batrybraxis* Reitter, 1882

=*Batribraxis* Schaufuss, 1887

Trimicerus currently contains 8 described species, distributed from Mexico to southern Brazil (Asenjo *et al.* 2019), sometimes treated under the now-synonymous *Batrybraxis* Reitter, e.g. by Park (1942). No species have previously been reported from Ecuador, with the nearest described species having been recorded from Venezuela, *T. longipennidis* Newton (a replacement name for *T. longipennis* (Raffray)). Two new species are described below.

Diagnosis. (TL: 1.6–1.9mm, Avg. 1.7mm) Currently, *Trimicerus* is conceived primarily as those Iniocyphini that possess oblique setose incisions on the sides of the frons behind the antennal insertions, a highly distinctive character (not, however, apparently limited to *Trimicerus*), while lacking dorsobasal elytral foveae (present in the similar *Dalmonexus*), and lacking any subhumeral marginal elytral carina (present in *Phybytharsis*) (the two latter genera are considered likely synonyms of each other by Chandler, unpub. data). Males may have modifications of the front of the head and/or the antennae, and they generally vary considerably in form, suggesting that further revision at higher levels is needed. No male genitalia have previously been illustrated or described for the genus. In the new species described here, the aedeagus has a large basal bulb with the dorsal diaphragm occupying most of its dorsal surface, and short, apparently fused parameres extending from near the distal base of the bulb. The distal surface of the aedeagus is closed by a dorsally hinged operculum that opens for the extrusion of what may be a complex articulated median armature.

Remarks. At least 5 other species belonging in this genus have been collected, in cloud forests on both sides of the Andean crest, as well as in Amazonian lowlands. Unfortunately they are only represented by females, and given the probable importance of male secondary sexual characters in species recognition (not to mention genitalic characters), these will remain undescribed for now.

Trimicerus fenestratus **sp. nov.**
Figs 127M–O, 128I–J

Type material. Holotype ♂ (ZSFQ-i23239): "ECUADOR: Orellana, 0.6376˚S, 76.1499˚W, Tiputini Biodiv. Sta., 2–9.vi.2011, general hand collecting, AT1341, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12719"; deposited in ZSFQ.

Diagnosis. (TL: 1.9mm) Body (Fig. 127M) globose, dark orange, with rather long but sparse semierect setae; head relatively short, eyes located at its base, eyes rather small but coarsely faceted; male vertex (Fig. 127M–O) transversely elevated on each side of median depression; frons deeply and broadly depressed, smooth on each side of thin median carina, carina ending toward evenly depressed epistoma; side of depression appearing incised, but incision closed by translucent cuticle; labrum short, simple; antennomere I cylindrical, rather short, curving anterad from downward-facing socket; antennomere II similar in width but shorter; antennomeres III~VII subquadrate, small, VIII slightly enlarged, IX–XI forming gradually enlarged setose club, antennomere XI bulbous at base, tapered to apex; pronotum with median portion of disk smooth, sparsely and shallowly punctate, basal groove complete, simple, weakly foveate at middle, expanding slightly at sides, incising lateral pronotal margin as dorsoventral setose groove; elytra with dorsobasal and subhumeral foveae obsolete; legs without obvious secondary sexual modifications. Aedeagus (Fig. 128I, J) with oval, strongly convex basal bulb, apex of tegmen covered distally with hinged dorsal plate; ventral apex of tegmen narrowed and then slightly widened to a symmetrical, truncate apex; aedeagus with elongate, curved internal armature that presumably extrudes from under hinged distal plate.

Etymology. This species is named for the 'window-like' incisions in front of the eyes.

Distribution. This species is known only from the Tiputini Biodiversity Station in the Ecuadorian Amazon.

Remarks. The frontal modifications of this species have no parallel in any other known species. The setose vertexal overhangs are unique, as are the deep, glabrous depressions (separated by a median carina) beneath.

Trimicerus horarius **sp. nov.**
Figs 127P–R, 128K–L

Type material. Holotype ♂ (MECN-EN 41950): "ECUADOR: Cotopaxi, -0.4191˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 1990m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12884, Morphosp. Ot.A.049" / "MECN-EN 41950"; deposited in MECN. **Paratypes** (3♂): same data as type (MECN-EN 41951–41953).

Diagnosis. (TL: 1.6mm) Body (Fig. 127P) subtly tricolored, the head and pronotum dark reddish, the elytra, abdomen and basal antennomeres lighter, dark orange, the legs and apical antennomeres lighter still, yellowish; sparsely setose, with very sparse, short recumbent setae, with sparser long, erect and anteriorly recurved setae, the latter especially on the elytra and abdomen; head with vertex swollen dorsally, with short, low median carina; vertex becoming rather strongly impressed anterad around vertexal foveae, located anterolaterally; sides of frons above and behind antennal bases obliquely incised, the incision densely setose, the frons elevated behind; anterior margin of frons broad, subquadrate, with projecting setae; eyes low on gena, comprising about 28 facets, diameter equal to post-ocular genal length; antenna long, antennomere I cylindrical, about 3× as long as wide, II similar in width, about half length of I, III–VI about 1.25× longer than wide, VII shorter, VIII quadrate, IX slightly larger, rounded, X–XI distinctly larger, forming loose club, XI about twice length of X, apically subacute; pronotum with sides strongly constricted at basal third, with deeply impressed arcuate sulcus from side-to-side, pronotal foveae not evident; pronotal sides rounded and slightly widened anterad constriction, short basal portion also slightly wider than constriction; elytra convex, with sides strongly rounded, each elytron with large sutural and one smaller lateral basal fovea; humeral angle elevated and

weakly carinate; subhumeral fovea absent; subhumeral stria present in distal two-thirds; 1st abdominal tergite about twice length of 2nd; sides of abdomen rounded, but with single lateral carina between tergite and ventrite; male mesotrochanter with small tooth on posterior margin; last male ventrite broadly and rather deeply depressed. Aedeagus (Fig. 128K, L) with large basal bulb, dorsum largely membraneous; tegmen curved strongly ventrad, with ventromedian subquadrate keel; left side of tegmen with elbow-like, flattened, distal process, bent inward, then distad, narrowing to blunt apex, a basally directed spike extending from near its apical bend; a broad, protrusible median rod extends from within basal bulb over tegmenal processes, terminating in a densely bottle-brush-like tuft.

Etymology. This species' name refers to its somewhat 'hourglass' shape, due to the strong pronotal constriction.

Distribution. This species is known only from mid-elevation cloud forests in the Bosque Integral Otonga, in northwestern Cotopaxi Province, Ecuador.

Remarks. While sharing genus-defining characters, this new species is distinct in numerous respects, and stretches the boundaries somewhat. Most obviously, the elytra possess basal foveae, purportedly absent from *Trimicerus,* while present in *Dalmonexus*. Further species discovery may bridge some of these differences or support further division.

Goniaceritae: Proterini

Harmomima Raffray, 1904

Fig. 129

Harmomima has, up until now, contained only 2 Bolivian species (Asenjo *et al.* 2019). Three new species are described below.

Diagnosis. (TL: 1.3–1.7mm, Avg. 1.5mm) The Proterini are first characterized as Goniaceritae having subequal-length first and second abdominal tergites and a sulcate subhumeral carina extending posterad from a distinct subhumeral fovea. Among them, *Harmomima* lacks a transverse basal pronotal sulcus. Male genitalia have never previously been described for any species of the genus. Those of the species described below, very similar on external characters, differ so greatly as to suggest different genera. The basal bulb is very large in both *H. sulcata* and *H. prominens,* in both with an apicoventral tegmen dwarfed by the bulb, although the position of the diaphragm is quite different. *Harmomima glabra*, on the other hand, has a small basal bulb and very prominent tegmen. Associating any with the generic type, however, will require that species (*Harmomima grandiceps* Raffray) to be dissected.

Harmomima glabra **sp. nov.**
DNA barcode: GenBank PX930305
Figs 129A–C, J–K

Type material. Holotype ♂ (ZSFQ-i23241): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12691, Morphosp. LL.A.027"; deposited in ZSFQ.

Diagnosis. (TL: 1.5mm) Body (Fig. 129A) orange, somewhat elongate, sparsely and inconspicuously setose; head (Fig. 129C) broad, smooth, finely setose; eyes slightly protuberant, diameter slightly more than half gena width, finely faceted; vertex slightly depressed on either side, with distinct pair of lateral foveae; frons slightly elevated between antennal bases, finely incised at sides; labrum narrow at base, slightly widened to truncate, setose apex; antennae short, scape short, cylindrical, antennomere II round, only slightly elongate, III–VIII small, bead-like, IX–X widened and increasingly transverse, XI about length of preceding 3 antennomeres combined, broad at base, tapered to subacute apex; pronotum more or less evenly widened from base to apex, disk with well developed lateral foveae and shallower median fovea, transverse basal impression absent, disk finely punctate, setae indistinct; each elytron with sutural and one humeral fovea, humerus produced laterad; elytra distinctly depressed along sutural stria; subhumeral fovea and stria well developed; male protrochanter with distinct tooth; male metatrochanter with curved flange-like process; last male abdominal ventrite discretely depressed in middle third, slightly produced along posterior margin. Aedeagus (Fig. 129J, K) with short basal bulb bearing paired, blunt, ventrolateral processes with weakly sclerotized parameres; tegmen wide, strongly curved ventrad, expanded to apex, membraneous above; inner armature comprising strongly sclerotized, median rod tapered to near apex, then expanded into rounded laminate process.

Etymology. This species is named for its minimally setose dorsum.

Distribution. This species is known only from the seasonal coastal forests of the Bosque Seco Lalo Loor, Manabí Province, Ecuador.

Remarks. The described species of *Harmomima* are not well characterized. But based on dorsal photographs of the types, the new species described here generally appear more elongate and with a more evenly posteriorly narrowed pronotum. *Harmomima glabra* differs from the following species in lacking the male modification of the frons, though it shares some secondary sexual characters of the legs.

Harmomima prominens **sp. nov.**
DNA barcode: GenBank PX930258
Figs 129D–F, L–M

Type material. Holotype ♂ (ZSFQ-i23240): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, FIT, 2200–2400m. AT1329, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12639, ElP.A.038"; deposited in ZSFQ.

Diagnosis. (TL: 1.7mm) Body (Fig. 129D) orange, elongate, sparsely and inconspicuously setose; head smooth, finely setose; eyes slightly protuberant, finely

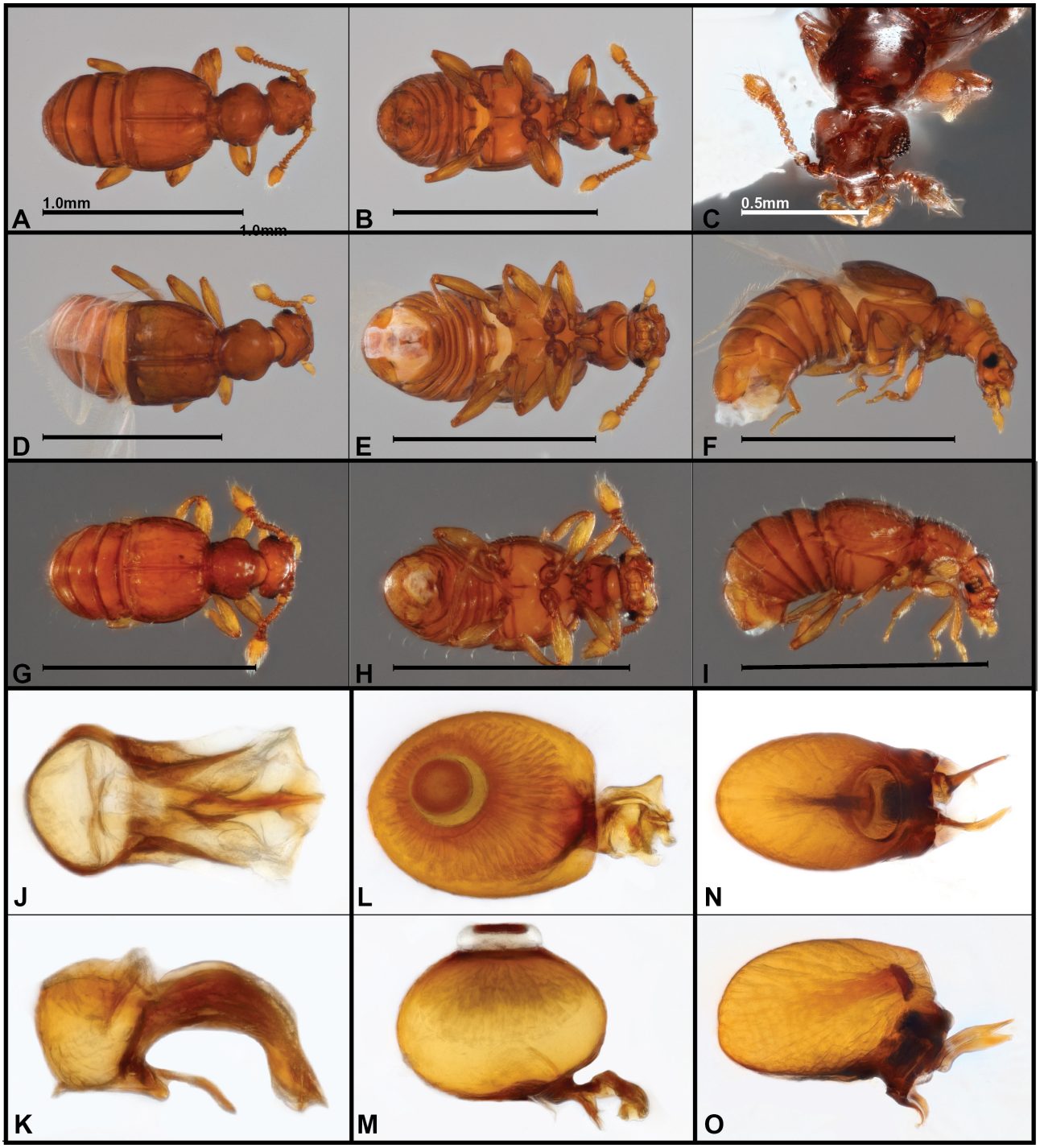

FIGURE 129. Photographs, *Harmomima* spp. **A–C, J, K** *H. glabra* (body: dorsal, ventral, frontal; aedeagus: dorsal, lateral) **D–F, L, M** *H. prominens* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *H. sulcata* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm unless otherwise indicated.

faceted; male vertex with raised, transverse median shelf, carinate anteriorly, frons depressed below, anteriorly with small median tubercle; labrum narrow at base, slightly widened to truncate, setose apex; antennae short, scape short, cylindrical, antennomere II elongate oval, III–VIII small, beadlike, IX–X widened and increasingly transverse, XI about length of preceding 4 antennomeres combined, broad at base, tapered to subacute apex; pronotum more or less evenly widened from base to apex, disk with well developed lateral foveae and shallower median fovea, transverse basal impression absent; each elytron with sutural and one humeral fovea, humerus produced laterad; elytra distinctly depressed along sutural stria; subhumeral fovea and stria well developed; last male tergite convex; prosternum with anterior margin serrate; male protrochanter with distinct tooth; male protibia weakly dentate at middle, slightly concave in basal half; male metatrochanter with curved flange-like process; last male abdominal ventrite slightly produced along posterior margin. Aedeagus (Fig. 129L, M) very large, occupying

more than half of abdomen; basal bulb comprising most of aedeagus, with small, transverse ventral basal foramen and larger, round dorsal diaphragm; tegmen with ventral setose 'tongue' and asymmetrically expanded dorsal plate with angulate corner.

Etymology. This species is named for its 'prominent' frontal shelf.

Distribution. This species is known only from the cloud forests of El Pahuma Orchid Reserve, Pichincha Province, Ecuador.

Remarks. Despite the radically distinct aedeagal structure of this species from the preceding, the two species do cluster together by DNA barcode. The two share apparent secondary sexual characters of the pro- and metatrochanters, but the elevated frontal shelf of the male of this species is unique.

Harmomima sulcata **sp. nov.**
DNA barcode: GenBank PX930236
Figs 129G–I, N–O

Type material. Holotype ♂ (MECN-EN 40764): "ECUADOR: Sucumbíos, -0.2074˚, -75.9269˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 2.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13109, Morphosp. Cu.026"; deposited in MECN. **Paratypes** (1♂, 1♀): same data as type (MECN-EN 40513, 40515).

Diagnosis. (TL: 1.3mm) This species is distinct from the others described here principally in the following: Body (Fig. 129A) uniformly orange, with inconspicuous recumbent setae and very sparsely scattered longer erect setae; vertex rather broadly produced over shallow median depression, with weak mediobasal impression; head with weak carina over eye; pronotum widest in front, sides rounded, weakly margined, depressed at sides, constricted anteriorly to very short anterior collar, constricted basally at lateral foveae; lateral foveae present, with straight, shallow transverse sulcus between them; median fovea weak; elytra short, only about 1.3× as long as pronotum, with sides rounded, depression extending posterad from lateral basal fovea not complete; 1st abdominal segment with paratergites; 2nd–4th segments not divided laterally, lacking lateral carina; male last tergite convex, apex emarginate; prosternum with precoxal foveae separated by about length of protrochanter; process separating mesocoxae very narrow; metaventrite short, only about 1.5× length of mesocoxa; male last ventrite depressed. Aedeagus (Fig. 129N, O) with basal bulb very large, elongate, with apical diaphragm, small diaphragmatic sclerite present; median lobe comprising very short apicoventral plate, curving strong ventrad; inner armature extruded comprising pair of thin, strongly sclerotized, acute rods.

Etymology. The name of this species refers to the deep (though not uniquely so) subhumeral elytral sulcus.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. I had initially considered this a species of the new genus, *Nunkui,* described below. However, it lacks the setose postantennal incisions that the species below exhibit, and its intermediate abdominal segments are not margined laterally—no paratergites are present except on the first visible segment. Its placement in *Harmomimus*, however, is also not entirely certain, as the posterior part of the pronotal disk is rather deeply, transversely depressed, if not fully sulcate.

Nunkui Caterino **gen. nov.**
Fig. 130

Type species. *Nunkui lineata* **sp. nov.**, by present designation.

Diagnosis. (TL: 0.9–1.1mm, Avg. 1.0mm) This genus shares the Proterini characters of: metacoxae flattened and widely separated by a broad process of the 1st abdominal ventrite, (common to most Goniaceritae), the 1st and 2nd abdominal tergites subequal in length (common to various Proterini and Iniocyphini), and a deeply sulcate elytral epipleuron (unique to Proterini). It is distinct from other Proterini principally in the deeply emarginate lateral frontal margins. These resemble those found in some Iniocyphini (e.g. *Trimicerus*), but are much more open, and continuous ventrad with a deep pre-ocular pocket. Other distinguishing characters include: body broad, slightly flattened; head swollen dorsomedially, with deeply impressed vertexal foveae anterolaterad this swelling, these foveae more or less connected by a 'V'-shaped sulcus; apical maxillary palpomere somewhat pear shaped, very broad at base, tapered apically to subacute apex, setose; antennae compact, with short cylindrical scape, mostly transverse intermediate antennomeres, and a 2-segmented club, with the basal club segment very short and transverse, the apical segment narrowly subacute and setose at the apex; base of pronotum complexly structured, with a weakly depressed transverse subbasal sulcus (lacking in *Harmomima*), shallowly impressed median and lateral foveae, shallow longitudinal sulci extending anterad the lateral foveae, and a series of shallow depressions along the pronotal base; lateral pronotal margins entire or constricted just posterolaterad the lateral foveae; base of each elytron with a sutural and one lateral fovea, with a more or less complete depression extending posterad from the lateral one (incomplete in *Harmophola* Raffray); subhumeral sulcus deep and broad, easily visible from above; 1st abdominal tergite with weak, oblique sublateral carinae, not quite the length of the segment; abdominal paratergites narrow but distinct, set off by a fine median suture; prosternum and metaventrite lacking median carina (as present in *Euharmophola* Park); anterior margin of prosternum distinctly serrate, a character not previously described but present in at least some other Proterini (e.g. *Harmomima*); mesocoxae narrowly separated by an anterior mesoventral process; metacoxae widely separated; legs short, femora weakly swollen, tibiae slender, widest just beyond middle, setose; tarsi short, 2nd tarsomere distinctly swollen, apical

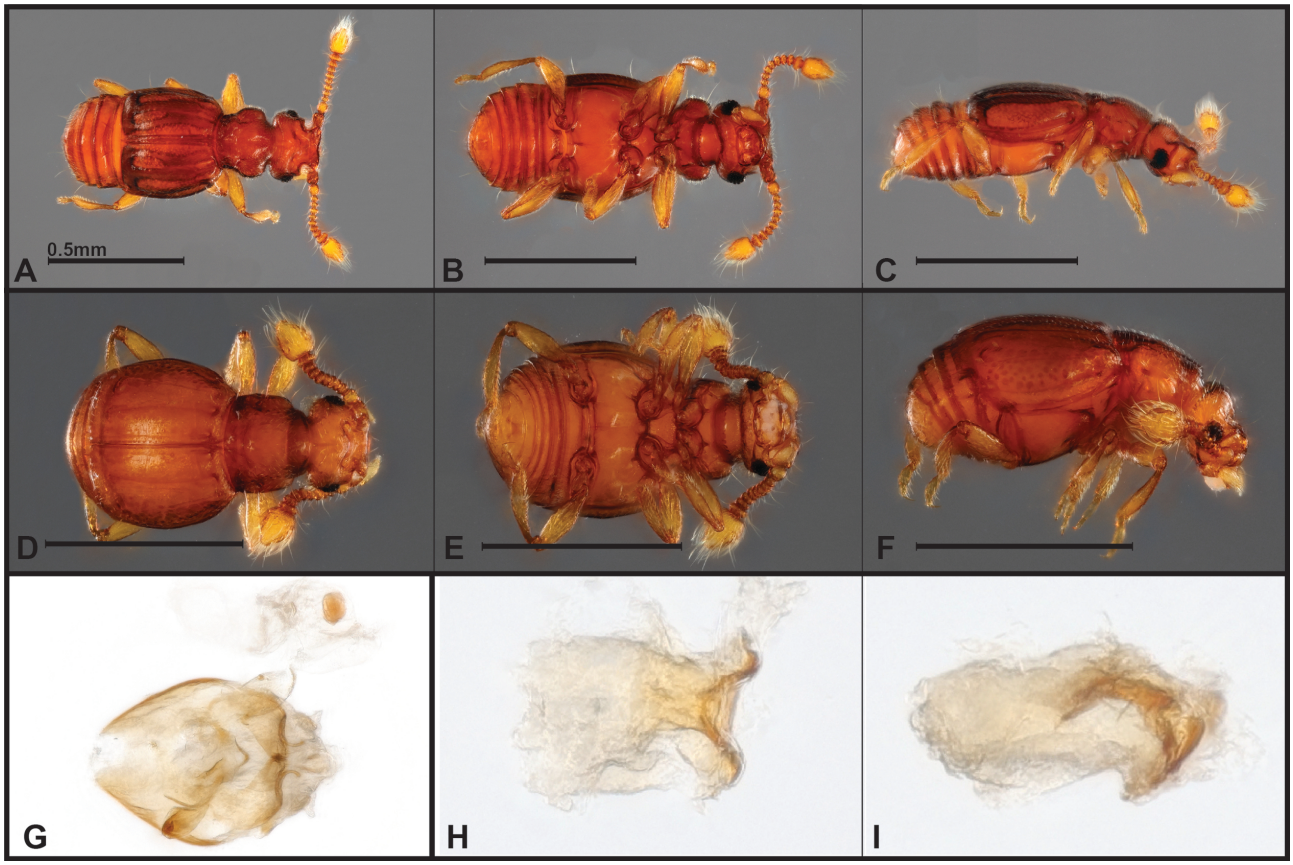

FIGURE 130. Photographs, *Nunkui* spp. **A–C, G** *N. lineata* (body: dorsal, ventral, lateral; female genital complex, distal view) **D–F, H–I** *N. parallela* (body: dorsal, ventral, lateral; female genital complex, dorsal & lateral views). Scale bars = 0.5mm.

tarsomere shorter and narrower; pretarsus of a single claw. Aedeagus unknown, as only female specimens have been studied.

Etymology. The name of the genus recalls a feminine forest spirit who, when properly acknowledged, promotes the fertility of the Shuar people and their cultivated staples. Nunkui also oversees the production of critical ceramics used in preparing the chicha (fermented cassava drink) and ayahuasca. The genus name is feminine (as are all the known specimens).

Remarks. None of the genera of Proterini are well-characterized, and the even the

distinction between this tribe and Iniocyphini needs further support. The epipleural sulcus that primarily distinguishes them varies considerably, while the frontal incisions shown by this species (and weakly by the new *Harmomima* species described above) are now also shared by the two tribes. Nonetheless, this taxon seems sufficiently distinct from anything yet described to warrant its recognition as a separate genus. It is perhaps sister to *Harmomima*, sharing a similar general habitus, with the most signfiicant difference being that which Park (1942) cites as diagnostic of the latter, *Nunkui* having a transverse basal pronotal sulcus that *Harmomima* is supposed to lack. The two species described here do differ in some reasonably significant characters, such as pronotal shape and degree of separation of both meso- and metacoxae, and it is conceivable that they represent distinct lineages. However, they also share many characters unusual in the tribe, as detailed above. Until males and the corresponding genitalic and secondary sexual characters can be assessed, their close relationship must be considered hypothetical.

In Fig. 130G–I images of what I believe are the female genital complex are presented. These have more sclerotized structure than many other examined female Pselaphinae, and it was not immediately clear what sex these specimens were. No features identifiable as aedeagus parts were evident however, whereas the aedeagus of the closely related *Harmomima* has a large and well-sclerotized basal bulb.

Nunkui lineata **sp. nov.**
DNA barcodes: GenBank PX930217, PX930313
Figs 130A–C, G

Type material. Holotype ♀ (MECN-EN 40808): "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13161, Morphosp. Mch.024"; deposited in MECN. **Other material:** 1♀ : "ECUADOR: Tungurahua, -1.4327˚, -78.3120˚, NaturetrekCandelariaRes, 2040m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13220, Morphosp. Cnd.037" (MECN-EN 40867).

Diagnosis. (TL: 1.1mm) This species' appearance

is covered largely by the generic diagnosis, with the following characters perhaps aiding species recognition: body (Fig. 130A) color mostly dark orange, legs and antennae ligher, golden, with elytra appearing longitudinally banded; body uniformly setose, most setae short and subrecumbent, with very few longer, erect setae mostly along the sides of the elytra and on the abdominal tergites; head broad, transverse behind very deep lateral post-antennal incisions (Fig. 130A); eyes large, emarginate posteriorly, comprising about 38 ommatidia; antennae rather compact; pronotum wider than long, sides in front of basal constriction rounded, narrowed anterad to short collar, abruptly narrowed to base; pronotal disk weakly depressed along lateral margins, and multiply dimpled along base; elytra with sides weakly rounded, apicolateral corners slightly prolonged, appearing diffusely, longitudinally banded, the bands darkly outlined, lighter and granulate within, with broad sutural and humeral bands and shorter apicomedian one; humeral corner of elytron slightly dentate at base of deep subhumeral sulcus; first four abdominal segments with distinct paratergites; venter smooth, glabrous; mesocoxae separated by about one-fourth the width of one coxa; metaventrite long, almost 3× length of one mesocoxa; last female abdominal ventrite with 4 small basal teeth.

Etymology. This species' name refers to the striped appearance of the elytra.

Distribution. This species is found on both sides of the Río Pastaza, above 2000m, the known localities separated by about 7 km by air, with a 1000m deeper valley between them.

Remarks. There are several differences between this and *Nunkui parallela*, most particularly the more distinct paratergites of the abdomen. However, the similarities in head, antennal, pronotal, prosternal, and subhumeral structure argue that they do comprise a lineage.

Nunkui parallela **sp. nov.**
DNA barcode: GenBank PX930234
Figs 130D–F, I

Type material. Holotype ♀ (MECN-EN 40762): "ECUADOR: Sucumbíos, -0.2077˚, -75.9272˚, ResProdFaunaCuyabeno, Waita Lodge Trails 220m, 2.XI.2024, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13107, Morphosp. Cu.024"; deposited in MECN.

Diagnosis. (TL: 0.9mm) This species follows the generic description in most characters. The body (Fig. 130D) is uniformly orange, with short, fairly inconspicuous setae on most surfaces, although the sides of the pronotum have longer setae; head widest at rear; vertexal foveae deeply impressed, with deep convergent sulci anterad; post-antennal incisions deep and setose; eyes medium-sized, comprising about 20 ommatidia; antennae compact, with short, cylindrical scape, antennomeres II–IX transverse, progressively widening slightly apicad, X wider, short, almost cupuliform, XI bulbous at base, setose, tapered to narrowly rounded apex; pronotum with sides subparallel, barely widened at basal third, narrowed only at front to short anterior collar; pronotal disk without distinct foveae, with only very shallow, inconspicuous transverse depression; elytra long, sides strongly rounded, each with sutural and one lateral fovea, with shallow depressions extending posterad from each lateral one nearly the elytral length; subhumeral fovea deeply impressed, with sulcate impression posterad along entire elytral length; first four abdominal segments with lateral carina, only first with paratergite; mesocoxae distinctly separated, mesoventral process between them about half the width of one coxa; metaventrite short, about 1.5× length of one mesocoxa.

Etymology. The name of this species derives from the approximately parallel pronotal margins.

Distribution. This species is known only from the Amazonian lowlands within the Cuyabeno Wildlife Reserve, in northeastern Ecuador.

Remarks. Known from only a female, there was some initial concern that it might be the female of *Harmomima sulcata*, from the same locality and known only from a male. However, the differences between them are reasonably substantial, and support that they are distinct. Most importantly the pronotal shape is very different, with the parallel-sided pronotum that gives this species its name very unusual, not only for the genus, but for the tribe. In addition the longer elytra and wider mesocoxal separation in *N. parallela* are not differences associated with sex. Neither of these have the subhumeral stria as deeply sulcate as in *N. lineata* (described below).

Goniaceritae: incertae sedis

A number of new taxa have come to light that so far defy confident placement to tribe, while possessing most or all of the characters of the supertribe Goniaceritae. Their possible relationships based on interpretations of various character systems are discussed under their respective descriptions.

Ayapuna Caterino, **gen. nov.**
Figs 131–132

Type species. *Ayapuna tunda* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.1–1.6mm, Avg. 1.4mm) Body (Fig. 131) small, sparsely setose; head subtriangular, flattened above; vertexal foveae present, shallow; antenna short, with 2- segmented club, antennomere X subcupuliform, XI ovoid, with distinct specialized setae; venter of head with dense beard of trogastrine-like anteriorly directed setae; pronotum widest at middle, with median longitudinal and lateral longitudinal sulci; lateral subbasal pronotal foveae deeply impressed; transverse subbasal pronotal sulcus present, interrupted by raised points on either side of midline; base of pronotum uneven, somewhat coarsely sculptured, depressed on either side of midline; each elytron with four basal foveae, may have

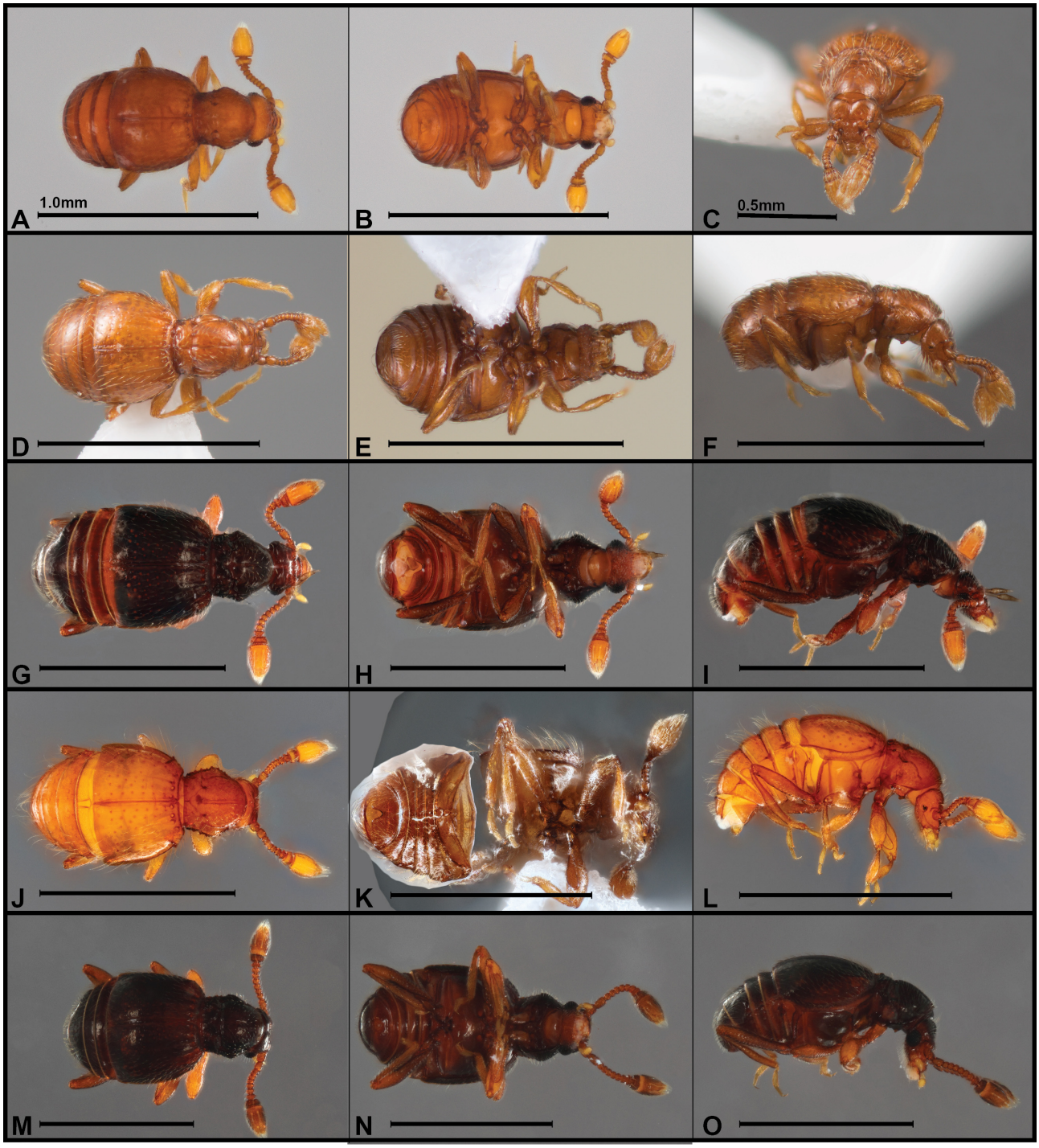

FIGURE 131. Habitus photos, *Ayapuna* spp., dorsal, ventral, lateral views **A–C** *A. tunda* (macrophthalmous) **D–F** *A. tunda* (microphthalmous) **G–I** *A. advector* **J–L** *A. goaltalensis* **M–O** *A. sculptilis.* Scale bars = 1.0mm unless otherwise indicated.

elytral striae extending posterad from foveae; subhumeral fovea deep, subhumeral carina complete; abdomen lacking paratergites, with lateral carinae separating tergites from sternites; profemur with large, oval sensory patches on most of anterior (inner) surface (Fig. 131C); anterior prosternal margin serrate, each denticle quadrate, prosternum with small median knob (Fig. 131F, I, L, O); hypomera longitudinally carinate along weak depression for reception of head; second tarsomeres long and slightly swollen, ultimate tarsomeres shorter and thinner; male last abdominal ventrite emarginate with small penial plate. The aedeagus is similar among species (Fig. 132), with a large basal bulb bearing a small, anterodorsal diaphragam, and a short, ventromedian keel; a single apparent paramere extends distad along the lower left side of the tegmen, ending freely near its apex; the tegmen is elongate, rather simple, curved ventrolaterad to the left, with an extrusible, multidenticulate internal sac extruded from its apex.

Etymology. The name of this genus combines two Kichwa words ‘aya’ and ‘puna’, together meaning ‘spirit of the mountain’. While Kichwa is not a gendered language, I use it here as feminine.

Distribution. The species of this genus are known from both sides of the Andean crest, from coastal seasonal forest to upper elevation cloud forests.

Remarks. At least the type species, and probably others, have polymorphic males. Large eyed males are winged, whereas small-eyed males are wingless (with short elytra and correspondingly short metathoraces).

The tribal relationships of *Ayapuna* are difficult to determine. The lack of abdominal paratergites and basically fused (with carinae) sternites and tergites support placement in Goniaceritae, whereas its general habitus seems more consistent with Euplectitae, including the pronotal shape, with a median longitudinal sulcus, and reduction of the antennal club to a two antennomeres (the basalmost much shorter than apical). The distinct sensory area of the profemur is found in a variety of Euplectitae, including Metopiasini, to varying degrees in Trichonychini: Panaphantina (e.g. *Biblomelba* Park, *Ramecia* Casey), and in the otherwise quite dissimilar *Tinkuna*, described elsewhere in this paper. A number of Trimiina genera (e.g. *Triangusella* Park, *Dalmosanus* Park) also have significant similarites, particularly in antennal structure, pronotal shape, and head shape. Male genitalia exhibit a small, well-developed anterodorsal diaphragm, well-developed basal bulb, and elongate, sclerotized apical blade, consistent with several Euplectitae (e.g. *Euplectus* Leach, *Pycnoplectus* Casey), but also with such Goniaceritae as *Euphalepsus* (Brachyglutini: Baradina). The compact antennal club is quite inconsistent with the latter, which invariably has a loose 3-segmented club. The species exhibit a finely 'serrated' prosternal margin similar to some Proterini, seen also in Euplectitae: Bythinoplectini. More work will be necessary to refine the position of this interesting genus.

Ayapuna tunda **sp. nov.**
DNA barcodes: GenBank PX930202, PX930291, PX930292
Figs 131A–F, 132A–B

Type material. Holotype ♂ (ZSFQ-i23311): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 22.v.2011, AT1312, M. Caterino, A. Tishechkin, Leaf/rotting stick litter" / "Caterino DNA voucher, Ext. MSC-12675, Morphosp. LL.A.011"; deposited in ZSFQ. **Paratypes** (2♂, 6♀): same data as type (ZSFQ-i14978–14981, i23312–i23315). **Additional material:** 1♀: "ECUADOR: Santa Elena, 1.83636˚S, 80.64298˚W, Manglaralto, Barcelona, 11.III.2024, Winkler, 115m, M. Barreno | A. Pazmiño" / "Caterino DNA voucher, Ext. MSC-12772, Morphosp. Bar.A.004" (MECN-EN 38557).

Diagnosis. (TL: 1.1mm) Body (Fig. 131A–F) small, orange, sparsely clothed with subrecumbent setae; head short, emarginate at base; vertexal foveae weak; major male eyes well developed (Fig. 131B), convex, occupying most of gena; minor male and female eyes (Fig. 131F) reduced to a few facets; antennae compact, scape short, cylindrical, antennomere II roundly subquadrate, slightly shorter, antennomeres III–VIII short, transverse, IX slightly wider, X cupuliform, smooth, wider at apex than base, XI forming large, oval, tomentose club; venter of head with dense beard of short setae; pronotum widest, subangulate near middle, slightly constricted immediately behind, weakly multidentate, narrowed evenly to apex; disk with shallow median longitudinal sulcus and deeper transverse subbasal sulcus; lateral and sublateral foveae present in transverse sulcus; elytra rather short (wingless?), rounded; 1st and 2nd abdominal tergites similar and short, 3rd and 4th increasingly longer, 5th forming pygidium; prosternum with conspicuous median tooth in front of coxae; profemur with sensory patches delimited by carinae. Aedeagus (Fig. 132A, B) with large, round basal bulb, basal foramen small and ventral with small ventral tooth at its base, dorsal diaphragm distinct, small, located on apicoventral surface, with round diaphragmatic sclerite; tegmen with long ventral blade with basoventral keel, rounded apically, and shorter, sinuous lobe located immediately above it, expanded slightly toward apex, curving to left and bearing extrusible internal sac.

Etymology. This species' name refers to Tunda, a mythical coastal Ecuadorian creature, a shapeshifting woman of the forest that lures unsuspecting men to their doom. The shapeshifting is particularly apt for this polymorphic species.

Distribution. This species is known from two coastal sites, both seasonally dry forest, in Manabí and Santa Elena Provinces, Ecuador.

Remarks. Males of this interesting species are polymorphic, some small-eyed and wingless like the females, and some large-eyed and winged (although still lightly pigmented). Male genitalia do not differ between the forms, and they cluster closely in the COI barcode tree (Fig. 138 below). Only one of the three males reported here is the macrophthalmous/macropterous form.

Ayapuna advector **sp. nov.**
Figs 131G–I, 132C–D

Type material. Holotype ♂ (MECN-EN 40839): "ECUADOR: Tungurahua, -1.4361˚, -78.3105˚, NaturetrekCandelariaRes, 2241m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13192, Morphosp. Cnd.008"; deposited in MECN. **Paratypes** (1♂, 1♀): same data as type. **Additional material:** 1♀: "ECUADOR: Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13164, Morphosp. Mch.027" (MECN-EN 40811).

Diagnosis. (TL: 1.6mm) This species is nearly indistinguishable from *A. sculptilis* (below) externally, with large-eyed, winged males (Fig. 131G–I), and small-eyed, wingless females. The lateral pronotal margin is slightly more strongly dentate, with the tooth distinctly anterad middle; the frons is smoother; antennomere X sclerotized, cupuliform (widened to apex), tightly associated with XI. Aedeagus (Fig. 132C, D) also extremely similar, with

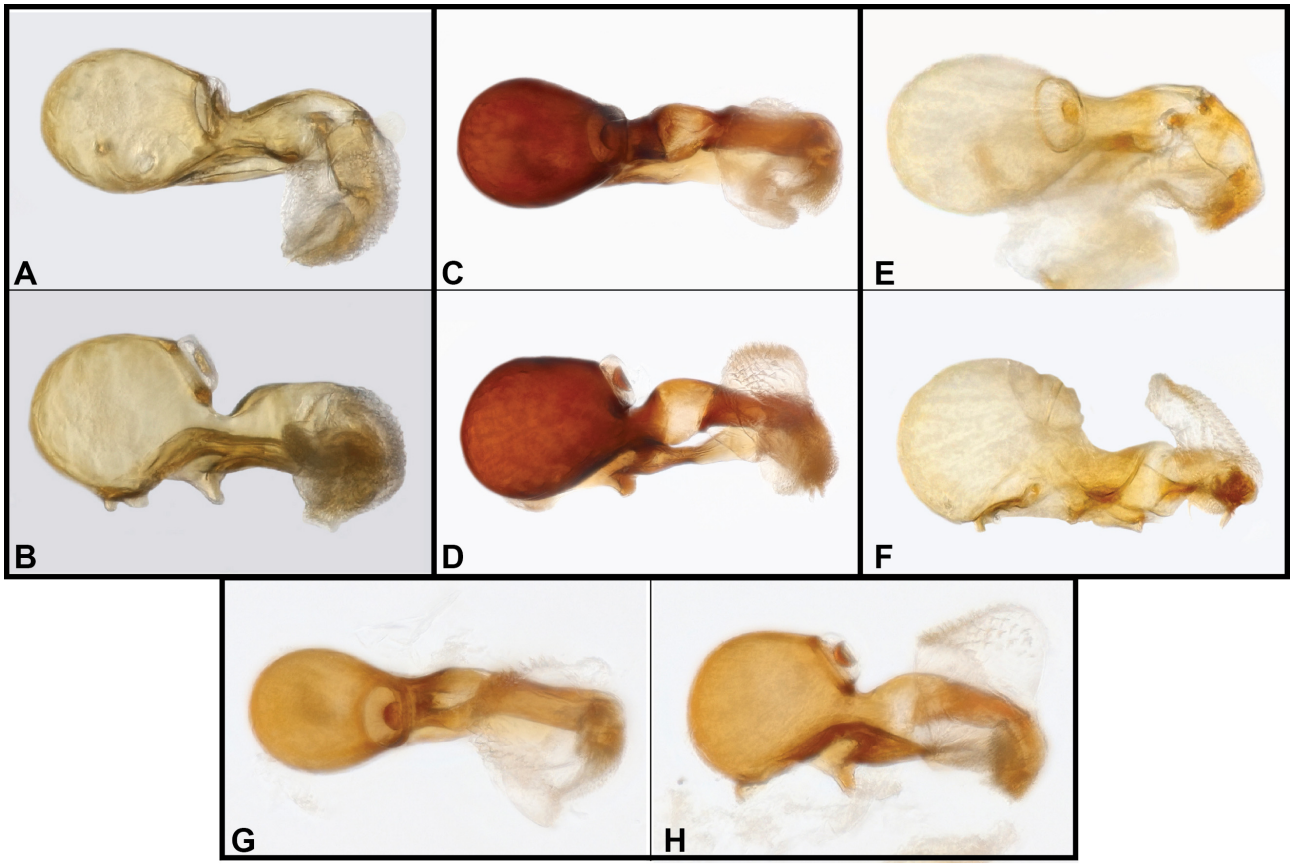

FIGURE 132. Aedeagus photos, *Ayapuna* spp., dorsal, lateral views **A, B** *A. tunda* **C, D** *A. advector* **E, F** *A. goaltalensis* **G, H** *A. sculptilis*.

the basal bulb slightly more elongate, the ventral keel blunter, and the tegmen more abruptly swollen beyond the junction with the basal bulb; the paramere appears to broaden more significantly toward the apex.

Etymology. This species' name refers to the fact that its type was 'carrying' two individual Laboulbeniales fungi on its frons.

Distribution. This species is known only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador.

Remarks. The close similarity of this species to one from Otonga (140km to the northwest, on the other side of the Andes), is surprising given their flightless females. A single female, very likely of this species, was also collected at the Río Machay Reserve, across the Río Pastaza, at a similar elevation.

Ayapuna goaltalensis **sp. nov.**
Figs 131J–L, 132E–F

Type material. Holotype ♂ (MECN-EN 40902): "ECUADOR: Carchi, 0.8050˚, -78.1711˚, El Goaltal, 1317m, 08.II.2025, M.Caterino, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13321, Morphosp. Goal.005" / "MECN-EN 40902"; deposited in MECN.

Diagnosis. (TL: 1.3mm) This species is very similar to the microphthalmous form of *A. tunda* described above, differing principally in the following characters; body (Fig. 131J) lighter orange (though apparently teneral), very sparsely and finely punctate, mostly smooth and shining, clothed with long suberect setae; antennae compact, all funicular antennomeres clearly transverse, antennomere IX very thin, X transverse, narrowed at inner edge, not too tightly associated with XI; lateral pronotal margins distinctly denticulate (Fig. 131J), median longitudinal pronotal sulcus deep and distinct; basal transverse sulcus widened at middle; lateral longitudinal pronotal impressions well developed; elytral humeri strongly dentate. Aedeagus (Fig. 132E, F) with only weak basal keel; tegmen weakly humped beyond base, less strongly bent to right, with basal plate that twists over an acute inner median process.

Etymology. This species' name refers to its type locality.

Distribution. This species is known from lower cloud forests of Carchi Province, in far northern Ecuador.

Remarks. This species is known only from a single, microphthalmous male. It is therefore impossible to know how fully this characterizes the species. It seems likely that it will be found to exhibit the polymorphism known for the type species. It is nevertheless distinguishable by its distinctly serrate pronotal margin, strongly impressed lateral pronotal margins, and details of the terminal antennomeres, especially the very thin antennomere IX.

Differences in male genitalia are subtle, but evident in the basal shape of the tegmen.

Ayapuna sculptilis **sp. nov.**
Figs 131M–O, 132G–H

Type material. Holotype ♂ (MECN-EN 41688): "ECUADOR: Cotopaxi, -0.4191˚, -79.0039˚, Bosque Integral Otonga, 13.VIII.2024, 1990m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12882, Morphosp. Ot.A.047"; deposited in MECN. **Paratypes** (1♀): same locality as type, -0.4157˚, -79.0046˚, 2132m, 14.VIII.2024 (MECN-EN 41689).

Diagnosis. (TL: 1.6mm) Body (Fig. 131M) dark castaneous, sparsely setose; male eyes prominent, occupying most of gena; venter of head densely clothed with erect setae; antennal scape cylindrical, short, pedicel cylindrical, shorter, antennomeres III–VIII similar, shorter than long, IX wider, transverse, X subcupuliform, broad, sclerotized, expanded to apex, XI densely tomentose, almost 4× as long as X, with few longer coarser setae in circumferental series; pronotum widest, subangulate near middle, slightly narrowed to base, weakly multidentate, narrowed more smootly to apex; disk with shallow median longitudinal sulcus and deeper transverse subbasal sulcus, where they meet is a broad 'V'-shaped depression; elytra long, weakly rounded (male winged), each elytron with four small dorsobasal foveae, short shallow sulci extended posterad from outer foveae. Aedeagus (Fig. 132G, H) with large basal bulb, small diaphragm present at dorsoapical margin (above base of tegmen), distinct diaphragmatic sclerite present; tegmen with prominent but short basal keel, ventral process otherwise short, dorsal process longer, subtubular, bent slightly, apically rounded with denticulate internal sac everted through its dorsal apex.

Etymology. This species' name refers to the 'sculpted' pronotum, common to members of the genus.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. While closely related to the above, *A. advector* especially, this species differs in several respects, most related to a more 'complete' morphology, being winged, macrophthalmous, etc.

Zhapra Caterino, **gen. nov.**
Fig. 133

Type species. *Zhapra maldonadae* **sp. nov.**, by present designation.

Diagnosis. (TL: 1.0–1.2mm, Avg. 1.1mm) Body (Fig. 133A–F) rather short and wide, sides rounded, castaneus, sparsely setose, the head and pronotum distinctly sculptured; head short with elevated posterior vertexal margin and short, median longitudinal vertexal carina; vertexal foveae deeply impressed; antennal cavities open, smooth in front of eyes to epistoma; eyes large, protruding, finely faceted; ventral surface of genae with few long, erect setae; antennae compact, with cylindrical scape, globular pedicel, short intermediate antennomeres, IX–XI forming weak club, XI strongly acuminate; basal portion of pronotal disk with short lateral longitudinal carinae just mediad lateral basal foveae; median discal fovea absent; anterior corners of pronotum foveate; pronotum short, about as wide as head, strongly sculptured, with complete median longitudinal carina only slightly interrupted by complete subbasal sulcus, distinctly margined; elytra with sutural and two lateral dorsobasal foveae, the sutural and first lateral rather close together; subhumeral fovea and complete subhumeral stria present; abdominal tergites short, margined laterally, with narrow paratergites; 1st tergite with widely separated pair of arcuate longitudinal carinae; prosternum with weak median carina; mesoventrite with carina in front of each mesocoxa, mesocoxae separated by about one-third coxal width; metaventrite simply convex; metacoxae with median corners meeting; apical margin of male last ventrite sinuate; legs short, simple; 2nd tarsomeres swollen, longer than 3rd; claws long, either single or extremely asymmetrical. Aedeagus with dominant basal bulb bearing large dorsal or dorsobasal diaphragm; parameres present, though may be asymmetrical; median lobe poorly developed.

Etymology. The genus name comes from a Kichwa word meaning 'hojarasca', the common Spanish for 'leaf litter'. While Kichwa is not a gendered language, I use it as feminine.

Distribution. This genus is known from localities on both sides of the Andean crest, in Cotopaxi and Tungurahua Provinces, in both cases in mid- to upper-elevation cloud forests.

Remarks. This genus is similar in many respects to *Euharmophola* Park (presently Proterini), which is known from a single female specimen from Jamaica. The two are probably closely related. Yet, they differ in a number of moderately significant characters. In particular, *Euharmophola* is described as having a complete median metaventral carina, contiguous mesocoxae, serrate pronotal margin, only two dorsobasal elytral foveae, and the pair of carinae on the 1st abdominal tergite close and parallel. Park (1960) described the first abdominal segment of *Euharmophola* as having "no lateral margin *per se*", whereas both *Zhapra* species described here have distinct, if narrow, paratergites. Further, being a female, the male genitalic characters of *Euharmophola* are unknown. It is possible that these differences may be bridged by discovery of additional species, but given this fairly lengthy list of differences, I would maintain they are sufficiently distinct to be recognized at the generic level.

Otherwise, this genus is distinctive among neotropical Pselaphines, distinguished by dorsal sculpturing, acuminate antenna, carinate prosternum, and swollen second tarsomeres. The species share some of these characters with the preceding genus (*Ayapuna*), particularly the sculptured appearance of the head and pronotum, and swollen 2nd tarsomeres. However, these seem to be superficial, as they are countered by a variety of other characters. The possession of ventral setae on the

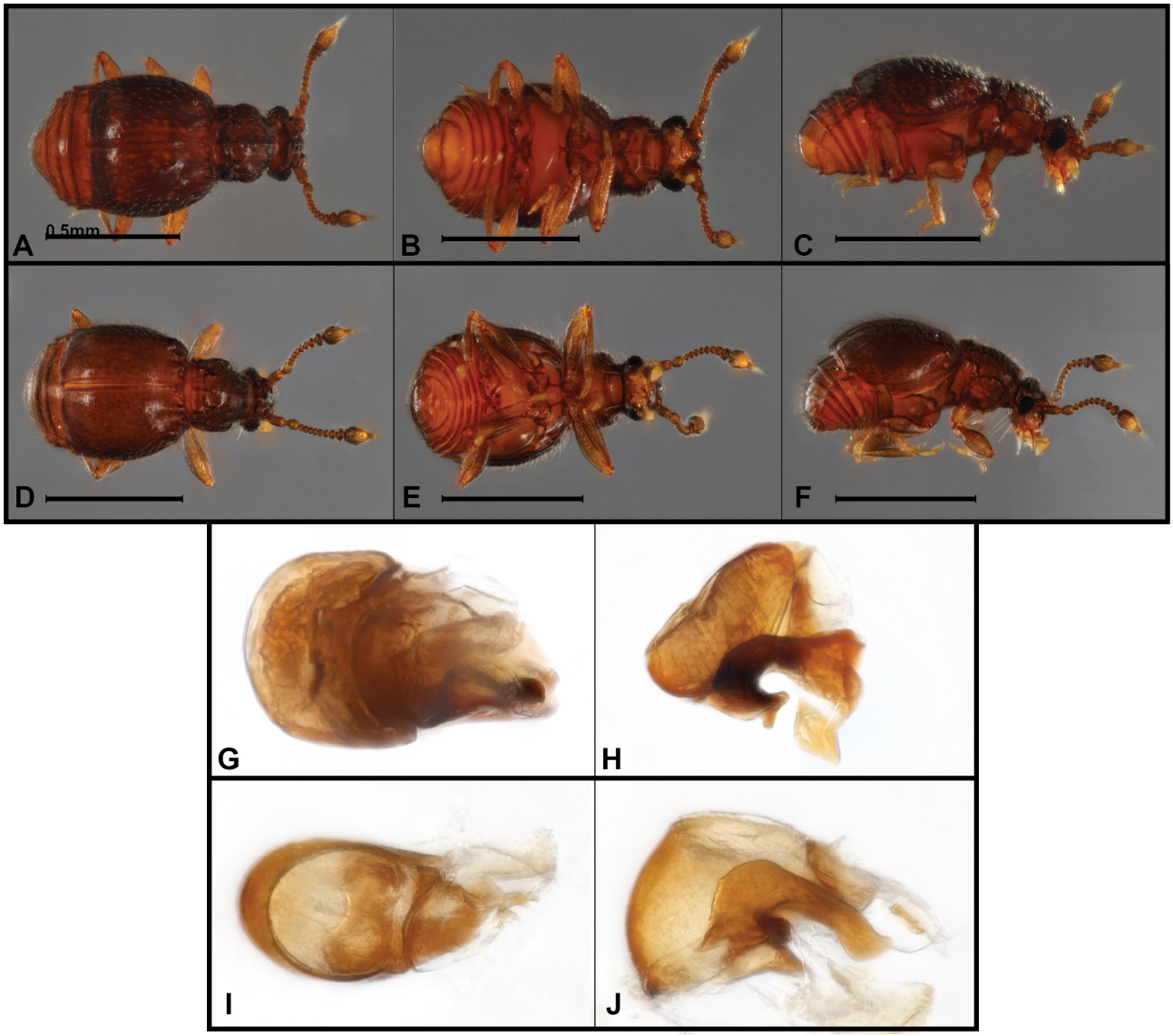

FIGURE 133. Photographs, *Zhapra* spp. **A–C, G, H** *Z. maldonadae* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *Z. candelaria* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 0.5mm.

head (at least in *Zhapra*; not described in *Euharmophola*) might also at a very general level be considered similar. But those of *Zhapra* are few and long, strongly resembling those of *Euphalepsus*, while those of *Ayapuna* are much denser and very reminiscent of Trogastrina. Also, where *Ayapuna* has a median pronotal sulcus, similar to those of many other Euplectitae, *Zhapra* has a carina. The male genitalia of the two are very different, with those of *Zhapra* retaining at least one well-developed paramere, which suggests relationships within or close to brachyglutine Goniaceritae.

Zhapra maldonadae **sp. nov.**
DNA barcode: GenBank PX930342
Figs 133A–C, G–H

Type material. Holotype ♂ (MECN-EN 38596): "ECUADOR: Cotopaxi, -0.4192˚, -79.0031˚, Bosque Integral Otonga, 13.VIII.2024, 1966m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-13306, Morphosp. Ot.A.017"; deposited in MECN. **Paratypes** (3♀, same general locality and date as type): 1: -0.4176˚, -79.0041˚, 2062m; 1: -0.4187˚, -79.0039˚, 2008m; 1: -0.4194˚, -79.0033˚, 13.VIII.2024, 1963m (MECN-EN 38594–38595, MECN-EN 42064).

Diagnosis. (TL: 1.2mm) Body (Fig. 133A) small, dark, sparsely clothed with short curved, subrecumbent setae; head short, with elevated posterior vertexal margin and short, median longitudinal vertexal carina; vertexal foveae deeply impressed; frons transversely impressed between eyes; antennal insertions distinctly swollen above; antennal cavities rather large and smooth in front of eyes to epistoma; eyes large, protruding, finely faceted; ventral surface of genae with 5 long, erect setae on each side, frontmost acute and anteriorly directed, posterior ones perpendicular to head and weakly spatulate; antenna with scape cylindrical, about twice as long as globular pedicel, antennomeres III–V rounded, weakly transverse; VI–X progressively wider and more transverse, IX–XI

forming weakly differentiated compact club, XI strongly acuminate, about 4× as long as X, with dense cluster of apical setae; pronotum short, about as wide as head, strongly sculptured, with complete median longitudinal carina only slightly interrupted by complete subbasal sulcus, the transverse sulcus enlarged on each side of median carina; sides rounded anterad and weakly posterad basal sulcus, widest anteriorly, distinctly margined; basal portion of disk with short lateral longitudinal carinae just mediad lateral basal foveae; median discal fovea absent; anterior corners of pronotum foveate; elytra long (winged), sides rounded, each elytron with small sutural and two large lateral dorsobasal foveae; subhumeral fovea large, subhumeral stria present; abdominal segments short, 1st and 4th visible tergites slightly longer than 2nd and 3rd, pygidium convex; lateral abdominal carina well developed, inner groove present on most tergites, delimiting narrow paratergites; prosternum with weak median carina; metaventrite wide, rather short, about twice length of metacoxa, smooth and glabrous; abdominal ventrites smooth; last male abdominal ventrite longer, depressed at middle, slightly raised on either side; legs short, simple, 2nd tarsomeres swollen, longer than 3rd, claw long, either single or extremely asymmetrical (with one claw thereby inconspicuous). Aedeagus (Fig. 133G, H) with vertically ovoid basal bulb, bearing broadly open dorsal diaphragm on most of dorsobasal surface, diaphragmatic sclerite inconspicuous; strong basal knob present, bearing apparent parameres, fused at the base, left one curving strongly dorsad then distad, with weakly sclerotized, obliquely subquadrate ventral process extending from its inner margin, the right very short and bluntly rounded; median lobe extending distad above ventral paramere, bent inward and ventrad, ending with elongate, roundly subquadrate tip; dorsally tegmen includes considerable poorly sclerotized and membraneous material of difficult-to-resolve shape.

Etymology. I name this species in appreciation for the contributions of Ms. Andrea Nicol Maldonado Ona to this study. While carrying out a parallel study on staphylinid diversity, she helped collect, sort, and prepare many specimens, and assisted with the collection of the types of this species.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Zhapra candelaria **sp. nov.**
DNA barcodes: GenBank PX930214, PX930316
Figs 133D–F, I–J

Type material. Holotype ♂ (MECN-EN 40859): "ECUADOR: Tungurahua, -1.4342˚, -78.3118˚, NaturetrekCandelariaRes, 2140m, 13.XI.2024, M.Caterino, sifted litter" / "Caterino DNA voucher, Ext. MSC-13212, Morphosp. Cnd.028"; deposited in MECN. **Other material:** 1♀: "ECUADOR:Tungurahua, -1.3838˚, -78.2918˚, Río Machay Reserve, 2345m, 12.XI.2024, M.Caterino, sifted litter" (MECN-EN 40812).

Diagnosis. (TL: 1.0mm) This species is extremely similar to the preceding differing externally only in the following characters: head (Fig. 133D) narrower, eyes slightly smaller; anterior portion of median pronotal carina almost absent; inner two dorsobasal elytral foveae more distinctly separated. Aedeagus (Fig. 133I, J) with large basal bulb broadly open beneath; small basal apodeme present at distal ventral margin; dorsal diaphragm large, diaphragmatic sclerite transversely ~'8'-shaped, occupying only about anterior half of diaphragm; hinged subtriangular dorsal plate broadly attached to apical margin of basal bulb; parameres present, attached along lower margin of outer edge of basal bulb, arched upward, laterally compressed, then descending along side median lobe, slightly enlarged apically; median lobe largely membraneous, extending beneath dorsal plate, containing pair of weakly hooked internal sclerites.

Etymology. This species takes its name from the type locality.

Distribution. This species is known for certain only from the Cerro Candelaria Reserve, in the cloud forests along the southern side of the Río Pastaza watershed, Tungurahua, Ecuador. A similar-appearing female was found across the canyon on the north side, at Río Machay Reserve.

Remarks. While differing in only rather minor external characters, the aedeagus of the two *Zhapra* species are quite distinct. Both have a broadly open basal bulb, but it is much taller in *Z. candelaria*, with a truly dorsal diaphragm, rather than dorsobasal as in *Z. maldonadae*. Both have a well-developed left paramere, which has a more dorsal extent in *Z. candelaria*, and bends more immediately distad, apparently lacking the distal extension seen in the other species completely.

The female from the Río Machay reserve (opposite side of the Río Pastaza) cited under 'other material' is similar in all visible characteristics. However, while its COI sequence does cluster with other *Zhapra* sequences, it is quite divergent from the type population at Candelaria, and probably, in fact, represents a distinct species. A comparison of male genitalia will be necessary to assess their respective status.

Pselaphitae: Tyrini: Somatipionina

Cercoceropsis Raffray, 1896
Figs 134A–C, G–H

This genus includes only 2 previously described species, from Brazil and Paraguay (Asenjo *et al.* 2019). One new species is described below.

Diagnosis. *Cercoceropsis* shares maxillary palpal form with *Cercoceroides* Raffray, having the ultimate palpomere elongate, subparallel-sided to slightly narrowed apically, and bearing a sulcus along its entire inner margin. However, its first abdominal tergite is much longer than the second, and the median pronotal fovea is said to lack setae. Males (including that of the species described below) lack secondary sexual characters of the

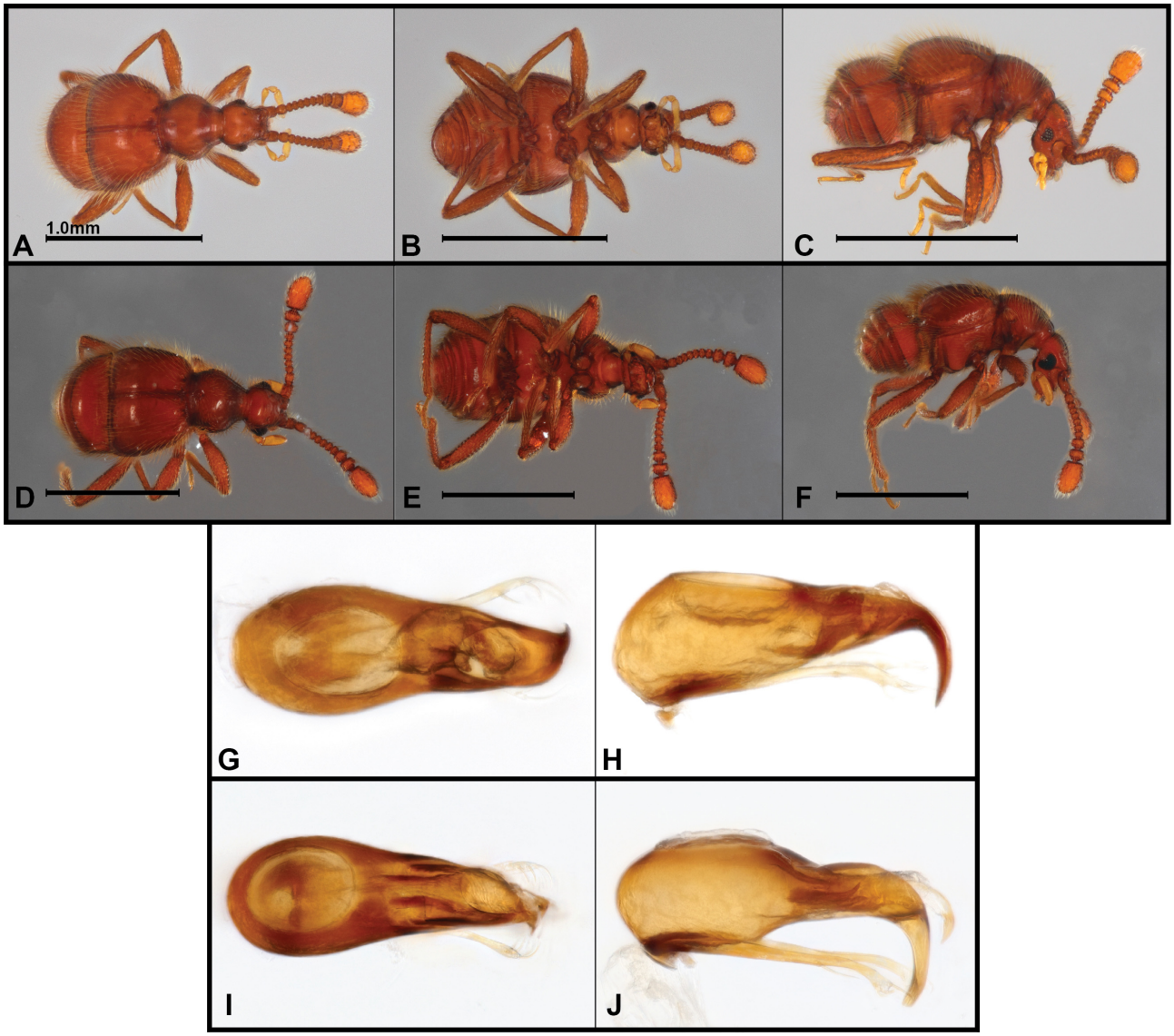

FIGURE 134. Photographs, Tyrini: Somatipionina. **A–C, G, H** *Cercoceropsis pacifica* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, I, J** *Circocerus kuru* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

metaventrite, present throughout known *Cercoceroides*. Male genitalic characters have never previously been described for any species of the genus. In the species described here, the basal bulb is well developed, with oval dorsal diaphragm, thin, symmetric, setose parameres, the tegmen narrowing evenly to a slightly asymmetric, downturned median lobe. A complex internal sac that extrudes through the disal foramen is visible.

Cercoceropsis pacifica **sp. nov.**
DNA barcodes: GenBank PX930290, PX930307
Figs 134A–C, G–H

Type material. Holotype ♂ (MECN-EN 41904): "ECUADOR: Guayas, -2.160995˚, -79.974517˚, Bosque Protector Cerro Blanco, Ductos, 08.V.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12804, Morphosp. CrBl.A.002" / "MECN-EN 41904"; deposited in MECN. **Paratypes** (9♂, 7♀, same general locality as type): 3: same data as type; 2: Quebrada Condor, -2.14427˚, -80.08553˚, 10.IV.2022; 6: Quebrada Canoa, -2.1753513˚, -80.021311˚, 23.IV.2022; 1: Cosumbo, -2.159579˚, -80.02109˚, 25.IV.2022; 5: Antennas 507, -2.173485˚, -79.979409˚, 5.V.2022 (MECN-EN 41905–41920).

Other material: 3♂, 3♀: "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 22.v.2011, AT1312, M. Caterino, A. Tishechkin, Leaf/rotting stick litter", 1: "Caterino DNA voucher, Ext. MSC-12672, Morphosp. LL.A.008" (ZSFQ-i23231–i23237).

Diagnosis. (TL: 1.6mm) Body (Fig. 134A) sparsely clothed in long, erect setae; head rather narrow, eyes moderately protuberant, small, diameter approximately one-third genal length; vertex with shallow, bare foveae widely separated; median frontal fovea absent; antennal insertions elevated, narrowly separated by longitudinal median sulcus; epistoma broadly rounded, rather densely punctate and setose; maxillary palpi elongate, slightly bulbous at base, sides evenly tapered to narrowly rounded

apex, inner margin with slightly oblique sulcus along apical third; antennae short, antennomere I cylindrical, II about half its length, cylindrical, antennomeres III–VII short, transverse, rounded, antennomeres VIII shorter, wider, IX–XI forming loose club, IX–X short, cylindrical, XI longer, broadly rounded apically; pronotum convex, median basal fovea bare, distinct; lateral pronotal foveae setose, situated low, near posterior hypomeral edge, covered from front by distinct cluster of elongate setae; each elytron with two large bare foveae, one at base of suture and one near humerus, subhumeral fovea absent; male protrochanter sharply denticulate; profemur with short broad tubercle at middle of inner edge; male abdominal ventrites convex, unmodified. Aedeagus (Fig. 134G, H) elongate, tapered, basal bulb long, basal foramen small and basoventral, with large dorsal diaphragm; parameres thin, bent outward distally, each with four setae, two along inner margin of apical half, two near apex; tegmen strongly curved to obliquely truncate apex, dorsal surface with ovoid opening for extrusion of inner sac/armature.

Etymology. The species name refers to its Pacific coastal distribution.

Distribution. This species is known from seasonal forest localities along Ecuador's west coast, from Manabí south to Guaymas.

Remarks. The two described species of the genus are separated on minor differences in maxillary palpal shape (in Park 1942). *Cercoceropsis pacifica* would be closer to *C. longipes* Raffray on that account, but such a similarity is probably not very meaningful. The described species will need revision to clarify reliable species-level differences.

Circocerus Motschulsky, 1855

Figs 134D–F, I–J

= *Apharus* Reitter, 1882
= *Cercocerus* LeConte, J.L., 1861

This genus contains 7 described species from Mexico to Brazil (Asenjo *et al.* 2019a; Chandler 2013). The most geographically proximate of these is *C. colombiensis* (Park 1942). Many of these species have spent their taxonomic history in the now synonymous genus *Apharus* (e.g. Park 1942). One new species is described below.

Diagnosis. Among Tyrini, *Circocerus* is distinguished mainly by the large apical maxillary palpomere that has a median sulcus along only the apical 2/3 of the inner edge. They may often be distinguished from species of *Hamotus* Aubé by a narrower abdominal margin, and a longer 1st abdominal tergite. Most species' males have dentate protrochanters (as seen also in *Cercoceropsis*), but other sexual dimorphisms are not apparent. No male genitalia have been illustrated previously for the group. Becker and Sanderson (1954) illustrated something they presumed were the genitalia, but it is not clear what they illustrated, describing it only as 'very aberrant'. In fact, as shown here (Fig. 134I, J), the aedeagus is very conventional for Tyrini, having free and distinct setose parameres, a basal bulb bearing distinct dorsal diaphragm, and long median lobe that curves downward distally. Some inner armature is visible, and will likely vary among species.

Circocerus kuru **sp. nov.**

DNA barcode: GenBank PX930345
Figs 134D–F, I–J

Type material. Holotype ♂ (MECN-EN 41921): "ECUADOR: Cotopaxi, -0.4165˚, -79.0041˚, Bosque Integral Otonga, 14.VIII.2024, 2098m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12887, Morphosp. Ot.A.052"; deposited in MECN.

Diagnosis. (TL: 2.0mm) Body (Fig. 134D) dark orange, smooth and shining, covered with long, semi-erect, golden setae; head smooth, vertex convex, with wide-set, shallow vertexal foveae; frons depressed; antennal pedestal slightly emarginate; eyes large, protruding, slightly emarginate posteriorly, rather finely faceted; antennae robust, somewhat compact, antennomere I cylindrical, about 1.5× longer than wide, II slightly narrower, 1.25× as long as wide, III–VIII short, increasingly transverse, IX–XI forming incrassate, setose club, IX and X short, XI about 4× as long as X, widened to and rounded at apex; pronotum widest just basad middle, evenly tapered to front, slightly constricted to rear, basal rim depressed; lateral and median foveae present, the lateral located on sides, surrounded by dense setae; pronotal discal setae converging toward median fovea; pronotal sulci absent; elytra with sides slightly rounded, widest near rear, each with sutural and one lateral basal foveae; 1st abdominal tergite about as long as others combined; femora robust, distinctly rugose; metaventrite swollen on each side; male protrochanter with small, acute tooth at apex; male venter otherwise lacking obvious secondary sexual characters. Aedeagus (Fig. 134I, J) with basal bulb elongate, rounded, entire aedeagus evenly narrowing to apex (in dorsal view); parameres free, thin, extending nearly to apex of median lobe, with 3 or 4 incurved apical setae; median lobe with slightly off-center apicodorsal foramen, apex strongly curved downward below to narrowed tip; inner armature of three curved, acute rods visible within median lobe, a longer, membraneous sac emerging from apical foramen tiped with weakly sclerotized hook.

Etymology. The name of this species comes from a Kichwa term meaning 'short', referring to its generally compact form.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species is quite similar to *C. colombiensis* Park, which, having been described from a female, may never been fully diagnoseable. A few minor but perhaps significant differences may be found in the antennae, *C. colombiensis* having shorter, strongly transverse intermediate antennomeres. Both species have the metaventrite swollen, suggesting that it is not a sexually

dimorphic character, as it is in many other Pselaphinae. While Park (1942) describes its femora as 'scabroid', available photos suggest this is less pronounced than in *C. kuru*.

Ephimia Reitter, 1882
Fig. 135

Five species of *Ephimia* are described from Central America and the West Indies (Asenjo *et al.* 2019). None have previously been documented from South America. Three new species are described below.

Diagnosis. (TL: 1.8–2.0mm, Avg. 1.9mm) The species of *Ephimia* have smaller terminal maxillary palpomeres than the other Tyrini described here, lacking any sulcus along its inner margin, but having a vestiture of stiff setae. Members of the genus also have the antennal insertions approximate and elevated, and the antennae with a three segmented club made up of elongate narrow antennomeres. They may resemble Ctenistini in having a short arc of setae, sometimes sqamous, between the eye and the antennal insertion. But the other body setae are generally not considered squamous (though one of the species described here stretches that assertion). They have three well-developed subbasal pronotal foveae, and two large basal elytral foveae. All previously known species have had the male protibia thin and rather broadly bowed outward, though that is not true of all the species described below. No male genitalia have been described for any member of the genus, but generally they resemble those of other Tyrini, with well developed, apically setose parameres, a large basal bulb, dorsally flat with large ovoid diaphragm, an apically downturned tegmen, and a moderately complex internal armature.

Ephimia arcifer **sp. nov.**
DNA barcode: GenBank PX930299
Figs 135A–C, J–K

Type material. Holotype ♂ (ZFSQ-i23242): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12682, Morphosp. LL.A.018"; deposited in ZSFQ.

Diagnosis. (TL: 1.96mm) Body (Fig. 135A) elongate, rather densely setose, the setae short and reclinate; vertex narrow between very large, protuberant, coarsely faceted eyes; oval patch of short, scale-like setae present between eyes and antennal bases; vertexal foveae distinct, small, bare, closer to each eye than to each other; antennal bases united and produced; antennae elongate, antennomere I curved distad, cylindrical, antennomere II about one-third length of scape, cylindrical, antennomeres III–VIII as long as wide, edges sharp, antennomeres IX–XI slender, elongate, XI slightly bulbous apically, not quite as long as IX–X combined; pronotum lacking subbasal impression, median and lateral pronotal foveae broad and shallow, not densely setose; each elytron with two deep foveae, one at base of suture, one near humerus, subhumeral fovea absent; profemur of male swollen, protibia thin, evenly outwardly curved; other legs and abdominal ventrites without distinct secondary sexual characters. Aedeagus (Fig. 135J, K) elongate, tapered, basal bulb long, basal foramen small and basoventral, dorsal diaphragm oval; parameres approximate basally, thin, bent outward to apices; tegmen slightly narrowed and strongly curved to broadly rounded apex.

Etymology. This species' name refers to its curved front tibiae.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. This species is shining, with relatively long antennae, and having none of the body setae obviously squamous.

Ephimia confusa **sp. nov.**
Figs 135D–F, L–M

Type material. Holotype ♂ (MECN-EN 41961): "ECUADOR: Guayas, -2.12579, -80.08328, Bosque Protector Cerro Blanco, Guitarra, 12.IV.2022, Winkler, C. Cujigualpa" / "Caterino DNA voucher, Ext. MSC-12808, Morphosp. CrBl.A.006" / "MECN-EN 41961"; deposited in MECN.

Diagnosis. (TL: 1.9mm) Body (Fig. 135D) elongate, setose, the setae short, thick, and reclinate; head narrow, with very large, protuberant, coarsely faceted eyes; stiff setae present on genae behind eyes, and vertically oval patch of scale-like setae present between eyes and antennal bases; gula of head with distinct quadrate 'knob' (in lateral view); vertexal foveae distinct, small, bare, closer to each eye than to each other; antennal bases united and produced; antennae with thick, cylindrical antennomere I, antennomere II about one-half length of scape, cylindrical, III–VIII shorter, transverse, edges sharp, IX–XI forming elongate club, XI about twice as long as either IX or X; pronotum lacking subbasal impression; median pronotal fovea distinct, round, not distinctly setose; lateral pronotal foveae broad, distinctly interrupting lateral margin, filled with stiff setae; each elytron with two deep dorsobasal foveae, one at base of suture, one near humerus, subhumeral fovea absent; prothoracic legs of male not obviously modified; other legs and abdominal ventrites without distinct secondary sexual characters. Aedeagus (Fig. 135L, M) rather broad; parameres weakly sinuate; tegmen narrowed slightly at base, widened to broadly rounded, strongly downcurved apex; internal sac with one curved, elongate, apparently bifid median rod, flanked by pair of shorter lateral rods.

Etymology. This species' misleading morphology (and the fact that I scratched my head over its placement for a while) led to its name.

Distribution. This species is known only from the Cerro Blanco forest preserve, in the mountains of coastal Ecuador, just west of Guayaquil.

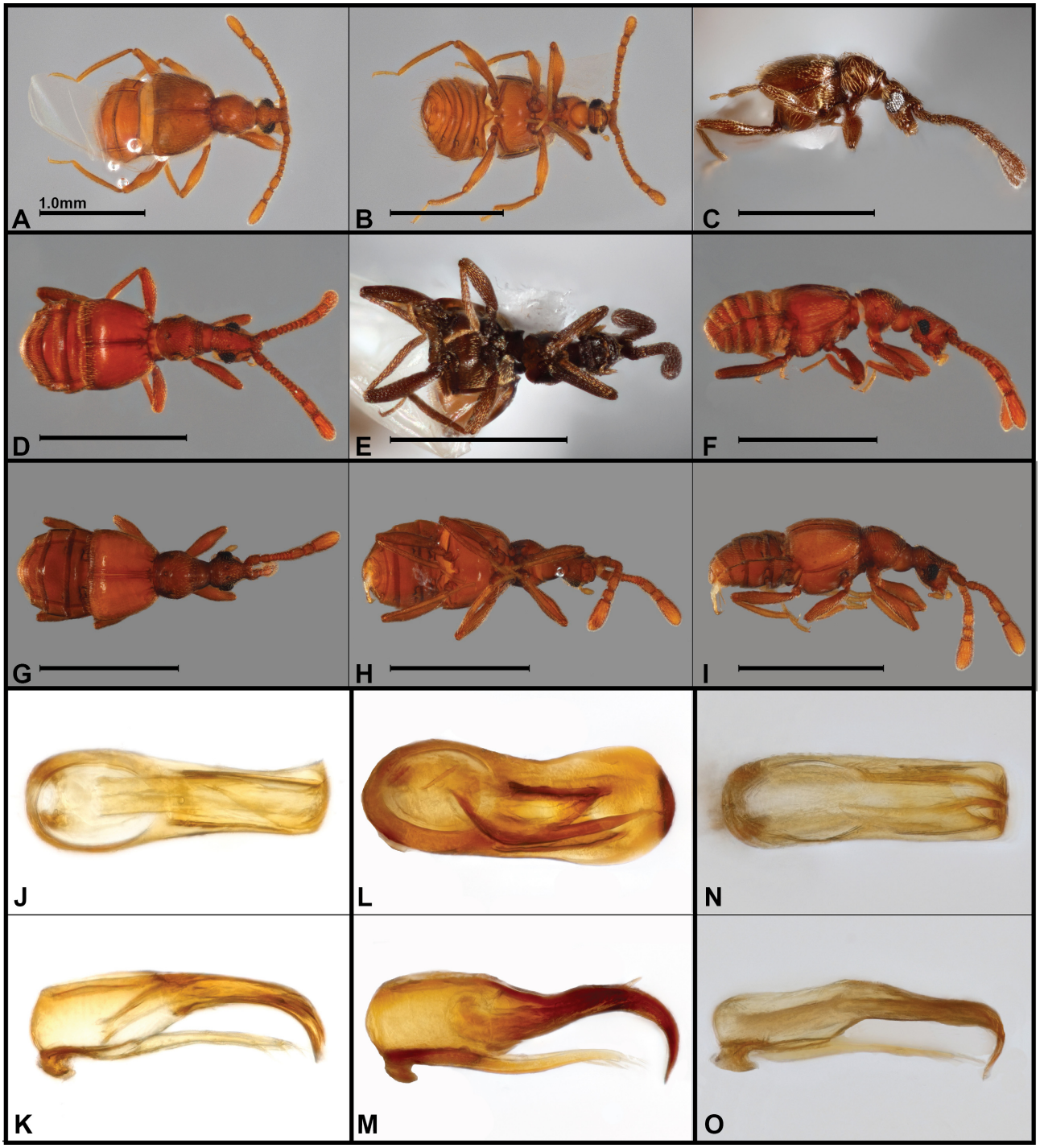

FIGURE 135. Photographs, *Ephimia* spp. **A–C, J, K** *E. arcifer* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **D–F, L, M** *E. confusa* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral) **G–I, N, O** *E. hanak* (body: dorsal, ventral, lateral; aedeagus: dorsal, lateral). Scale bars = 1.0mm.

Remarks. The pronotal texture of this species is unique, rugose in the same pattern as the scale-like setae, allowing the setae to sit within the depressions. The generally squamate appearance of many body setae is very Ctenistini-like, though the small maxillary palps show that it doesn't belong there.

Ephimia hanak **sp. nov.**
DNA barcode: GenBank PX930200
Figs 135G–I, N–O

Type material. Holotype ♂ (QCAZ-I-280288/MECN-EN 40706): "ECUADOR: Carchi, 0.75587°, -77.96642°, El Angel, Saladero, 3301m, 26JUL2016, S. Muñoz & R.Tobar, Ex.Berlese" / "Caterino DNA voucher, Ext. MSC-13051, Morphosp. Angel4"; deposited in QCAZ. **Paratype** (1♂): same data as type (MECN-EN 280289).

Other material: 1: same data as type (MECN-EN 280290).

Diagnosis. (TL: 1.8mm) Body (Fig. 135G) elongate, sparsely setose, the setae short, slightly thickened, and reclinate; head narrow, with very large, protuberant, coarsely faceted eyes; few stiff setae on genae behind eyes; small vertical patch of stiff setae along anterior edge of eyes; gula not knobbed; vertexal foveae distinct, small, bare, closer to each eye than to each other; antennal bases united and produced; antennae with thick, cylindrical antennomere I, antennomere II about one-half length of scape, cylindrical, III–VIII very short, transverse, edges sharp, IX–XI forming elongate club, X shorter, about two-thirds length of IX, XI almost 4× as long as X; pronotum lacking subbasal impression; median pronotal fovea distinct, round, not distinctly setose; lateral pronotal foveae only slightly larger, not interrupting lateral margin, with a few stiff setae; each elytron with two deep dorsobasal fovea, one at base of suture, one near humerus, subhumeral fovea absent; prothoracic legs of male not obviously modified; other legs and abdominal ventrites without distinct secondary sexual characters. Aedeagus (Fig. 135N, O) elongate, parallel-sided, basal bulb long, basal foramen small and basoventral, dorsal diaphragm elongate oval; parameres approximate basally, thin, bent outward slightly to apices; tegmen flattening toward apex, strongly curved to ventrally directed, subtruncate apex.

Etymology. The name of the species comes from a Kichwa term for 'high place', a reference to the fact that most or all other species of the genus have been reported from relatively low elevations. This one was found at over 3000m.

Distribution. This species is known only from the Reserva Ecologica El Angel, near the Colombian border in Carchi, Ecuador.

Remarks. The slightly thickened, recumbent setae of this species are unique, showing a transition between regular thin setae and more obviously scale-like ones. The antennal club is very compact, with the divisions between club antennomeres barely evident, and the middle of the three (antennomere X) is shorter than IX or XI. The third specimen cited as 'other material' is from the same sample, but is significantly smaller, and has the antennomeres of the club shorter, though still alternating. This may simply be the female.

Hamotus Aubé, 1844

Figs 136–137

One of the larger Pselaphine genera in the neotropics, 97 species of *Hamotus* are reported from Central and South America, ranging just into the southern U.S. (Asenjo *et al.* 2019). Park (1942) noted that, due to the relatively large size and flight ability of most of the species, several have fairly broad ranges. Thus, although only one species (*H. fuscopilosus* Reitter) is specifically reported from Ecuador, a larger number of described species from Colombia (14 described species), Venezuela (14 species), Peru (1 species), or Amazonian Brazil may be expected to occur in the country. Unfortunately, none of these, as far as I can find, have had their male genitalia described or illustrated. So assignment of newly discovered populations to existing or new species is going to be a nearly impossible exercise. Therefore I describe several as new below, acknowledging that by chance some may correspond to known but poorly characterized species. As most of these are from cloud forest habitats, however, where relatively little previous work has focused, these chances would seem to be relatively slight.

Diagnosis. (TL: 2.9–3.4mm, Avg. 3.2mm) As Tyrini, *Hamotus* has similar-sized, paired tarsal claws and lacks any of the squamous facial setae of Ctenistini. *Hamotus* further has a greatly enlarged maxillary palpomere IV, oval and swollen, with a longitudinal sulcus extending most of the length of the inner edge, and usually lacks an antebasal pronotal sulcus. Other related Tyrini (e.g. *Circocerus, Pseudohamotus* Raffray*, Cercoceroides*) have an abbreviated or no longitudinal sulcus on the apical maxillary palpomere, and/or have a transverse basal pronotal sulcus. *Hamotus* includes some of the largest neotropical Pselaphinae, reaching nearly 6mm in body length.

Two subgenera have been recognized, *Hamotoides* Schaufuss separated from the nominate subgenus by the posession of a transverse basal pronotal sulcus. Park (1942) recognized problems with this arrangement, but I will follow it blindly below, pending further revision. Park (1942) further followed Raffray (1904) in recognizing 14 subgroups of *Hamotus*, based on seemingly subtle characters of antennomere shape (which Park took pains to justify). I will comment on the placement of the new species with respect to these groups, but do not give them significant credence as having likely phylogenetic meaning.

Hamotus (Hamotus) asymmetricus **sp. nov.**

DNA barcode: GenBank PX930266

Figs 136A–C, 137A–B

Type material. Holotype ♂ (ZFSQ-i23419): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res. 29.v.2011, 2100m, Forest litter sifting, AT1334 M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12717, *Hamotus nr. grandipalpis*"; deposited in ZSFQ. **Paratypes** (1♂, 1♀): same locality as type, misc. hand collecting (ZFSQ-i23420–i23421).

Diagnosis. (TL: 3.4mm) Body (Fig. 136A) large, densely, erectly setose; vertex with pair of lateral foveae, frons with non-setose median fovea; outer/lower half of terminal palpomere densely covered with short setae, inner/upper surface smooth, with many fewer, longer setae; antennae very elongate, scape as long as next three antennomeres combined, antennomeres II–VIII elongate, IX–X thicker, more densely setose, XI enlarged, slightly asymmetrical, about as long as VIII–X combined; pronotum with three large subbasal foveae not connected by impression; each elytron with sutural and one humeral foveae, subhumeral fovea absent; male metatrochanter

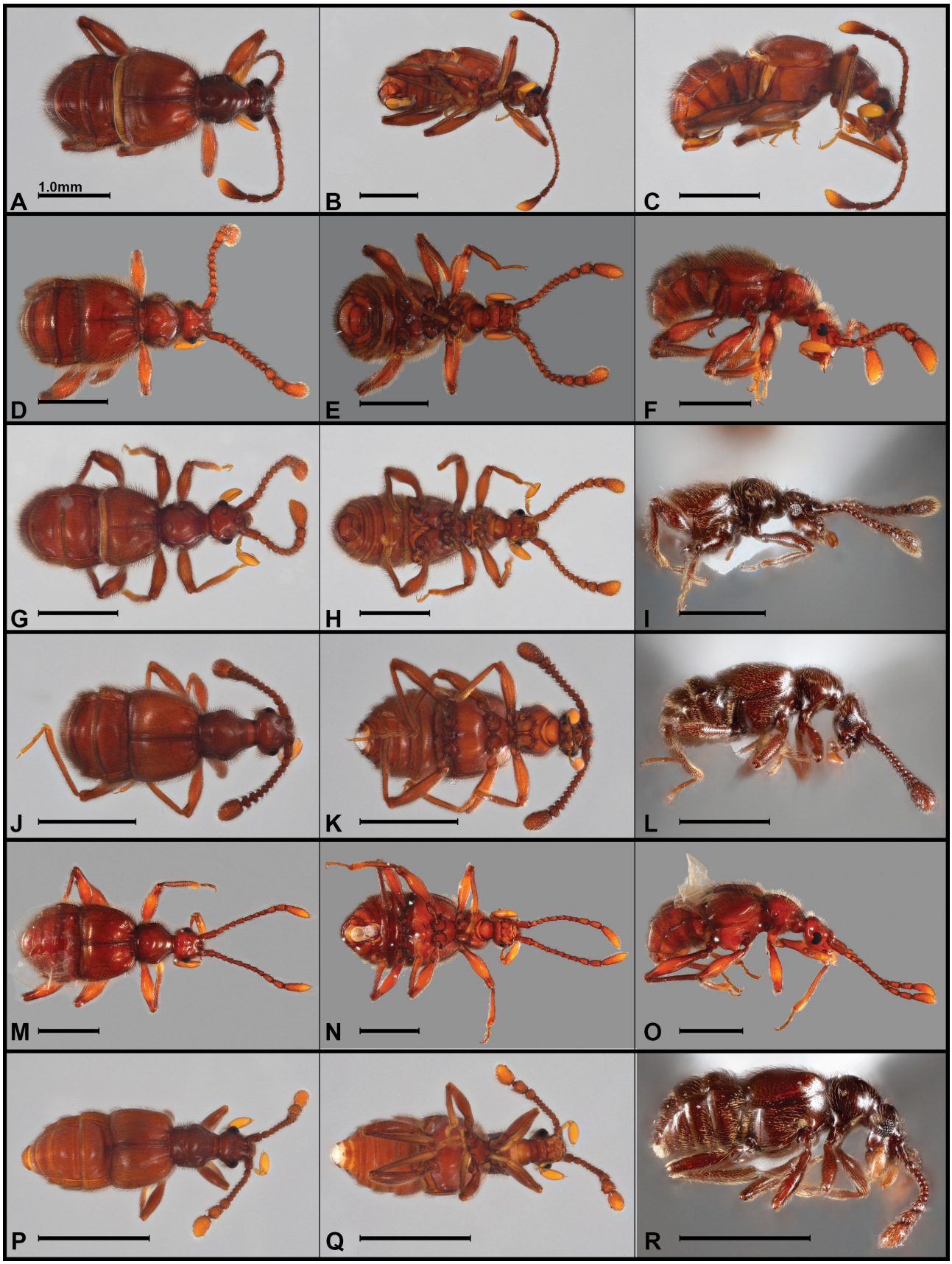

FIGURE 136. Habitus photos, *Hamotus* spp., dorsal, ventral, lateral views **A–C** *H. asymmetricus* **D–F** *H. auritus* **G–I** *H. cactus* **J–L** *H. horrens* **M–O** *H. obliquus* **P–R** *H. manabensis.* Scale bars = 1.0mm.

distally elongated; male metaventrite with short, elevated oblique carinae leading posterior intercoxal depression; male abdominal ventrites III–VI flattened at middle, VII setose on either side of a short, blunt median process. Aedeagus (Fig. 137A, B) flattened; basal foramen small, transverse; dorsal diaphragm large; parameres well developed, symmetrical, densely setose along ventral inner margins and with separate cluster of four apical setae; tegmen asymmetrical, apex offset to one side, apically truncate with small, acute inner tooth.

Etymology. This species is named in reference to the asymmetrical apical antennomere.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species is conceivably identical to *H. grandipalpis* Sharp (in Park/Raffray Group I), described from Panama. In particular, they share an elongate antenna, with the terminal antennomere asymmetrically curved mediad, and the two are at least closely related. However, as the male genitalia have never been described for Sharp's species, I prefer to keep this well-characterized species separate pending description of aedeagal characters for Panamanian specimens representing topotypical *H. grandipalpis*.

Hamotus (Hamotus) auritus **sp. nov.**
Figs 136D–F, 137C–D

Type material. Holotype ♂ (MECN-EN 41922): "ECUADOR: Cotopaxi, -0.4176˚, -79.0040˚, Bosque Integral Otonga, 13.VIII.2024, 2063m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12872, Morphosp. Ot.A.037" / "MECN-EN 41922"; deposited in MECN.

Diagnosis. (TL: 3.1mm) This species is very closely related to and similar to *H. cactus* (described below), differing primarily in aedeagal characters. However, a few minor external differences may be diagnostic: body (Fig. 136D) slightly less elongate, abdominal segments in particular seeming shorter; lateral pronotal foveae very large, setose, carinate on their inner edges; elytra short, slightly concave along combined posterior margins; male metatrochanteral flange (Fig. 136F) massive; antennomeres VI–VIII slightly shorter than III–V, subtransverse. Aedeagus (Fig. 137C, D) with basal bulb squared on sides, dorsolateral edges subcarinate, basal foramen small and ventral, large dorsal diaphragm almost entirely filled by diaphragmatic sclerite; parameres thick, somewhat flattened, bearing pair of long setae on truncate, membraneous apex; dorsal process of tegmen a short, acute, triangular tooth limited to left side.

Etymology. The name of this species refers to the deep, setose, 'ear-like' lateral pronotal foveae.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. This species, like the above, would run to Group I in Park's (1942) key, and thence to *H. boliviensis* Raffray. *Hamotus auritus* is similar to the following species (*H. cactus),* but has much larger lateral pronotal foveae, as well as a larger male metatrochanteral flange.

Hamotus (Hamotus) cactus **sp. nov.**
Figs 136G–I, 137E–F

Type material. Holotype ♂ (ZFSQ-i23411): "ECUADOR: Pichincha 0.0182˚N, 78.6372˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, 2500m, Forest litter sifting AT1337, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12618, Morphosp. ElP.A.017"; deposited in ZSFQ.

Diagnosis. (TL: 3.4mm) Body (Fig. 136G) large and densely setose; head with setose pair of large vertexal foveae and setose median frontal fovea; antennomere I cylindrical, slightly longer than II and III combined, II short and cylindrical, III–VIII subquadrate, about as long as wide, IX–XI forming loose club, IX–X similar in size, 1.5× as long as wide, XI slightly asymmetrical, as long as IX and X combined; ultimate maxillary palpomere large, convex, with narrow median furrow along entire inner margin; pronotum convex, with very large, setose lateral foveae forming incision through lateral margin, disk with large setose median foveae; transverse subbasal impression absent; each elytron with setose sutural and single humeral fovea, base of elytra depressed around them; subhumeral elytral fovea absent; (male?) tibiae slightly bent near apex; male metatrochanter with prominent, posteriorly directed quadrate flange; male abdominal ventrites 2–5 slightly flattened medially, with shorter and posteriorly directed setae compared to lateral portions of those ventrites. Aedeagus (Fig. 137E, F) with basal bulb squared on sides, dorsolateral edges subcarinate, basal foramen small and ventral, large dorsal diaphragm; parameres thick, somewhat flattened, bearing pair of long setae on truncate, membraneous apex; dorsal process of tegmen asymmetrical, a flattened inbent flange on left side.

Etymology. This species name refers to its densely spinose body. It is used as a noun in apposition.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species would go in Park's (1942) Group I based on having antennomeres IX and X longer than wide (although not 'much longer than wide' as specified). Then, having similar length 1st and 2nd abdominal tergites, and larger lateral than median pronotal foveae it would key to *Hamotus boliviensis* Raffray. Whether they have any meaningful similarity would have to await much closer study of that species' type. The question marks following some of the characters in the description note the uncertainty whether the described states are sexually dimorphic given the absence of female specimens.

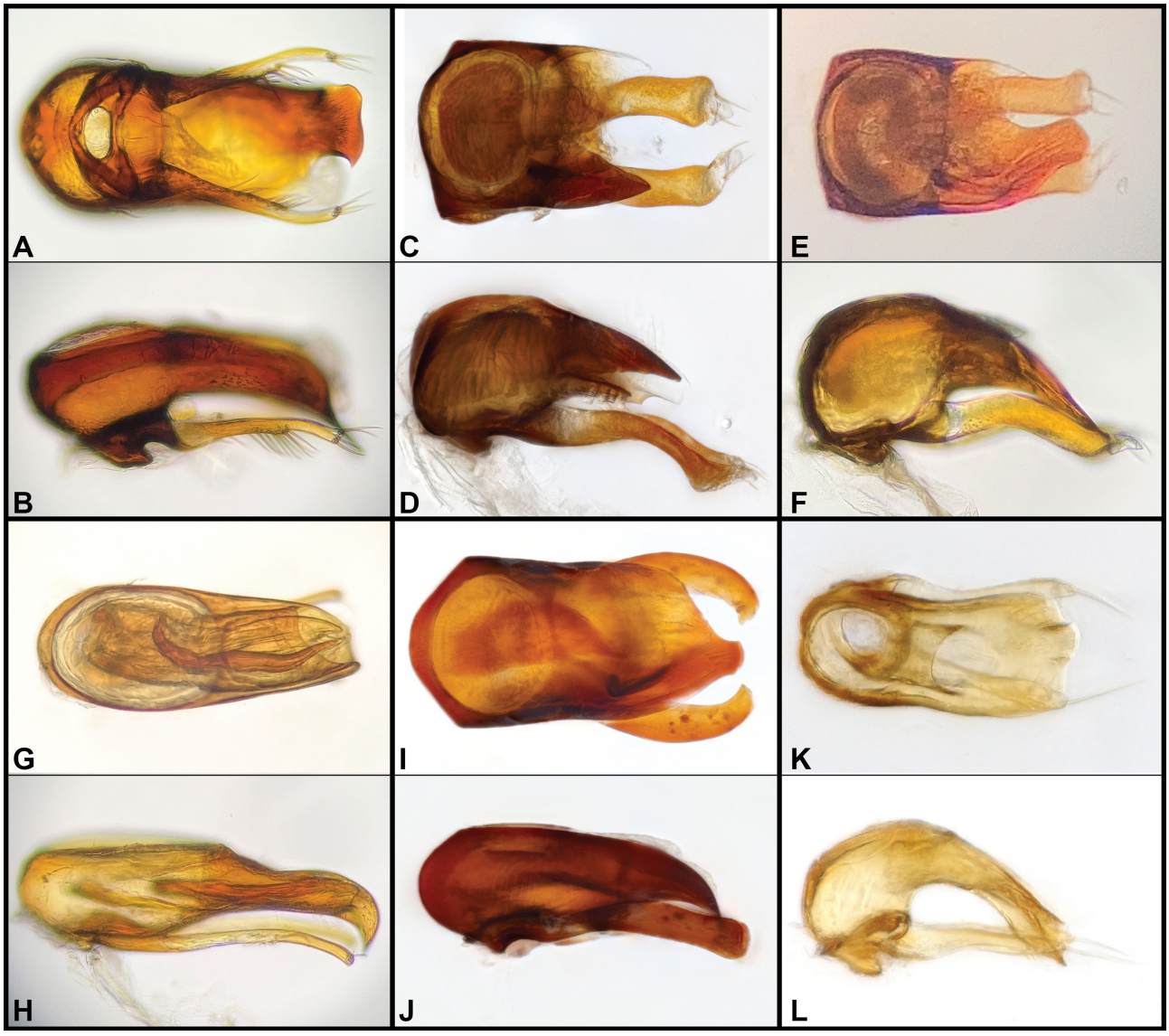

FIGURE 137. Aedeagus photos, *Hamotus* spp., dorsal (except as noted), lateral views **A, B** *H. asymmetricus* (*ventral* and lateral views) **C, D** *H. auritus* **E, F** *H. cactus* **G, H** *H. horrens* **I, J** *H. obliquus* **K, L** *H. manabensis*.

Hamotus (Hamotus) horrens **sp. nov.**
DNA barcodes: GenBank PX930265, PX930268
Figs 136J–L, 137G–H

Type material. Holotype ♂ (ZFSQ-i23422): "ECUADOR: Pichincha, 0.0264˚N, 78.6344˚W, El Pahuma Orchid Res., 28.v–1.vi.2011, AT1324, 1900–2100m, Misc. hand collecting, M.Caterino, A.Tishechkin" / "Caterino DNA voucher, Ext. MSC-12652, Morphosp. ElP.A.051"; deposited in ZSFQ. **Paratypes** (1♂, 2♀): same locality as type, 2500m, understory fogging (ZSFQ-i23423–i23425).

Diagnosis. (TL: 2.9mm) Body (Fig. 136J) large, setose; head with small triangle of non-setose vertexal and frontal foveae, median fovea lying at base of narrow inter-antennal trough; antennae rather short, antennomere I cylindrical, twice length of II, III–VIII short, transverse, IX–XI forming loose club, IX–X short, strongly transverse, XI thick, slightly asymmetrical, apically rounded; apical maxillary palpomere smooth, cylindrical, sparsely setose, with depressed median furrow along distal 4/5 of inner margin; pronotum elongate, narrowed anteriorly and posteriorly, with setose lateral and median foveae, subbasal transverse impression absent; each elytron with sutural and one humeral foveae, subhumeral fovea absent; legs and abdominal venter without obvious secondary sexual characters, male metatibia perhaps slightly more curved at apex. Aedeagus (Fig. 137G, H) rather slender, with large, elongate dorsal diaphragm; parameres long, thin, sinuate, apically setose; tegmen evenly tapered, dorsal emargination slightly asymmetrical; inner armature with long, sinuate, acute, strongly sclerotized median rod.

Etymology. This species' name may mean both 'bristling', referring to the general appearance, and 'rough', to refer specifically to the texture of the ultimate antennomere.

Distribution. This species is known only from the Reserva Orchideológica El Pahuma, in the cloud forests of northwestern Pichincha, Ecuador.

Remarks. This species would key relatively

straightforwardly to Park/Raffray's group III, with more transverse antennomeres. The group III key to species does not apply very well, however, as antennomeres IX and X in *H. horrens* are both strongly transverse, with X only slightly wider than IX.

Hamotus (Hamotus) obliquus **sp. nov.**
Figs 136M–O, 137I–J

Type material. Holotype ♂ (MECN-EN 41923): "ECUADOR: Cotopaxi, -0.4165˚, -79.0041˚, Bosque Integral Otonga, 14.VIII.2024, 2098m, M. Caterino & A. Pazmiño, Sifted leaf litter" / "Caterino DNA voucher, Ext. MSC-12885, Morphosp. Ot.A.050" / "MECN-EN 41923"; deposited in MECN.

Diagnosis. (TL: 3.4mm) This species is very closely related to and similar to *H. asymmetricus* (described above), differing primarily in aedeagal characters. Both are large species, with elongate antennae, the terminal antennomere being slightly asymmetrical (Fig. 136M, O), and the males having metaventral modifications. However, a few external differences are diagnostic: male pro- and metatrochanters spurred; male metaventrite with more strongly raised short, oblique ridges (Fig. 136O). Aedeagus (Fig. 137I, J) with basal bulb angulate at basal corners, sides subparallel, dorsolateral edges subcarinate, basal foramen small and ventral, large dorsal diaphragm almost entirely filled by diaphragmatic sclerite; parameres wide, flattened, curved inward with inner apical corners subacute, with few inconspicuous apical setae; dorsal process of tegmen asymmetric, narrowed to bluntly rounded apex.

Etymology. The name of this species refers to the oblique ridges on the male metaventrite.

Distribution. This species is known only from the higher elevation of the Bosque Integral Otonga, in northern Cotopaxi Province, Ecuador.

Remarks. As with *H. asymmetricus*, this species would key to Park/Raffray Group I and to *H. grandipalpis* in Park (1942).

Hamotus (Hamotoides) manabensis **sp. nov.**
DNA barcode: GenBank PX930298
Figs 136P–R, 137K–L

Type material. Holotype ♂ (ZSFQ-i23426): "ECUADOR: Manabí, 0.0832˚S, 80.1520˚W, Lalo Loor Bosque Seco Res., 21–27.v.2011, AT1301, M. Caterino, A. Tishechkin" / "Caterino DNA voucher, Ext. MSC-12681, Morphosp. LL.A.017"; deposited in ZSFQ. **Paratypes** (1♀): same locality as type, under bark (ZSFQ-i23427).

Diagnosis. (TL: 2.4mm) Body (Fig. 136P) large, densely setose; eyes strongly protuberant; vertex with small pair of weakly setose lateral foveae, frons with setose median fovea; terminal maxillary smooth, oval, with complete furrow along inner margin; antennae rather short, scape about twice as long as II, antennomeres III–VIII short, slightly transverse, IX–XI forming looser club, IX–X thick, setose, about as long as wide, XI about 1.5× as long as X, asymmetrically rounded at apex; pronotum with sides widened to apical third, disk with three large subbasal foveae connected by subbasal impression; each elytron with sutural and one humeral foveae, subhumeral fovea absent; legs rather short, male protrochanter with short, triangular distal flange, other legs lacking obvious secondary sexual characters. Aedeagus (Fig. 137K, L) strongly dorsally curved; basal bulb rather small; basal foramen round; dorsal diaphragm large; parameres well developed, thickened toward apex, bearing seta near inner base, two setae on inner margin near apex, and very long strong apical seta; tegmen symmetrical, widened and flattened to unevenly truncate apex.

Etymology. The name of the species is derived from the coastal Ecuadorian province where it is found.

Distribution. This species is known only from lowland dry forests of the Bosque Seco Lalo Loor Reserve, managed by the Ceiba Foundation, in Manabí, Ecuador.

Remarks. This species keys to Park/Raffray Group XII, and therein to *H. electrae* Park, described from Veracruz, Mexico. Its stout, three-segmented antennal club is also similar to that of *H. monachus* Reitter, from Mexico and Central America, though its tenth antennomere is clearly longer than wide. These three are probably all closely related.

Barcoding results

Barcoding was only moderately successful. Of almost 600 attempts, only 194 clean barcode sequences were obtained. These represent 128 new species, most of the additional ones representing unidentified/undescribed females and duplicates of various species that represent morphological variability, sexual dimorphism, or more rarely the same species being found at multiple sites. The relatively low success rates are somewhat difficult to explain. It is clear that there are some taxonomic biases, indicating that the 'universal' primers did not adequately match some groups. For example, almost no *Arthmius* sequences were obtained, out of almost 60 attempts. Two of the three that were obtained represent one subgroup, and those are on exceptionally long branches, supporting the suggestion that mutation rates are elevated and may have obscured priming sites. In other groups, like Trogastrini, coverage is comparatively good. However, even here no more than half the attempts were successful. I suspect that the HotShot extraction protocol did not fully neutralize some inhibitors, leading to unpredictable amplification success, but have not had time to test that hypothesis. Indeed, some preliminary work done using a magnetic bead-based extraction resulted in a higher success rate, although still with similar taxonomic biases.

The number and density of available sequences were not sufficient to attempt any species delimitation analyses or to provide a clear picture of diversification. Nonetheless they will provide a coarse framework for assigning newly discovered taxa to lineages in the future, and also provide some faint hints of phylogenetic support (or lack thereof)

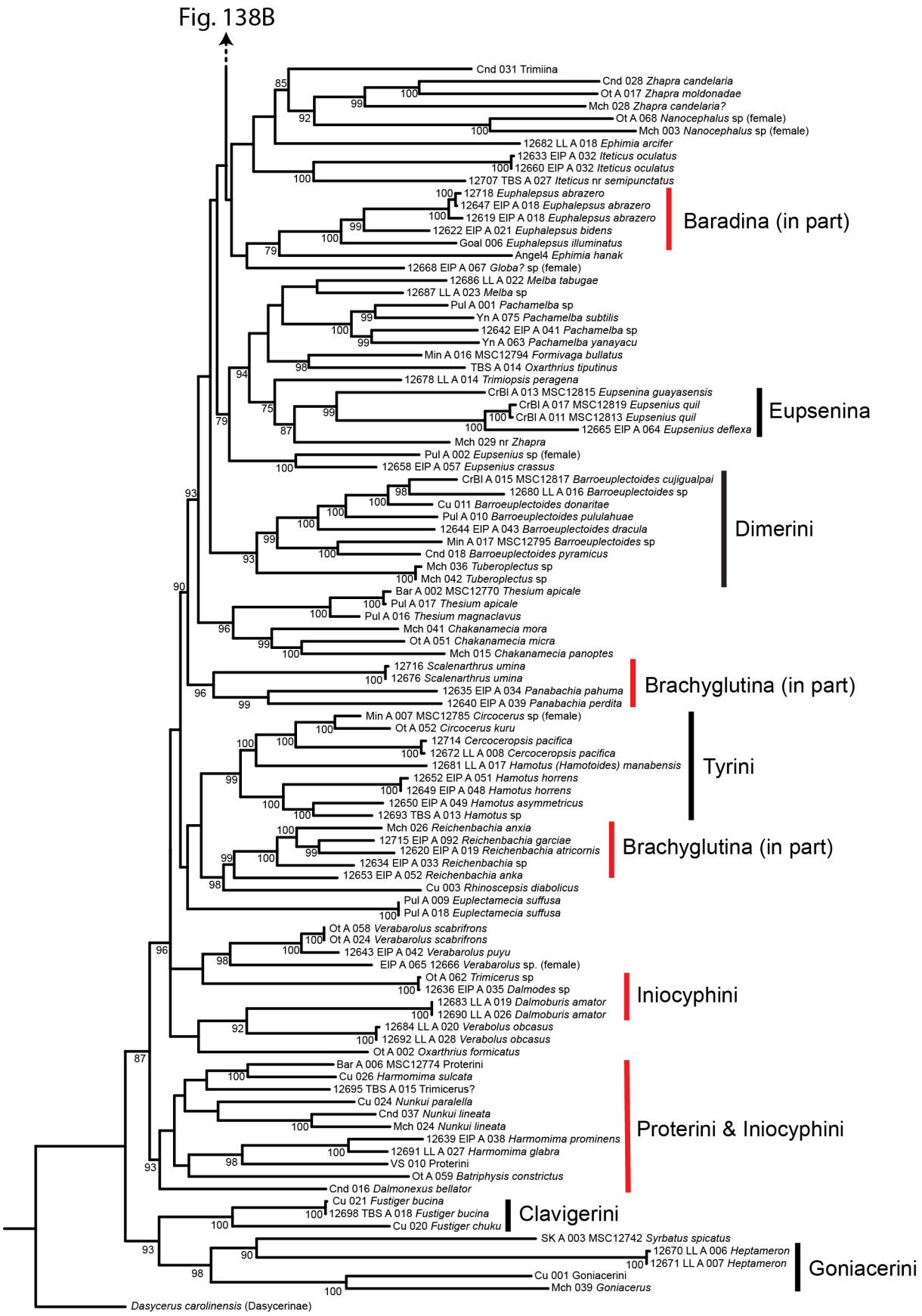

FIGURE 138A. Maximum-likelihood phylogram based on COI barcode sequences. Fast bootstrap values shown where >75%. Black bars at right outline some monophyletic higher taxa. Those bars in red indicate higher taxa that are not monophyletic. **A** bottom half of phylogeny **B** Top half of phylogeny.

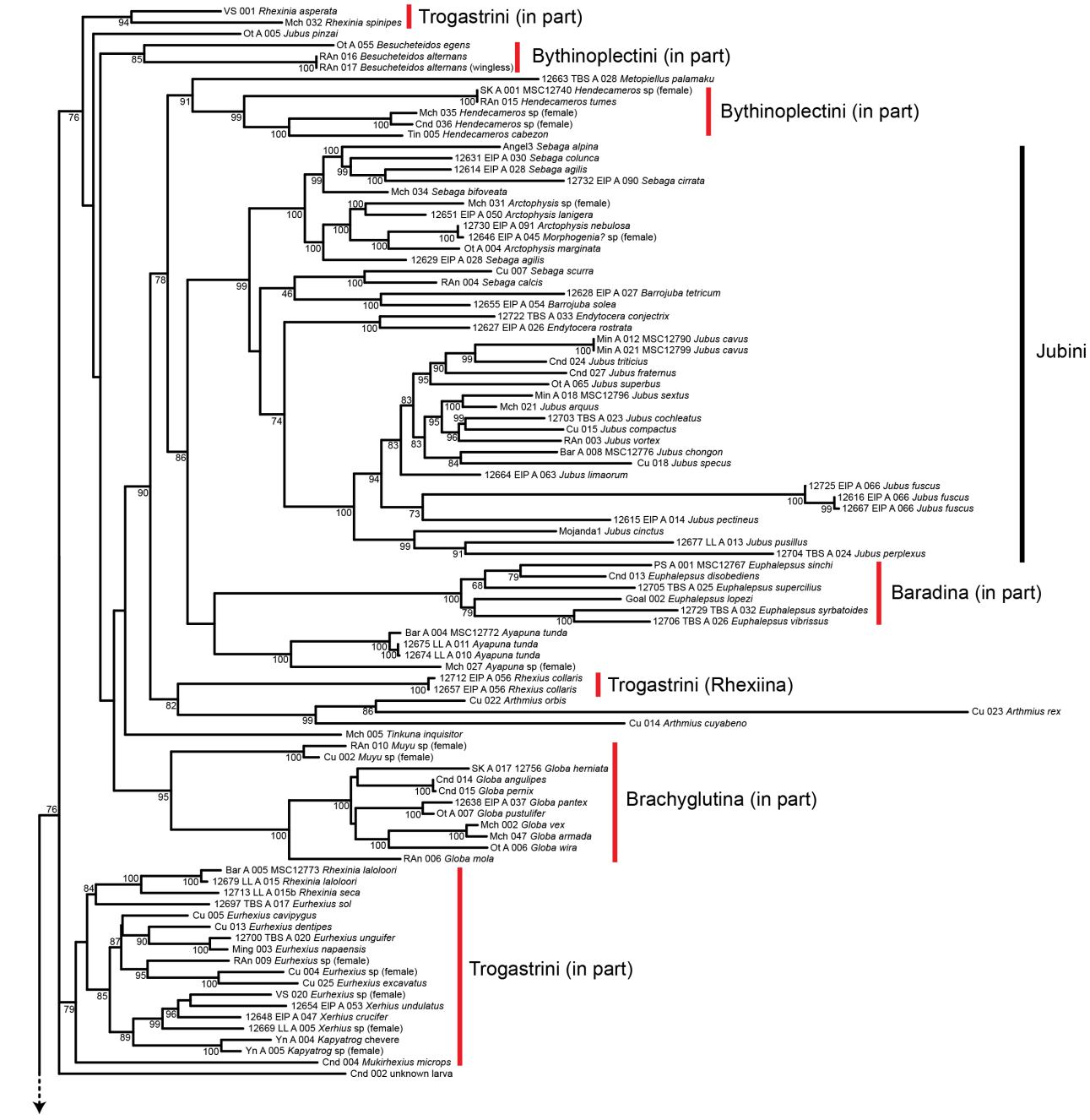

Fig. 138A

FIGURE 138B. Maximum-likelihood phylogram based on COI barcode sequences. Fast bootstrap values shown where >75%. Black bars at right outline some monophyletic higher taxa. Those bars in red indicate higher taxa that are not monophyletic. **A** bottom half of phylogeny **B** Top half of phylogeny.

for various lineages, suggesting future hypotheses to examine more carefully, and taxa potentially in need of further scrutiny. A maximum likelihood tree of all available sequences is presented in Fig. 138. In the aforementioned Trogastrine lineage, for example, *Eurhexius* is suggested to be paraphyletic with respect to both *Xerhius* and *Kapyatrog*, while *Rhexinia* is resolved into two widely separated clades. In the Jubini, different lineages of *Sebaga* appear to be more closely related to *Arctophysis* on one hand, and *Barrojuba* on another. Various more specific cases, placements of particular genera or prospective relationships within have been addressed above under those taxa's individual treatments. Moving ahead, it appears that comprehensive barcoding of Pselaphinae will require some refinement of procedures before it will provide a reliable tool for molecular identification. And, clearly, additional markers will be necessary to resolve relationships in this hyperdiverse lineage.

Conclusions

It was a foregone conclusion that the fauna of Ecuadorian Pselaphinae would prove highly diverse. However, it is worth considering what the now-available data might say about overall diversity in the country and region. This study, focusing primarily on mid- to higher elevation cloud forest sites, found most species to be restricted to single locations. Out of 339 species, only 37 were found at more than one locality. Of those, nearly half had their furthest known populations less than 5 km apart (and most of these were on opposite sides of the same (Río Pastaza) watershed, my two most proximate sampling points). Some of these had slightly larger ranges, being also found at additional sites on the eastern Andean slope, such as *Arthmius orientalis*, whose range includes both Río Pastaza sites as well as Pacto Sumaco (~110km northeast). *Arthmius cruciatus* occurs in the Rio Pastaza region as well as at Yanayacu (100km north-northeast). *Jubus tetrad* was found at both Rio Machay and at Tinajillas, 180 km to the south. Some similarly broader distributions were found in a few species among areas on the western slope, such as *Arthmius smithae* and *A. turgidus*, both found at Otonga and then either El Pahuma (63 km NE) or Pululahua (~80km NE), respectively. *Jubus pichinchae* was found at El Pahuma, Pululahua, and Mindo.

In general, most of the broadest distributions were found in species whose distributions were primarily at lower elevations. *Syrbatus chelatus* was found at two Amazonian sites (Tiputini and Cuyabeno, 54 km apart), as well as at a slightly higher site, Sumak Kawsay (1250m, 270km to the southwest). In the coastal lowlands, several species were found to occur at multiple sites, such as *Ayapuna tunda, Verabarolus obcasus,* and *Rhexinia laloloori* (all at both Lalo Loor and Barcelona, ~200km apart), *Cercoceropsis pacifica* (Lalo Loor and Cerro Blanco, 203km apart), and *Endytocera serrata* (found from Barcelona to Canandé, 300 km apart, as well as in the mountains at Otonga).

However, some of the largest ranges were surprisingly also seen at the highest elevations, in species seemingly restricted to páramo habitats. *Jubus humboldti* occurs at high elevations from Chimborazo to Pichincha Provinces, a probably patchy range of over 200km. *Jubus culebrillas* is found in both Cañar and Pichincha páramo (255km apart). And *Sebaga alpina* occurs from Chimborazo to Carchi Provinces, spread over 320km. It is doubly surprising in that all of these Jubine species are expected to have flightless females (unlike some of the more widespread cloud forest species, such as those in the genus *Arthmius,* whose males and females are both winged). It does seem more likely that these páramo 'species' will prove to be species complexes, but it still remains unclear how they might have achieved such broad distributions in the first place. Moret (2005) reports a number of what he terms 'macroendemic,' high-elevation carabids, occurring over rather broad ranges even from northern Peru to Colombia. However, these are nearly all capable of flight in both sexes. Some 'mesoendemic' carabids range from higher elevation Chimborazo to Pichincha Provinces, and this geographic range covers most of those pselaphines listed here. One such species, *Dyscolus alpinus* Chaudoir, was analyzed by Muñoz-Tobar and Caterino (2019) and found, despite its flightlessness, to exhibit fairly close relationships among its populations across several seemingly isolated páramo patches. So, failure to speciate, or diverge significantly among now-isolated high elevation populations, while suprising, is not unprecedented.

In the lowland species, the generally broader distributions can probably be attributed to greater habitat connectivity. As one moves up the mountains, however, the landscape's higher degree of topographic complexity seems to dissect distributions more finely, isolating populations, leading to higher rates of divergence and smaller range sizes. Exceptions to this pattern in páramo are puzzling, but they may simply be cases where more detailed study would detect cryptic diversification.

For Pselaphinae, few conclusions as to beta diversity can be reached knowing that the alpha diversity remains so poorly known. Even for the sites more intensively sampled in this study, it is unlikely that even half the species occurring there have been detected. A few species accumulation curves for such sites reveal steadily climbing lines, with no indication of tapering off (Fig. 139). No statistics are going to accurately estimate an asymptote from such data, and the true number of pselaphine species at any of these sites will be much greater. The only site in Ecuador for which any such estimate is available is Yasuní National Park where, from an observed total of 178 pselaphine species in about 110 samples, Carlton *et al.* (2004) extrapolated a potential total in excess of 300 species. The amount and intensity of sampling at any of these sites necessary to flatten the species accumulation curve will be substantial.

Nonetheless, the present study should help establish a foundation upon which such future efforts might build. The current study covers 82 genera, whereas Carlton *et al.* (2004) noted only 62 in their Yasuní samples. One might hope that generic numbers for the region would be nearing an asymptote, but that is also impossible to assess at present. Generic assignment, moreover, remains difficult in a number of prominent groups. A substantial number of trimiine morphospecies were left undescribed due to uncertainty about where they should be placed. The best illustrated and documented neotropical trimiine genera at present are putative Caribbean endemics (e.g. Park 1955, 1960, Park *et al.* 1976), and many of those are characterized by distinctive secondary sexual characters, which are relatively scarce among the Ecuadorian morphospecies at hand. Exemplar male genitalia for many of the described genera have been illustrated (e.g. Grigarick & Schuster 1980), showing remarkable diversity of form, but very few have been characterized by particular apomorphies. Therefore assigning new species to existing genera is largely arbitrary and gestalt-based.

In another case, for a group with a more extensive publication history (e.g. Comellini 1979, 1981a, 1990a, 1990b), generic divisions in Goniacerini are more complicated than they should be. They have somewhat

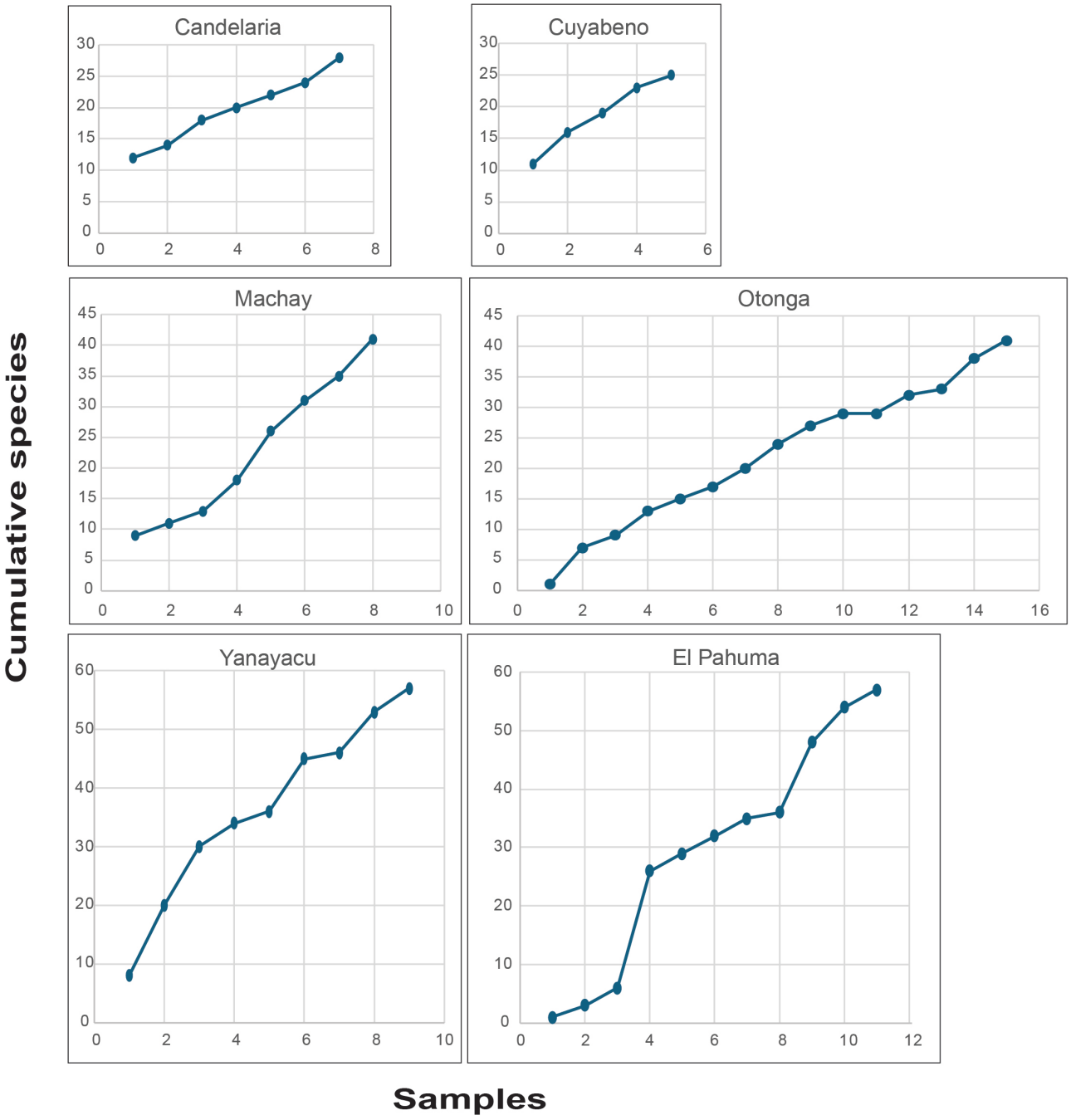

FIGURE 139. Samples (x-axis) vs. cumulative numbers of species at 6 sites (Candelaria, Cuyabeno, Rio Machay, Bosque Integral Otonga, Yanayacu, El Pahuma). All are shown to same scale for both axes.

varied and distinctive morphologies, but the generic level characters are subtle and variable (Comellini makes extensive use of 'more or less' in his 1979 key), and in several cases based on particular male antennal characters, subject to particular variation. What are likely several new species were not treated because of this uncertainty.

I have also alluded to some apparent issues with tribal affiliations of some genera in the Proterini/Iniocyphini. Although this did not preclude describing several new species in these groups in this study, confidence about some of these assignments is not as high as in many other groups, and many of these will have to be reassessed in the future light of greater diversity. None of these caveats will surprise more serious students of pselaphine taxonomy, but they will continue to present challenges to newcomers until revisionary work can be carried out at a finer scale. We hope that a forthcoming key to Neotropical genera (Chandler & Caterino, in prep.) will encourage a larger number of students to try.

Still, the above problems notwithstanding, I will predict with some confidence that future discoveries in Ecuadorian (and Andean somewhat more broadly) Pselaphinae will be mostly in (now) well characterized genera. Any new locality moderately distant from those already collected will turn up new species of *Jubus*, *Arthmius,* and *Euphalepsus* (an additional ~20 species of

the last of these have already been noted in the QCAZ collection). Higher elevation localities will probably turn up many additional species of *Globa* and *Panabachia*, while other brachyglutine genera like *Muyu*, *Pelota*, and *Scalenarthrus* will likely be well-represented at lower elevation sites (the last seemingly more coastal than Amazonian, however).

Practical recommendations for future study of the litter beetle fauna are somewhat hard to offer. On the one hand it would be easy to recommend sampling fewer sites but sampling them more intensively, in the hopes of flattening out a species accumulation curve. However, that might be a vain hope, involving countless hours of sorting and separating the new from more common taxa. Rather, for the time being, I think something like the shotgun approach employed here, at a new selection of localities (ideally 100km or more from well-sampled sites and from each other), would be more productive. Such an approach would uncover the most common species at a site, reveal something of species-sharing among closer sites, and test the prediction that genus level discoveries should be nearing an asymptote. In terms of applicability of such data, monitoring programs to assess the stability of leaf-litter communities in the face of changing climate and other environmental conditions would be based on more common and easily sampled species. So identifying such candidate species for site managers sooner would provide a basis for ongoing sampling programs that would yield a steady source of rarer taxa on into the future. Lastly collaborations with local scientists will be an essential element of any such studies. There is a large backlog of material in many museums, as well as a strong contingent of students interested in furthering knowledge of their faunas. And permitting logistics continue to metastasize, making committed local collaborators essential to successful field programs. It is my hope that this study contributes to an increase in focus on less conspicuous but diverse elements of neotropical insect faunas, particularly those of the leaf litter. The challenges are many, but so are the rewards.

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Supplementary Materials. The following supporting information can be downloaded at the DOI landing page of this paper.

SupplementalTable_GenBank