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Synonymy of *Reikosiella* Yoshimoto under *Merostenus* Walker (Hymenoptera: Chalcidoidea: Eupelmidae), with a checklist of world species and a revision of those species with brachypterous females

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Abstract

Reikosiella Yoshimoto, 1969 is synonymized under *Merostenus* Walker, 1837 **n. syn.** and treated as *M.* (*Reikosiella*), one of four subgenera recognized in the genus. *Hirticauda* Bouček, 1988, previously treated as a subgenus of *Reikosiella*, is synonymized under *M.* (*Merostenus*) **n. syn.**, and two subgenera established in *Reikosiella* by Gibson (1995) are synonymized under *Merostenus* and treated as the subgenera *M.* (*Capreocauda*) and *M.* (*Incohata*) **n. syns.** The new generic synonymy is proposed after morphological comparison of females and males of *Merostenus* and *Reikosiella sensu* Gibson (1995), including reanalysis of features possessed by a basal group of genera of Eupelminae whose females share two hypothesized symplesiomorphies—a medially divided mesotrochantinal plate and lack of a mesotibial apical groove. A checklist of the 51 world species assigned to *Merostenus* is given, with 1 described species in *M.* (*Incohata*), 6 in *M.* (*Capreocauda*), 6 in *M.* (*Reikosiella*) and 38 in *M.* (*Merostenus*). All but one, the type species of *Merostenus*, represent new combinations. The species of *Merostenus* with brachypterous females are revised, with 8 of 10 species described as new. In addition to *M.* (*Merostenus*) *excavatus* (Dalman) (♀, ♂) from the Palaearctic, described in the same subgenus are one new species from Mexico, *M.* (*Merostenus*) *mexicanus* **n. sp.** (♀), and seven from the Afrotropical region, *M.* (*Merostenus*) *distigma* **n. sp.** (♀: Kenya, Tanzania), *M.* (*Merostenus*) *micropterus* **n. sp.** (♀: Democratic Republic of the Congo), *M.* (*Merostenus*) *platyscapus* **n. sp.** (♀: South Africa), *M.* (*Merostenus*) *reticulatus* **n. sp.** (♀, ♂: Kenya), *M.* (*Merostenus*) *speculum* **n. sp.** (♀: Burundi), *M.* (*Merostenus*) *congoensis* (♀: Democratic Republic of the Congo), and *M.* (*Merostenus*) *longistylus* **n. sp.** (♀, ♂: South Africa). The first seven species are assigned to the *excavatus* species-group of *M.* (*Merostenus*) based on females sharing a completely sclerotized pronotum and apically truncate syntergum. Also treated is *M.* (*Reikosiella*) *melinus* (Yoshimoto) **n. comb.** (♀: Argentina, Brazil, Hawaii), the only species known with macropterous to variably strongly brachypterous females. Six species are transferred to other genera. *Merostenus ferrugineus* Yoshimoto & Ishii is transferred to *Anastatus* Motschulsky as *A. ferrugineus* (Yoshimoto & Ishii) **n. comb.**, *Merostenus guamensis* Yoshimoto & Ishii and *Merostenus palauensis* Yoshimoto & Ishii are transferred to *Eupelmus* Dalman and provisionally classified in *E.* (*Eupelmus*) as *E.* (*Eupelmus*) *guamensis* (Yoshimoto & Ishii) **n. comb.** and *E.* (*Eupelmus*) *palauensis* (Yoshimoto & Ishii) **n. comb.**, *Eupelminus subapterus* Ashmead is transferred to *E.* (*Eupelmus*) as *E.* (*Eupelmus*) *subapterus* (Ashmead) **n. comb.**, and *Eupelminus robustus* Brues and *Eupelminus tarsatus* Waterston are transferred to *Arachnophaga* (*Parasolindenia* Brues) as *Arachnophaga* (*Parasolindenia*) *robusta* (Brues) **n. comb.** and *Arachnophaga* (*Parasolindenia*) *tarsata* (Waterston) **n. comb.** The character-state analysis and treated species are illustrated through macrophotography and, except for *A. robusta*, notes and illustrations provided for the excluded species to assist their future recognition.

Key words: Eupelminae, brachyptery, Afrotropical, Neotropical, Palaearctic

Introduction

Walker (1837) established his new genus *Merostenus* (Eupelmidae: Eupelminae) for *Merostenus phedyma* based on a male from England. Walker (1839) subsequently described in the same genus a female from Galapagos as *Merostenus sadales*, but this was discovered by Haliday (1844) to be a species of *Lelaps* Walker (Pteromalidae: Diparinae). The highly sexually dimorphic brachypterous females of *M. phedyma* had actually been described earlier from Sweden by Dalman (1820) under the name *Eupelmus excavatus*. Westwood (1839) subsequently described the new genus *Urocryptus* for *E. excavatus*, but Dalla Torre (1897) discovered *Urocryptus* to be a junior homonym and provided *Eupelminus* as a replacement name. Ruschka (1921) realized that *M. phedyma* and *E. excavatus* were conspecific and synonymized both *Urocryptus* and *Eupelminus* under *Merostenus*, and recognized *M. excavatus* (Dalman) as the valid species name. Other than *M. excavatus*, one species from Hawaii, two species from Africa, and three species from Micronesia have been described in *Merostenus* or *Eupelminus* based on females. None of these has been treated subsequent to their original description and the three species described in *Eupelminus* were never formally transferred to *Merostenus* after *Eupelminus* was synonymized under *Merostenus*, though they were listed under *Merostenus* in Noyes (2016).

Gibson (1995) included *Merostenus* as one of 33 recognized world genera of Eupelminae and stated that he had seen females representing four undescribed species. Among other features, *Merostenus* was distinguished from other eupelmine genera by females being brachypterous in combination with having a completely sclerotized pronotum and an unmodified syntergum (Gibson 1995). *Merostenus* was also one of 10 genera that Gibson (1995, figs 515, 516) hypothesized as a basal group within Eupelminae based on common retention of a single symplesiomorphy, a medially cleft mesotrochantinal plate. Included also in this group was *Reikosiella* Yoshimoto (1969), with four constituent subgenera, *R.* (*Capreocauda* Gibson 1995), *R.* (*Hirticauda* Bouček 1988), *R.* (*Incohata* Gibson 1995), and *R.* (*Reikosiella*). Although recognizing *Merostenus* as a valid genus, Gibson (1995) presented two alternative hypotheses of its possible phylogenetic relationships. One was that *Merostenus* and *Reikosiella* were both monophyletic, possibly sister genera (Gibson 1995, fig. 516). The other was that *Merostenus* rendered *Reikosiella* and *R.* (*Hirticauda*) paraphyletic, being only a small group of species within *R.* (*Hirticauda*) whose females had secondarily become brachypterous in addition to evolving a completely sclerotized pronotum and losing a deeply emarginate syntergum as a result of the ovipositor sheaths being secondarily shortened (Gibson 1995, fig. 515). As part of an intended revision of *Merostenus*, various morphological features of females and males were re-examined relative to Gibson (1995). This reanalysis supports the hypothesis that *Merostenus* renders *Reikosiella* and *R.* (*Hirticauda*) paraphyletic. The purpose of this paper is to present the character reanalysis, make necessary nomenclatural changes to correctly assign species to or exclude species from *Merostenus*, and describe and characterize those species of *Merostenus* that have brachypterous females. No new genera have been described in Eupelminae since Gibson (1995) and with synonymy of *Reikosiella* under *Merostenus* the number of recognized genera is now reduced to 32 within the subfamily.

Material and methods

Specimens on which this study is based were obtained from the following collections (individuals facilitating specimen loans given in parentheses):

BMNH	The Natural History Museum, Department of Entomology, London, England (N. Dale-Skey Papilloud).
BPBM	Bernice P. Bishop Museum, Honolulu, HI, USA (J. Boone).
CNC	Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa, ON, Canada.

HNHM	Hungarian Natural History Museum, Zoological Department, Budapest, Hungary (S. Csősz and Z. Vas).
MRAC	Musée Royal de l'Afrique Centrale, Section d'Entomologie, Tervuren, Belgium (E. de Coninck).
NMK	National Museums of Kenya, Nairobi, Kenya (R. Copeland and M. Gikungu).
NHRS	Department of Entomology, Swedish Museum of Natural History, Stockholm, Sweden (P. Magnusson and H. Vårdal).
QMBA	Queensland Museum, Brisbane, Queensland, Australia (C. Burwell).
SAMA	Iziko Museums of South Africa, Entomology Collection, Cape Town, South Africa (S. van Noort).
TAMU	Texas A&M University, Department of Entomology, College Station, TX, USA (J. Woolley & E. G. Riley).
UCRC	UCR Entomological Teaching and Research Collection, University of California, Riverside, CA, USA (S. Triapitzin, D. Yanega).
USNM	United States National Entomological Collection, U.S. National Museum of Natural History, Washington, DC, USA (M. Gates).

Descriptive taxonomy and format, citation of specimen data, and morphological terms and abbreviations used are mostly the same as given in the respective section for Gibson (2016). The term 'mesopleurosternum' is used to designate the combined lateral and ventral surfaces of the mesothorax in females, which consists of two regions differentiated by the acropleural sulci—the 'acropleuron', the large convex region on either side that is delimited by the acropleural sulcus, and the 'mesopectus', the ventral surface between the acropleural sulci and the lateral surface anterior to the dorsally recurved portion of each acropleural sulcus. The acropleuron and mesopectus often are not distinctly differentiated by the acropleural sulcus anterolaterally, but the mesopectus extends posteriorly to a level about equal with the base of the tegula and usually is variably setose compared to the bare acropleuron. The term 'anal tube' (Figs 14, 16: ant) is used for the tubular extension of the rectum that, when protruded externally in *Merostenus*, consists of a terminal anus (Figs 14, 16: an), a melanized 'subanal plate' ventrally (Figs 14, 16: sbp), and usually a melanized 'supra-anal plate' dorsally (Figs 14, 16: spp). The only absolute measurement given is length of the body excluding the ovipositor sheaths. Length and width ratios of the flagellomeres of the holotype and allotype were taken at a magnification where 10 units = 0.57 mm. For species based on multiple specimens the values of the allotype and/or holotype are given between square brackets. The list of examined material for *M.* (*Merostenus*) *melinus* (Yoshimoto) **n. comb.** includes whether the specimen is a paratype (PT) and, if wings remain, whether it is macropterous (ma) or brachypterous (br). The checklist of species classified in *Merostenus* includes the subgeneric assignment and prior generic combinations and synonyms, if any. The type depository is given only if the new combination results from examination of type material rather than mere transfer of the name from *Reikosiella* or *Hirticauda*. Notes sometimes are included between square brackets to provide additional information relevant to a name. Recorded distribution is included for each valid name, but Noyes (2016) should be consulted for additional relevant information.

Methods of specimen examination and photography are as per Gibson (2016). For some imaged specimens and body parts, some lighter-colored, more yellowish to yellowish-orange regions sometimes appear somewhat darker, more orangish to orangish-brown in the images than described from the specimen itself. This results from photographing card-mounted specimens or because a body part is empty, lacking internal tissue, and a darker color results from artefacts of image layering. All imaged specimens except for holotypes and allotypes bear a unique "CNC Photo" number label, which is cited in the figure captions. All imaged specimens are in the CNC except where indicated otherwise.

The mesosoma of females of selected genera of Eupelminae mounted on scanning electron stubs that were used to illustrate Gibson (1995) were dissected to examine structure of the t2-tr2 (mesotergal-mesotrochanteral) muscle. Under the classification of Gibson (1995), females of the following were dissected: *Arachnophaga* (*Brasemopsis*) *longiceps* (Brues), *Australoodera* sp., *Calymmochilus* sp., *Ecnomocephala townesi* Gibson, *Eutreptopelma leucocheilum* Gibson, *M. excavatus*, *Mesocomys albitarsis* (Ashmead), *Oozetetes* sp. (*bucheri* group), *Phlebopenes* sp., *Reikosiella* (*Incohata*) *guttata* Gibson, *R.* (*Reikosiella*) sp., *T.* (*Tineobius*) sp. and *Xenanastatus* sp. The dissected parts remain in the CNC on the stubs.

Merostenus Walker

Merostenus Walker, 1837: 354–355. Type species: *Merostenus phedyma* Walker (= *Eupelmus excavatus* Dalman, 1820), by monotypy.

Urocryptus Westwood, 1839: 72. Type species: *Eupelmus excavatus* Dalman, 1820: 382–383, by monotypy and original designation. Preoccupied by *Urocryptus* Temminck, 1838: 31, discovered by Dalla Torre, 1897: 85. Synonymy by Ruschka, 1921: 309.

Eupelminus Dalla Torre, 1897: 85. Replacement name for *Urocryptus* Westwood. Synonymy by Ruschka, 1921: 309.

Finlayia Girault, 1934: 1. Type species: *Finlayia puella* Girault, by monotypy. Preoccupied by *Finlayia* Giles, 1904: 365, discovered by Bouček, 1988: 558. **n. syn.**

Reikosiella Yoshimoto, 1969: 627–628. Type species: *Reikosiella melina* Yoshimoto, by monotypy and original designation. **n. syn.**

Hirticauda Bouček, 1988: 558. Type species: *Cerambycobius pax* Girault, by original designation. Synonymy under *Reikosiella* by Gibson 1995: 259. **n. syn.**

Reikosiella (*Capreocauda*) Gibson, 1995: 262. Type species: *Idoleupelmus tsaratananae* Risbec, by monotypy and original designation. **n. syn.**

Reikosiella (*Incohata*) Gibson, 1995: 263. Type species: *Reikosiella (Incohata) guttata* Gibson, by monotypy and original designation. **n. syn.**

Reikosiella (*Reikosiella*); Gibson, 1995: 265.

Reikosiella (*Hirticauda*); Gibson, 1995: 263.

Diagnosis. FEMALE. Head with scrobal depression subcircular to broadly oval, the lateral margin often directed obliquely from torulus towards and sometimes to inner orbit, but lateral and dorsal margins not carinately margined. Mandibles tridentate. Antenna sometimes bicolored with scape, pedicel or one or more funiculars pale to white; with one anellus (fl1). Maxillary palpus normal, not unusually long. Pronotal collar divided medially or (*excavatus* species-group) completely sclerotized. Structures of dorsellum and propodeum relative to apex of scutellum highly variable (characteristic of subgenus). Wings fully developed or strongly reduced; macropterous individuals without linea calva and with marginal vein comparatively long, distinctly longer than costal cell; brachypterous individuals, except for *M. melinus*, with fore wing extending at most to about level of posterior margin of Gt1 if held flat over body and hyaline to variably infuscate without transverse band or anterior and posterior hyaline spots with white setae. Middle leg without groove apically between mesotibial spur and tarsus and with or without apical pegs over base of mesotarsus (depending on subgenus) but pegs, when present, of similar color as tibia and sometimes difficult to discern; mesotarsus with pegs of similar color as tarsus and with single row of pegs along either side of basitarsus. Metatibia not conspicuously compressed. Prepectus with frontal surface small and not contrasting in color with surrounding cuticle. Acropleuron bare posterior to setose mesopectal region below prepectus; variable in structure posteriorly (characteristic of subgenus). Gaster with penultimate tergite exposed anterior to syntergum, not divided mediolongitudinally, and usually more or less transverse-rectangular rather than tapered posteriorly; syntergum, except rarely, with dorsal surface extensive anterior to posterior margin, but structure variable posteriorly, most often deeply emarginate (omega-like: Ω) but sometimes posterior margin more or less transverse in dorsal view; anal tube with variably melanized subanal plate ventral to anus and, except for *R.* (*Incohata*), almost always with distinct, though sometimes yellowish supra-anal plate dorsal to anus contiguous with posterior margin of syntergum. Ovipositor sheaths variable, though often long and filamentous when syntergum omega-like emarginate and short and rigid when syntergum not distinctly emarginate.

MALE. Diagnosis as given by Gibson (1995) for *Reikosiella* except for following changes or additions: head—vertex sometimes with variably distinct sulcus or line between anterior margin of posterior ocellus and inner orbit; flagellum—funiculars obviously longer than wide with variably long and dense mps and comparatively long but variably dense setae, but at least mps not in multiple rows per funicular and without long, apically free, seta-like portion, and setae at least about as long as width of funicular even if comparatively sparse and subapressed to funicular rather than more conspicuously projecting out from funicular; mesoscutum—variably sculptured, but usually meshlike coriaceous to coriaceous-imbricate (at least New World males); metapleuron—bare or partly setose; fore wing—disc dorsally entirely setose or sometimes bare behind parastigma and base of marginal vein to basal and mediocubital folds, but bare region not conspicuous because ventral surface setose, or very rarely with oblique bare band similar to linea calva separated by setae from venation and discal folds; metasoma—gaster entirely dark or partly paler basally to subbasally.

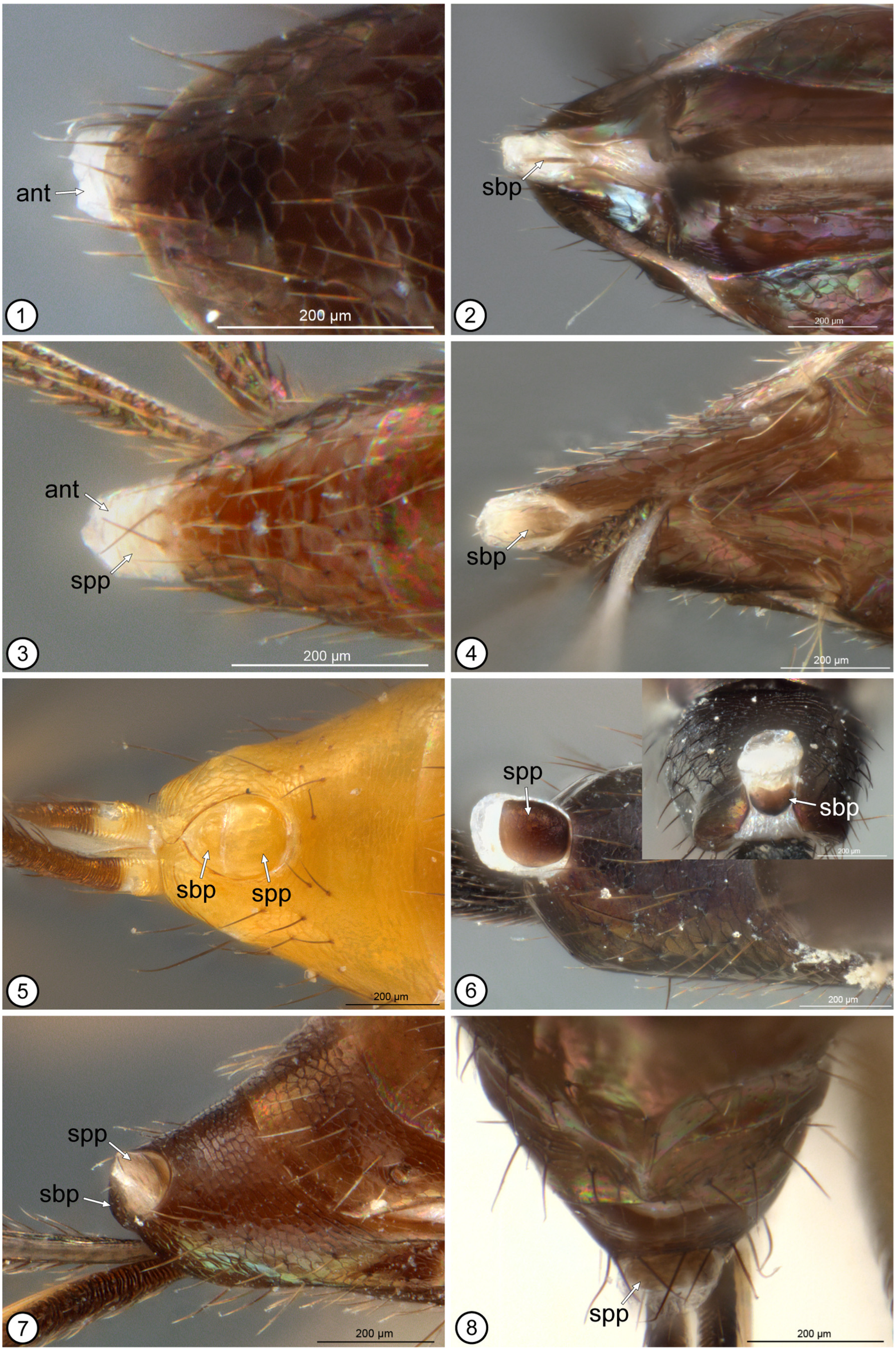
Distribution. Based on examined specimens, all four recognized subgenera—*M.* (*Capreocauda*), *M.* (*Incohata*), *M.* (*Merostenus*) and *M.* (*Reikosiella*) occur in the New World, both Nearctic and Neotropical, even though species of *M.* (*Capreocauda*) and *M.* (*Merostenus*) have yet to be recorded from these regions (see species checklist). Species of *M.* (*Capreocauda*) occur also in the Afrotropical, Australasian and Oriental regions, but I have yet to see specimens from the Palaearctic. Species of *M.* (*Incohata*) and *M.* (*Reikosiella*) occur only in the New World, other than *M.* (*Reikosiella*) *melinus*, which likely was introduced to Hawaii from South America (see species treatment). Though relatively few species are yet described, the New World fauna of *Merostenus* is dominated by species of *M.* (*Reikosiella*), whereas *M.* (*Merostenus*) is most diverse in the Old World where it occurs in all biogeographic realms.

Biology. Of 51 described species of *Merostenus*, the only one for which hosts and biology are confidently known through multiple rearings is *M.* (*Merostenus*) *excavatus*, which is an egg predator of species of *Hypera* Gemar (Coleoptera: Curculionidae), including the alfalfa weevil and clover leaf weevil (Chamberlin 1924b). Larvae estivate in the stems of alfalfa prior to adults emerging (Chamberlin 1924b). Fusu (2013) cited galls of Cynipidae (Hymenoptera) as rearing records for three other species of *M.* (*Merostenus*) from Europe—*M. bolivari* (Kalina) **n. comb.**, *M. hungaricus* (Erdős) **n. comb.**, and *M. rostratus* (Ruschka) **n. comb.** However, he noted that none of these records prove cynipids as the actual hosts for the three species. Although individuals of *M. rostratus* have been reared several times from cynipid galls, Bouček (1977) thought that eggs of Orthoptera deposited on the galls were likely the true hosts. Fusu (2013) also suggested that two other rearing records for *M. rostratus* could indicate it as a parasitoid of inquiline caterpillars in cynipid galls on oaks or some other Lepidoptera larvae associated with oak trees that pupate in hollow galls or under the bark. Single individuals of *M. bolivari* were also reared from cynipid galls in France and Spain, but subsequent attempts to rear more specimens in Spain failed and it was suggested the specimens may have emerged from hidden eggs or from some other host in empty galls (Fusu 2013).

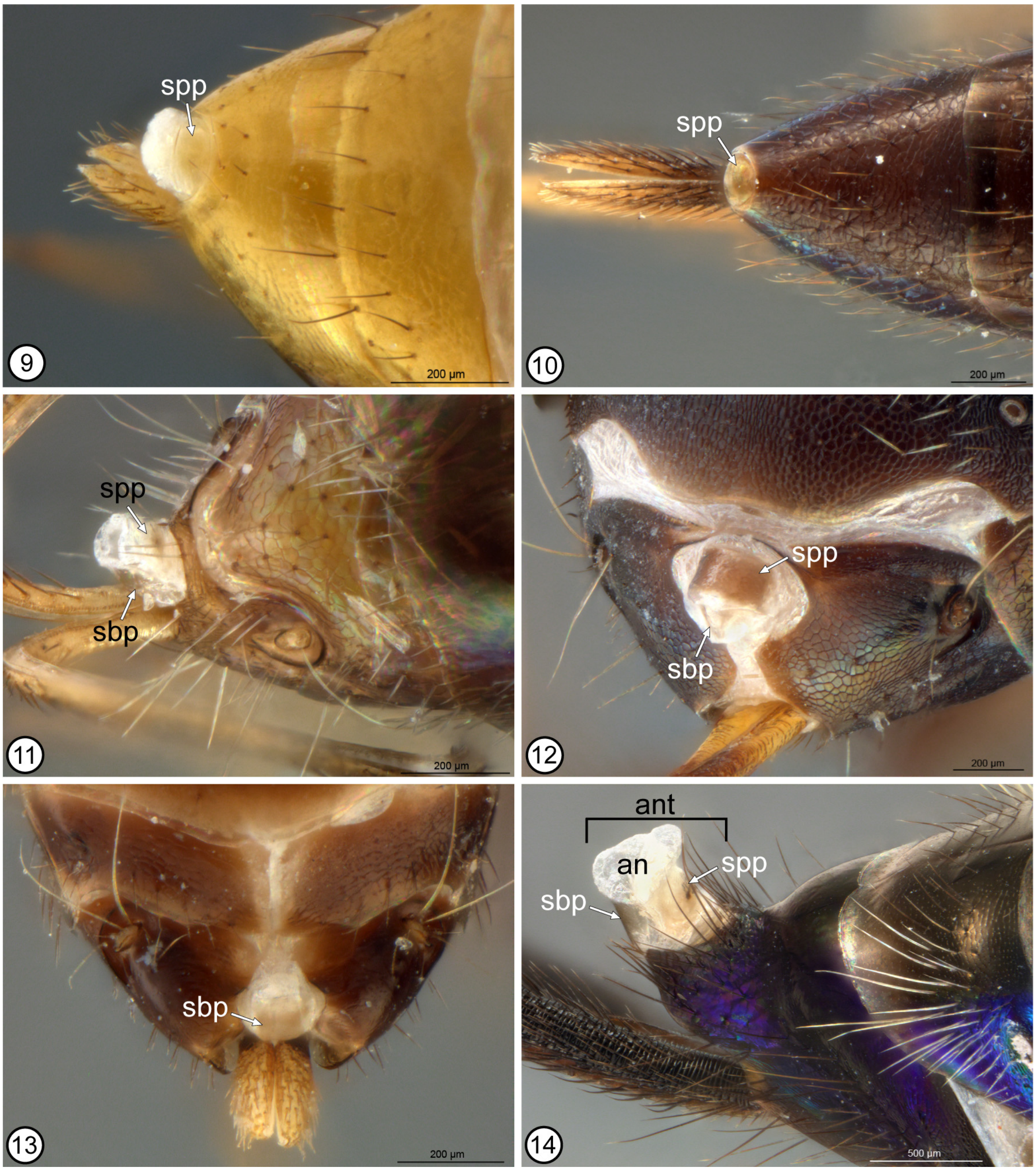
In describing *M.* (*Reikosiella*) *melinus*, Yoshimoto (1969) stated that this species was reared from the larvae or pupae of *Alucita objurgatella* (Walsingham) (Lepidoptera, Alucitidae), though this record also requires confirmation (see under species treatment). The CNC has four females representing two undescribed species of *M.* (*Reikosiella*) from USA reared from cynipid galls—two from a single rearing in Arizona from galls of *Dryocosmus coxii* (Bassett) on *Quercus emoryi* Torr. (Fagaceae), and two from a single rearing in Georgia labelled with "Chestnut gall" (likely a gall on *Castanea dentata* (Marsh) Borkh. (Fagaceae)). These are the only host records among numerous specimens of *M.* (*Reikosiella*) in the CNC from throughout North America. Finally, based on label data, Gibson (1995) reported *Grapholita packardi* (Zeller) (Lepidoptera: Tortricidae) as a host for an unidentified species of *M.* (*Capreocauda*) from British Columbia, Canada. He also stated he saw one specimen labelled as "ex. gall" (Georgia, USA) and another as bred from *Vachellia farnesiana* (L.) Wight & Arn. (Fabaceae) (Texas, USA). The CNC has another female labelled from British Columbia as associated with Douglas fir, *Pseudotsuga menziesii* (Mirb.) Franco (Pinaceae).

Far too few verified host records are known to confidently predict either the host range or biology of species of *Merostenus*. Although several records indicate an association of species of *M.* (*Merostenus*), *M.* (*Reikosiella*) and *M.* (*Capreocauda*) with cynipid galls, the very few reared specimens relative to the number of times cynipid galls have been reared over the years suggests these might be fortuitous associations and Cynipidae are not the actual hosts. Fusu (2013) further suggested that, based on detailed collection records, species of *M.* (*Merostenus*) have arboreal lifestyles. Although this appears to apply to most *Merostenus* species where biological information is known, it does not for *M. excavatus*, which has brachypterous females. Additional research is necessary to determine whether there are any host or other biological differences between species having macropterous or brachypterous females.

Brachyptery. Female brachyptery in *Merostenus* is known only for *M.* (*Reikosiella*) *melinus* and several species of *M.* (*Merostenus*), mostly from the Afrotropical region. Polymorphism in wing length is known only for *M. melinus*, females being macropterous to variably strongly brachypterous (Yoshimoto 1969). Brachypterous females of *M.* (*Merostenus*) sometimes have the fore wings slightly infuscate, but only those of *M. melinus* typically have a hyaline cross-band with white setae behind the marginal vein apically, similar to macropterous females of the species. This latter color pattern is similar to that of many species of *Anastatus* Motschulsky with either macropterous or brachypterous females.



FIGURES 1–8. Gastral apex ♀. *1 & 2*, *Phenaceupelmus chilensis* (2016-49): **1**, dorsal; **2**, ventral. *3 & 4*, *Merostenus* (*Incohata*) sp. (2016-37): **3**, dorsal; **4**, ventral. *5–8*, *Merostenus* spp.: **5**, *M.* (*Capreocauda*) sp., dorsal (2016-44); **6**, *M.* (*Merostenus*) sp., dorsal (2016-54) [insert: posterior view]; **7**, *M.* (*Reikosiella*) sp., posterodorsal (2016-43); **8**, *M.* (*Reikosiella*) sp., dorsal (2016-36). [ant = anal tube, sbp = subanal plate, spp = supra-anal plate]



FIGURES 9–14. Gastral apex ♀: **9**, *Merostenus* (*Reikosiella*) sp., dorsal (2016-40). **10**, *M.* (*Merostenus*) sp., dorsal (2016-39). **11**, *Australoodera* sp., dorsolateral (2016-51). **12**, *T.* (*Tineobius*) sp., posterolateral (2016-46). **13**, *Ecnomocephala townesi*, dorsal (2016-52). **14**, *Phlebopenes* sp., lateral (2016-47). [an = anus, ant = anal tube, sbp = subanal plate, spp = supra-anal plate]

Generic limits and relationships. Couplet one of Gibson's (1995) key to genera of Eupelminae divided females into two groups based on three features—structure of the syntergum, presence or absence of a mesotibial apical groove and, when present, relative position of the mesotibial apical pegs. Keyed through the first half of the couplet were females with an apically deeply emarginate syntergum (Gibson 1995, character 39, state 2; figs 311–313, 315–324) in combination with a mesotibia without a apical groove (Gibson 1995, character 34, state 1; figs 331–342) and either without apical pegs (Gibson 1995, character 35, state 1; figs 337, 338) or, when present, with these positioned at least partly over the base of the tarsus (Gibson 1995, character 35, state 2; figs 331–336, 339–342). Keyed through the second half of couplet one were females with an apically truncate (character 39, state 1) or posteriorly rounded (character 39, state 3) syntergum and/**or** a mesotibia with an apical groove (Gibson 1995, character 34, state 2; figs 327–330) and with apical pegs restricted to a narrow region above the base of the mesotibial spur (Gibson 1995, character 35, state 3; figs 327–330). An apically truncate syntergum, absence of a mesotibial apical groove, and absence of mesotibial apical pegs were all hypothesized as the groundplan states of the respective characters for female Eupelminae. Based on the different character-state combinations, *Reikosiella* and five other genera (*Australoodera* Girault, *Ecnomocephala* Gibson, *Eupelmus* Dalman, *Phlebopenes* Perty and *Tineobius* Ashmead) were keyed through the first half of couplet one, whereas *Merostenus* was keyed through the second half of the couplet along with all other eupelmine genera. This included *Omeganastatus* Gibson and *Brasema* Cameron, even though females of the former genus and some females of the latter genus have a deeply emarginate syntergum (Gibson 1995, fig. 314), because their mesotibia has an apical groove and apical pegs over the base of the tibial spur. Females of the two genera also share what was hypothesized as the apomorphic structure of the mesotrochantinal plate, i.e. consisting of a narrow, flat to slightly convex plate terminated in tiny articulatory lobes (Gibson 1995, character 22, state 2; fig. 94). Because of the character-state combination, a deeply emarginate syntergum was hypothesized to have evolved in *Omeganastatus* and in a few species of *Brasema* independently from those genera keyed through the first half of the couplet, likely in association with secondarily lengthened, filamentous ovipositor sheaths (Gibson 1995).

Although no evidence was presented that they represent a monophyletic group, Gibson (1995, figs 515, 516) illustrated a group of 10 genera as constituting a mostly unresolved basal group within Eupelminae based on retention of the hypothesized symplesiomorphic structure of the mesotrochantinal plate, i.e. consisting of two partly to completely separated articulatory lobes (Gibson 1995, character 22, state 1; fig. 93). Included in the group were the six genera listed above that were keyed through the first half of couplet one plus *Merostenus*, *Mesocomys* Cameron, *Phenaceupelmus* Gibson and *Xenanastatus* Bouček (Gibson 1995, table 1). Although structure of the mesotrochantinal plate is variable in *Reikosiella*, it was included because females of the hypothesized most basal subgenus, *R.* (*Incohata*), possess the plesiomorphic structure, as do at least some species of the other three other subgenera that were classified in the genus. Furthermore, females of *Reikosiella* lack a mesotibial apical groove (Gibson 1995, fig. 342), which is shared with the other nine genera having a plesiomorphic structure of the mesotrochantinal plate.

Gibson (1989) hypothesized Eupelminae as a monophyletic group based primarily on two features, extreme sexual dimorphism (character 1, state 2), which is a composite of several features, and, for females, reduction of the t2–tr2 (mesotergal-mesotrochantinal) muscle from a large tubular muscle originating from each axilla and axillar phragma (Gibson 1989, character 17, state 1; fig. 131) to a slender, tendon-like muscle originating from the apex of the ventroapical angle of the lateral surface of the axilla (Gibson 1989, character 17, state 6; fig. 132). Subsequently, Gibson (1995, figs 515, 516) hypothesized the monotypic genus *Phenaceupelmus* Gibson as the basal-most lineage of Eupelminae based on several external features, including possession of the hypothesized plesiomorphic structures of the mesotrochantinal plate and syntergum for females. This basal relationship was later supported by the discovery that females as well as males of *P. chilensis* Gibson possess the symplesiomorphic structure of the t2-tr2 muscle for Eupelmidae (Heraty *et al.* 2013). Gibson's (1989) original hypothesis of reduction of the t2-tr2 muscle in females as a synapomorphy for Eupelminae was based on dissections of females of only three genera, one with the plesiomorphic mesotrochantinal plate structure (*Eupelmus*) and two with the apomorphic structure (*Anastatus* and *Brasema*). Because of the discovery that *P. chilensis* females possess the plesiomorphic t2-tr2 structure, females of additional genera, as listed under 'Material and methods', were dissected for the present study. This included those of all the genera listed above as comprising a basal group possessing separate mesotrochantinal lobes plus four additional genera possessing the apomorphic mesotrochantinal lobe structure. All the newly dissected females were found to have similar tendon-like structures of t2-tr2 originating from the apex of the ventroapical angle of the lateral surface of the axilla. This more comprehensive character-state survey therefore more strongly supports *Phenaceupelmus* as the sister group of remaining Eupelminae. The basal position of *Phenaceupelmus* within Eupelminae was important for the phylogenetic analysis of Gibson (1995) because most character-state polarities were based on the hypothesis that individuals of *P. chilensis* retain the symplesiomorphic groundplan structures of the subfamily.

In addition to mesotrochantinal lobe structure, females of *P. chilensis* were recorded as also having the hypothesized plesiomorphic structure of the syntergum, i.e. a dorsally flat to evenly convex, apically undifferentiated tergite having a more or less transverse posterior margin (Gibson 1995, character 39, state 1; figs 271–278). Two other syntergal structures were described as apomorphic states, the apically omega-like emarginate syntergum, and one in which the syntergum is tapered and constricted posteriorly into a narrow, posteriorly rounded or angulate margin and/or reflexed into a rim or posteriorly rounded flange (Gibson 1995, character 39, state 3; figs 283–306). Both the emarginate and flanged syntergal structures were hypothesized to have evolved independently from a plesiomorphic structure similar to that possessed by *P. chilensis* (Fig. 1). The plesiomorphic syntergal structure was also recorded for *R.* (*Incohata*) (Gibson 1995, figs 309, 310), the hypothesized basal-most lineage of *Reikosiella*. Its basal position within *Reikosiella* was postulated primarily because of relative structure of the scutellum, dorsellum and propodeum (sdp-complex) (Gibson 1995, character 24, state 1; fig. 189), which is also very similar to that of *P. chilensis* (Gibson 1995, fig. 187). Because of the combination of sdp-complex and syntergal structure for *R.* (*Incohata*) it was further suggested that the deeply emarginate synterga characteristic of almost all other *Reikosiella* (Gibson 1995, table 1; figs 311–313) evolved convergently to similar deeply emarginate synterga that characterize females of *Australoodera* (Gibson 1995, fig. 318), *Ecnomocephala* (Gibson 1995, fig. 319), *Eupelmus* (Gibson 1995, figs 320–324), *Phlebopenes* (Gibson 1995, fig. 316) and *Tineobius* (Gibson 1995, fig. 317). Females of *R.* (*Capreocauda*), *R.* (*Hirticauda*) and *R.* (*Reikosiella*) were recorded as having different, variably derived structures of the sdp-complex, as were females of the above five genera except for some *Australoodera* (Gibson 1995, table 1).

In addition to *P. chilensis* and *R.* (*Incohata*), females of *Merostenus* were also recorded as having the plesiomorphic structure of the syntergum, except for one species here described as *M. mexicanus*, which was stated as having the syntergum reflexed apically into a posteriorly rounded syntergal flange (Figs 75, 81). Females of *Mesocomys* (Gibson 1995, fig. 300) and *Xenanastatus* (Gibson 1995, fig. 306) also have variably developed syntergal flanges, as do females of most genera with the apomorphic structure of the mesotrochantinal plate (Gibson 1995, table 1). Structure of the sdp-complex was not coded for genera composed only of species with brachypterous females, such as *Merostenus*, because Gibson (1995) noted that the sdp-complex tends to be highly modified for brachypterous females in genera with both macropterous and brachypterous females. However, the sdp-complex structure of females that would be assigned to *Merostenus* is more similar to that of *R.* (*Hirticauda*) than the other subgenera of *Reikosiella* because the dorsellum abuts the apex of the scutellum so that in lateral view the scutellum is not protuberant, unlike females of *R.* (*Reikosiella*) (Gibson 1995, fig. 176) and *R.* (*Capreocauda*) (Gibson 1995, fig. 180), and the propodeum is variably modified from that of *R.* (*Incohata*) females (Gibson 1995, fig. 189).

Very few genera other than *Phenaceupelmus*, *R.* (*Incohata*) and *Merostenus* were recorded by Gibson (1995, table 1) as possessing a plesiomorphic syntergal structure, primarily *Brasema* Cameron and *Calymmochilus* Masi, though both states 1 (unmodified) and 3 (flanged) or structures difficult to assign unambiguously to either state were recorded for some genera. In reassessing the difference between an unmodified syntergum and one with a syntergal flange for this study, particularly the difference between the syntergal structures typical of *Brasema* (Gibson 1995, fig. 272) and *Zaischnopsis* Ashmead (Gibson 1995, figs 305, 306), it was realized that the hypothesized symplesiomorphic structure should likely also include a row of elongate setae that originate slightly anterior to the posterior margin of the syntergum and extend conspicuously over the margin (e.g. Figs 1, 19). Females of *P. chilensis* have such a row of setae (Fig. 1), as do most species of *Brasema* (Fig. 19), whereas females with a syntergal flange lack setae paralleling the margin, though often there are more conspicuously premarginal setae whose apices project, at most, just beyond the syntergal apex (Gibson 1995, figs 284, 286, 290, 292, 296, 298, 305, 306). This setal difference indicates that syntergal flanges evolved through secondary expansion of the sublinear region of cuticle posterior to the line of submarginal setae characteristic of such taxa as *P. chilensis* (Fig. 1) and *Brasema* (Fig. 19). The different setal patterns can be used as a supplemental feature to differentiate females of most species of *Brasema* and *Zaischnopsis*. However, Gibson (1995) hypothesized that *Zaischnopsis* might render *Brasema* paraphyletic (Gibson 1995, fig. 517), and the syntergal structure/setal patterns of females of the *Brasema schizomorpha*-group *sensu* Gibson (1995) could support such a hypothesis. Females of the *schizomorpha*-group have the posterior margin of the syntergum slightly incurved rather than posteriorly rounded, and the apical-most setae in a transverse row with their apices projecting somewhat beyond the posterior margin, but the setae are quite distinctly premarginal because there is a transverse, lighter-colored to translucent, flat or slightly reflexed cuticular region posterior to them (Fig. 19: insert). Either the syntergal structure/setal patterns of *schizomorpha*-group and *Zaischnopsis* females evolved independently or the *schizomorpha*-group represents a clade of species in which the cuticle posterior to the premarginal setae increased prior to the posterior margin becoming posteriorly rounded. If so, *schizomorpha*-group species are indicated to be more closely related to *Zaischnopsis* than to other *Brasema* and therefore are incorrectly classified. Syntergal setation is variable for museum specimens of *R.* (*Incohata*), but some females have two long premarginal setae paramedially (Fig. 3) or even more numerous premarginal setae.

FIGURES 15–21. *15–18*, gastral apex, *Eupelmus* spp. ♀: **15**, *E.* (*Episolindelia*) sp., dorsal (2016-45) [insert: *E.* (*Eupelmus*) *memnonius*, dorsal]; **16**, *E.* (*Eupelmus*) *atropurpureus* Dalman (2016-55), dorsolateral [insert: posterior view]; **17**, *E.* (*Episolindelia*) *hartigi* Förster (2016-56), dorsolateral [insert: posterior view]; **18**, *E.* (*Episolindelia*) sp., *hartigi*-group (2016-57), dorsolateral [insert: dorsal view]. *19–21*, gastral apex ♀, dorsal: **19**, *Brasema* sp. (2016-58) [insert: *Brasema schizomorpha* (2016-106)]; **20**, *Brasema* sp. (2016-59); **21**, *Omeganastatus macrocercus* (2016-48). [an = anus, ant = anal tube, sbp = subanal plate, spp = supra-anal plate]

Although not analyzed as a character within Eupelminae, Gibson (1995) also noted the presence of a melanized sclerite, which he called the anal sclerite (Gibson 1995, figs 320, 323: asc), in some females with a deeply emarginate syntergum. A similar melanized sclerite is usually also visible in ventral view under the apex of an unmodified syntergum or one with a syntergal flange, though sometimes it is concealed between the syntergum and ovipositor sheaths. In all instances this sclerite is separated from the posterior margin of the syntergum by membrane. Gibson (1995, p. 44) hypothesized that the former structure was a consequence of the syntergum being "shortened dorsally [because of development of a deep emargination], resulting in the primitively concealed anal sclerite being pulled from a ventral position to a posteriorly or dorsally directed position". However, examination of the syntergal structure of females that would be classified in *Merostenus sensu* Gibson (1995), and subsequent re-examination of the structures of females of other genera with a deeply emarginate syntergum shows the observation of structure was inaccurate. The single known female of *M. mexicanus* has a melanized sclerite faced ventrally under the reflexed apex of the syntergum (Figs 81, 82), and the dorsal surface of the syntergum is sparsely setose with similarly short setae, including along the extreme posterior margin (Figs 75, 82). However, except for *M. platyscapus*, at least some females of the other species here classified as the *excavatus* group of *M.* (*Merostenus*) (= *Merostenus sensu* Gibson 1995), have two externally visible syntergal sclerites. There is a variably transverse sclerite faced dorsally or posteriorly behind and contiguous with the posterior margin of the syntergum (Figs 38, 47, 48, 89, 105) and a ventral, suboval sclerite that is separated from the dorsal sclerite by membrane, which sometimes is extended posteriorly into an 'anal tube' (Figs 14, 16: ant). When an anal tube is evident, more typically in critical-point dried than air-dried females, the dorsal sclerite is seen to lie dorsal to and the ventral sclerite ventral to the terminal anus (Figs 14, 16–18: an). Consequently, the more dorsal sclerite is here called the 'supra-anal plate' (Figs 38, 47, 48, 89, 105, 122: spp) and the ventral sclerite the 'subanal plate' (Figs 48, 81, 82: sbp), to reflect the double structure and position of each relative to the anus (see further below). Females of *M. excavatus* are variable in development of the supra-anal plate. Some females have quite a distinct, dark supra-anal plate whereas others just a slightly yellowish, strongly transverse, inconspicuous supra-anal plate that abuts the posterior margin of the syntergum (Fig. 47) or is more conspicuous behind the syntergum if the anal tube is extended (Fig. 48). Some females also appear to lack a supra-anal plate, but based on presence in many females this likely is because in air-dried females the anal tube typically is collapsed within the gaster and the supra-anal plate is then sometimes hidden under the apex of the syntergum. Known females of *M. platyscapus* also lack a visible supra-anal plate, but true absence requires confirmation through observation of freshly collected specimens because apparent absence in available specimens might result from the sclerite being hidden under the syntergum apically. Setation of the syntergum of *excavatus*-group females is variable, often being bare dorsally, but if setose then evenly setose without a line of longer premarginal setae that project distinctly beyond the posterior margin. Females of *P. chilensis* that have the anal tube extended (Fig. 1: ant) lack an evident supra-anal plate and in ventral view the subanal plate is very slender, being strongly melanized/sclerotized only mediolongitudinally (Fig. 2: sbp). Within what was classified as *Reikosiella sensu* Gibson (1995), females of *R.* (*Incohata*) also lack a distinct supra-anal plate, though sometimes the membrane above the anus is yellowish, being slightly sclerotized/melanized (Fig. 3: spp), in critical-point dried females having the anal tube extended posteriorly (Fig. 3: ant). Females of *R.* (*Incohata*) also have a variably strongly but more extensively sclerotized/melanized subanal plate below the anus than for *P. chilensis*, being more oval (Fig. 4) similar to the subanal plate characteristic of females of the other three subgenera (Figs 5–7) and other female Eupelminae (Figs 12–14, 16). A revision of the species of the subgenera is required in order to document character-state distribution accurately, but at least the vast majority of females of *R.* (*Capreocauda*) (Fig. 5), *R.* (*Hirticauda*) (Figs 6, 10) and *R.* (*Reikosiella*) (Figs 7–9) *sensu* Gibson (1995) have a distinctly melanized, variably large supra-anal plate adjacent to the syntergal emargination in addition to a variably melanized, suboval subanal plate ventrally. The presence of such a strongly sclerotized/melanized supra-anal plate that it appears as a separate sclerite along the posteromedial margin of the syntergum is undoubtedly a derived feature. Further, the vast majority of females of the three subgenera lack or have only a couple of long syntergal premarginal setae paramedially (Figs 5–7, 9, 10), though rarely there is a complete row (Fig. 8). This indicates that syntergal premarginal setae were secondarily lost within *Reikosiella*, but more accurate knowledge of character-state distribution is required to determine whether a complete row was the groundplan state for the genus and, if so, how many times loss to two paramedial or no premarginal setae occurred. Of the other basal genera with a distinctly emarginate syntergum, females of *Australoodera* (Fig. 11), *Ecnomocephala* (Fig. 13) and *Phlebopenes* (Fig. 14) are similar to those of *R.* (*Incohata*) in at least lacking a strongly melanized/sclerotized supra-anal plate, though when the anal tube is extended posteriorly the dorsal membrane anterior to the anus is often slightly melanized/sclerotized (Figs 11, 14). There is also a similarly or more strongly melanized subanal plate (Figs 11, 13, 14). Females of *Australoodera* (Fig. 11; Gibson 1995, fig. 318) and *Ecnomocephala* (Fig. 13; Gibson 1995, fig. 319) have a very short, sublinear dorsal surface of the syntergum (Gibson 1995, table 1, character 39, state 2b) and at most two long premarginal setae paramedially (Fig. 11). Females of *Phlebopenes* have an extensive dorsal surface of the syntergum anterior to the emargination (Gibson 1995, table 1, character 39, state 2a) and numerous premarginal setae that project conspicuously beyond the syntergal emargination (Fig. 14; Gibson 1995, fig. 316).

Most examined museum females of *T.* (*Tineobius*) have the syntergal emargination partly to completely hidden under one or more preceding tergites, but the dorsal surface of the syntergum anterior to the emargination is sublinear (Fig. 12; Gibson 1995, fig. 317). Syntergal premarginal setae were not observed for any female in which the slender dorsal surface was visible, but a subanal plate and variably melanized supra-anal plate are present. Females of some species have a comparatively lightly sclerotized, yellowish supra-anal plate similar to the preceding genera, but at least some have a more distinctly melanized supra-anal plate (Fig. 12) similar to *Reikosiella sensu* Gibson (1995) excluding *R.* (*Incohata*). Finally, females of most species of *Eupelmus* have a deep syntergal emargination partly to completely surrounding a single visible melanized plate (Gibson 1995, figs 320–324), but whether this is the supra-anal or subanal plate differs among species. The single, typically strongly sclerotized/melanized plate of *E.* (*Eupelmus*) and *E.* (*Macroneura*) females (Gibson 1995, figs 323, 324) is the subanal plate based on its position ventral to the anus (Fig. 16: insert) and often the presence of a more lightly melanized/sclerotized supra-anal plate dorsal to the anus when the anal tube is extended (Fig. 16). The latter plate is normally concealed within the gaster when the anal tube is not extended. In the hypothesized basal grade of *Eupelmus*, *E.* (*Episolindelia* Girault) (Gibson 1995, figs 321, 322), females of what Gibson (1995) differentiated as the *australiensis* group, those with the gaster obviously tapered posteriorly and with a terminal syntergal emargination, either have both a supra-anal and subanal plate externally visible within the emargination (Fig. 15; Gibson 1995, fig. 322: note transverse line that separates the two sclerites behind the syntergal premarginal setae) or just the supra-anal plate visible when the anal tube is not extended. The two plates, particularly the subanal plate, are often only lightly melanized/sclerotized so that presence or absence of an external subanal plate is often difficult to determine confidently, but when both are obvious the supra-anal plate is anterior to the subanal plate (Fig. 15) similar to some *Reikosiella* with a similar apical structure of the syntergum (Fig. 5). Gibson (1995) also differentiated the *hartigi*-group within *E.* (*Episolindelia*). Females of this group often have the gaster flattened apically, but at least the syntergal emargination is faced more dorsally and the syntergum extends posterior of the emargination to some extent. Such females also have only a single, typically more strongly sclerotized/melanized plate visible when the anal tube is not extended (Gibson 1995, fig. 320: asc). However, this sclerite is seen to be the supra-anal plate if the anal tube is extended (Figs 17, 18). Therefore, the sclerites labelled as "asc" (anal sclerite) in Gibson (1995, figs 320, 323) are not the same sclerite but the supra-anal sclerite in fig. 320 and the subanal sclerite in fig. 323. The difference in structure between the *hartigi*-group of *E.* (*Episolindelia*) and that of *E.* (*Eupelmus*) and *E.* (*Macroneura*) is clearly evident only if the anal tube is extended. Gibson (1995) stated that females of *E. memnonius* Dalman, the type species of *Eupelmus*, are structurally intermediate between those of the *E.* (*Episolindelia*) *australiensis*-group and those of *E.* (*Eupelmus*), and only questionably classified *E. memnonius* in *E.* (*Eupelmus*) based on the presence of dark mesotarsal pegs that are slightly differentiated into two rows apically on the basitarsus. An image of the syntergum of *E. memnonius* (Fig. 15: insert) taken by Lucian Fusu (Al. I. Cuza University, Iasi, Romania) shows that structure is most similar to *E.* (*Episolindelia*) *australiensis*-group females, including the presence of externally visible supra-anal and subanal plates when the anal tube is not extended. This suggests that a terminal, more or less obliquely angled syntergal emargination with externally visible supra-anal and subanal plates are groundplan features for *Eupelmus*. Presence of just an externally visible supra-anal plate for *E.* (*Episolindelia*) *hartigi*-group females, and just a subanal plate for *E.* (*Eupelmus*) + *E.* (*Macroneura*) females, also indicates these two clades represent independent monophyletic lineages, with *E. memnonius* possibly the basal clade of *E.* (*Eupelmus*) + *E.* (*Macroneura*) based on symplesiomorphic syntergal anal plate structures but a more derived mesotarsal peg structure relative to *E.* (*Episolindelia*) females. In all instances within *Eupelmus* there is again a maximum of two syntergal premarginal setae paramedially (Figs 15, 16; Gibson 1995, figs 321, 322).

Females of *Calymmochilus*, which were included in the basal group of Eupelminae based on mesotrochantinal plate structure, lack any evident supra-anal plate behind the transverse posterior margin of the syntergum, suggesting a plesiomorphic structure except for a reduced number of syntergal premarginal setae. Females of most species have the syntergum bare posterodorsally, though I have seen very few females with two long premarginal setae paramedially. Of those genera with the apomorphic structure of the mesotrochantinal plate (Gibson 1995, figs 519, 520), all apparently also lack a sclerotized/melanized supra-anal plate when the anal tube is extended, including females of *Omeganastatus macrocercus* Gibson (Fig. 21) and those of *Brasema*, whether the posterior margin is distinctly emarginate (Fig. 20) or not (Fig. 19). Females of at least the vast majority of *Brasema* species have a line of syntergal premarginal setae (Figs 19, 20), but these are lacking from *O. macrocercus* females (Fig. 21).

Based on the above character analysis, Gibson's (1995) coding of the groundplan syntergal structure of

Brasema as symplesiomorphic is supported. Syntergal structure of *Calymmochilus* is also similar to the hypothesized plesiomorphic structure except for a reduced number or lack of any premarginal setae, and their syntergal structure could have evolved simply through secondary loss of the premarginal setae. However, even though females of species of *Merostenus sensu* Gibson (1995) have very similar syntergal structures as for *Calymmochilus* females, their coding as plesiomorphic by Gibson (1995) is undoubtedly incorrect. This is evidenced by the presence of a comparatively strongly sclerotized/melanized supra-anal plate along the posterior margin of the syntergum in combination with the lack of a differentiated line of syntergal premarginal setae for *M. excavatus* (Figs 47, 48). Of six other newly described species that would have been classified in *Merostenus* based on the combination of female brachyptery, completely sclerotized pronotum, and apically transverse syntergum, four have similar syntergal structures and setal patterns (Figs 38, 89, 105, 122) as for *M. excavatus*. Available females of *M. mexicanus* (Fig. 82) and *M. platyscapus* (Fig. 96) lack visible supra-anal sclerites, but absence for *M. mexicanus* is correlated with its flanged syntergum and confirmation of absence for *M. platyscapus* requires additional, critical-point dried females. The presence of a distinct supra-anal plate in brachypterous females of most species here classified as the *excavatus*-group of *Merostenus* indicates that their superficially plesiomorphic syntergal structure actually is a derived structure that evolved though loss of a syntergal emargination in association with the ovipositor sheaths being secondarily shortened, but with retention of the supra-anal plate in most species, even though sometimes it is very small. A reduced syntergal emargination associated with comparatively short ovipositor sheaths but with retention of a distinct supra-anal plate along the posterior margin of the syntergum is exhibited by the fully winged females of at least one species of *M.* (*Merostenus*) (Fig. 10) and *M.* (*Reikosiella*) (Fig. 9). This indicates that reduction of a syntergal emargination is at least possible, if not likely, when the ovipositor sheaths are secondarily shortened in *Reikosiella*. Interestingly, no species of *E.* (*Macroneura*) or *E.* (*Eupelmus*) with brachypterous females have secondarily lost an omega-like emargination even though the ovipositor sheaths are comparatively short and rigid. This may be for some functional reason correlated with an extremely short rather than more extensive dorsal surface of the syntergum characteristic of *Reikosiella* and *Merostenus sensu* Gibson (1995).

The syntergal structure of *R.* (*Incohata*) is at least very similar to that postulated as the groundplan eupelmine structure (*cf.* Figs 1, 3), though the subanal plate is comparatively large and suboval (Fig. 4), which is more similar to that of other *Reikosiella* and eupelmines rather than *P. chilensis* (Fig. 2). As a unique state, the very slender, only mediolongitudinally sclerotized subanal plate of *P. chilensis* could be an autapomorphy of that species or a uniquely retained symplesiomorphy within Eupelminae. If the latter, the more extensively sclerotized/melanized subanal plate represents another synapomorphy for Eupelminae excluding *Phenaceupelmus*. It also remains to be determined more confidently whether an apical line (e.g. Fig. 8) rather than just 2 paramedial premarginal setae (e.g. Fig. 3) is the groundplan syntergal setal pattern for *R.* (*Incohata*) and the genus. Critical-point dried females show that an anal tube can extend beyond the syntergum in *R.* (*Incohata*), and the membrane anterior to the anus is at least sometimes slightly sclerotized/melanized (yellowish) dorsally (Fig. 3). However, this region is not as strongly sclerotized/melanized as for females of the other three subgenera, in which it typically appears as quite a distinct sclerite along the posteromedial margin of the syntergum (Figs 5–10). A basal position for *R.* (*Incohata*) relative to the other three subgenera is thus supported not only by structure of the sdp-complex of females (Gibson 1995, fig. 189), but also by syntergal structure, i.e. lacking a deep syntergal emargination in combination with at most having a very slightly sclerotized/melanized supra-anal plate, and possibly a row of long premarginal setae as groundplan features. The presence of a comparatively much more strongly sclerotized/melanized supra-anal plate in females of the other three subgenera of *Reikosiella* (Figs 5–10) and a variably strongly sclerotized/melanized supra-anal plate in other basal genera characterized by a deeply emarginate syntergum (Figs 11–18) suggests that the membrane dorsal to the anus is prone to secondary sclerotization/melanization for some functional reason when the anal tube is directed more posterodorsally to dorsally than posteriorly to posteroventrally. Most likely this is to lessen desiccation and/or for protection of the secondarily exposed anus. Based on syntergal structure of *R.* (*Incohata*), sclerotization/melanization of the supra-anal plate in the other three subgenera of *Reikosiella* (Figs 5–10) is indicated to have evolved independently of that of *Australoodera* (Fig. 11), *Ecnomocephala* (Fig. 13), *Eupelmus* (Figs 15–18), *Phlebopenes* (Fig. 14) and *Tineobius* (Fig. 12). Further, it is only within *R.* (*Capreocauda*) (Fig. 5) + *R.* (*Hirticauda*) (Figs 6, 10) + *R.* (*Reikosiella*) (Figs 7–9) *sensu* Gibson (1995), most species of what is here classified as the *excavatus*-group of *Merostenus* (Figs 47, 48, 105, 122), and at least some species of *T.* (*Tineobius*) (Fig. 12) and the *hartigi*-group of *E.* (*Episolindelia*) (Figs 17, 18; Gibson 1995, fig. 320) that the supra-anal plate is so strongly sclerotized/melanized that it appears as a distinct sclerite posterior to the syntergal emargination.

Eupelmus + *Australoodera* + *Tineobius* are indicated as a monophyletic group based on shared presence of a comparatively large and light-colored frontal prepectal surface (Gibson 1995, character 19, state 2), though females of *Mesocomys*, which have a syntergal flange, have a similar frontal prepectal surface structure (Gibson, 1995, table 1). *Ecnomocephala* + *Eupelmus* + *Australoodera* + *Tineobius* may also be indicated as a monophyletic lineage by common reduction of the dorsal surface of the syntergum to a slender band anterior to the emargination (Figs 11–13). Reduction of the syntergal premarginal setae to at most two long setae paramedially may also be a synapomorphy for the four genera, though it remains to be proven whether a similar setal pattern in some *Reikosiella* results from common ancestry or homoplasy. The reduction in number of syntergal premarginal setae to just two setae paramedially perhaps is prone to evolve for some functional reason in taxa with a deeply emarginate syntergum and sclerotized supra-anal plate, possibly used to sense the angle of the supra-anal plate when the anal tube is extended during defecation. However, as noted above, females of at least a couple of species of *Calymmochilus* have a similar setal pattern even though they lack a supra-anal plate and not all females with a deeply emarginate syntergum and noticeably sclerotized supra-anal plate have two syntergal premarginal setae paramedially. The syntergal emargination of *Phlebopenes* is almost certainly independently derived from the other five basal genera with an emargination because not only is the dorsal surface of the syntergum extensive anterior to the emargination but there is a line of long premarginal setae that project over the emargination (Fig. 14) similar to those few *Brasema* with a deeply emarginate syntergum (Fig. 20). The functional advantage of a deeply emarginate syntergum remains uncertain. Females with the plesiomorphic syntergal structure (Figs 1, 3, 19) or those with a syntergal flange apparently have the anus directed posteriorly to posteroventrally over the ovipositor sheaths for defecation, whereas those with a deeply emarginate syntergum have the anus directed posterodorsally to dorsally. This is taken to the most extreme condition in some *E.* (*Episolindelia*) *hartigi*-group species (Fig. 18). One would think it would be a disadvantage to defecate dorsally over one's self (Fig. 18), but it might be advantageous to lessen chances of fouling the ovipositor.

Other than what was interpreted as the plesiomorphic syntergal structure, Gibson (1995) retained *Merostenus* as a valid genus primarily because females exhibit the following three features: brachyptery (character 29, state 2), pronotum completely sclerotized (character 14, state 2), and scutellum not extending to transscutal articulation such that the axillae are contiguous anteriorly but are separated by a variably distinct depression anterior to the scutellum (structure not analyzed as a character). However, all of these features are possessed also by females of some species of *Reikosiella sensu* Gibson (1995). Wing polymorphism in *M.* (*Reikosiella*) *melinus* and female brachyptery in the two non-*excavatus* group species of *M.* (*Merostenus*), *M. congoensis* and *M. longistylus*, indicate brachyptery evolved at least twice and, depending on the phylogenetic relationships of the latter two species with those of the *excavatus* species-group, possibly more times in *Merostenus* in the present sense. Furthermore, a somewhat differently sculptured and/or lighter-colored mediolongitudinal line anteriorly on the pronotum of most *M. excavatus* females (Fig. 41) and a slight mediolongitudinal depression posteriorly on the pronotum of the unique holotype of *M. reticulatus* (Fig. 100) indicates a completely sclerotized pronotum in the *excavatus* species-group evolved through secondary sclerotization from one or more ancestors that had the pronotum divided medially. Except for one species of *Xenanastatus*, females of no other eupelmine genera are known to have a completely sclerotized pronotum other than some fully winged species of *R.* (*Capreocauda*) and *R.* (*Reikosiella*) *sensu* Gibson (1995, table 1, character 14), including both macropterous and brachypterous females of *M. melinus* (Figs 125, 130). This demonstrates that secondary pronotal sclerotization, like female brachyptery, evolved at least twice in *Merostenus* in the present sense. I have not seen any macropterous females of *R.* (*Hirticauda*) *sensu* Gibson (1995) with a completely sclerotized pronotum. If *Merostenus* represents only a modified subgroup of the latter subgenus then a completely sclerotized pronotum evolved independently in all recognized subgenera except *M.* (*Incohata*). Finally, females of *M.* (*Reikosiella*) *melinus* and of the two non-*excavatus* group species of *M.* (*Merostenus*) all have scutellar-axillar structures in which the axillae are separated by a variably large and distinct depression anterior to the base of the scutellum (Figs 26, 61, 63), though certainly this is very small and inconspicuous for *M. melinus* (Figs 130, 131). In addition, females of all species classified in the *excavatus* species-group have a modified mesoscutal structure in which the anterior margin is variably upcurved anterior to the lateral lobes (Figs 33, 41, 86, 93, 100). Females of *M. melinus* (Fig. 130) and *M. longistylus* (Fig. 60) do not have such a modified mesoscutum, but females of *M. congoensis* do (Fig. 26).

Consequently, none of the features possessed by females of species that would be classified in *Merostenus sensu* Gibson (1995) are unique to the group, but are shared also with some species that would be classified in one or more subgenera of *Reikosiella sensu* Gibson (1995). Further, as given in the diagnosis for *M.* (*Merostenus*) below, females that would be classified in *Merostenus* and *R.* (*Hirticauda*) share presence of mesotibial apical pegs and other putatively derived structures of the sdp-complex and acropleuron.

Of the seven species here classified as the *excavatus*-group of *Merostenus*, only males of *M. excavatus* are definitely associated with females through multiple rearing events. However, the males of *M. reticulatus* and of the non-*excavatus* group species *M. longistylus* are newly described based on association with females through collecting. Fusu (2008) determined that *M. excavatus* has a karyotype similar to what Fusu (2013) classified as *R.* (*Hirticauda*) *rostrata* and different from that of species of *Eupelmus*. This at least supports a possible phylogenetic association of *M. excavatus* and *Reikosiella*, though not that *Merostenus* renders *Reikosiella* paraphyletic. Gibson (1995) further stated that males of *M. excavatus* have a small pit or circular depression within the scrobal depression at the apex of the interantennal prominence (character 47, state 3) similar to many males of *Reikosiella sensu* Gibson (1995, figs 406–408). Fusu (2013, figs 43, 44) illustrated a distinct facial pit for one *M. excavatus* male, though the pit is at best obscure in many individuals (Fig. 51). Even though apparently variable in development, presence of an evident pit for at least some *M. excavatus* males further supports at least a sister-group relationship between *Merostenus* and *Reikosiella sensu* Gibson (1995). The lack of an evident pit from males of both *M. longistylus* (Fig. 68) and *M. reticulatus* (Figs 108, 109) demonstrates presence or absence of a distinct scrobal depression pit is variable for both *Reikosiella* and *Merostenus sensu* Gibson (1995).

Fusu (2013, fig. 44) differentiated males of *M. excavatus* from regional males of *R.* (*Hirticauda*) by Gt1 being contrastingly dark yellow to pale brownish relative to the remainder of the gaster and the fore wings being slightly, uniformly infuscate. The male of *M. reticulatus* also has slightly infuscate fore wings (Fig. 113) and the gaster partly pale at least ventrally (Fig. 107). However, smaller males of *M. excavatus* do not have the fore wings noticeably infuscate (Fig. 53). More comprehensive character-state analysis is required to assess accurately, but fore wing and gastral color patterns likely are more of species than generic features. Gibson (1995, couplet 54 in key to males) questionably differentiated *M. excavatus* males from those of *Reikosiella* based on the metapleuron extending only about two-thirds or less the distance to the base of the propodeum, and the mesepimeron having the posterodorsal margin raised as slender flange lateral to the base of the propodeum (Gibson 1995, *cf.* figs 434, 436). Perhaps a more objective comparison is that in males of *M. excavatus* the metapleuron extends dorsally only to about the level of the anterior margin of the spiracle (Figs 50: insert, 55). The males of *M. reticulatus* and *M. longistylus* have the metapleuron extending more dorsally, obviously anterior to the level of the propodeal spiracle (Figs 71, 111), though both have the posterodorsal margin of the acropleuron developed as a slender flange that is separated from and raised slightly over the anterodorsal margin of the metapleuron. Character-state analysis of this feature across Eupelminae is necessary to assess its phylogenetic significance, but at least some male *Eupelmus* also have the posterodorsal margin of the acropleuron separated from the anterodorsal margin of the metapleuron. Consequently, this structure is likely symplesiomorphic at the level of *Reikosiella sensu* Gibson (1995) and the metapleural structure of *M. excavatus* probably represents a secondarily more derived, species feature.

The males of very few species of *Reikosiella sensu* Gibson (1995) are known through association with females so that limits of variation remain uncertain. Gibson (1995) diagnosed and keyed four groups of males in *Reikosiella* based on flagellar structure and setation. Subsequent study indicates that “flagellar type 3” (Gibson 1995, fig. 370) and “flagellar type 4” (Gibson 1995, fig. 371) do not belong to males of *Reikosiella sensu* Gibson (1995), but to males of *Ooderella* Ashmead (these results to be published separately). However, “flagellar type 1” (Gibson 1995, figs 367, 368; Fusu 2013, figs 22, 27, 30) and “flagellar type 2” (Gibson 1995, fig. 369) are possessed by males of *Reikosiella sensu* Gibson (1995). The flagellum of the latter two types are characterized as being variably long but comparatively gracile-filiform with funiculars that are obviously longer than wide and with comparatively long setae at least about as long as the width of a funicular and with variably long mps that, if appearing dense, are quite long and at most in widely overlapping rather than short and in multiple rows per funicular. Type 3 and type 4 flagella differ by having very short and inconspicuous setae; further, the mps are dense and either comparatively short and in multiple rows per funicular (type 3) or each has a long, slender, apically free portion such that the mps superficially look like setae projecting apically at an acute angle relative to the funicle (type 4). Fusu (2013, figs 22, 27, 30) also noted that at least Palaearctic *Reikosiella* males have the funiculars separated by short pedicels as compared to *Eupelmus* males in which the funiculars abut (e.g. Gibson and Fusu 2016, figs 9f, 12g, 14d, 23h).

Although not all New World males considered to belong to *Merostenus* in the present sense have the funiculars separated by evident pedicels, those of *M. longistylus* (Fig. 69), *M. excavatus* (Fig. 52) and *M. reticulatus* (Fig. 110) do, which also supports at least a sister-group relationship between *Merostenus* and *Reikosiella sensu* Gibson (1995). Males of the latter two *excavatus*-group species have the funiculars conspicuously longer than most males of *Reikosiella sensu* Gibson (1995, figs 368, 369) or Fusu (2013, figs 22, 30) or *M. longistylus* (Fig. 69). However, some Afrotropical males associated through collection records with females that would be classified in *R.* (*Hirticauda*) *sensu* Gibson (1995) have similarly long and setose funiculars as those of *M. excavatus* and *M. reticulatus*. If the sex associations are correct they indicate funicular length is variable for males of *Reikosiella sensu* Gibson (1995). Gibson (1995) hypothesized that the plesiomorphic male flagellar structure for Eupelminae (character 50, state 1) was a subclavate flagellum composed of comparatively short funiculars with outstanding setae and relatively sparse mps similar to that of *P. chilensis* males (Gibson 1995, fig. 349). Males of *Australoodera*, *Ecnomocephala* and *Tineobius* have the flagellum variably more distinctly clavate. Although flagellar structure is highly variable in *Eupelmus* (Gibson 2011; Gibson and Fusu 2016), a clavate flagellum is the most likely groundplan structure based on typical species of *E.* (*Episolindelia*) (Gibson 1995, fig. 351). Males of *Phlebopenes* have a compact-filiform to lobate flagellum (Gibson 1995, fig. 343). Consequently, a comparatively long and gracile-filiform flagellum with outstanding setae and comparatively sparse though variably long mps further supports a hypothesis that *Merostenus* + *Reikosiella sensu* Gibson (1995) constitute a monophyletic group, though not necessarily that *Merostenus* renders *Reikosiella* paraphyletic. Further character-state analysis is required to determine whether or not funicular pedicels are a groundplan feature of the male antenna of *Reikosiella sensu* Gibson (1995), particularly those of *R.* (*Incohata*). If not, presence of funicular pedicels would more strongly support the hypothesis that *Merostenus* renders *Reikosiella* paraphyletic.

Gibson (1995) stated that the fore wings of male *Reikosiella* are "often" distinctively long with the marginal vein "usually" at least 0.7× the width of the wing and the disc "usually" entirely setose though sometimes with an indistinct bare region below the parastigma and base of the marginal vein. This latter statement is inaccurate because many *Reikosiella* males, particularly ones with a distinctively elongate-narrow fore wing and long marginal vein, have the disc variably extensively bare dorsally behind the base of the marginal vein and parastigma to the basal and mediocubital folds. This bare region is less distinct than the more conspicuous speculum that characterizes male *Eupelmus* (see figures in Gibson 2011 and Gibson and Fusu 2016) because unlike in *Eupelmus* it is partly obscured by setae on the ventral surface. However, the dorsally bare setal pattern could represent an intermediate state in a transformation series resulting in the development of both a dorsally and ventrally bare region. If so, a possible sister-group relationship between *Merostenus* in the present sense and *Eupelmus* is indicated. However, most males now identified as *Ooderella* also have a dorsally bare region behind the parastigma and base of the marginal vein that is more or less obscured by setae on the ventral surface (results to be published separately). Further, males are not associated with females for any *M.* (*Incohata*) species so that the groundplan fore wing structure, setal pattern, and venation all remain unsubstantiated for *Merostenus*.

Fusu (2013) recognized the males of five species of *R.* (*Hirticauda*) in the Palaearctic, *R. hungarica*, *R. koreana* Fusu, *R. rostrata*, *R. tripotinorum* Fusu and *R. vanharteni* Fusu. All have entirely setose fore wings or with at most a small, indistinct area of sparse setae behind the parastigma (Fusu 2013). Fore wing length varies between about 2.2–2.5× wing width, and length of the marginal vein between about 0.63–0.76× wing width. Fore wings of the newly described non-*excavatus* group species *M. longistylus* are similar in being less than 2.5× as long as wide, and with the marginal vein only about 0.6× the width of the wing, but they uniquely have an oblique bare band behind the parastigma and base of the marginal vein that is separated by setae from the venation and basal and mediocubital folds (Fig. 72). This bare band thus resembles a linea calva, which characterizes most fully winged *E.* (*Eupelmus*) females. The fore wings of male *M. excavatus* (Fig. 53) and *M. reticulatus* (Fig. 113), the only two *excavatus*-group species for which males are known, are entirely setose though conspicuously elongate-slender with a comparatively long marginal vein (fore wing length at least about 2.9× width and marginal vein at least about 0.9× wing width). Based merely on these observations, male fore wing structure and venation might be considered as putative synapomorphies for the *excavatus*-group. However, many, if not most New World *Reikosiella* males *sensu* Gibson (1995) have elongate-slender fore wings with comparatively long marginal veins more similar to those of *M. excavatus* and *M. reticulatus*. Although unassociated with females, such males are almost certainly those of *R.* (*Reikosiella*) *sensu* Gibson (1995). Further, at least some males from the Afrotropical and Oriental regions, which probably are males of *R.* (*Hirticauda*) or *R.* (*Capreocauda*) *sensu* Gibson (1995), have similarly long wings and marginal veins. Consequently, if comparatively short and broad fore wings with a comparatively short marginal vein represent groundplan features of *Merostenus* in the present sense, and if the different subgenera are monophyletic clades, then elongation of the fore wing and marginal vein appear to have evolved convergently in at least *M.* (*Reikosiella*) and *M.* (*Merostenus*). Finally, Fusu (2013) described the gaster of males of three of five species of *R.* (*Hirticauda*) from the Palaearctic as being compressed basally, similar to the condition of *M. reticulatus* (Fig. 106), but not *M. excavatus* or *M. longistylus*, which have a transversely oval to somewhat flattened gaster (Figs 49, 66). The presence of the same state in multiple males of the same species demonstrates the difference is not simply an artefact of preservation but is taxonomically significant. However, presence of the two different male gastral structures for species with fully winged females as well as within the *excavatus*-group indicates multiple origins or losses of a basally compressed gaster. Males have yet to be associated with females for any species here classified in *M.* (*Incohata*) or *M.* (*Capreocauda*). It remains to be shown through association of the sexes of many more species than at present whether the four subgenera recognized in *Merostenus* can be differentiated by male as well as female features. At present, presence or absence of an evident pit within the scrobal depression, flagellar structure, fore wing features, and gastral structure all appear to be homoplastic.

Based on the above character analysis for females and males, several congruent states at least support *Merostenus* + *Reikosiella sensu* Gibson (1995) as a monophyletic group. The presence of a comparatively strongly sclerotized/melanized supra-anal plate for females of most species that would be classified in *Merostenus* (Figs 38, 48, 89, 105, 122) and *Reikosiella* (Figs 5–10, 30, 65, 133) *sensu* Gibson (1995) excluding the hypothesized most basal group, *R.* (*Incohata*) (Fig. 3), additionally supports a hypothesis that *Merostenus* renders *Reikosiella* paraphyletic. Presence of mesotibial apical pegs and similar structures of the sdp-complex and acropleuron also indicate *Merostenus* renders *R.* (*Hirticauda*) paraphyletic. I conclude that *Merostenus* is nothing more than a small group of species of *Reikosiella sensu* Gibson (1995) whose females share a suite of conspicuously modified features, which may have evolved convergently more than once (see further below). These include the loss of a deep syntergal emargination as a consequence of the ovipositor sheaths being secondarily shortened, but in most species with retention of an evident supra-anal plate along the posterior margin of the syntergum as evidence of an ancestral deeply emarginate syntergum. It also includes secondary reduction of the wings (brachyptery) and medial sclerotization of the pronotum. I therefore newly synonymize *Reikosiella* Yoshimoto, 1969 under *Merostenus* Walker, 1837, treat *Reikosiella* (*Hirticauda* Bouček 1988) as a junior synonym of *M.* (*Merostenus*), and recognize *M.* (*Capreocauda* Gibson 1995), *M.* (*Incohata* Gibson 1995) and *M.* (*Reikosiella*) as subgenera within *Merostenus***.** I also treat as the *excavatus* species-group within *M.* (*Merostenus*) those species whose females are brachypterous and have a uniformly sclerotized pronotum.

Relationships of *Merostenus* with the other genera considered as basal within Eupelminae by Gibson (1995), particularly those with a deeply emarginate syntergum, remain to be clarified. Such putatively apomorphic features as a reduced dorsal surface of the syntergum anterior to the emargination and a comparatively large, pale anterior prepectal surface support a possible *Ecnomocephala* + (*Eupelmus* + *Australoodera* + *Tineobius*) sister-group relationship. However, both females and males of some species of *Merostenus* share similarities with some *Eupelmus*, particularly species of *E.* (*Episolindelia*), which is hypothesized to represent a grade of the more basal species of *Eupelmus* (Gibson 1995; Gibson & Fusu 2016). Further, some species of *Merostenus* exhibit putatively plesiomorphic and others apomorphic structures of the sdp-complex, mesotrochantinal plate, and syntergal structure. The similarities between some *Merostenus* and *Eupelmus* might all represent symplesiomorphies and, if so, could support *Merostenus* as the sister-group of at least *Eupelmus* + *Australoodera* + *Tineobius*. Other than perhaps a comparatively elongate-slender fore wing and long marginal vein in females, substantial support for monophyly of *Merostenus* is lacking. Additional phylogenetic analysis supported by molecular evidence is required to document that the four subgenera recognized in *Merostenus* constitute a monophyletic lineage and to confidently resolve relationships with other eupelmine genera.

Monophyly and relationships of the *excavatus* species-group. The *excavatus* species-group within *M.* (*Merostenus*) is here established for seven species (*M. distigma*, *M. excavatus*, *M. mexicanus*, *M. micropterus*, *M. platyscapus*, *M. reticulatus* and *M. speculum*) that under the concepts of Gibson (1995) would have been classified in *Merostenus* based on a combination of four features (female brachyptery, completely sclerotized pronotum, medially separated axillae anterior to the scutellum, and superficially unmodified syntergum in all but *M. mexicanus*). Monophyly of the *excavatus*-group is not supported by any uniquely shared features, and because of their uniquely flanged syntergum possible relationships of *M. mexicanus* to the other *excavatus*-group species are particularly intriguing. Females of two non-*excavatus* group species within *M.* (*Merostenus*), *M. congoensis* and *M. longistylus*, are brachypterous, which could support one or both as sister taxa of the *excavatus* group. However, brachyptery evolved at least twice in *Merostenus* because it also evolved in *M.* (*Reikosiella*) *melinus*. Brachyptery may therefore have also evolved more than once in *M.* (*Merostenus*). As noted above, possible monophyly of *M. congoensis* + *excavatus*-group species is supported by one shared feature—the anterior margin of the mesoscutum being variably distinctly upcurved behind the pronotum in front of the lateral lobes (excluding possibly *M. mexicanus*, see description). Females of *M. longistylus* and *M. melinus*, the other two non-*excavatus* group species with brachypterous females do not have an anteriorly modified mesoscutum. Females of *M. congoensis* also have the syntergum only slightly incurved (Fig. 29) relative to the more distinctly incurved synterga of *M. melinus* (Fig. 133) and *M. longistylus* (Fig. 65), which might represent an intermediate state in evolution of the non-emarginate synterga of *excavatus*-group females. Therefore, *M. congoensis* is indicated as the most likely sister group of the *excavatus* group based on shared female brachyptery, an anteriorly upcurved mesoscutum, and a reduced syntergal emargination in association with strongly reduced ovipositor sheaths.

Within the *excavatus*-group, four of five Afrotropical species (*M. distigma*, *M. micropterus*, *M. reticulatus* and *M. speculum*) are supported as a monophyletic clade. Females of these four species share a coriaceous to coriaceous-imbricate scutellar-axillar complex that consists of a uniformly convex and oval scutellum and elongate-slender axillae separated by a deep depression anterior to the scutellum (Figs 36, 87, 103, 119), an elongate propodeum with the foramen shallowly incurved and with the panels variably distinctly concave on either side of a low median carina (Figs 36, 87, 103, 119), and a mostly setose and similarly structured metapleuron (Figs 35, 88, 102, 120). All of these shared features likely are synapomorphic for the four Afrotropical species, though their shared scutellar-axillar structure shares some features with non-*excavatus* group species. An evenly convex and uniformly oval scutellum is shared with *M. melinus* (Fig. 131) and *M. congoensis* (Fig. 28), whereas elongate-slender axillae that are separated by a comparatively large and deep depression is shared with *M. longistylus* (Fig. 61). A convex, more or less oval scutellum is likely plesiomorphic but a large depression separating the axillae is undoubtedly apomorphic. In addition to their axillar structure, the scutellar structure of *M. longistylus* is likely also derived, being comparatively broad and convex posteriorly but tapered anteriorly with inclined sides so as to form a dorsolongitudinal angulation (Figs 61, 63). This structure is similar to that of the *excavatus*-group species *M. excavatus* (Fig. 43), *M. mexicanus* (Fig. 78) and *M. platyscapus* (Fig. 94) except that in the latter three the scutellum is at least partly carinately margined dorsolongitudinally. Females of *M. platyscapus* also have the axillae longitudinally carinate on either side of an anteriorly carinate scutellum (Fig. 94), whereas females of *M. excavatus* have large, entirely longitudinally striate-strigose axillae anterior to a much less distinctly anteriorly carinate scutellum (Fig. 43).

Females of the four Afrotropical species and *M. melinus* not only share a likely plesiomorphic scutellar structure, but also a setose though differently structured metapleuron. In the four Afrotropical species the metapleuron is virtually entirely setose except the dorsal half to two-thirds of the anterior margin is at least linearly bare and slightly curved anteriorly or reflexed into a slender flange along the posterodorsal margin of the acropleuron. The setose anteroventral margin is also variably distinctly angled posteroventrally above the base of the mesocoxa, and the ventral margin above the metacoxa is only slightly reflexed such that a distinct ventral region is not differentiated between the meso- and metacoxae (Figs 35, 88, 102, 120). Females of *M. melinus* differ by having the metapleuron bare dorsally, flat, and with the anterior margin slightly sinuate so that medially it forms an anteriorly curved region that fits within the emarginate posterodorsal margin of the acropleuron (Fig. 132); a slender, bare, ventral region is present between the acropleuron and base of the metacoxa. Gibson (1995) hypothesized that a setose metapleuron is plesiomorphic within Eupelminae. Although a revision of *Merostenus* is required to determine exact character-state distribution, females of the other species treated here and the vast majority of other species in the genus have a bare metapleuron, including those of *M.* (*Incohata*). Consequently, the setose metapleuron in *M. melinus* and the four Afrotropical species likely represent independent origins in *M. melinus* and in the common ancestor of the Afrotropical species, though females of *M. excavatus* and *M. platyscapus* might also have a partly setose, albeit highly modified metapleuron. Most examined museum females of *M. excavatus* have one (Fig. 44: arrow) or two setae on a ventrally faced region differentiated between the acropleuron, recurved ventral margin of the metapleuron, and base of the metacoxa. Males also typically have one or two setae in a similar position, but within the anteroventral angle of the metapleuron itself (Fig. 50: insert). Females of M. *platyscapus* have a similarly differentiated ventral region as females of *M. excavatus* but it is much more extensively setose (Fig. 95). Males of *M. platyscapus* are unknown, but they too may have an anteroventrally setose metapleuron based on both sexes of *M. excavatus* and *M. reticulatus* having similar setal patterns. If so, this might indicate that the ventral region bearing the setae in female *M. excavatus* and *M. platyscapus* actually represents a secondarily demarcated part of the metapleuron. Females of the other described brachypterous species have quite differently structured metapleura. In *M. longistylus* (Fig. 62) the anterior margin is abruptly sinuate at about mid-height so that the metapleuron is sublinear dorsally but much wider over about the ventral half where it is slightly reflexed as a comparatively inconspicuous slender flange. In an uncontorted state this slender flange extends over a depressed region of the acropleuron along its posterodorsal margin, whereas the ventral margin is more distinctly reflexed into a slender flange over the base of the mesocoxa so as to differentiate a small, bare, ventral region between the acropleuron and basal margin of the metacoxa. Females of *M. congoensis* (Fig. 25), *M. excavatus* (Fig. 44) and *M. platyscapus* (Fig. 95) also have the anterior margin of the metapleuron variably extensively reflexed into a slender flange abutting the posterior margin of the acropleuron, with the entire anterior margin reflexed in *M. congoensis* and *M. platyscapus*, but only about the ventral third reflexed for *M. excavatus*. In all three species the ventral margin is reflexed above the metacoxa so that a ventral region is differentiated between the acropleuron and metacoxal base. This latter region is not clearly visible in the holotype of *M. congoensis* because of glue, but it appears to be bare or at most as sparsely setose as for *M. excavatus*. Because of its contorted state, exact structure of the metapleuron is also not clearly visible for the holotype of *M. mexicanus*, but it is at least bare. As a result of contortion (Fig. 74) the propodeum and metapleuron are angled upwards relative to the posterior margin of the acropleuron (Fig. 80) such that the anterior margin of the metapleuron is horizontal rather than vertical behind the acropleuron. The left side is covered in glue, but the right side has dark spots below the horizontal anterior margin (Fig. 80), which might indicate a setose ventral region, though this needs to be confirmed by additional specimens. In a female of *M. excavatus* in which the metapleuron is slightly separated from the acropleuron, the anterior part is seen to form a concave 'pocket' into which the posterior margin of the acropleuron normally fits. Gibson (1989) hypothesized that some sort of mesothoracic locking mechanism was necessary for the modified jumping structure of female eupelmines so that the acropleural (pl2-t2c) muscles can fully contract and stretch the resilin pad within each acropleuron prior to the stored energy being suddenly released to arch the mesonotum and pull up on the t2-tr2 muscles for jumping. Gibson (1995) subsequently hypothesized that this locking mechanism was formed by the conjunction between the anterior margin of the metapleuron and the variably incised posterior margin of the acropleuron. Because of the variation exhibited in metapleural structure within just the few species of *Merostenus* treated here, a revision of the genus is required to determine the most likely groundplan structure for the genus. However, based on *M.* (*Incohata*) females, the groundplan structure most likely was similar to that of *M. longistylus* (Fig. 62). Regardless, except for the four Afrotropical *excavatus*-group species discussed above, the other treated species do not share multiple, congruent, putatively derived features that would strongly support sister-group relationships. Molecular methods should help resolve such relationships.

Key to species of *Merostenus* with brachypterous females

1 Female 2

\- Male 11

2(1) Mesosoma in lateral view with apex of scutellum protuberant over underlying dorsellum (Fig. 132) and in dorsal view propodeum with transverse carina dividing anterior concave portion under apex of scutellum from posterior portion behind scutellar apex (Fig. 131); mesotibia with patch of strong spines apically over base of mesotarsus but not row of pegs; head green and meso- and metasoma yellowish to orange with some brown markings (Figs 125, 126); outer surface of metacoxa entirely and about ventral half of metapleuron setose (Fig. 132) . . . . **Merostenus (*Reikosiella*) *melinus* (Yoshimoto)**

\- Mesosoma in lateral view with dorsellum subvertical, cuplike over apex of scutellum and in dorsal view propodeum variable in structure but without transverse carina dividing plical region into anterior and posterior portions; mesotibia with variable number of pegs in row apically over base of mesotarsus; other features variable, but not in combination. . . . . . 3 [*M.* (*Merostenus*)]

3(2) Pronotum divided medially (Figs 26, 60) 4

\- Pronotum uniformly sclerotized (Figs 33, 41, 86, 93, 100) even if sometimes with paler line mediolongitudinally (Fig. 41) or short mediolongitudinal furrow posteriorly (Fig. 100: arrow) . . . . 5 [*excavatus* species-group]

4(3) Flagellum with at least fl3 and fl4 white, and fl5 somewhat lighter yellowish-brown in contrast to other darker brown flagellomeres (Figs 22, 24); ovipositor sheaths short and rigid, exserted beyond syntergum by only about one-fifth length of gaster (Fig. 29); scutellar-axillar complex longitudinally strigose without large depression between axillae anterior to scutellum (Figs 26, 28); fore wing slender and tapered to angulate apex (Fig. 28); propodeum with posterior margin widely separated from anterior margin and with median carina (Fig. 28) . . . . **M. (*Merostenus*) *congoensis* n. sp.**

- Flagellum entirely dark (Fig. 59); ovipositor sheaths long and filamentous, exserted beyond syntergum for distance at least equal to length of gaster (Fig. 58); scutellar-axillar complex meshlike coriaceous to coriaceous-imbricate and with large depression between axillae anterior to scutellum (Figs 61, 63); fore wing spatulate with broadly rounded apical margin (Figs 61, 63); propodeum with posterior margin incurved to anterior margin medially (Fig. 61). . . . . **_M._ (_Merostenus_) _longistylus_ n. sp.**

5(3) Antenna with scape to fl2 yellowish (Fig. 77); fore wing right-angle bent with about basal half of disc membranous and apical half consisting only of dark, linear venation (Fig. 77: insert); propodeum strongly transverse with narrow plical region deeply concave on either side of high median carina and mesal to convex callar regions (Fig. 79); scutellar-axillar complex with each axilla almost flat except for indistinct mediolongitudinal carina (Figs 78, 79); syntergum recurved apically as posteriorly rounded syntergal flange (Figs 75, 81) [New World] . . . . **_M._ (_Merostenus_) _mexicanus_ n. sp.**

- Antenna sometimes with scape and pedicel yellowish but flagellum dark; fore wing flat over body and disc membranous to apex; propodeum variable, but if similar to above then axillae longitudinally striate-strigose; syntergum flat with posterior margin transverse [Old World] 6

6(5) Scutellar-axillar complex with each axilla at least as large as scutellum and longitudinally striate-strigose (Fig. 43); propodeum (Fig. 43) with posterior margin sinuately incurved almost to anterior margin such that medial margins contiguous over much of length and curved up to form high median carina and forming narrow plical region between cone-like protuberant callar regions (Figs 43, 44); fore wing with disc short-spatulate, only slightly longer than wide and extending only to about level of anterior margin of scutellar frenum (Fig. 43); antenna with scape yellow (Figs 39, 42) [Palaearctic]. . . . . **_M._ (_Merostenus_) _excavatus_ (Dalman)**

- Scutellar-axillar complex with each axilla much smaller than scutellum and smooth to finely coriaceous; propodeum with posterior margin distant from anterior margin, only shallowly, ∩-like incurved, and broad plical region with median carina in almost same plane as callar regions; fore wing usually with disc elongate-spatulate, much longer than wide and extending to base of gaster; antenna sometimes with scape dark [Afrotropical]. 7

7(6) Antenna with scape foliaceously compressed and flagellum robust-clavate with all funiculars strongly transverse (Figs 90–92); metapleuron bare (not to be confused with ventral setose region between acropleuron and meso- and metacoxae, Fig. 95); scutellar-axillar complex with scutellum carinate anteriorly between longitudinally carinate axillae (Fig. 94) . . . . **_M._ (_Merostenus_) _platyscapus_ n. sp.**

- Antenna with scape slender and flagellum gracile-clavate with all or most funiculars quadrate to longer than wide (Figs 34, 85, 101, 117); metapleuron mostly setose (Figs 35, 88, 102, 120); scutellar-axillar complex with scutellum uniformly convex and oval, and axillae not distinctly carinate (Figs 36, 87, 103, 119) 8

8(7) Fore wing extending only to about level of posterior margin of propodeal spiracle (Fig. 87); head with frons (Fig. 83) and mesoscutum (Fig. 86) smooth and shiny; scrobal depression shallow and high ∩-like, about as high as wide (Fig. 83) . . . . **_M._ (_Merostenus_) _micropterus_ n. sp.**

- Fore wing extending to base of gaster (Figs 36, 103); head either with frons and mesoscutum coriaceous to reticulate (Figs 31, 98) or scrobal depression distinctly concave and transversely ∩-like (Fig. 115) 9

9(8) Mesoscutum with subcircular pit on lateral lobe near mid-length (Fig. 33: arrows); head with frons finely coriaceous between scrobal depression and anterior ocellus (Fig. 31); mesoscutum coriaceous (Fig. 33); body mostly dark brown, including entire gaster (Figs 32, 34) . . . . **_M._ (_Merostenus_) _distigma_ n. sp.**

- Mesoscutum uniformly sclerotized without pits; head and mesoscutum either smooth and shiny or more strongly reticulate than above; body extensively orangish to orangish-brown, including basal two gastral tergites 10

10(9) Head with face (Fig. 98), mesoscutum (Fig. 100) and most of gaster (Fig. 104) strongly reticulate; scrobal depression shallow and high ∩-like, about as high as wide (Fig. 98) . . . . **_M._ (_Merostenus_) _reticulatus_ n. sp.**

- Head between scrobal depression and anterior ocellus (Fig. 115), mesoscutum (Fig. 118) and gaster (Fig. 121) smooth and shiny; scrobal depression distinctly concave and transversely ∩-like (Fig. 115) . . . . **_M._ (_Merostenus_) _speculum_ n. sp.**

11(1) Metapleuron setose within ventral half (Fig. 111) . . . . **_M._ (_Merostenus_) _reticulatus_ n. sp.**

- Metapleuron bare or with at most one or two setae anteroventrally (Fig. 50: insert) 12

12(11) Metapleuron extending dorsally to level equal with anterior margin of spiracle (Fig. 55); propodeum with callus usually at least noticeably convex and often variably distinctly cone-like produced (Fig. 55), but at least spiracle positioned near mid-length (Fig. 54); length of pedicel + flagellum more than twice head width and funiculars beyond fl1 more than twice as long as wide (Fig. 52); fore wing elongate-slender, with marginal vein similar in length to width of wing and with disc uniformly setose (Fig. 53). . . . . **_M._ (_Merostenus_) _excavatus_ (Dalman)**

- Metapleuron extending dorsally obviously anterior to level of spiracle (Fig. 71); propodeum with callus not distinctly convex and spiracle positioned within about one ocellar diameter from anterior margin (Figs 70, 73); length of pedicel + flagellum less than twice head width and funiculars beyond fl1 less than twice as long as wide (Fig. 69); fore wing comparatively broad and short with marginal vein only about 0.6× width of wing and disc basally with variably conspicuous, oblique bare band separated by setae from venation and basal and mediocubital folds (Fig. 72). . . . . **_M._ (_Merostenus_) _longistylus_ n. sp.**

Brachypterous species of *Merostenus* Walker

Merostenus (*Merostenus* Walker)

Diagnosis. FEMALE. Mesosoma in lateral and dorsal views with dorsellum appressed over apex of scutellum such that in lateral view apex of scutellum not protuberant; propodeum highly variable, but without transverse carina dividing plical region into anterior and posterior portions; mesotibia with pegs in row apically over base of mesotarsus; acropleuron with posterior margin broadly rounded and evenly curved to anterolateral margin of mesocoxa.

***M.* (*Merostenus*) *congoensis* n. sp.**

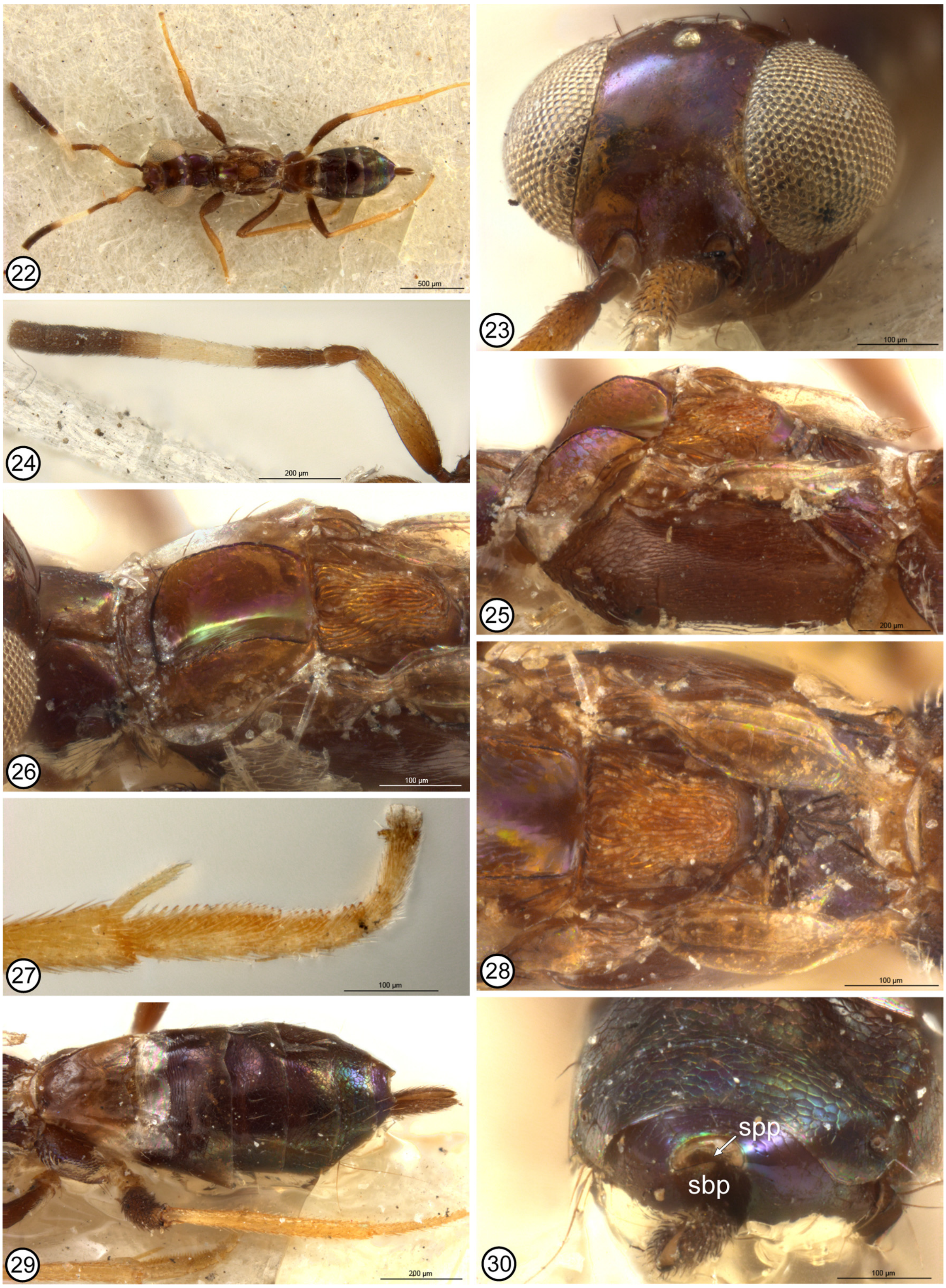
Figs 22–30

Type material. *Holotype* ♀ (HNHM). [Democratic Republic of the Congo] "149 [blue label] / Kindamba, Meya, settl. | Louolo river | 10.XII.1963 | leg. BALOGH /ZICSI | Congo-Exped. d. Inst. | Syst. Zool. Budapest | 16.X.63. – 21-I.64. | Fundort No.: 149 / HOLOTYPE ♀ | *M.* (*Merostenus*) | *congoensis* | Gibson". Glued on rectangular card by venter, with glue concealing some structures; entire except clava of left antenna and apical three tarsomeres of left front leg missing, and right leg beyond coxa detached and glued separately to card; uncontorted.

Etymology. Based on the type locality.

Description. FEMALE (habitus: Fig. 22). Length = 2.1 mm. Head (Fig. 23) mostly brown but under some angles of light with some violaceous to purple lusters on frons and scrobal depression lighter, orangish-brown; in frontal view subquadrate, approximately 1.2× as wide as high (lower face in glue), but in lateral view only about 1.3× as high as long with highly convex frontal surface; smooth and shiny except vertex very finely and inconspicuously meshlike coriaceous and likely lower face finely sculptured (not clearly visible); scrobal depression, dorsal surface of interantennal prominence above level of toruli, and frontovertex bare except for line of dark setae along inner orbit (ventrally where scrobal depression touches lower inner orbit to upper inner orbit behind ocelli) and transversely on vertex posteriorly, but lower face uniformly setose with short white setae; scrobal depression quite strongly inclined above dorsal surface of interantennal prominence and transversely ∩-shaped between inner orbits, the lateral margin directed obliquely from torulus to lower inner orbit where slightly undulate, and broadly convex dorsal margin separated from anterior margin by about 3× LOL; ratio of OOL: POL: LOL: MPOD = 1.4: 2.0: 1.1: 1.0. Antenna (Figs 22, 24) with scape yellow apically to brownish-yellow basally, pedicel to fl2 brown to yellowish-brown depending on angle of light, fl3 and fl4 white, fl5 varying in color from whitish or at least paler basally to yellowish-brown to dark brown apically, and fl6 to clava dark brown; scape slender, about 6× as long as apical width but broadest within basal half such that only about 4.2× as long as greatest width; flagellum clavate with fl1 about as long as wide, subsequent funiculars all longer than wide with fl2 longest and funiculars decreasing in length apically [length(width) of pedicel–fl8 (left antenna) and clava (right antenna) = 16(9), 7(7), 25(8), 21(10), 19(11), 18(11), 17(11), 16(11), 15(12), 37(15)]. Color of labiomaxillary complex and mandibles hidden by glue.

Mesosoma (Fig. 25) mostly brown but scutellar-axillar complex (Fig. 28), and under some angles of light mesoscutum, lighter, more orangish-brown. Pronotum divided mediolongitudinally (Fig. 26); collar shiny, virtually smooth and with line of setae along lateral margin, the dorsal surface otherwise bare but with 3 or 4 setal pores visible on either side indicating dorsal setae abraded. Mesoscutum (Fig. 26) with lateral lobes strongly angulate from midline, ʌ-like, carinately margined dorsolongitudinally, with angulations connected anteriorly by slightly curved, transverse carina differentiating shallowly concave, transverse region along anterior margin of mesoscutum; shiny and almost smooth but very finely meshlike coriaceous under indirect light, with 3(?) setal pores in row along inner inclined surface and line of setae along outer inclined surface. Scutellar-axillar complex (Figs 25, 26, 28) with scutellum and axillae bare and similarly longitudinally strigose except for smooth frenum; scutellum elongate-oval, similarly lowly convex as, but obviously longer and larger than axillae, and extending almost to transscutal articulation; axillae anterior to scutellum separated by only tiny depression between strigose sculpture. Fore wing (Fig. 28) extending flat over mesosoma to base of gaster; disc elongate-slender, about 3.4× as long as greatest width, slightly brownish basally and apically but more hyaline subapically, smooth, and with setose submarginal vein extending almost three-quarters length to differentiate bare costal cell and subequally broad part of wing, but continued distally within apically tapered part of wing as narrower vein to slightly curved, acutely angled apex, with 1 somewhat longer seta basally and 2 setae apically on vein plus setae on membrane and along posterior margin of apically narrowed portion. Mesopleurosternum with mesopectus mostly concealed by glue; acropleuron slightly angulate posteriorly near ventral margin of metapleuron (Fig. 25), meshlike coriaceous anteriorly but mostly longitudinally coriaceous-alutaceous. Metanotum with dorsellum vertically raised over apex



FIGURES 22–30. *M.* (*Merostenus*) *congoensis* n. sp., holotype ♀: **22**, dorsal habitus; **23**, head, frontolateral; **24**, antenna without clava; **25**, mesosoma, dorsolateral; **26**, pronotum and mesonotum, dorsolateral; **27**, apex of mesotibia and tarsus; **28**, scutellar-axillar complex to propodeum plus wings; **29**, gaster, dorsolateral; **30**, gastral apex, posterodorsal. [sbp = subanal plate, spp = supra-anal plate]

of scutellum, smooth and shiny (Figs 25, 28). Metapleuron (Fig. 25) bare, meshlike coriaceous to coriaceous-imbricate; anterior margin straight and reflexed into slender but distinct smooth band behind posterodorsal margin of acropleuron, and curved along ventral margin as flange above metacoxa to segregate small ventral region between acropleuron and anteroventral margin of metacoxa, the ventral region obscured by glue but apparently bare or only sparsely setose. Legs (Fig. 22) with coxae and femora brown but tibiae and tarsi yellow (Figs 22, 27); mesotibia with 4 apical pegs (Fig. 27); metacoxa with single white seta dorsobasally, a couple of long white setae dorsoapically, and with white setae on outer surface basally continued in a line ventrolaterally along length. Propodeum (Fig. 28) long, medial length about 0.4× distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin broadly V-like behind dorsellum; carinate margin of foramen reflexed anteriorly near midline to differentiate small, triangular region posteromedially behind high median carina formed by strongly inclined part of plical region, the inclined surface obliquely strigose but meshlike coriaceous mesal to spiracle; callus lowly convex anteriorly to flat posteriorly, apparently once with line of long white setae along lateral margin (?) though most setae now missing, and with spiracle only narrowly separated from lateral margin by distance obviously less than own diameter.

Metasoma with petiole transverse-quadrangular (Fig. 28). Gaster (Fig. 29) with Gt1 comparatively light-brownish and almost smooth, Gt2 hyaline, and subsequent tergites dark brown and comparatively distinctly meshlike coriaceous, the basal tergites setose only laterally but more apical tergites also with transverse line of setae dorsally; syntergum in dorsal view shallowly incurved (Fig. 29) and in posterior view (Fig. 30) with strongly transverse supra-anal plate under apical margin of syntergum and larger subanal plate faced ventrally; ovipositor sheaths somewhat lighter yellowish-brown than gaster apically, rigid and short, extending beyond syntergum by almost 0.2× length of gaster excluding sheaths.

MALE. Unknown.

Distribution. AFROTROPICAL: Democratic Republic of the Congo.

Hosts. Unknown.

Remarks. Females of this non-*excavatus* group species are most readily differentiated from other brachypterous *Merostenus* by flagellar color pattern, with at least fl3 and fl4 being white (Fig. 24). Color of fl5 indicates this flagellomere likely is variably extensively white to dark. Females also differ from other brachypterous *Merostenus* by their lowly convex and longitudinally strigose scutellar-axillar complex (Figs 26, 28). However, they share a modified mesoscutal structure with females of all *excavatus*-group species except possibly *M. mexicanus* (exact structure uncertain for *M. mexicanus*, see description). However, in *M. congoensis* the upcurved anterior part of the mesoscutum is uniquely differentiated posteriorly by a transverse carina that extends between the two dorsolongitudinally carinate lateral lobes (Fig. 26). When the mesonotum is arched the pronotum likely is pulled over the reflexed portion of the mesoscutum, and the transverse carina likely limits the extent to which this is possible. Females of *M. congoensis* also share entirely dorsolongitudinally carinate mesoscutal lateral lobes with four *excavatus*-group species, *M. excavatus* (Fig. 41), *M. micropterus* (Fig. 86), *M. platyscapus* (Fig. 93) and *M. speculum* (Fig. 118), which in the last two species are less highly angulate than in the first two species. Their short and rigid ovipositor sheaths are associated with an only slightly incurved posterior margin of the syntergum (Fig. 29).

M. (*Merostenus*) *distigma* n. sp.

Figs 31–38

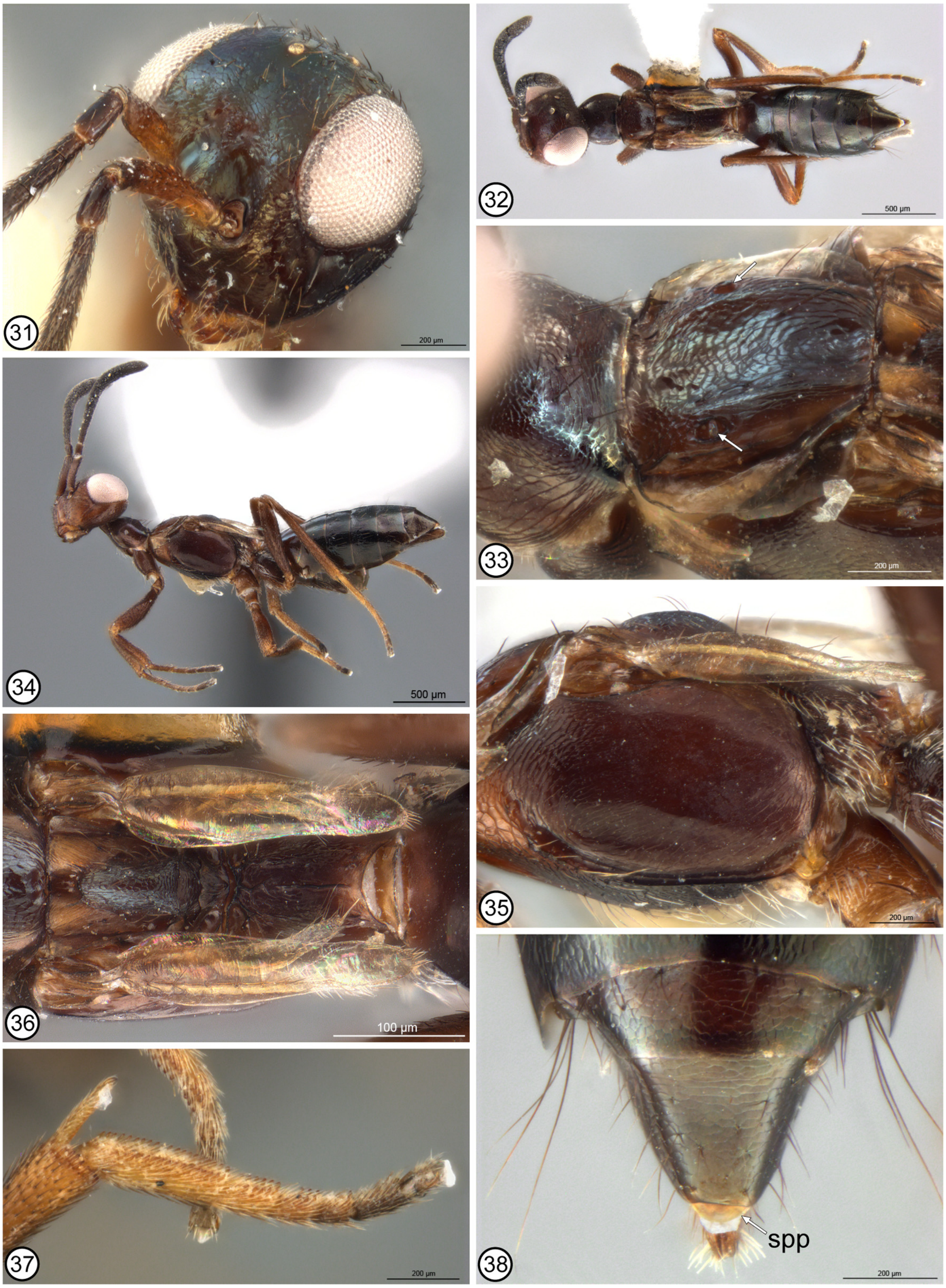
Type material. *Holotype* ♀ (CNC). "TANZANIA, Mt. Meru, | above Miriakamba Huts | S3.22201° E36 78352° | 3178m, 2.xii.2012, sift | 06, V. Grebennikov leg. / HOLOTYPE ♀ | *M.* (*Merostenus*) | *distigma* | Gibson". Point-mounted by right acropleuron; entire; uncontorted.

Paratypes (2♀). **Kenya**. Mt Kenya, Teleki Valley, IV.1980, 10,000 ft, D. Levin, Bambo [sic] forest along stream (1♀ CNC, CNC Photo 2016-53). Mt. Kenya, 3700m, 18.I.1980, D. Westerberg (1♀ BMNH, NHMUK010353722).

Etymology. A combination of the Greek prefix *di-* (two) and *stigma* (spot), in reference to the two pits on the mesoscutum that uniquely differentiate females of this species.

Description. FEMALE (habitus: Figs 32, 34). Length = 2.8–3.1 mm. Head (Fig. 31) dark brown with variably distinct bluish to bluish-green luster under some angles of light or all but frontovertex lighter orangish-brown; in frontal view subquadrate, about 1.2× as wide as high, and in lateral view lenticular, about 1.6× as high as long with anterior surface uniformly curved; face in smaller females mostly meshlike coriaceous with parascrobal regions and scrobal depression dorsolaterally somewhat more strongly sculptured, and in largest female frontovertex coriaceous-reticulate and parascrobal regions quite distinctly, though shallowly reticulate; entirely setose with dark setae except for bare scrobal depression, with setae on frons mostly separated by distance equal to or slightly greater than anterior ocellar diameter; scrobal depression transversely ∩-shaped above convex dorsal surface of interantennal prominence, the lateral margin curved dorsally near lateral limit of torulus so distinct parascrobal region differentiated, and dorsomedially with shallow depression on either side of midline, the depressions sometimes delimited ventrally by transverse ridge or carina, and dorsally above depressions smoothly merged into frons so dorsal limit not distinct, but separated from anterior ocellus by distance greater than LOL; ratio of OOL: POL: LOL: MPOD = 1.1: 2.5: 1.6: 1.0. Antenna (Figs 31, 32, 34) dark brown or scape basally variably extensively lighter, yellowish; scape slender, about 4.7× as long as apical width, and slightly curved; flagellum clavate with fl1 longer than wide and at least fl2–fl5 obviously longer than wide, but fl6–fl8 shorter, slightly longer to slightly shorter than wide [length(width) of pedicel and flagellomeres = 16(9), 10(7), 19(8), 19(10), 17(13), 15(13), 15(14), 15(15), 14(15), 37(17)]. Labiomaxillary complex and mandibles same color as head.

Mesosoma (Figs 32, 34) dark brown except axillae sometimes distinctly lighter, yellowish (Fig. 36). Pronotum completely sclerotized (Figs 32, 33); collar meshlike coriaceous and with dark setae mostly in ∩-like line from posterolateral angle across collar near middle. Mesoscutum (Fig. 33) meshlike coriaceous to coriaceous-reticulate; with anterior margin abruptly reflexed as strongly transverse band between posterior margin of pronotum, and with lateral lobes only slightly, convexly raised relative to comparatively broad and shallowly concave median region, the lateral lobes not longitudinally carinate but with deep, subcircular pit or opening in cuticle within anterior half (Fig. 33: arrows); with line of comparatively long, variably dark brown setae along inner and outer inclined surfaces of lateral lobe, but broadly bare dorsomedially. Scutellar-axillar complex (Fig. 36) with scutellum elongate-oval and uniformly convex, somewhat more highly than, and only slightly longer than, but conspicuously larger than axillae, with frenum meshlike coriaceous and bare, but coriaceous to coriaceous-imbricate anterior to frenum and with dark setae laterally; axillae elongate-slender, more finely sculptured than scutellum, with at most obscure carinae dorsomedially adjacent to scutellum, with dark setae on outer surface, and anterior to scutellum separated by deep, slightly longer than wide depression. Fore wing (Fig. 36) extending flat over mesosoma to base of gaster; disc elongate-slender, about 3.6× as long as greatest width, almost uniformly light brownish to more distinctly brown basally and subhyaline apically, smooth or at most only very slightly, transversely wrinkled, and mostly bare but with marginal fringe apically, and with line of setae along broader submarginal vein differentiating bare costal cell extending about two-thirds length of disc, and with line of 3 or 4 setae on venation apically (presumptive marginal vein) not quite extending to rounded apical margin. Mesopleurosternum with mesopectus meshlike reticulate anterior to acropleural sulcus below prepectus and more finely coriaceous posteroventrally, with long white setae ventrally and linearly along acropleural sulcus; acropleuron (Fig. 35) posteriorly broadly curved to level of anterior margin of mesocoxa, meshlike coriaceous-imbricate over about anterior one-third, but about posterior two-thirds virtually smooth or medially only very finely, longitudinally coriaceous-strigose and posteriorly with subeffaced, more meshlike sculpture. Metanotum (Fig. 36) with dorsellum vertically raised over apex of scutellum, with only single distinct carina medially. Metapleuron (Fig. 35) entirely setose with long, comparatively dense white setae; anterior margin curved slightly over posterodorsal margin of acropleuron at about midheight but not obviously flange-like reflexed, though anteroventral margin angled posteroventrally over posterodorsal angle of mesocoxa, and ventral margin only slightly reflexed such that ventral region between acropleuron and metacoxa not distinctly differentiated. Legs (Figs 32, 34) similar to or distinctly lighter in color than mesosoma, often yellowish beyond coxae; mesotibia (left) with 4 apical pegs (Fig. 37); metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally, and with 1–4 pits in line on outer surface basally. Propodeum (Fig. 36) long, medial length about 0.7× distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin shallowly incurved medially behind dorsellum; with paramedial longitudinal ridges at about level of lateral margin of dorsellum delimiting slightly concave median plical region from slightly higher lateral callar regions, the paramedial ridge reflexed slightly toward median anteriorly; plical region with complete median carina or carina irregular to obsolete anteriorly, but otherwise finely, irregularly sculptured; callus similarly but more finely sculptured than plical region, with spiracle separated from lateral margin by distance much greater than own diameter and with angulation or ridge lateral to spiracle basally differentiating lateral setose band with long white setae extending length and becoming more numerous posteriorly in region between metapleuron and propodeal foramen.



FIGURES 31–38. *M.* (*Merostenus*) *distigma* n. sp. **31**, head, frontolateral (2016-53). *32–38*, holotype: **32**, dorsal habitus; **33**, pronotum and mesoscutum, dorsolateral [arrows point to mesoscutal pits]; **34**, lateral habitus; **35**; mesosoma, lateral; **36**, scutellar-axillar complex to propodeum plus wings; **37**, apex of mesotibia and tarsus; **38**, gastral apex, dorsal. [spp = supra-anal plate]

Metasoma with petiole transverse-quadrangular (Fig. 36). Gaster (Figs 32, 34) entirely dark brown or with green to partly coppery lusters; tergites all similarly sculptured, shiny and variably distinctly meshlike coriaceous, and with comparatively inconspicuous dark setae dorsolaterally, Gt1 with only a couple of setae laterally but setae becoming increasingly more numerous and extensive posteriorly; syntergum in dorsal view with posterior margin transverse to slightly incurved (Fig. 38); supra-anal plate brown; ovipositor sheaths brown, projecting only slightly beyond syntergum.

MALE. Unknown.

Distribution. AFROTROPICAL: Kenya, Tanzania.

Hosts. Unknown.

Remarks. As discussed within the section on monophyly and relationships of the *excavatus* species-group, *M. distigma* undoubtedly forms a monophyletic group with *M. micropterus*, *M. reticulatus* and *M. speculum* based on metapleural structure and setation, similar propodeal structures, and similarly structured scutellar-axillar complexes. Females of *M. distigma* differ from those of all other known *Merostenus*, brachypterous or not, by the presence of two circular pits laterally on the mesoscutum, on the mesoscutal lateral lobe just within the anterior half (Fig. 33: arrows). I have not seen such pits in any other eupelmid, but presence in the three available females demonstrates it is not an aberration. All three females also have two variably distinct paramedial depressions dorsally within the scrobal depression (Fig. 31) and one or more depressions or pits in a line laterally on the metacoxa basally. The unique holotype of *M. speculum* also has paramedial depressions at the dorsal limit of the scrobal depression, but lack the mesoscutal and metacoxal pits. Females of *M. distigma* are intermediate in sculpture between *M. reticulatus* and those of *M. micropterus* and *M. speculum*, the head, mesoscutum and gaster of *M. reticulatus* being much more coarsely reticulate and those of the latter two species more smooth and shiny. The different sculpture patterns are also correlated with different setal patterns. Females of *M. reticulatus* are the most densely setose whereas those of *M. micropterus* and *M. speculum* the most sparsely setose. Although a relative feature, the difference is most easily quantifiable on the mesoscutum. Females of *M. reticulatus* have the dorsally concave part of the mesoscutum entirely, uniformly setose (Fig. 100), whereas the setae are reduced to only a single row laterally on the inclined surface of the lateral lobe of *M. distigma* (Fig. 33) and to just one or two setae laterally on the inclined surface of the lateral lobe in *M. speculum* (Fig. 118) and *M. micropterus* (Fig. 86), respectively. Females of *M. distigma* share comparatively long fore wings extending to the base of the gaster with all but *M. micropterus*, and a marginal fringe apically with all species except *M. reticulatus*.

***M.* (*Merostenus*) *excavatus* (Dalman)**

Figs 39–55

Eupelmus excavatus Dalman, 1820: 382–383. Holotype ♀ (NHRS, examined). Type data: [Sweden] Scaniae.

Merostenus Phedyma Walker, 1837: 355. Lectotype ♂ (BMNH, type no. 5.2313, examined), designated by Graham, 1969: 93. Type data: England: nr London. Synonymy by Ruschka, 1921: 309.

Urocryptus excavatus; Westwood, 1839: 72.

Eupelmus (*Urocryptus*) *excavatus*; Thomson, 1876: 108.

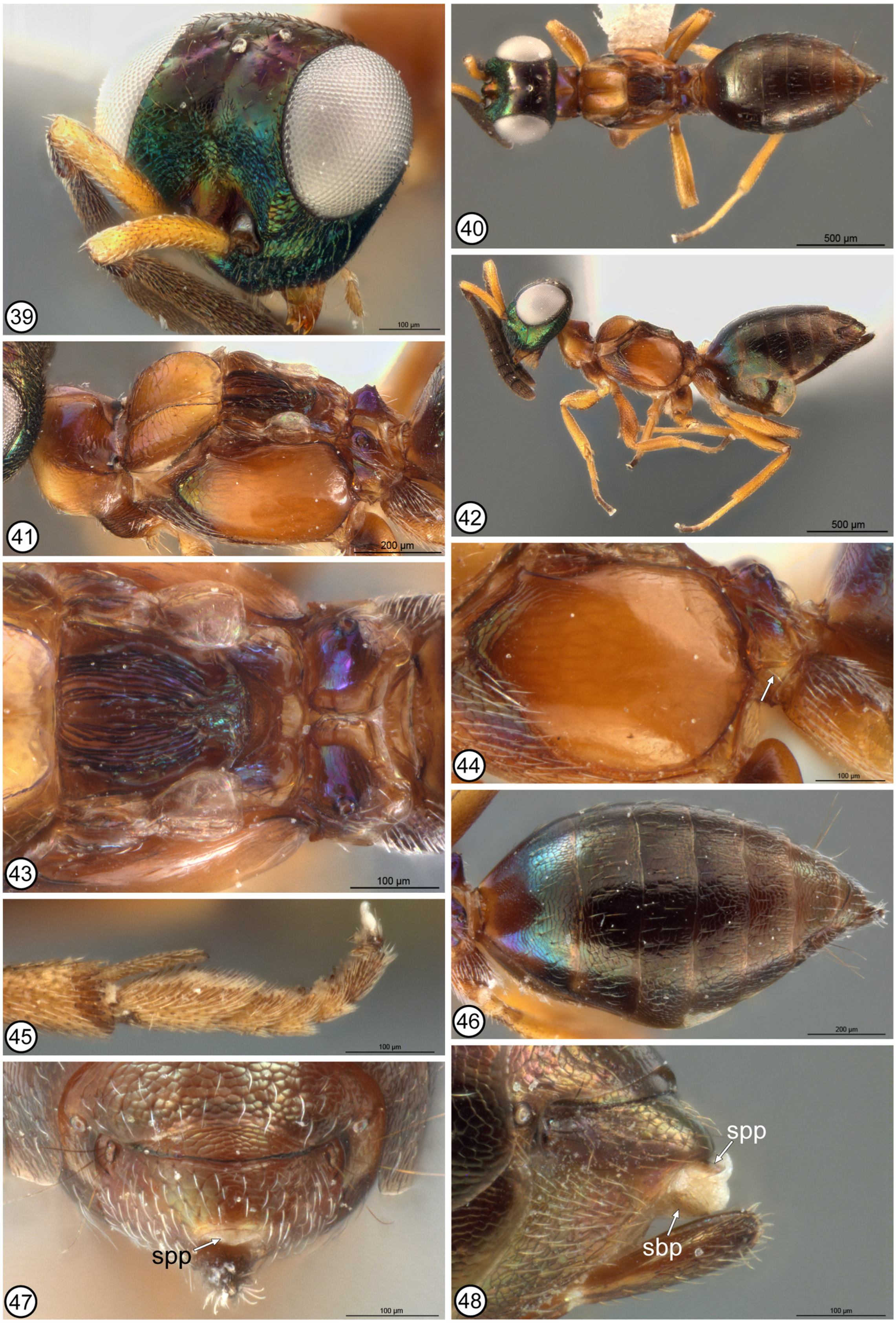
Eupelminus excavatus; Dalla Torre, 1898: 272.

Merostenus excavatus; Ruschka, 1921: 309; Nikol'skaya, 1952: 487/500 [key]; Erdős, 1960: 204–205 [key]; Peck, Bouček and Hoffer, 1964: 61–62 [key]; Askew, 1987: 49 [key]; Trjapitzin, 1978: 235/426 [key]; Fusu, 2013: 5 [male compared with *Reikosiella* Yoshimoto males], 16 [male imaged].

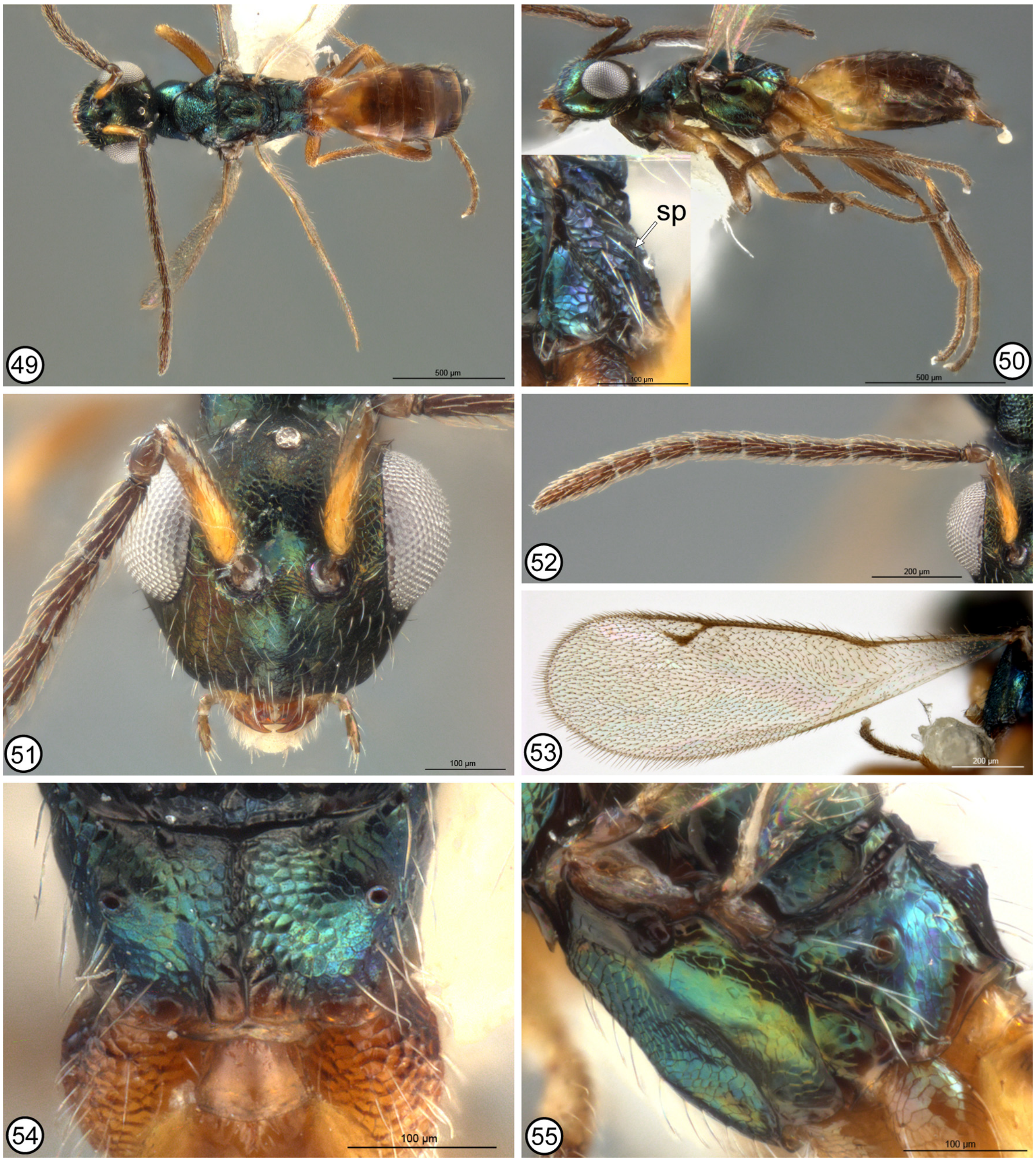
Type material. The holotype of *Eupelmus excavatus* is an uncontorted female pinned laterally through the mesosoma such that all features are visible; it has two labels, a tiny blue square piece of paper and a larger white label with "153", and is entire except both antennae beyond the anelli are missing. The male lectotype of *Merostenus Phedyma* has the following four labels: LECTOTYPE [purple-bordered circular label] / *Merostenus* | *phedyma* | Walker / *Eupelminus* | *excavatus* Dalm. | Ch. Ferriere det. ♂ / B.M. TYPE | HYM. | 5.2313. It is entire and glued by its venter to a card rectangle.

Description. FEMALE (habitus: Figs 40, 42). Length = 1.3–2.7 mm. Head (Fig. 39) dark brown in smallest individuals but usually mostly green with variably distinct and extensive reddish-violaceous to purple lusters on smoother part of frons and within scrobal depression, most commonly at least on dorsal surface of interantennal prominence; in frontal view about 1.2× as wide as high, and in lateral view about 1.6× as high as long with lower face abruptly angled to longer upper face such that anterior and ventral margins subparallel and vertex uniformly rounded; vertex meshlike coriaceous and scrobal depression meshlike reticulate to transversely reticulate-rugose, but frons between about level of posterior ocelli and scrobal depression shiny and much smoother, at most in part with subeffaced coriaceous sculpture, with dorsal surface of interantennal prominence similarly shiny or variably distinctly coriaceous to alutaceous, and lower face distinctly coriaceous to alutaceous; entirely setose with short setae except for bare scrobal depression, with setae on lower face paler compared to dark setae on frontovertex and those on frons separated by distance mostly greater than MPOD and at least in larger females originating from tiny but quite distinct pits; scrobal depression distinct though transversely to high ∩-shaped, the broadly arched upper margin usually separated from anterior ocellus by distance about equal to POL though sometimes appearing closer if frons distinctly coriaceous below anterior ocellus, but at least lateral margin outcurved from lateral margin of torulus toward lower inner orbit such that parascrobal region absent; ratio of OOL: POL: LOL: MPOD = 1.5–2.0: 2.6–3.7: 1.4–2.0: 1.0 [larger individuals with smaller ratios]. Antenna (Fig. 42) dark except for yellow scape (Figs 39, 42); scape slightly curved and slender, with thin flange on inner surface apically and therefore slightly wider apically, but mostly tubular with length about 5.5–6.3× medial width; pedicel about 1.75–2× as long as apical width; fl1 usually slightly wider than long but at most quadrate, fl2–fl4 all longer than wide and fl5–fl8 decreasing in length such that apical funiculars quadrate to slightly transverse; clava about 1.9–2.8× as long as wide. Labiomaxillary complex yellow to brownish-yellow and mandibles paler, more yellowish basally, and darker, more orangish to reddish apically.

Mesosoma (Figs 40–42) mostly orangish to orangish-brown but at least larger individuals with following darker brown and sometimes with violaceous to purple lusters: dorsal surface of pronotum except for mediolongitudinal paler band within anterior half (Fig. 41), scutellar-axillar complex (Fig. 43), at least convex callar regions of propodeum (Fig. 43), mesopectus and extreme anterior angle of acropleuron (Figs 42, 44), and often metapleuron (Fig. 41). Pronotum completely sclerotized but often with slight indication of mediolongitudinal furrow or slender band of slightly different sculpture mediolongitudinally, and distinctly convex, cone-like produced dorsomedially (Figs 41, 42) with neck forming anterior portion and collar forming posterior portion, but both similarly meshlike coriaceous; mostly bare dorsally but with a few, short, inconspicuous setae along anterior margin and sides, and transversely over medial ridge on putative collar portion anteriorly. Mesoscutum (Fig. 41) with lateral lobes strongly ^-like angulate from median, but carinate only posteriorly, and with anterior margin curved up anterior to lateral lobes behind pronotum; variably distinctly meshlike coriaceous but dorsally extensively setose with at least two lines of setae along inclined inner surface and line of setae dorsally and ventrally along outer inclined surface of lateral lobe. Scutellar-axillar complex (Fig. 43) with scutellum convex, the frenum bare and coriaceous, but anterior to frenum more coarsely sculptured, setose, and tapered anteriorly to acute angle widely separated from transscutal articulation, with angulation carinately margined only apically; axillae comparatively large and long, longitudinally striate-strigose, setose laterally, and anterior to scutellum separated by deep longitudinal depression. Fore wing (Fig. 43) short, disc only about 1.25–1.5× as long as wide, spatulate with broadly rounded to truncate apical margin extending to level equal with anterior margin of frenal area of scutellum; disc hyaline with submarginal vein extending at least two-thirds length but terminating at least slightly before apex of disc, and with 2 or 3 setae, but membrane otherwise bare except often for inconspicuous marginal fringe along posterior and/or apical margins of disc. Mesopectus entirely setose with white setae; acropleuron (Fig. 41) posteriorly broadly curved to level of anterior margin of mesocoxa (Fig. 44), shiny and mostly smooth with distinct sculpture only narrowly along anterior margin and sometimes subeffaced sculpture dorsally and ventrally. Metanotum (Fig. 43) with dorsellum delineated as laterally carinate, anteriorly V-like incised median region, with median carina at least anteriorly. Metapleuron (Fig. 44) bare, variably distinctly meshlike coriaceous to coriaceous-reticulate, with sinuate anterior margin so as to be widest ventrally and slightly reflexed into slender flange abutting posterior margin of acropleuron, and with ventral margin also reflexed as slender flange continued obliquely toward acropleuron so as to differentiate a triangular region with 1 (Fig. 44: arrow) or 2 setae between acropleuron and anterodorsal angle of metacoxa. Legs (Figs 40, 42) mostly yellowish-orange to orangish-brown with coxae and apical tarsomeres usually darker brown if mostly light in color; mesotibia with row of up to 8 apical pegs in larger individuals (Fig. 45); metacoxa setose along outer surface basally and dorso- and ventrolongitudinally. Propodeum (Fig. 43) superficially quite long, medial length about one-third distance between transscutal articulation and posterior margin of dorsellum, but upcurved posterior margin sinuately incurved toward anterior margin medially to form high ridge with subcontiguous margins posteriorly and fused anteriorly into median carina; callus strongly, cone-like produced (Fig. 44) with terminal spiracle lateral to furrow differentiating median ridge, shiny and smooth or at most finely coriaceous, and setose laterally and very sparsely posterior of spiracle.



FIGURES 39–48. *M.* (*Merostenus*) *excavatus* (Dalman) ♀. *39–43*, 2015-17: **39**, head, frontolateral; **40**, dorsal habitus; **41**, mesosoma, dorsolateral; **42**, lateral habitus; **43**, scutellar-axillar complex to propodeum plus wings. **44**, acropleuron and metapleuron (2015-17) [arrow points to seta]. **45**, apex of mesotibia and tarsus (2016-60). *46 & 47*, 2015-17: **46**, gaster, dorsolateral; **47**, gastral apex, posterodorsal. **48**, gastral apex, lateral (2016-60). [sbp = subanal plate, spp = supra-anal plate]



FIGURES 49–55. *M.* (*Merostenus*) *excavatus* (Dalman) ♂. **49**, dorsal habitus (2016-61). **50**, lateral habitus (2016-62) [insert: metapleuron and propodeum (2016-76)]. *51–54*, 2016-61: **51**, head, frontal; **52**, antenna; **53**, fore wing; **54**, propodeum and petiole. **55**, posterior of mesosoma, dorsolateral (2016-62). [sp = propodeal spiracle]

Metasoma with petiole transverse-quadrangular (Fig. 43). Gaster (Fig. 46) dark brown with at most slight coppery to violaceous lusters except Gt1 variably extensively green to bluish-green or with some reddish-violaceous lusters; meshlike coriaceous with transverse band of inconspicuous dark setae on all tergites except Gt1 and syntergum uniformly setose without marginal line of setae; syntergum in dorsal view (Fig. 40) with posterior margin transverse; supra-anal plate sometimes not evident, but often visible as yellowish to brown, transverse sclerite adjacent to posterior margin of syntergum (Figs 47, 48); ovipositor sheaths brown, projecting only slightly beyond syntergum.

MALE (habitus: Figs 49, 50). Length = 1.0–1.9 mm. Head (Fig. 51) sometimes mostly brown with only slight metallic luster in smallest individuals but usually dark with variably conspicuous blue to green lusters and with variably extensive purple, coppery and/or reddish-violaceous lusters; mostly to entirely meshlike-coriaceous but smaller individuals with frons and scrobal depression often with finer sculpture and sometimes virtually smooth and shiny; with white setae on lower face and frons and darker setae on vertex; scrobal depression shallow, transversely oval with indistinct margins, laterally not extending completely to inner orbit such that narrow, setose parascrobal region differentiated along inner orbit, and dorsally smoothly merged with frons, and without or with variably distinct but tiny pit medially above interantennal prominence; OOL: POL: LOL: MPOD = 1.4–2.0: 2.4–3.0: 1.1–1.6: 1.0; frontovertex about 0.6× head width. Antenna (Fig. 52) variably dark brown except scape basally often variably extensively paler, more yellowish, and dark part usually with slight greenish luster; scape compressed-tubular with subparallel dorsal and ventral margins, about 5.0–5.8× medial width; pedicel about 1.6–1.9× as long as broad and much shorter than fl2; combined length of pedicel + flagellum about 2.3–2.5× head width; fl1 strongly transverse, anelliform; fl2 to clava each with short pedicel basally, and with semierect, curved setae somewhat longer than width of flagellomere, and with obscure, very sparse mps apically; fl2–fl8 conspicuously elongate-tubular, all of similar length but apical funiculars somewhat shorter with fl2 about 2.7–3.3× as long as wide and fl8 about 2.2–2.3× as long as wide excluding basal pedicels; clava about 4.3–4.7× as long as wide with clavomeres separated by distinct sutures. Eye (Fig. 51) very sparsely and obscurely setose with very short setae; EH about 1.2–1.3× EL and 1.1–1.6× MS. Labiomaxillary complex light brown to brown.

Mesosoma (Figs 49, 50) similar in color to head, mostly brown in smaller individuals but usually metallic green with some coppery luster to bluish. Pronotum completely sclerotized, meshlike coriaceous, and setose with white setae laterally and along posterior margin. Mesonotum (Fig. 49) meshlike coriaceous to variably strongly roughened, reticulate-rugulose, and setose with white or at least pale setae anterior to frenum. Fore wing (Fig. 53) hyaline in smaller individuals but usually with at least slight brownish infuscation on disc basally behind parastigma and sometimes more extensively; length about 2.9–3.3× as long as maximum width and length of marginal vein about 0.9–1.0× width; cc: mv: stv: pmv = 3.9–4.8: 3.1–4.0: 1.0: 2.1–2.3; stigmal vein distinct; costal cell dorsally with line of setae along about apical half of leading margin and ventrally setose along length; basal cell and disc entirely, uniformly setose. Metapleuron (Fig. 55) bare except usually for 1 or 2 setae anteroventrally (Fig. 50: insert), and meshlike coriaceous to smooth dorsally but more strongly sculptured, usually reticulate, ventrally; extending dorsally only about two-thirds or less distance to anterior margin of propodeum, to level equal with anterior margin of propodeal spiracle (Figs 50: insert, 55), and with posterodorsal margin of acropleuron separated from anterodorsal margin of metapleuron. Propodeum (Figs 54, 55) with medial length about 0.4–0.5× distance between transscutal articulation and posterior margin of dorsellum; with variably complete median carina and with transverse crenulate furrow along anterior margin lateral to dorsellum, but otherwise meshlike reticulate; callus setose with white setae lateral of spiracle, the spiracle obviously separated by more than own diameter from anterior margin with posterior margin close to mid-length and usually at apex of at least an apparent convexity if not a distinct, cone-like protuberance (Fig. 55). Leg color highly variable, from entirely yellowish, including coxae, to entirely dark brown with slight metallic luster (Fig. 50); metacoxa setose with white setae along ventrolateral margin and dorsolongitudinally, and sometimes on outer surface basally.

Metasoma with petiole (Fig. 54) yellowish to brown, smooth and shiny except sometimes with some fine longitudinal crenulae basally, and trapezoidal with sides divergent posteriorly and with posterior margin wider than anterior margin. Gaster (Figs 49, 50) dark apically but Gt1 dorsally at least extensively pale, yellowish, and sometimes with up to about basal half of gaster entirely yellow; dorsoventrally flattened to oval in cross-section (Figs 49, 50); Gt1 smooth, shiny and bare dorsally, but subsequent tergites finely coriaceous to alutaceous and variably extensively setose dorsolaterally, though often at least Gt2 bare medially.

Distribution. PALAEARCTIC: listed by Noyes (2016) from throughout the region as far east as Yaroslavl Oblast in Russia. I examined specimens from Austria (BMNH), Croatia (BMNH), Cyprus (USNM), England and France (CNC, USNM), Germany, Hungary and Italy (CNC, UCRC, USNM), Palestine (BMNH), and Sweden and Switzerland (CNC). NEARCTIC: Canada (Nova Scotia).

Chamberlin (1924a) stated that 430 males and 471 females of *M. excavatus* were released from Europe into Utah, of which voucher material remains in UCRC, but Essig and Michelbacher (1933) stated that it apparently never established. Gibson (1995) did not see any *M. excavatus* collected in Utah or elsewhere in the USA and also questioned whether it had established. However, one male collected in 1993 and two other males collected in 2004 (CNC) in Nova Scotia indicate it was accidentally introduced and has established in eastern Canada.

Hosts. *Hypera postica* (Gyllenhal) (Chamberlin 1924b), *Hypera punctata* (Fabricius) (Chamberlin 1924b), *Hypera variabilis* Herbst (Bouček 1977) (Coleoptera: Curculionidae).

Chamberlin (1924b) stated that *M. excavatus* feeds externally on the egg masses of the alfalfa weevil, *H. postica*, and the clover leaf weevil, *H. punctata*. Larvae estivate in the stems of alfalfa and adults emerge in the autumn.

Remarks. *Merostenus excavatus* is the only *excavatus*-group species in the Palaearctic region and its relationships with other species in the species-group and *M.* (*Merostenus*) remain unresolved. Females are readily distinguished by their unique scutellar-axillar structure/sculpture pattern (Fig. 43) and cone-like produced propodeal callar regions that terminate in the spiracle (Figs 43, 44). Males are perhaps most readily identified by the metapleuron extending dorsally only to a level equal with the anterior margin of the propodeal spiracle (Fig. 55) rather than distinctly anterior of the spiracle closer to the anterior margin of the propodeum. Most males also have the callus at least noticeably convex, if not more cone-like produced (Fig. 55), similar to females. Because of these features the males from eastern Canada are confidently identified as *M. excavatus* even though females have yet to be collected. As noted in the section on monophyly and relationships of the *excavatus* species-group, males often have one or two setae within the anteroventral angle of the metapleuron above the recurved flange that forms the ventral margin of the metapleuron above the metacoxa (Fig. 50: insert). Females have one or two setae in a similar relative position but in a differentiated region below the recurved ventral margin between the acropleuron and metacoxa (Fig. 44: arrow). The setae of males and females likely are in a homologous position because in males the ventrally recurved margin of the metapleuron extends above the base of the metacoxa to its anterior margin, whereas in females the recurved ventral margin extends obliquely from above the posterodorsal angle of the metacoxa toward the acropleuron, thereby differentiating the region with the one or two setae between the acropleuron and anterodorsal angle of the metacoxa.

***M.* (*Merostenus*) *longistylus* n. sp.**

Figs 56–73

Type material. *Holotype* ♀ (CNC). "SOUTH AFRICA: Shephard's | Valley, Malaise Trap | 31.79324°S 19.10271°E | 20–30.ix.2005, 523m | Fynbos, J. Schmidt / HOLOTYPE ♀ | *M.* (*Merostenus*) | *longistylus* | Gibson". Point-mounted by venter of mesosoma; entire except missing left ovipositor sheath; uncontorted.

Allotype ♂ (CNC). Same data as holotype except collected 14–20.X.2005 by J. Schmidt. *Paratypes* (16♀ & 5♂). **South Africa**. Same data as holotype (1♀ CNC); same data as holotype except collected 30.IX–14.X.2005 (3♂, including CNC Photo 2016-73, and 6♀, all CNC except 1♂ SAMA) or 14–20.X.2005 (5♀, including CNC Photos 2016-64, 2016-66 and 2016-67, and 1♂, CNC Photo 2016-68, all CNC) or 21–27.X.2005 (1♀ CNC, CNC Photo 2016-65). Farm Glenlyon/Renosterveld, 31.41435°S 19.14488°E, 767m, 3–20.XI.2005, J. Schmidt, malaise (1♂ CNC, CNC Photo 2016-69). W. Cape, West Coast Fossil Park, 3 km 270° W Langebaanweg, 32°58.445'S 18°07.236'E, S. van Noort, D. Larsen, E. Bartnick, Sand Plain Fynbos: 4–11.IX.2002, pitfall trap, LW02-N3-P07 (1♀ SAMA); 18–25.IX.2002, yellow pan trap, LW02-N3-Y249 (2♀ SAMA, including CNC Photo 2016-72).

Etymology. A combination of *longus* (long) and *stylus* (stake), in reference to the very long ovipositor of females of this species.

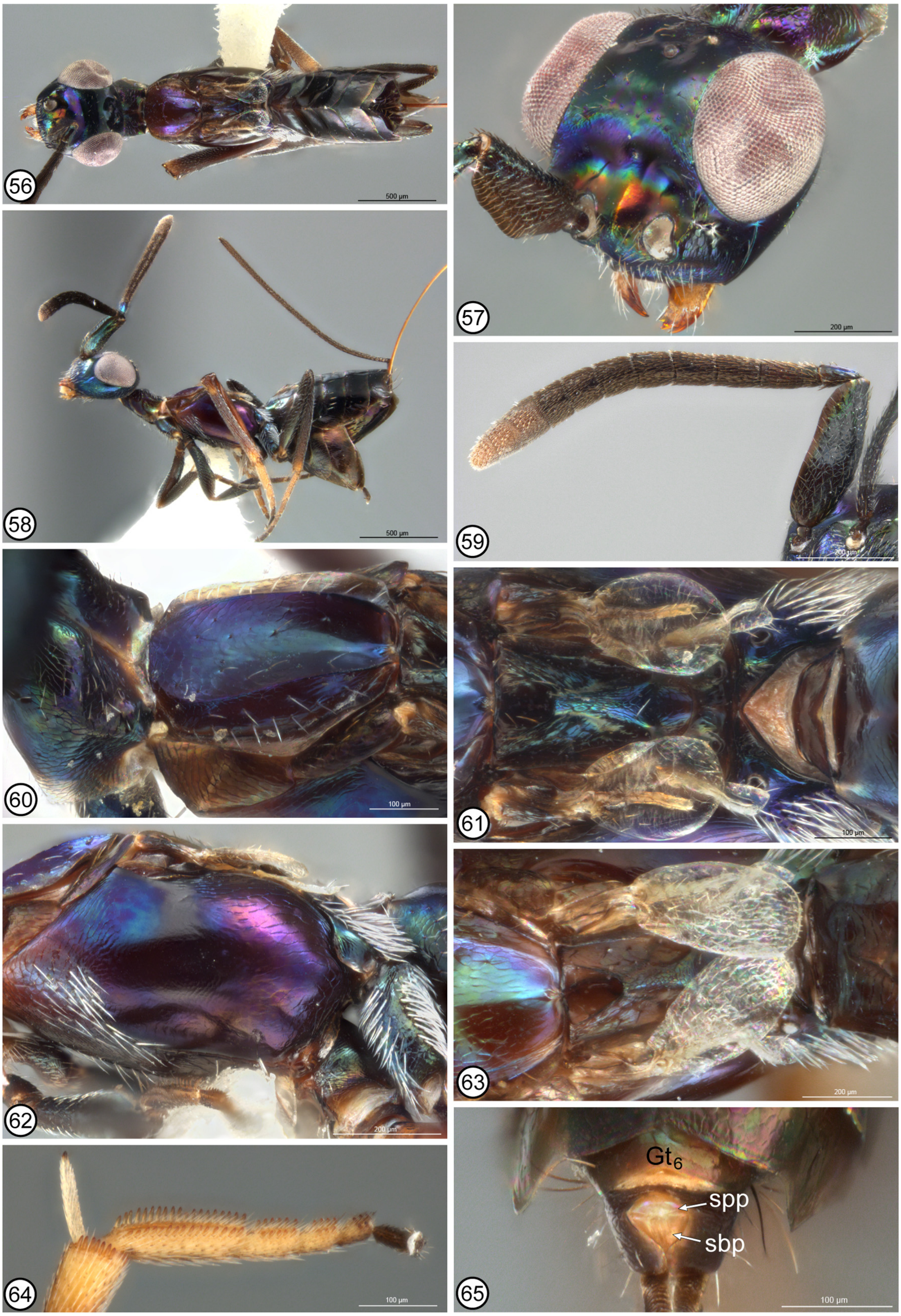
Description. FEMALE (habitus: Figs 56, 58). Length = 1.5–2.8 mm. Head (Fig. 57) dark with at least green and usually variably extensive blue, purple, violaceous and/or coppery lusters; in frontal view about 1.2× as wide as high, and in lateral view about 1.6× as high as long with anterior surface almost uniformly curved; vertex and sometimes ocellar triangle finely coriaceous to transversely alutaceous, but otherwise frontovertex smooth and shiny from about level of posterior ocelli to scrobal depression, scrobal depression and dorsal surface of interantennal prominence also shiny and smooth or in part very finely coriaceous, and lower face distinctly coriaceous to alutaceous; lower face uniformly setose with paler, longer setae than dorsally, with line of short dark setae along inner orbits and transversely along upper margin of scrobal depression, but frons otherwise with only a few scattered dark setae; scrobal depression broadly ∩-shaped between inner orbits, the lateral margin acute to carinate near torulus and outcurved from torulus toward lower inner orbit so distinct parascrobal region not differentiated, with broadly arched dorsal margin separated from anterior ocellus by distance similar to POL, and sometimes with tiny, shallow depression evident medially above interantennal prominence; ratio of OOL: POL: LOL: MPOD = 2.2–3.7: 3.2–3.7: 2.0–3.0: 1.0. Antenna (Fig. 59) dark brown; scape strongly compressed, about 2.2–3.0× as long as greatest width with dorsal and ventral margins usually subparallel over most of length but smallest individuals with ventral margin evenly arched, and with both outer and inner surfaces similarly coriaceous-alutaceous and setose except for slender bare band along ventral margin, the outer surface with this region developed as thin flange along about apical three-quarters; pedicel about 1.9–2.1× as long as wide;

flagellum clavate with fl1 subquadrate and at least fl2–fl4 longer than wide, but fl6–fl8 shorter, the more apical funiculars slightly transverse [length(width) of pedicel and flagellomeres = 19(9): 8(8): 17(10): 18(12): 17(13): 15(14): 13(14): 12(14): 12(15): 40(15)]. Labiomaxillary complex yellowish and mandibles yellowish to orangish basally and orangish to reddish apically.

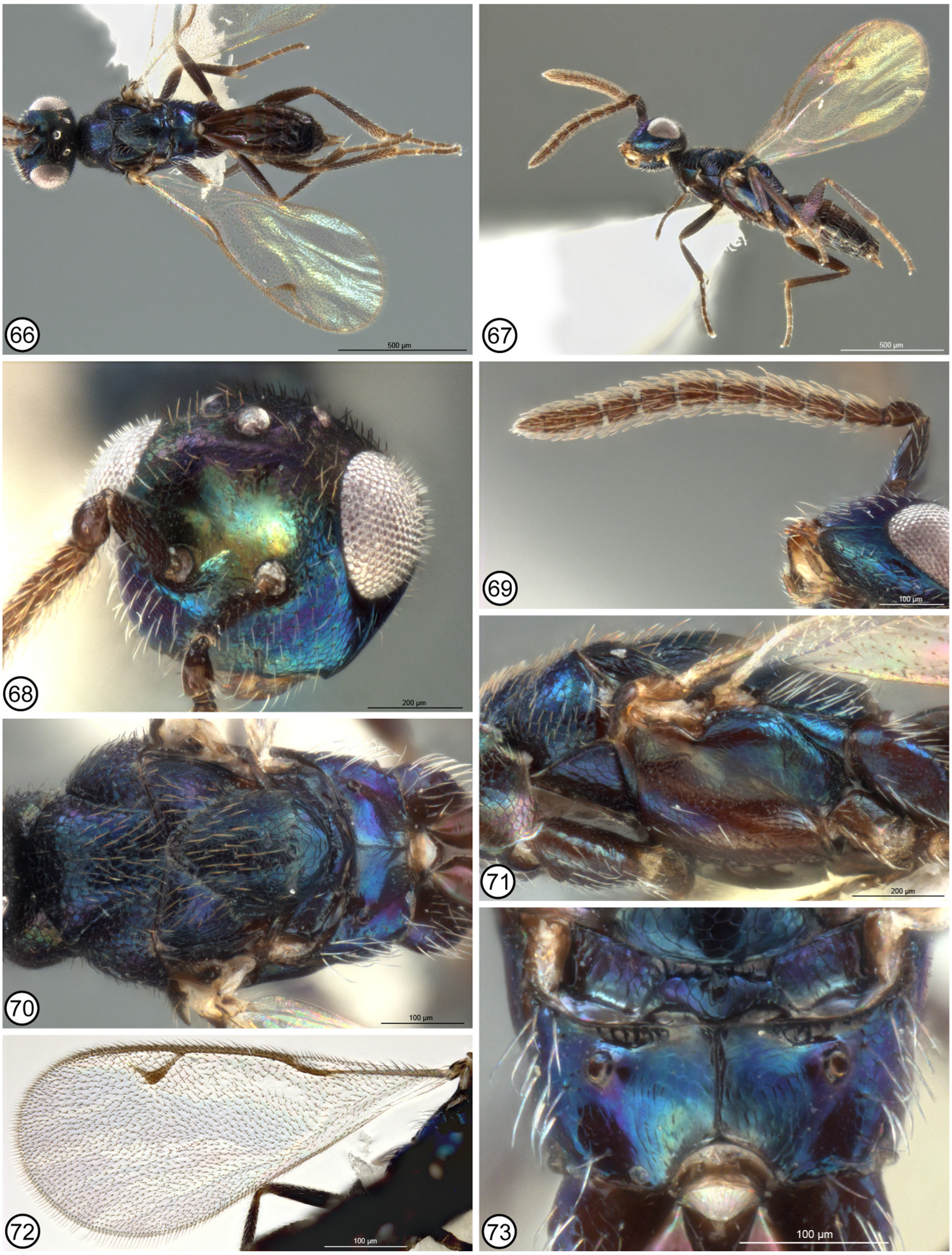
Mesosoma (Figs 56, 58) mostly dark brown but with variably extensive and distinct metallic lusters, usually with some green on pronotum and blue to purple or more reddish-violaceous lusters elsewhere under different angles of light. Pronotum divided mediolongitudinally (Fig. 60); collar coriaceous-alutaceous and setose with pale setae except along mediolongitudinal division. Mesoscutum (Fig. 60) with lateral lobes comparatively lowly ∧-like angulate with dorsal surface flat behind pronotum but increasingly more deeply concave posteriorly where quite distinctly ∨-like near transscutal articulation, with lateral lobe dorsolongitudinally carinate for entire or almost entire length; shiny and often virtually smooth, but usually with at least obscure, subeffaced meshlike sculpture, and with row of setae along inner inclined surface of lateral lobe and with two rows of setae along outer lateral lobe. Scutellar-axillar complex (Figs 61, 63) with scutellum elongate-slender, consisting of flat to slightly convex, coriaceous, bare frenum and somewhat more coarsely sculptured, dorsolaterally setose, triangular region anterior to frenum widely separated from transscutal articulation, the anterior part differentiated by abruptly inclined sides but not carinately margined dorsally; axillae elongate-slender, dorsally setose, and anterior to scutellum separated by comparatively large, deep depression such that each axilla narrowed anterolaterally with margin along depression usually carinate. Fore wing (Figs 61, 63) short, disc only about 1.4–1.9× as long as wide, spatulate, with broadly rounded apical margin extending from about anterior margin of propodeum to slightly over base of gaster and then often slightly reflexed apically; disc hyaline or variably distinctly brownish basally, with setose submarginal vein extending at least half length but not completely to apex, and variably conspicuously and extensively setose with white setae, the shortest wings sometimes superficially completely bare but usually with at least a few, sparse, inconspicuous setae apically on ventral surface (Fig. 61) and often more extensively setose over disc and with line of setae within costal cell, and longer wings at least quite distinctly setose (Fig. 63) ventroapically and usually variably densely dorsally, but without marginal setae. Mesopectus (Fig. 62) with white setae ventrally and anterolaterally between prepectus and acropleural sulcus; acropleuron (Fig. 62) broadly curved posteriorly to level of anterior margin of mesocoxa, shiny and mostly smooth but finely coriaceous-alutaceous anteriorly and sometimes obscurely coriaceous along other margins. Metanotum (Fig. 61) with dorsellum delineated as laterally carinate, coriaceous, anteriorly V-like incised, quadrangular region over apex of scutellum. Metapleuron (Fig. 62) bare, smooth and shiny, with anterior margin distinctly sinuate so acutely triangular to sublinear dorsally but abruptly wider over about ventral half, with anterior margin slightly reflexed as inconspicuous, slender flange along posterior margin of acropleuron and smoothly curved as slender flange over base of metacoxa to differentiate a small, bare, ventral region between acropleuron and anteroventral angle of metacoxa. Legs usually at least mostly similarly dark as body, but sometimes tibiae variably extensively paler apically and up to basal three tarsomeres yellowish; mesotibia with row of 5–9 apical pegs (Fig. 64); metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally (Fig. 62). Propodeum (Fig. 61) very short medially, with posterior margin ∩- to ∧-like incurved to anterior margin medially and variably distinctly reflexed as slender flange, most conspicuously in larger individuals, with plical region transversely concave between median and callus, the concave region with 1 seta laterally adjacent to callus; callus lowly convex with spiracle separated from lateral margin by distance similar to own diameter, with line of white setae lateral to spiracle and extensively setose to posterior margin between metapleuron and propodeal foramen.

Metasoma with petiole transverse-quadrangular (Fig. 61). Gaster (Figs 56, 58) dark brown with slight bluish or other metallic lusters similar to mesosoma; tergites meshlike coriaceous at least basally, the apices sometimes variably extensively smooth, and Gt1–Gt5 basally with transverse line of dark setae; Gt5 usually overlying and concealing Gt6 and syntergum, but if syntergum exposed then with transverse dorsal surface bearing paramedial marginal setae anterior to omega-like emargination surrounding similarly melanized supra-anal and subanal plate (Fig. 65); ovipositor sheaths dark, filamentous, and at least as long as gaster and sometimes about as long as body (Fig. 58).

MALE (habitus: Figs 66, 67). Length = 1.0–1.4 mm. Head (Fig. 68) extensively blue to purple, but under some angles of light with variably extensive violaceous or reddish-violaceous lusters on lower face and sometimes on frontovertex medially, and scrobal depression and sometimes frons laterally more greenish, the scrobal depression sometimes also with some coppery luster; with mostly meshlike sculpture, coriaceous on frons and dorsally within



FIGURES 56–65. *M.* (*Merostenus*) *longistylus* n. sp. ♀: *56 & 57*, 2016-65: **56**, dorsal habitus; **57**, head, frontolateral. *58 & 59*, holotype: **58**, lateral habitus; **59**, antenna. *60–62*, 2016-64: **60**, pronotum and mesoscutum, dorsolateral; **61**, scutellar-axillar complex to base of gaster plus wings; **62**; mesosoma, lateral. **63**, mesoscutum to base of gaster plus wings (2016-72). **64**, apex of mesotibia and tarsus (2016-67). **65**, gastral apex, dorsal (2016-66). [Gt_6 = sixth gastral tergite, sbp = subanal plate, spp = supra-anal plate]



FIGURES 66–73. *M.* (*Merostenus*) *longistylus* n. sp. ♂: **66**, dorsal habitus (2016-68). **67**, lateral habitus (allotype). **68**, head, frontal (2016-73). **69**, gena and antenna, lateral (allotype). **70**, mesosoma, dorsal (2016-68). **71**, mesosoma, lateral (2016-73). **72**, fore wing (2016-68). **73**, metanotum to petiole (2016-68).

scrobal depression and more coarsely coriaceous to coriaceous-reticulate on lower face, but extensively shiny and smooth or almost so within scrobal depression; with whitish setae on lower face compared to more brownish setae on frontovertex, the setae on frons originating from tiny, pinprick-like punctures; scrobal depression shallow, transversely oval, shinier and bare compared to distinctly differentiated, sculptured, setose parascrobal region along inner orbit, and without evident pit above interantennal prominence; OOL: POL: LOL: MPOD = 1.0–1.75:

3.0–3.7: 1.5–2.0: 1.0; frontovertex 0.58–0.6× head width. Antenna (Fig. 69) dark brown; scape compressed-spindlelike with slightly outcurved dorsal and ventral margins, about 2.4–3.2× as long as greatest width; pedicel about 1.6× as long as broad and slightly longer than fl2; combined length of pedicel + flagellum about 1.6× head width; fl1 strongly transverse, anelliform; fl2–clava each with short pedicel basally, with semierect, curved setae of similar length as width of flagellomere, and with obscure, very sparse mps only within about apical half of funiculars; fl2–fl8 oblong, all obviously longer than wide with f2 1.4–1.7× as long as wide and apical funicular about 1.1–1.3× as long as wide; clava about 3.2–3.8× as long as wide excluding pedicel; [length (width) of pedicel and flagellomeres, excluding pedicels = 22(9), 11(7), 2(4), 10(5), 10(7), 12(7), 11(7), 11(7), 10(7), 9(7), 24(7)]. Eye (Fig. 68) comparatively densely and conspicuously setose but with very short setae; [EH: EL: MS = 30: 25: 19]. Labiomaxillary complex yellowish to light brown.

Mesosoma (Figs 70, 71) mostly blue to purple with slight violaceous lusters under some angles of light. Pronotum with collar mostly concealed by head in all specimens, but apparently uniformly covered with pale setae and completely sclerotized. Mesonotum (Fig. 70) entirely, similarly meshlike coriaceous and setose with pale to light brownish setae except for bare frenum. Fore wing (Fig. 72) hyaline with yellowish-brown venation; length about 2.2–2.3× as long as maximum width and length of marginal vein about 0.6× width; cc: mv: stv: pmv = 3.1–3.6: 2.2–2.3: 1.0: 2.2–2.6; stigmal vein with uncus variably long, separated from pmv by distance less than or greater than own length; costal cell dorsally with line of setae along about apical half to two-thirds of leading margin and ventrally setose along length; disc entirely setose except for variably distinct but slender, oblique bare band behind parastigma and base of marginal vein, the bare band separated by setae from venation and basal and mediocubital folds. Metapleuron (Fig. 71) bare, finely meshlike coriaceous; extending dorsally to near level of anterior margin of propodeum conspicuously anterior of propodeal spiracle, with about ventral two-thirds to three-quarters of anterior margin abutting posterior margin of acropleuron, and with posterodorsal margin of acropleuron separated slightly from and lying above level of anterodorsal margin of metanotum. Propodeum (Fig. 73) with median length about 0.4–0.45× distance between transscutal articulation and posterior margin of dorsellum; with median carina and with transverse, crenulate furrow along anterior margin lateral to dorsellum, but otherwise uniformly, finely, meshlike coriaceous or somewhat smoother and shinier medially; callus with comparatively long white setae lateral of spiracle but otherwise bare and lowly convex with spiracle within anterior one-third. Legs (Figs 66, 67) almost entirely dark, but extreme base of protibia pale and extreme bases of meso- and metatibiae more obscurely pale; metacoxa bare except for line of white setae along ventrolateral margin and band of white setae along dorsolateral margin.

Metasoma with petiole dark, smooth and shiny, transversely lunate to trapezoidal with posteriorly divergent sides and posterior margin wider than anterior margin (Fig. 73). Gaster (Figs 66, 67) entirely dark; dorsoventrally flattened to oval in cross-section (Figs 66, 67); Gt1 and Gt2 smooth and shiny and bare except laterally, but subsequent tergites usually obscurely meshlike coriaceous and entirely setose with at least 2 and usually more transverse rows of setae.

Distribution. AFROTROPICAL: South Africa.

Hosts. Unknown.

Remarks. Very long and filamentous ovipositor sheaths differentiate females of *M. longistylus* from those of all other known *Merostenus* species with brachypterous females. Fore wing length and setation are also unusually variable compared to the other treated species. Different females have the fore wings extending anywhere from about the anterior margin of the propodeum to slightly over the base of the gaster (*cf*. Figs 61, 63). Further, the shortest fore wings are the least setose, being bare at least dorsally and sometimes superficially entirely bare, though usually with at least a couple of inconspicuous setae on the ventral surface apically (Fig. 61). The holotype has short fore wings that ventrally are comparatively sparsely though uniformly setose apically beyond the submarginal vein, and there are also setae ventrally in the costal cell. Females with longer fore wings extending to near or slightly over the base of the gaster have these at least more distinctly setose apically on the ventral surface and usually also variably extensively to completely setose dorsally (Fig. 63), though the costal cell is always bare dorsally. Of the 14 Shepard's Valley females, 7 have short wings and 7 have long wings with overlapping setal patterns among the specimens, whereas all 3 Fossil Park females have long and completely setose wings.

M. (*Merostenus*) *mexicanus* n. sp.

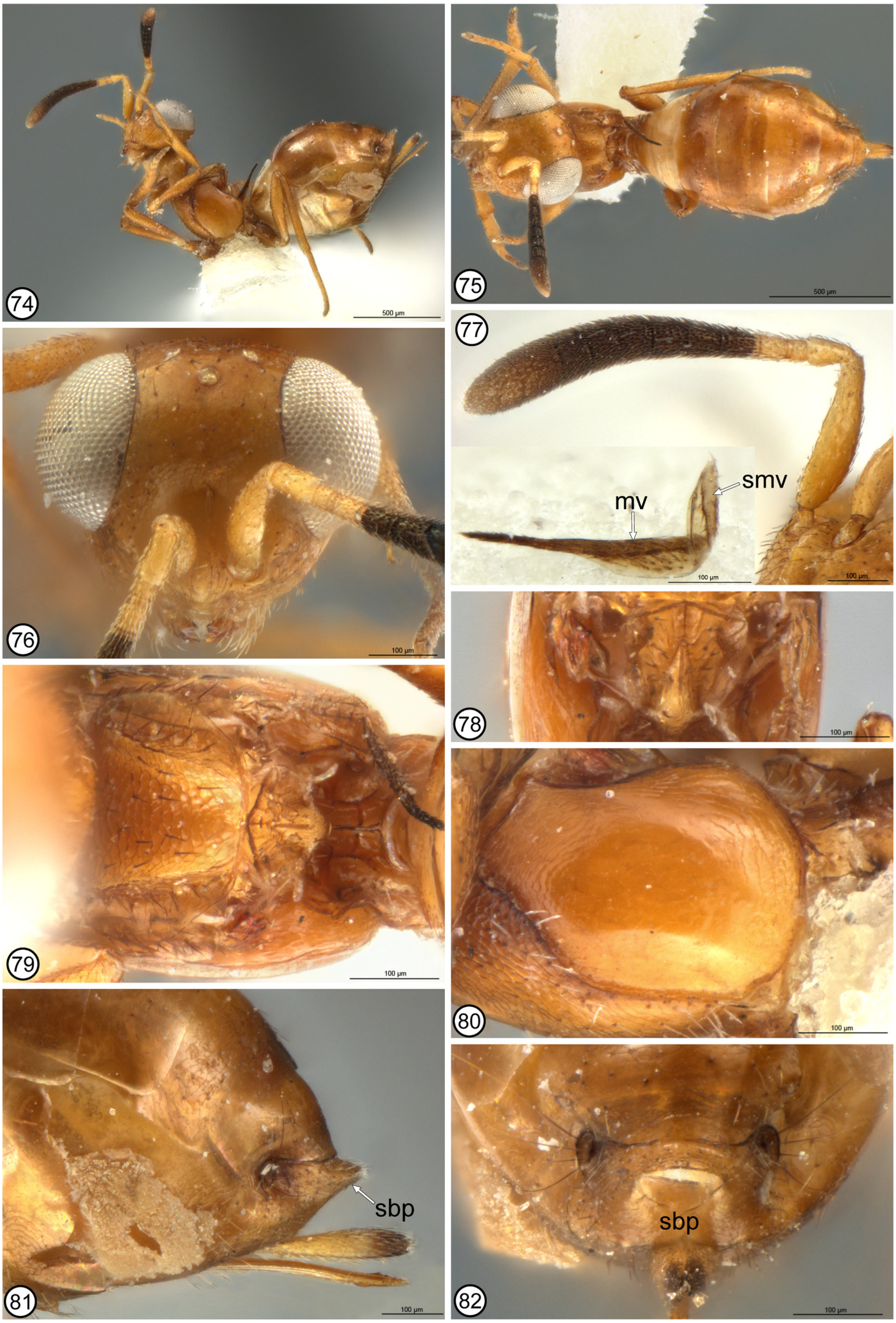
Figs 74–82

Type material. *Holotype* ♀ (TAMU). “MEXICO: Guerrero | 7mi W. Chilparlingo | ca. 7000', 15.VII.1987 | J.B. Woolley, 84-033-13 / HOLOTYPE ♀ | *M.* (*Merostenus*) | *mexicanus* | Gibson”. Point-mounted by meso- and metacoxae; entire but left fore wing detached and glued separately to point; strongly contorted.

Etymology. Named after the country of collection.

Description. FEMALE (habitus: Figs 74, 75). Length about 2 mm. Head (Fig. 76) yellow to light brownish-yellow under some angles of light; in frontal view subquadrate, about 1.2× as wide as high, and in lateral view about 1.6× as high as long with frontal surface convex; shiny and almost smooth but with obscure meshlike sculpture along inner orbits, lower face and vertex; with dark setae except scrobal depression and dorsal surface of interantennal prominence bare, with setae on frons mostly separated by distance greater than MPOD; scrobal depression comparatively shallow but ∩-shaped above interantennal prominence with lateral margin directed dorsally at level of outer margin of torulus so distinct parascrobal region differentiated and broadly arched margin separated from anterior ocellus by distance similar to POL; ratio of OOL: POL: LOL: MPOD = 1.0: 2.4: 1.4: 1.0. Antenna (Fig. 77) with scape, pedicel, and fl1 and fl2 yellow (Fig. 76), the remainder dark brown except clava ventrally lighter brown; scape spindle-shaped, widest subbasally, with length about 4× greatest width; flagellum clavate with fl1 subquadrate, fl2–fl4 longer than wide, but fl5–fl8 quadrate to slightly transverse [length(width) of pedicel and flagellomeres = 15(8), 7(7), 10(7), 10(8), 12(10), 11(11), 11(12), 10(13), 14(14), 31(14)]. Labiomaxillary complex and mandibles same color as head except mandibles reddish-brown apically.

Mesosoma (Figs 74, 75) yellow to light brownish-yellow under some angles of light. Pronotum completely sclerotized; neck meshlike coriaceous, dorsal view of collar concealed by mesoscutum but at least with scattered dark setae. Mesoscutum (Fig. 79) meshlike reticulate; anterior margin largely concealed by pronotum, but apparently narrowly reflexed; lateral lobes comparatively low angulate on either side of broad, shallowly concave median region, the lateral lobes abruptly but not carinately margined dorsolongitudinally; dorsally concave part setose with dark setae except posteromedially, and with line of similar setae along outer inclined surface of lateral lobe. Direct dorsal view of scutellar-axillar complex (Figs 78, 79) obscured by gaster but elongate-slender scutellum lowly convex posteriorly and tapered anteriorly to acute angle widely separated from transscutal articulation, with about anterior half carinately margined mediolongitudinally, and with line of 3 setae along length anterior to bare frenum; axillae elongate-slender, almost flat and below plane of scutellum, but dorsomedially with longitudinal carina extending from scutellum on either side of median, with 3 setae on outer surface, and anterior to scutellum separated by elongate depression. Fore wing (Fig. 77: insert) right-angle bent at about level of posterior margin of scutellar-axillar complex near apex of costal cell; with dark, setose, submarginal vein differentiating slender costal cell within about basal one-quarter, and vein continued along leading margin as apically tapered, dark, setose marginal vein; with membrane posterior to venation only within about basal half, the portion basal to the bend bare except for 1 seta basally on dorsal surface, but distally tapered apical portion of disc entirely setose dorsally. Mesopectus (Fig. 80) with white setae posteroventrally and narrowly along acropleural sulcus anteriorly; acropleuron (Fig. 80) broadly curved posteriorly to level of anterior margin of mesocoxa, transversely coriaceous-alutaceous anteriorly, smooth and shiny medially and very finely and inconspicuously meshlike coriaceous posteriorly. Metanotum concealed by gaster. Metapleuron not visible from posterior view but bare, shiny and at most obscurely coriaceous, and with only ventral margin above base of metacoxa distinctly reflexed, the anterior margin directed horizontally rather than vertically behind acropleuron because mesonotum flexed, but triangular region below anterior margin with dark spots suggesting presence of setose ventral region between acropleuron and metacoxa (Fig. 80). Legs (Fig. 74) yellow to light brownish-yellow similar to rest of body; mesotibia with row of 3 or 4 apical pegs; metacoxa with outer surface setose basally, the setae continued apically along ventrolateral margin, but apparently bare dorsolongitudinally. Propodeum (Fig. 79) comparatively long (relative length not measureable) with posterior margin shallowly, broadly incurved, with plical region quite highly angulate so as to be differentiated by deep depression from convex callar regions, with median carina and at about mid-length with transverse carina between median carina and callar region, and shiny with at most obscure meshlike sculpture; callus with position of spiracle relative to lateral margin not clearly visible, but with slender band of white setae extending from convex surface mesal to inner margin at about level of posterior margin of spiracle to posterolateral margin of propodeal foramen.



FIGURES 74–82. *M.* (*Merostenus*) *mexicanus* n. sp., holotype ♀: **74**, lateral habitus; **75**, dorsal habitus; **76**, head, frontal; **77**, antenna [insert: fore wing]; **78**, mesoscutum to propodeum (mesonotum flexed); **79**, scutellar-axillar complex; **80**, acropleuron; **81**, gastral apex, lateral; **82**, gastral apex, posterior. [mv = marginal vein, sbp = subanal plate, smv = submarginal vein]

Metasoma with petiole transverse-quadrangular. Gaster (Figs 74, 75) light brownish-yellow or under some angles of light somewhat darker brown than mesosoma except for subbasal pale band dorsally consisting of Gt2 and about apical half of Gt1, and with most sternites similarly pale; tergites finely meshlike coriaceous and inconspicuously, sparsely setose; syntergum in lateral view (Fig. 81) curved up relative to dorsal plane of gaster beyond fine, dark, transverse carina connecting cerci, and in dorsal view tapered posteriorly as broadly rounded syntergal flange, the dorsal surface uniformly setose with setae along posterior margin but these not differentiated from other setae (Figs 81, 82); supra-anal plate not visible but with subanal plate appressed to ventral surface of syntergum above ovipositor sheaths (Fig. 82); ovipositor sheaths mostly yellow but brown apically, projecting only slightly beyond syntergum.

MALE. Unknown.

Distribution. NEARCTIC: Mexico (Guerrero).

Hosts. Unknown.

Remarks. *Merostenus mexicanus* is the only *excavatus*-group species in the New World excluding *M. excavatus*, which apparently was introduced accidentally into eastern Canada. Unfortunately, the holotype is strongly contorted so that not all body parts can be described accurately or confidently. However, the holotype differs from all other *Merostenus* females in having the syntergum tapered posteriorly and curved upwards relative to the dorsal plane of the gaster, i.e. developed into a syntergal flange. It is also the only brachypterous species of *Merostenus* with the fore wings right-angle bent (Fig. 77: insert) rather than held flat over the body, and the only *excavatus*-group species with a setose disc and with the gaster subbasally pale dorsally and extensively pale ventrally (Figs 74, 75), though *M. congoensis* (Fig. 29) and *M. reticulatus* (Fig. 99) have Gt2 hyaline.

***M.* (*Merostenus*) *micropterus* n. sp.**

Figs 83–89

Type material. *Holotype* ♀ (MRAC). [Democratic Republic of the Congo] "I.R.S.A.C. [Institut pour la Recherche Scientifique en Afrique Centrale] -MUS. CONGO | Kivu : Terr. Kabare, | contref. S. E. Kahuzl, | 2080–2200m. VIII-51 | N. Leleup / HOLOTYPE ♀ | *M.* (*Merostenus*) | *micropterus* | Gibson". Card-mounted by right side; entire except one front leg missing, one front leg detached beyond coxa and glued to card under mesosoma, one middle leg including coxa missing, one middle leg including coxa detached from body and glued separately to card, and left fore wing beyond humeral plate missing; uncontorted.

Etymology. A combination of *micros* (small) and *pteron* (wing), in reference to very short fore wings of females of this species.

Description. FEMALE (habitus: Figs 84, 85). Length = 2.9 mm. Head (Fig. 83) yellowish-orange; in frontal view subquadrate, about 1.2× as wide as high, and in lateral view lenticular, about 1.6× as high as long with anterior surface uniformly curved; frontovertex smooth and shiny from dorsal limit of scrobal depression to about midway between posterior ocelli and occiput, but vertex posteriorly, scrobal depression, and parascrobal region between torulus and lower inner orbit meshlike coriaceous reticulate, and lower face more finely meshlike coriaceous to smooth and shiny along malar sulcus; setose with dark setae above and below scrobal depression, with setae on frons sparse, separated by distance greater than anterior ocellar diameter; scrobal depression ∩-shaped, shallow with lateral margin directed dorsally from lateral margin of torulus toward inner orbit near mid-height so as to differentiate triangular lower parascrobal region between torulus and lower inner orbit, and broadly concave dorsal margin indistinct except for sculptural difference but separated from anterior ocellus by distance equal to about POL; ratio of OOL: POL: LOL: MPOD = 1.0: 1.9: 1.3: 1.0. Antenna (Figs 83, 85) with scape yellowish and fl1 and fl2 brownish-yellow under most angles of light, but pedicel and fl3–clava darker brown; scape slender, about 5.3× apical width, and slightly curved; flagellum clavate with fl1 longer than wide and at least fl2–fl5 obviously longer than wide, but fl6–fl8 shorter, slightly longer to slightly shorter than wide [length(width) of pedicel and flagellomeres = 20(10), 10(8), 19(9), 19(10), 18(13), 15(14), 15(15), 14(16), 15(17), 44(20)]. Labiomaxillary complex and mandibles same color as head.

Mesosoma (Figs 84, 85) yellowish-orange to brown, with scutellum and particularly acropleuron darkest brown except pronotal collar dark posterolaterally anterior to spiracle. Pronotum (Fig. 86) completely sclerotized; collar finely meshlike coriaceous with scattered dark setae. Mesoscutum (Fig. 86) smooth and shiny; with anterior margin abruptly reflexed as strongly transverse band between posterior margin of pronotum and lateral lobes, the lateral lobes carinately margined dorsolongitudinally but lowly convex relative to comparatively broad and shallowly concave median region; with 2 setae on inclined inner surface of lateral lobe laterally within about posterior half and two-thirds, respectively (setae absent but setal pores evident) and with 4 setae on outer surface within anterior half (Fig. 86: arrows), the anterior-most seta very short. Scutellar-axillar complex (Fig. 87) with scutellum elongate-oval and uniformly convex, quite highly convex above plane of and only slightly longer than but conspicuously larger than axillae, with frenum meshlike coriaceous and bare, and anterior to frenum coriaceous to coriaceous-imbricate with dark setae laterally; axillae elongate-slender, more finely sculptured than scutellum but with two parallel carinae dorsolongitudinally between anterior margin and base of scutellum, with dark setae on outer surface, and anterior to scutellum separated by deep, longer than wide depression. Fore wing (Fig. 87) extending flat over mesosoma to level about equal with middle of propodeum; disc only about 2.4× as long as greatest width, slightly brownish, smooth, and bare except for marginal fringe of 3 setae apically and 1 seta slightly beyond middle of broad submarginal vein that differentiates bare costal cell extending most of disc length, but membrane angulate apically beyond vein. Mesopleurosternum with mesopectus meshlike reticulate anterior to acropleural sulcus below prepectus and more finely coriaceous posteroventrally, and with long white setae posteroventrally and in line along acropleural sulcus anteriorly; acropleuron (Fig. 88) broadly curved posteriorly to level of anterior margin of mesocoxa, meshlike coriaceous to coriaceous-imbricate anteriorly but mostly smooth and shiny. Metanotum (Fig. 87) with dorsellum vertically raised over apex of scutellum, shiny with only obscure longitudinal carinae. Metapleuron (Fig. 88) entirely setose with long, comparatively dense white setae; anterior margin at about midheight curved slightly over posterodorsal margin of acropleuron as slender, bare flange, with anteroventral margin angled posteroventrally over posterodorsal angle of mesocoxa, and ventral margin only slightly reflexed and not distinctly differentiating ventral region between acropleuron and metacoxa. Remaining legs (Fig. 85) similar in color as mesosoma, though somewhat more yellowish, particularly compared to acropleuron; mesotibial pegs not visible; metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally. Propodeum (Fig. 87) long, medial length almost 0.75× distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin shallowly incurved medially behind dorsellum; with paramedial longitudinal ridges delimiting slightly concave median plical region from slightly higher lateral callar regions, the paramedial ridge reflexed slightly toward median anteriorly; plical region with entire, somewhat sinuous median carina, otherwise very finely coriaceous to alutaceous; callus similarly sculptured as plical region, with spiracle separated from lateral margin by distance similar to own diameter, but with longitudinal carina midway between lateral margin of spiracle and lateral margin of callus differentiating slender, setose region with long white setae in line lateral to spiracle and with more numerous setae posteriorly in region between metapleuron and propodeal foramen.

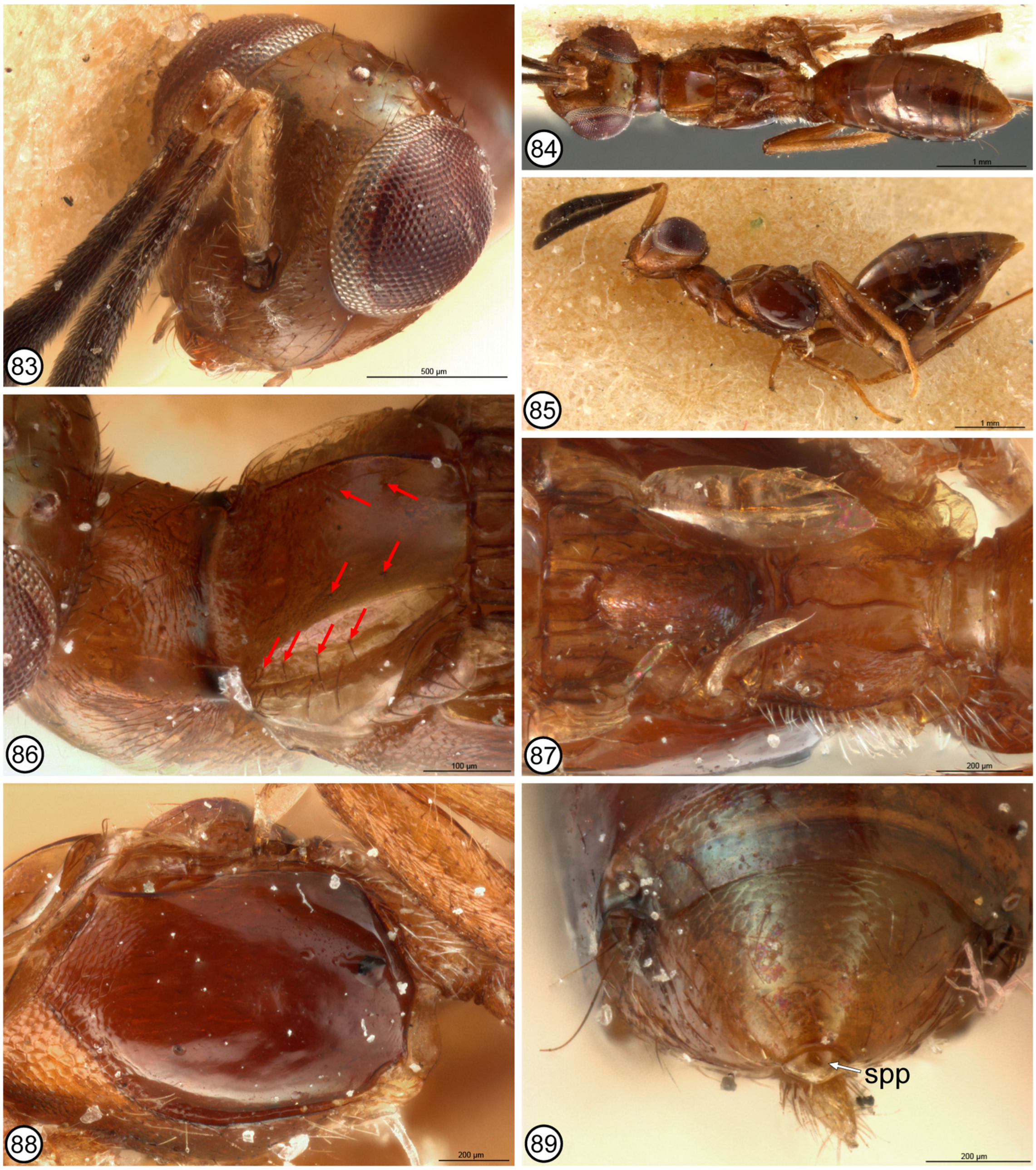
Metasoma with petiole transverse-quadrangular (Fig. 87). Gaster (Figs 84, 85) more or less uniformly meshlike coriaceous, but syntergum very finely so, and with sparse, inconspicuous dark setae dorsolaterally; syntergum in dorsal view (Fig. 84) with posterior margin transverse; supra-anal plate (Fig. 89) yellowish; ovipositor sheaths yellowish, projecting only slightly beyond syntergum.

MALE. Unknown.

Distribution. AFROTROPICAL: Democratic Republic of the Congo.

Hosts. Unknown.

Remarks. Putative relationships and differentiation of *M. micropterus* from *M. reticulatus*, *M. speculum* and *M. distigma* are discussed under the latter species. Females most closely resemble those of *M. speculum* because of a similarly colored and mostly smooth and shiny body, and the basal two flagellomeres under at least some angles of light being slightly lighter in color than the remainder of the flagellum. The most conspicuous difference between the two is that the fore wings extend to the base of the gaster in *M. speculum* (Fig. 119), but only to about mid-length of the propodeum in *M. micropterus* (Fig. 87). However, females also have a different scrobal depression structure, the scrobal depression in *M. micropterus* being quite shallow and high ∩-like (Fig. 83) similar to *M. reticulatus* (Fig. 98), whereas in *M. speculum* it is distinctly concave and transversely ∩-like (Fig. 115) similar to *M. distigma* (Fig. 31). Furthermore, the holotype of *M. micropterus* has two setae dorsally on the mesoscutum (Fig. 86: arrows) and only 1 submarginal seta visible on the single remaining fore wing, whereas the holotype of *M. speculum* has only one seta dorsally on the mesoscutum (Fig. 118: arrow) but five setae (four setae remaining plus one setal pore) visible in a line along the submarginal vein of the left fore wing. It remains to be proven with additional specimens whether these setal patterns are variable in either species.

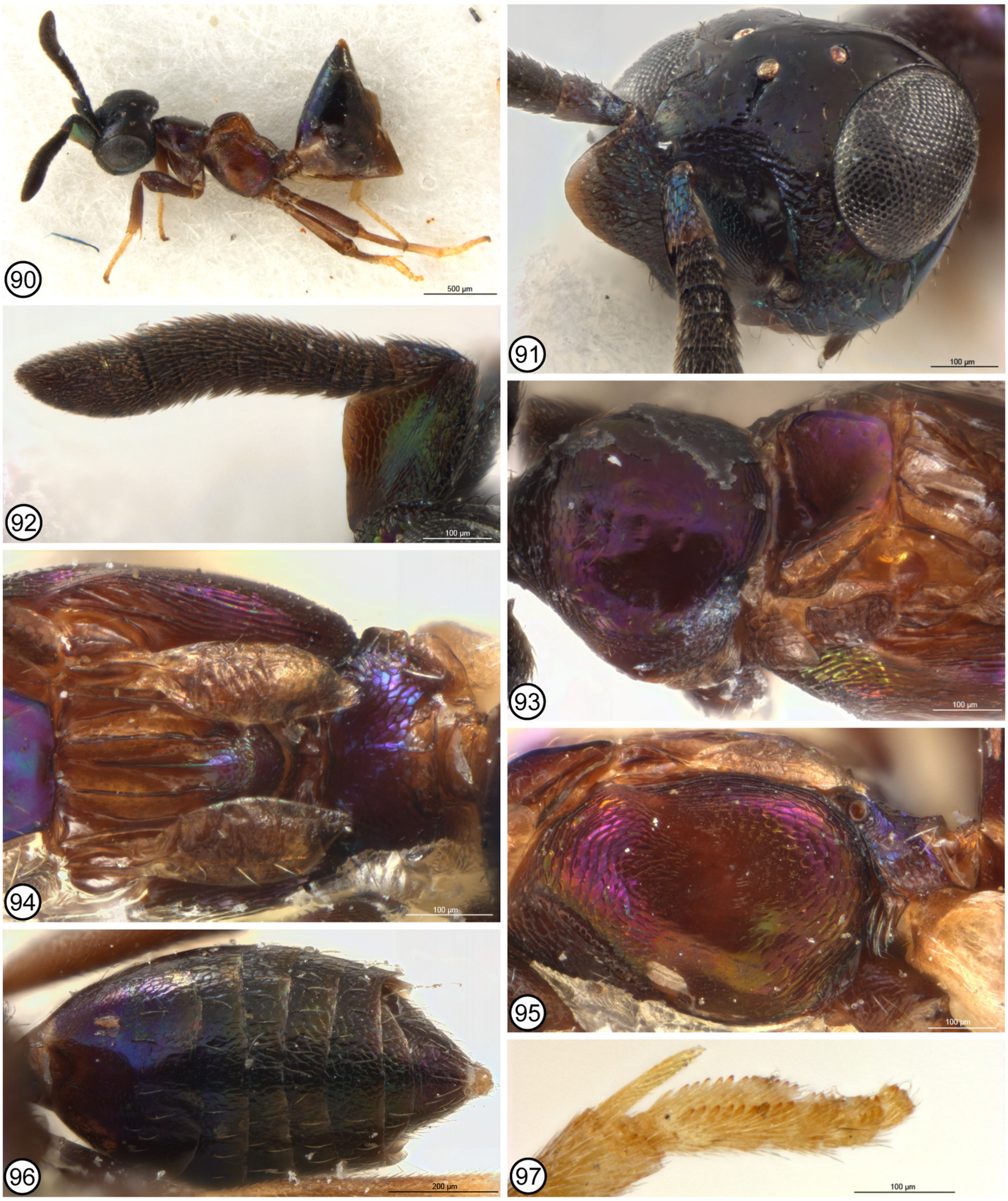


FIGURES 83–89. *M.* (*Merostenus*) *micropterus* n. sp., holotype ♀: **83**, head, frontolateral; **84**, dorsal habitus; **85**, lateral habitus; **86**, pronotum and mesoscutum, dorsolateral [arrows point to setal pores dorsally and setae laterally on mesoscutum]; **87**, scutellar-axillar complex to propodeum plus wings; **88**; mesosoma, lateral; **89**, gastral apex, posterodorsal. [spp = supra-anal plate]

***M.* (*Merostenus*) *platyscapus* n. sp.**
Figs 90–97

Type material. *Holotype* ♀ (BMNH). [South Africa] “Mossel Bay, | Cape Province. | January, 1922. / S. Africa. | R.E. Turner. | Brit. Mus. | 1922—67. / NHMUK010353723 / HOLOTYPE ♀ | *M.* (*Merostenus*) | *platyscapus* | Gibson”. Glued by right side to card rectangle; entire but left hind leg including coxa detached from body and glued separately to point; contorted.

Paratypes (3♀). **South Africa**. E. Cape Prov., Katberg, R.E. Turner: 4000 ft, XII.1932, Brit. Mus. 1933-69 (1♀ BMNH, NHMUK010353724); 15–30.I.1933, Brit. Mus. 1933-108 (1♀ BMNH, NHMUK010353725). Pondoland, Port St. John, 15–31.VIII.1923, R.E. Turner, Brit. Mus. 1923-463 (1♀ BMNH, 2016-70, NHMUK010353726).



FIGURES 90–97. *M.* (*Merostenus*) *platyscapus* n. sp. ♀. *90–93*, holotype: **90**, lateral habitus; **91**, head, frontolateral; **92**, antenna; **93**, pronotum to scutellar-axillar complex, dorsolateral. *94–96*, 2016-70: **94**, scutellar-axillar complex to propodeum plus wings; **95**, mesosoma, lateral; **96**, gaster, dorsal. **97**, apex of mesotibia and basal four tarsomeres (holotype).

Etymology. A combination of *platys* (broad) and *scapus* (stem), in reference to the very strongly compressed scape of females of this species.

Description. FEMALE (habitus: Fig. 90). Length = 2.1–2.5 mm. Head (Fig. 91) dark brown or at most with very slight purple to bluish luster on frontovertex under some angles of light; in frontal view subquadrate, about 1.2× as wide as high, and in lateral view lenticular, about 1.6× as high as long, but with lower face abruptly angled relative to much longer, uniformly curved frontovertex; frontovertex and parascrobal region along about dorsal half of scrobal depression smooth and shiny except sometimes for scattered setiferous pits, and frons at least with small depression below anterior ocellus and sometimes with more distinct sulcus extending partly between ocellus and scrobal depression, but about ventral half of parascrobal region and scrobal depression strongly, transversely reticulate-rugose, scrobes and dorsal surface of interantennal prominence above level of toruli finely coriaceous, and remainder of interantennal prominence and lower face more or less granular; sculptured part of parascrobal region, more strongly sculptured part of interantennal prominence, and lower face uniformly setose with dark setae, but frontovertex and smooth part of parascrobal region with only sparse, scattered dark setae sometimes originating from shallow depressions or pits, and scrobal depression and more finely sculptured part of interantennal prominence bare; scrobal depression deep, abruptly inclined above interantennal prominence, with lateral margin directed dorsally near lateral limit of torulus to differentiate distinct parascrobal region along lower inner orbit, but dorsally more ^-like incurved toward median and separated from anterior ocellus by distance similar to LOL; ratio of OOL: POL: LOL: MPOD = 1.5: 3.25: 1.9: 1.0. Antenna (Fig. 92) dark brown; scape foliaceously compressed, about 1.6× as long as greatest width, broadest apically and narrowed basally, with ventroapical margin extending to apex of fl1 when flagellum held at right angle to scape, the inner surface uniformly coriaceous-alutaceous, setose, and in one plane, but outer surface with expanded region thinner, bare, and more finely sculptured than dorsally thicker, setose part; pedicel about twice as long as wide and about as long as combined length of basal three funiculars; flagellum robust with fl1–fl8 subequally long and strongly transverse, with clava about 1.75× as long as wide and almost as long as combined length of apical four funiculars. Labiomaxillary complex dark brown but mandibles lighter, reddish.

Mesosoma (Fig. 90) yellowish-brown to dark brown with variably extensive and distinct violaceous to purple lusters. Pronotum (Fig. 93) completely sclerotized; collar bare, smooth and shiny dorsomedially but neck, lateral panels, and collar posteriorly meshlike coriaceous and sparsely setose. Mesoscutum (Fig. 93) with lateral lobes strongly ^-like angulate from midline, more deeply anteriorly than posteriorly, but carinately margined dorsolongitudinally to abruptly upcurved transverse region along anterior margin, the upcurved region carinate laterally behind spiracle and medially evident as triangular surface between angulate lateral lobes; shiny and smooth with line of 3–5 setae in row along inner inclined surface and similar row of setae along outer inclined surface. Scutellar-axillar complex (Fig. 94) with scutellum lowly convex posteriorly and tapered anteriorly with abruptly inclined sides forming mediolongitudinal carina over about anterior two-thirds that extend to near transscutal articulation, with dark setae only on convex portion anterior to frenum; axillae elongate-slender, wedge-like with abruptly inclined sides forming mediolongitudinal carina along length and with line of setae along outer surface dorsally. Fore wing (Fig. 94) extending flat on mesosoma over base of propodeum to about level of posterior margin of spiracle; disc brownish, about 2.3× greatest width, the surface distinctly roughened to undulating but bare except for setose submarginal vein extending most of length, and tapered apically to acute angle. Mesopectus with white setae ventrally and linearly along acropleural sulcus; acropleuron (Fig. 95) broadly curved posteriorly to level of anterior margin of mesocoxa, meshlike reticulate to obliquely strigose anteriorly and more meshlike coriaceous elsewhere except smooth and shiny medially. Metanotum (Fig. 94) with dorsellum vertically raised over apex of scutellum with paramedial longitudinal carinae. Metapleuron (Fig. 95) bare, meshlike coriaceous to coriaceous-reticulate, with anterior margin reflexed as slender, smooth flange over about ventral half behind posterodorsal margin of acropleuron, and smoothly curved into similar flange above metacoxa so as to differentiate a transverse-rectangular, setose, ventral region between acropleuron and anteroventral angle of metapleuron. Legs (Fig. 90) with front leg mostly brown except apex of tibia and tarsus lighter, more yellowish, middle leg similar to front leg except tibia more extensively to entirely yellowish-brown to yellow, and hind leg with femora brown but coxa yellowish at least apically, and tarsus and tibia mostly to entirely yellow; mesotibia without distinct apical pegs in any specimen (Fig. 97); metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally. Propodeum (Fig. 94) long, medial length about 0.5× distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin slightly raised medially as transverse flange behind dorsellum, with plical and callar regions indistinctly differentiated and similarly meshlike coriaceous-reticulate; callus with spiracle abutting lateral margin and opening faced laterally, with white setae between spiracle and posterolateral margin of propodeal foramen.

Metasoma with petiole transverse-quadrangular. Gaster (Figs 90, 96) dark brown or with variably distinct violaceous, blue to purple lusters dorsally; tergites meshlike coriaceous to coriaceous-imbricate with transverse line of long dark setae except about basal half of basal tergite more finely sculptured and syntergum uniformly setose; syntergum in dorsal view (Fig. 96) with posterior margin transverse; supra-anal plate not visible; ovipositor sheaths yellowish, projecting only slightly beyond syntergum.

MALE. Unknown.

Distribution. AFROTROPICAL: South Africa.

Hosts. Unknown.

Remarks. Although the species description is based on four females, one is mounted on a card triangle upside down and two of the other three are contorted so that several features are described based on just one female. However, antennal structure readily distinguished females from those of all other brachypterous *Merostenus*, the scape being foliaceously compressed and the flagellum having strongly transverse funiculars (Fig. 92). Females of *M. longistylus* also have the scape obviously compressed, but the flagellum has more elongate funiculars similar to the other treated species (Fig. 59). Females of *M. platyscapus* also differ from the other four Afrotropical *excavatus*-group species in apparently having a bare metapleuron. However, as discussed under monophyly and relationships of the *excavatus* species-group, there is a setose region below the metapleuron between the acropleuron and metacoxa (Fig. 95) that might represent a secondarily differentiated part of the metapleuron. Scutellar-axillar structure is unique among the species treated, with each elongate-slender axilla as a dorsolongitudinally carinate angulate lobe and with the scutellum narrowed into a similarly slender carinate lobe over almost the anterior two-thirds (Fig. 94). The single uncontorted female appears to have both the anterior margin of the mesoscutum (Fig. 93) and the propodeum behind the dorsellum raised such that V-like margins are formed, into which the posterior margin of the pronotum and dorsellum, respectively, fit into when the mesonotum is arched. However, better preserved and mounted specimens are required to confirm this structure. Although males are unknown, it is quite possible they have the metapleuron partly setose anteroventrally, as discussed under monophyly and relationships of the *excavatus* species-group.

***M.* (*Merostenus*) *reticulatus* n. sp.**

Figs 98–114

Type material. Holotype ♀ (NMK). "KENYA, Coast Prov. | Taita Hills, Vuria | Forest, 3.41428°S, | 38.29178°E, 2162m / Malaise trap, just | inside indigenous | forest, 13–27 MAY | 2012, R. Copeland / HOLOTYPE ♀ | *M.* (*Merostenus*) | *reticulatus* | Gibson". Point-mounted by meso- and metacoxae and base of gaster; entire; uncontorted.

Allotype ♂. Same data as holotype (NMK).

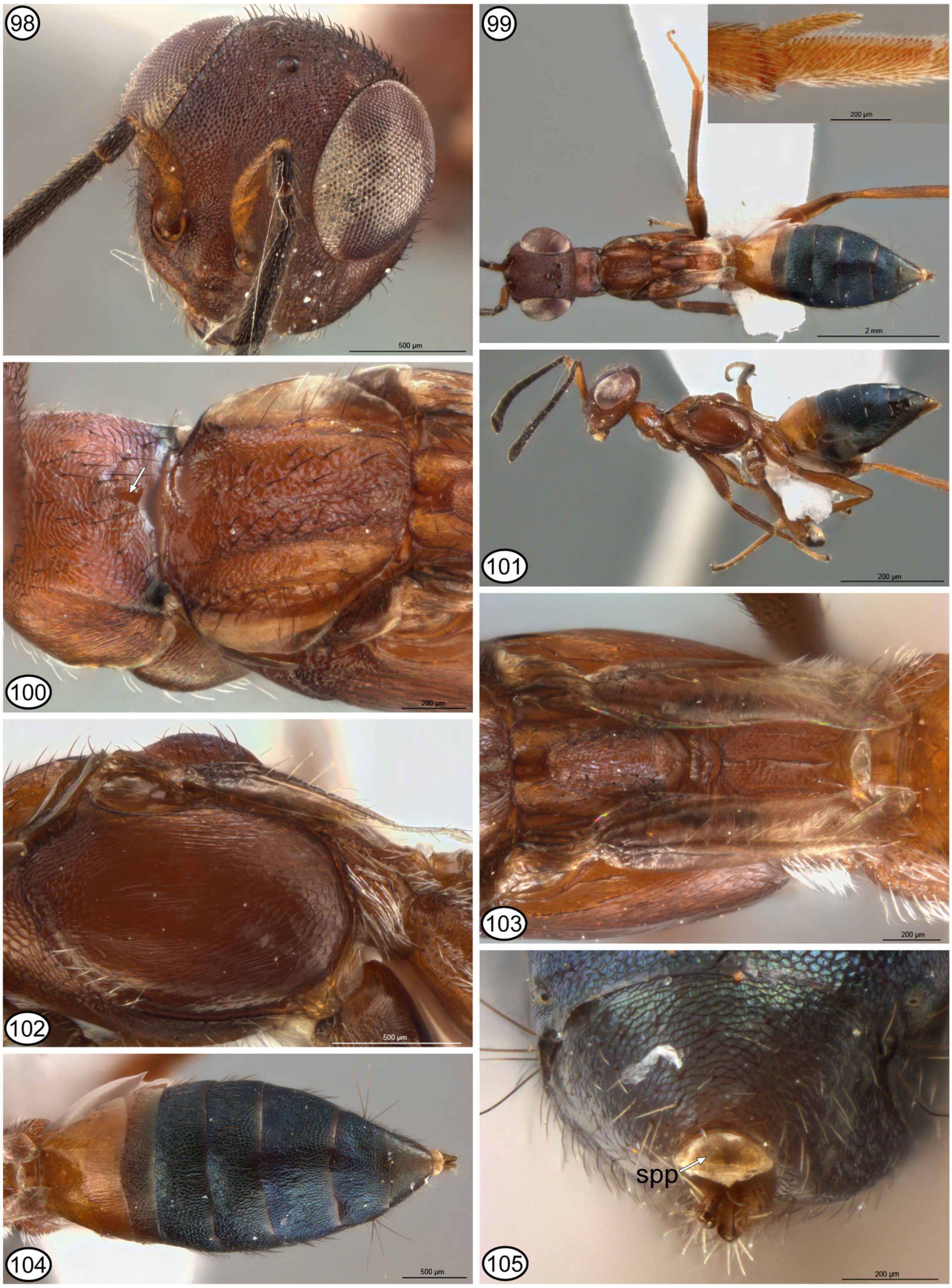
Etymology. The Latin word *reticulatus* (netlike), in reference to the generally reticulate body sculpture of females.

Description. FEMALE (habitus: Figs 99, 101). Length = 3.6 mm. Head (Fig. 98) orangish-brown or frontovertex somewhat darker brown depending on angle of light; in frontal view subquadrate, about 1.1× as wide as high, and in lateral view lenticular, about 1.8× as high as long with anterior surface slightly, uniformly curved; face mostly meshlike reticulate, but more punctate-reticulate within scrobal depression and lower parascrobal region above toruli transversely reticulate-strigose in part; entirely setose except for bare scrobal depression, with conspicuous dark setae on frons separated by distance less than anterior ocellar diameter; scrobal depression shallow, comparatively obscurely differentiated, but ∩-shaped above interantennal prominence, about as high as wide and extending at most half distance to anterior ocellus; ratio of OOL: POL: LOL: MPOD = 1.2: 2.8: 1.5: 1.0. Antenna (Fig. 101) dark except scape orangish-yellow; scape slender, about 6.2× greatest width, and slightly curved; flagellum clavate with fl1 slightly longer than wide and at least fl2–fl5 obviously longer than wide, but fl6–fl8 shorter, slightly longer to slightly shorter than wide [length(width) of pedicel and flagellomeres = 21(10), 11(10), 26(10), 25(12), 24(14): 20(16), 16(17), 15(18), 42(21)]. Labiomaxillary complex and mandibles same color as head.

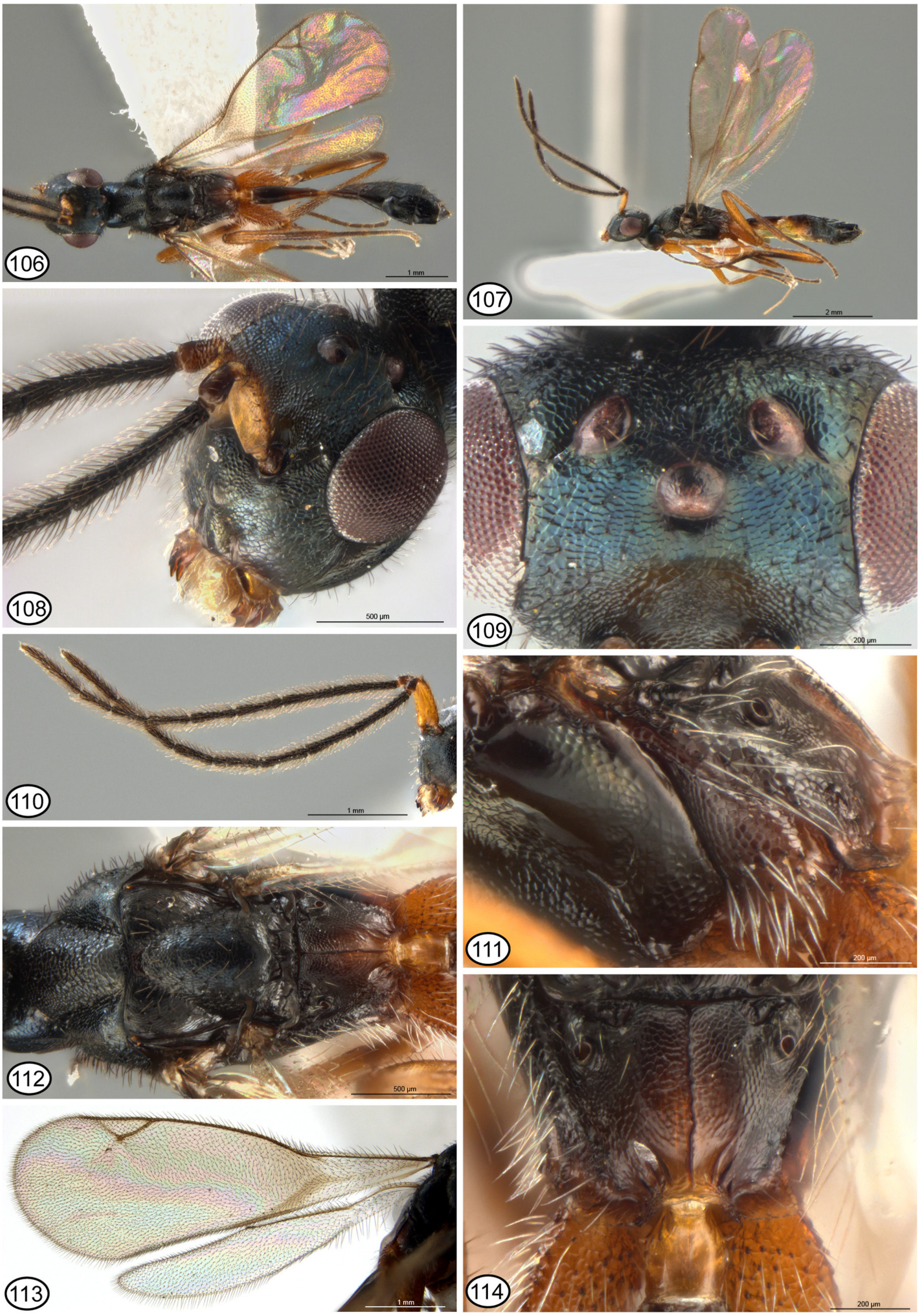
Mesosoma (Figs 99, 101) orangish to orangish-brown except pronotal collar dark posterolaterally anterior to spiracle. Pronotum completely sclerotized, though collar posteriorly with short mediolongitudinal sulcus (Fig. 100: arrow); collar coriaceous-alutaceous dorsally to slightly imbricate posterolaterally and with dark setae obviously longer than distance between setae. Mesoscutum (Fig. 100) with distinct, somewhat roughened, coriaceous-reticulate sculpture; with anterior margin only slightly reflexed behind pronotum and with comparatively lowly convex lateral lobes relative to broad and shallowly concave median region, the lateral lobes dorsolongitudinally carinate only within posterior half; dorsally with comparatively long and similarly dense dark setae as pronotum and with line of similar setae along outer inclined surface of lateral lobe. Scutellar-axillar complex (Fig. 103) with scutellum elongate-oval and uniformly convex, quite highly convex above plane of and only slightly longer than but conspicuously larger than axillae, with frenum meshlike coriaceous and bare, and anterior to frenum more coarsely meshlike reticulate to reticulate-imbricate with conspicuous dark setae laterally; axillae elongate-slender, more finely sculptured than scutellum but with two short carinae dorsomedially adjacent to scutellum, with dark setae on outer surface, and anterior to base of scutellum separated by deep, slightly longer than wide depression. Fore wing (Fig. 103) extending flat over mesosoma to base of gaster; disc elongate-slender, almost 5× greatest width, about basal three-quarters brown but hyaline apically and slightly, transversely wrinkled basally, but bare except for line of setae along broader, more distinctly melanized submarginal vein that differentiates bare costal cell extending about two-thirds length of disc, and with 2 or 3 setae apically on less distinct, narrower vein (presumptive marginal vein) extending to apex of leading margin of wing apex, with membrane angulate apically beyond venation. Mesopleurosternum with mesopectus meshlike reticulate anterior to acropleural sulcus below prepectus and more finely coriaceous posteroventrally, with long white setae posteroventrally and linearly along acropleural sulcus anteriorly; acropleuron (Fig. 102) broadly curved posteriorly to level of anterior margin of mesocoxa, meshlike coriaceous-imbricate anteriorly, longitudinally striate medially, and meshlike coriaceous-reticulate posteriorly, the posterior meshlike sculpture only slightly raised in part. Metanotum (Fig. 103) with dorsellum vertically raised over apex of scutellum, with anteriorly diverging longitudinal carinae. Metapleuron (Fig. 102) setose with long, comparatively dense white setae; anterior margin linearly bare, straight and abutting posterodorsal margin of acropleuron along about dorsal two-thirds, with anteroventral margin angled posteroventrally over posterodorsal angle of mesocoxa, and ventral margin only slightly reflexed and not distinctly differentiating ventral region between acropleuron and metacoxa. Legs (Figs 99, 101) same color as mesosoma; mesotibia (right) with row of 5 apical pegs (Fig. 99: insert); metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally. Propodeum (Fig. 103) long, medial length almost two-thirds distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin shallowly incurved medially behind dorsellum; with paramedial longitudinal ridges at about level of lateral margin of dorsellum delimiting slightly concave median plical region from slightly higher lateral callar regions, the paramedial ridge reflexed slightly toward median anteriorly; plical region with complete median carina, otherwise finely but distinctly coriaceous-reticulate; callus mostly concealed by wings but apparently similarly sculptured as plical region and with spiracle separated from lateral margin by distance greater than own width, with posteriorly widened band of long white setae along lateral margin.

Metasoma with petiole transverse, smooth and shiny. Gaster (Figs 101, 104) with Gt1 orangish, bare, shiny and smooth dorsobasally but very finely meshlike coriaceous to more longitudinally sculptured apically; Gt2 similar in color to Gt1 but hyaline so dark color of Gt3 shows through and appearing more distinctly coriaceous-reticulate than Gt1 (possibly because sculpture of Gt3 shows through), with transverse line of setae basally; Gt3–Gt6 dark with metallic bluish luster under most angles of light, distinctly meshlike reticulate and with similar setae as for Gt2; syntergum similar in color to preceding tergites but meshlike coriaceous, with posterior margin in dorsal view slightly outcurved; supra-anal plate (Fig. 105) yellowish-brown to brown depending on angle of light; ovipositor sheaths mostly brown but lighter apically. Ovipositor sheaths brown, projecting only slightly beyond supra-anal plate.

MALE (habitus: Figs 106, 107). Length = 3.2 mm. Head (Figs 108, 109) dark with slight bluish-green to bluish lusters under some angles of light, most conspicuously on frontovertex (Fig. 109); interantennal region and scrobal depression except narrowly above each torulus distinctly meshlike reticulate, but lower face meshlike coriaceous to coriaceous-imbricate, and frontovertex more finely meshlike coriaceous to very shallowly coriaceous-reticulate, most distinctly along inner orbits and on vertex, and with oblique sulcus extending between lateral ocellus and upper inner orbit (Fig. 109); with comparatively long and conspicuous brown setae, the setae on frons originating from tiny pin-prick like punctures; scrobal depression shallow with indistinct margins, the reticulation laterally extending over slightly convex, setose parascrobal region between torulus and inner orbit, and without evident pit above interantennal prominence; OOL: POL: LOL: MPOD = 0.8: 1.6: 0.7: 1.0; frontovertex 0.58× head width. Antenna (Fig. 110) with scape yellow except for dark brown setae dorsally and on inner surface, flagellum dark brown, and pedicel slightly paler brown than flagellum; scape compressed-tubular with subparallel dorsal and ventral margins, about 3.9× as long as wide; combined length of pedicel + flagellum about 3.2× as head width; fl1 strongly transverse, anelliform; f2–clava each with short pedicel basally (pedicels becoming more distinct apically), with semierect, apically slightly curved setae longer than width of flagellomere, and with obscure, very sparse mps apically; fl2–fl8 all much longer than wide, elongate-tubular, and clava with clavomeres separated by distinct sutures [length(medial width) of pedicel and flagellomeres excluding pedicels = 18(12), 2(8), 58(8), 50(8), 44(8), 41(8), 37(8), 34(8), 31(7), 70(8)]. Eye (Fig. 108) very sparsely and inconspicuously setose with very short setae; EH: EL: MS = 53: 44: 37. Labiomaxillary complex yellowish.



FIGURES 98–105. *M.* (*Merostenus*) *reticulatus* n. sp., holotype ♀: **98**, head, frontolateral; **99**, dorsal habitus [insert: apex of mesotibia and basitarsus]; **100**, pronotum and mesoscutum, dorsolateral [arrow points to mediolongitudinal depression on pronotum]; **101**, lateral habitus; **102**, mesosoma, lateral; **103**, scutellar-axillar complex to propodeum plus wings; **104**, gaster, dorsal; **105**, gastral apex, posterodorsal. [spp = supra-anal plate]



FIGURES 106–114. *M.* (*Merostenus*) *reticulatus* n. sp., allotype ♂: **106**, dorsal habitus; **107**, lateral habitus; **108**, head, frontolateral; **109**, head, dorsal; **110**, antennae; **111**, mesopleuron, metapleuron and propodeum, lateral; **112**, mesosoma, dorsal; **113**, wings; **114**, propodeum and petiole.

Mesosoma (Figs 106, 107) dark with obscure metallic lusters under some angles of light similar to head, except propodeum lighter brown medially and posterolaterally above metacoxa. Pronotum with collar covered by head, but at least extensively setose with dark setae. Mesonotum (Fig. 112) with mesoscutal medial lobe variably meshlike reticulate, with mediolongitudinal band of comparatively small reticulations extending much of length, obviously larger reticulations paramedially, smaller, more punctate-reticulate sculpture anterolaterally in posteriorly tapered region, and more effaced meshlike sculpture posteriorly near transscutal articulation, but with dark setae similar to head; lateral lobe with more minutely sculptured, bare parapsidal band, but otherwise similarly setose as medial lobe, with dorsal part mesal to parapsidal band finely meshlike coriaceous and lateral of parapsidal band more strongly coriaceous-reticulate with some setiferous punctures; scutellar-axillar complex with axillae and scutellum laterally anterior to frenum similarly setose as mesoscutum, and frenum with single seta laterally on either side, with axillae meshlike coriaceous, scutellum mostly coriaceous but slightly coriaceous-imbricate laterally and coriaceous-reticulate dorsomedially, and frenum finely coriaceous-reticulate. Fore wing (Fig. 113) with slight but distinct brownish infuscation, most conspicuously basally on disc and along mediocubital fold; length about 2.9× as long as maximum width and length of marginal vein equal to wing width; cc: mv: stv: pmv = 3.8: 3.9: 1.0: 2.0; stigmal vein variably developed between wings but extending at least for distance about equal with distance between stv and pmv; costal cell dorsally with line of setae along about apical half of leading margin and ventrally setose along length; disc entirely and uniformly as setose as basal cell. Metapleuron (Fig. 111) setose with long white setae in ventral half and distinctly though finely meshlike reticulate; extending dorsally as very slender angle to near level of anterior margin of propodeum conspicuously anterior to level of propodeal spiracle, and abutting posterior margin of acropleuron over most of height, but posterodorsal margin of acropleuron slightly separated from and lying above dorsal-most slender region. Propodeum (Fig. 114) with median length about 0.6× distance between transscutal articulation and posterior margin of dorsellum; with comparatively high median carina and transverse, crenulate furrow along anterior margin lateral of dorsellum, but otherwise plical region mostly meshlike coriaceous except more coriaceous-reticulate to transversely strigose along median carina and callus more distinctly reticulate, particularly posteriorly; callus with transverse line of white setae anterior of spiracle to about mid-way between spiracle and median carina, and with similar setae lateral of spiracle posteriorly to recurved margin over metacoxa, with spiracle conspicuously closer to anterior than posterior margin. Legs (Figs 106, 107), including coxae, mostly yellowish but tarsi and meso- and metatibiae extensively darker brown; metacoxa bare except for band of white setae ventrolaterally and dorsolongitudinally.

Metasoma with petiole yellow, longer than wide with sides divergent over about basal half and subparallel over about apical half, and smooth and shiny except for median carina (Fig. 114). Gaster mostly dark but Gt2 dorsally narrowly yellow apically, and Gt1–Gt4 yellow laterally and ventrally (Fig. 114); Gt1 and Gt2 compressed (Fig. 106), smooth, shiny, and bare except laterally, but subsequent tergites finely coriaceous and more extensively setose.

Distribution. AFROTROPICAL: Kenya.

Hosts. Unknown.

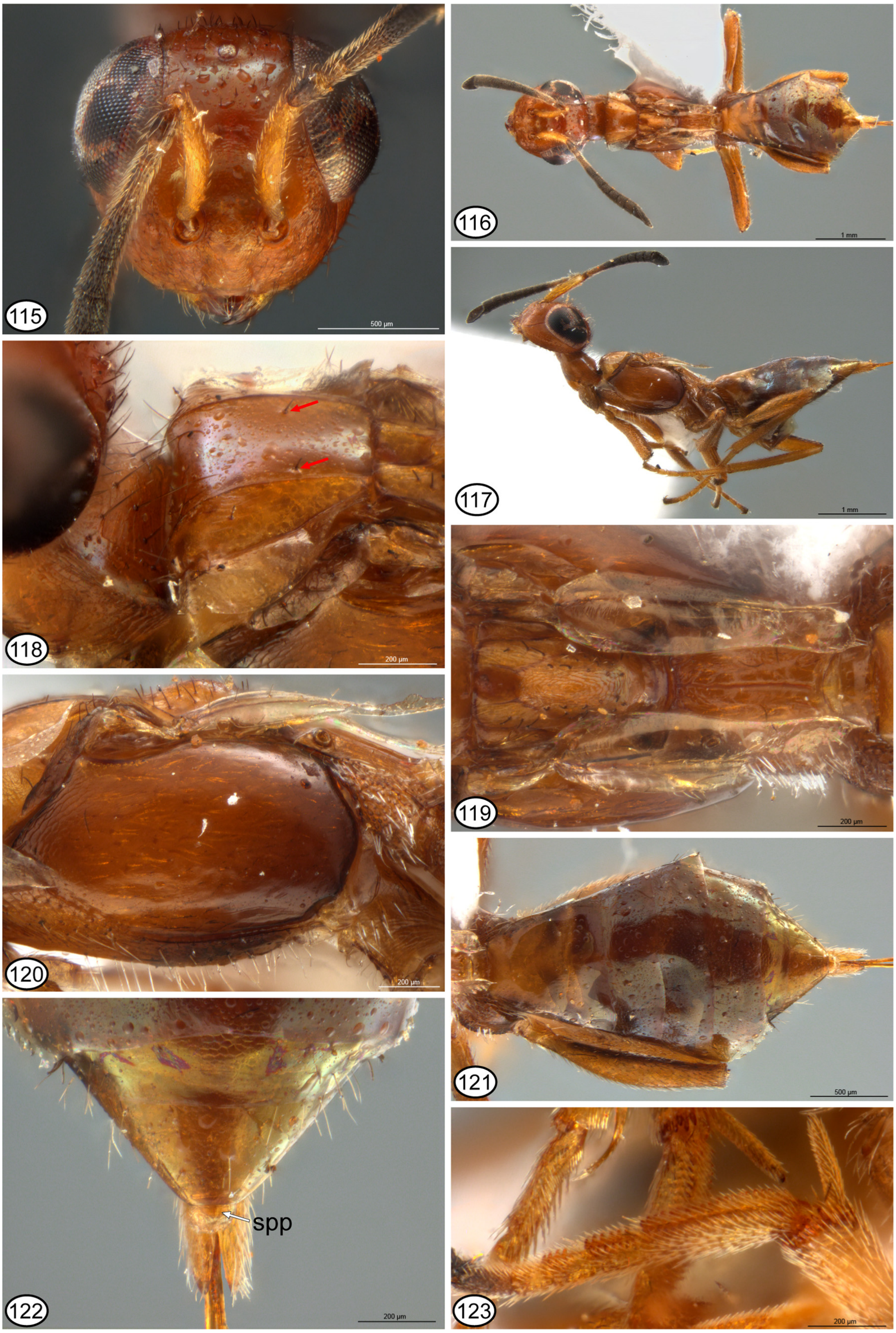
Remarks. Putative relationships and differentiation of females of *M. reticulatus* from those of *M. speculum*, *M. micropterus* and *M. distigma* are discussed under the latter species. The unique male has the gaster compressed basally (Fig. 106), which was described for males of three of five species of *R.* (*Hirticauda*) described by Fusu (2013). As discussed within the section on generic limits and relationships, this does not appear to be an artefact of preservation.

***M.* (*Merostenus*) *speculum* n. sp.**

Figs 115–123

Type material. Holotype ♀ (NMK). “BURUNDI, Kibira | National Park | 2177m, 2.93315°S, | 29.50583°E / Malaise trap, edge of | mixed forest/bamboo, | near meadow, 15–29 | JAN 2010, R. Copeland / HOLOTYPE ♀ | *M.* (*Merostenus*) | *speculum* | Gibson”. Point-mounted by right acropleuron; entire except left fore wing with leading margin missing beyond submarginal vein (Fig. 119) and body variably extensively covered with droplets of oily substance (e.g. Figs 115, 118); mesonotum not arched but pronotum pulled posteriorly over anterior margin of mesopectus such that prepectus rotated ventrally and mesoscutum anteriorly curved down to partly conceal pronotum (Fig. 118).

Etymology. The Latin word *speculum* (mirror), in reference to the generally smooth and shiny body of females, one of the differentiating features for this species.



FIGURES 115–123. *M.* (*Merostenus*) *speculum* n. sp., holotype ♀: **115**, head, frontal; **116**, dorsal habitus; **117**, lateral habitus; **118**, pronotum and mesoscutum, dorsolateral [arrows point to setae]; **119**, scutellar-axillar complex to propodeum plus wings; **120**; mesosoma, lateral; **121**, gaster, dorsal; **122**, gastral apex, dorsal; **123**, apex of mesotibia and tarsus. [spp = supra-anal plate]

Description. FEMALE (habitus: Figs 116, 117). Length about 2.7 mm. Head (Fig. 115) orangish; in frontal view subquadrate, about 1.2× as wide as high, and in lateral view lenticular, about 1.6× as high as long with anterior surface uniformly curved; smooth and shiny between scrobal depression and posterior ocelli and within concave part of scrobal depression above interantennal prominence, but vertex and lower face finely meshlike coriaceous, and upper face more coarsely reticulate-rugulose sculpture in transverse band along upper inclined part of scrobal depression and parascrobal region to inner orbit; entirely setose with dark setae except for bare scrobal depression, with setae on frons mostly separated by distance equal to or greater than anterior ocellar diameter; scrobal depression quite deep and transversely ∩-shaped above interantennal prominence with lateral margin outcurved from torulus but not extending to inner orbit so distinct parascrobal region differentiated, and broadly arched dorsal margin widely separated from anterior margin and with small depression on either side of midline (Fig. 119); ratio of OOL: POL: LOL: MPOD = 1.1: 2.3: 1.7: 1.0. Antenna (Figs 115–117) with scape yellowish and fl1 and fl2 brownish-yellow under most angles of light, but pedicel and fl3–clava darker brown; scape slender, about 5.6× apical width, and slightly curved; flagellum clavate with fl1 longer than wide and at least fl2–fl5 obviously longer than wide, but fl6–fl8 shorter, slightly longer to slightly shorter than wide [length(width) of pedicel and flagellomeres = 20 (9), 11(7), 23(8), 18(10), 15(11), 15(13), 14(14), 15(15), 38(16) (clava collapsed)]. Labiomaxillary complex and mandibles same color as head.

Mesosoma (Figs 116, 117) similarly orangish to yellowish-orange as head, except pronotal collar dark posterolaterally anterior to spiracle. Pronotum completely sclerotized (Fig. 118); collar finely meshlike coriaceous with scattered dark setae. Mesoscutum (Fig. 118) smooth and shiny; structure anteriorly concealed between pronotum and down-curved part of mesoscutum, but anterior margin likely narrowly reflexed; lateral lobes lowly convex relative to broad, shallowly concave median region, but completely carinate dorsolongitudinally; with single seta dorsolaterally on inclined surface of lateral lobe near mid-length (Fig. 118: arrows) and with 4 setae on outer surface of lateral lobe, one near mid-length and 3 more anteriorly (on anteriorly curved part of mesoscutum, not visible in Fig. 118). Scutellar-axillar complex (Fig. 119) with scutellum elongate-oval and uniformly convex, quite highly convex above and only slightly longer than but conspicuously larger than axillae, and finely meshlike coriaceous with dark setae laterally anterior to frenum; axillae elongate-slender, similarly sculptured as scutellum but with dorsolongitudinal carina between anterior margin and base of scutellum, with line of dark setae on outer surface, and anterior to scutellum separated by deep, longer than wide depression. Fore wing (Fig. 119) extending flat over mesosoma to base of gaster; disc elongate-slender, about 4× as long as greatest width, slightly brownish, smooth and mostly bare, but with about 3(?) marginal setae apically, and with line of 5 setae along broader, more strongly melanized submarginal vein extending about two-thirds length of disc differentiating bare costal cell, and with 1 seta on venation subapically (presumptive marginal vein) not extending to apically angulate margin. Mesopleurosternum with mesopectus meshlike reticulate anterior to acropleural sulcus below prepectus and more finely coriaceous posteroventrally, with long white setae posteroventrally and narrowly along acropleural sulcus anteriorly; acropleuron (Fig. 120) broadly curved posteriorly to level of anterior margin of mesocoxa, meshlike coriaceous near anterior margin but mostly smooth and shiny (attachment of acropleural muscle fibers visible beneath cuticle). Metanotum (Fig. 119) with dorsellum vertically raised over apex of scutellum, shiny and without longitudinal carinae. Metapleuron (Fig. 120) entirely setose with long, comparatively dense white setae; anterior margin over about middle one-third reflexed as slender, bare flange abutting posterodorsal margin of acropleuron, with anteroventral margin angled posteroventrally over posterodorsal angle of mesocoxa, and ventral margin only slightly reflexed and not distinctly differentiating ventral region between acropleuron and metacoxa. Legs (Fig. 117) same color as mesosoma; mesotibia with row of 6 apical pegs (Fig. 123); metacoxa with two separate bands of white setae, one ventrolaterally and one dorsolongitudinally. Propodeum (Fig. 119) long, medial length about 0.75× distance between transscutal articulation and posterior margin of dorsellum; posterior margin shallowly, broadly incurved, and anterior margin shallowly incurved medially behind dorsellum; with paramedial longitudinal ridges comparatively narrowly separated from median carina delimiting slightly concave median plical region from slightly higher lateral callar regions, the paramedial ridge reflexed slightly toward median anteriorly; plical region with complete median carina, otherwise very finely coriaceous to alutaceous; callus similarly sculptured as plical region, with spiracle separated from lateral margin by distance similar to own diameter, but basally with longitudinal carina between spiracle and lateral margin, the carina lateral to spiracle with line of long white setae but with more numerous setae in posteriorly widened band to posterior margin.

Metasoma with petiole transverse, smooth and shiny (Fig. 119). Gaster (Figs 117, 121) yellowish-orange dorsobasally, but darker brown beyond; shiny and mostly smooth though apical two tergites very finely meshlike coriaceous, and with sparse, inconspicuous dark setae dorsolaterally; syntergum in dorsal view (Fig. 122) with posterior margin transverse; supra-anal plate yellowish; ovipositor sheaths yellowish, projecting only slightly beyond syntergum.

MALE. Unknown.

Distribution. AFROTROPICAL: Burundi.

Hosts. Unknown.

Remarks. Putative relationships and differentiation of females of *M. speculum* from those of *M. micropterus*, *M. reticulatus* and *M. distigma* are discussed under the latter species. Females most closely resemble those of *M. micropterus* in most features, as discussed under the latter species, but have small paramedial depressions at the dorsal limit of the scrobal depression similar to *M. distigma*.

***Merostenus* (*Reikosiella* Yoshimoto)**

Diagnosis. FEMALE. Mesosoma in lateral view with apex of scutellum protuberant over underlying dorsellum; propodeum with transverse carina separating anterior, concave portion under apex of scutellum from posterior portion behind scutellar apex; mesotibia with patch of strong spines apically over base of mesotarsus; acropleuron angulate posteriorly, the posteroventral margin sinuately curved to anterolateral margin of mesocoxa.

***Merostenus* (*Reikosiella*) *melinus* (Yoshimoto) n. comb.**

Figs 124–133

Reikosiella melina Yoshimoto, 1969: 629. Holotype (BPBM, macropterous ♀, Bishop 8021, examined). Type data: Mt. Kaala, Oahu, VI.1967, C. M. Yoshimoto.

Reikosiella melina; Bouček, 1988: 557 [species groups, biology]; Fusu, 2013: 32 [biology].

Reikosiella (*Reikosiella*) *melina*; Gibson, 1995: 265.

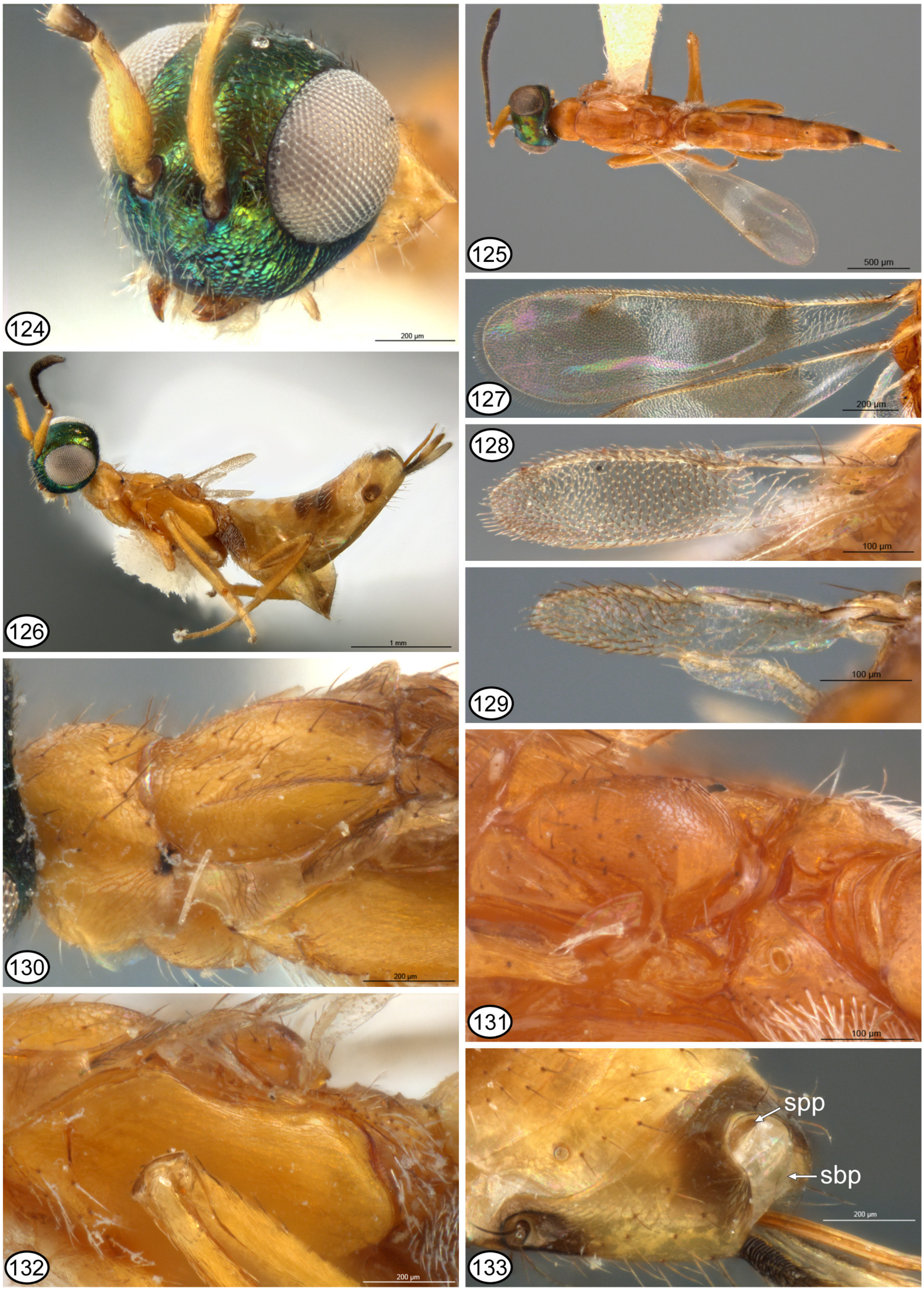
Holotype. The holotype is point-mounted by its right acropleuron and is entire except for its front legs, though it is contorted with the wings over the propodeum and gaster. The label data is as given in the original description except the collection date is stated as “20.VI.'67”.

Additional material examined (all BPBM unless stated otherwise). AUSTRALASIAN: **Hawaii**. *Kauai*, Kokee, VIII.1955 (1 ma PT♀), 13.IX.1965 (1 br PT♀), 16.IX.1965 (1 ma PT♀, CNC Photo 2016-109), J.W. Beardsley. *Lanai*, Lanaihale, 920m, 25.III.1966, J.W. Beardsley (1 ma♀). *Maui*, Kula Agric. Park, I–VI.1988 (1 ma♀, CNC Photo 2016-110), 28.VIII.1988, on ground with Argentine ants (1 ma♀), J.W. Beardsley. *Molokai*, nr. Halawa Val., 7.IX.1956, J.W. Beardsley, reared ex. *Plectronia* fruit with *Orneodes* (5 PT♀: 2 ma and 2 br; 1 br♀ CNC Photo 2016-112); Kalaupapa Lookout, 24.III.1966, J.W. Beardsley (1 ma♀); Mapulehu, X.1954, J.W. Beardsley (1 br PT♀). *Oahu*, Ewa, 1.III.1960 (1 br PT♀), 2.III.1960 (1 br PT♀), 4.VIII.1965 (1 br PT♀), 23.IX.1965 (1 PT♀), J.W. Beardsley; Ewa, Coral Plain, 27.X.1955, J.W. Beardsley (1 br PT♀); Honolulu, P.H., 18.X.1950, K.S. Hagen (1 ma♀ UCRC 00407593); Honolulu, HSOA Exp. Sta., 20.VII.1955, J.B. Beardsley (1 ma PT♀); Kolekole Pass, 1725 ft, 27.II.1967, J.R. Vockeroth (1 ma♀ CNC); Mt. Kaala, 17.VI.1964, H.L. Carson (1 ma♀); Peacock Flats, 1800 ft, 18.VIII.1988, J. Straznanac & C.J. Pritzler (1 br♀); Waianae Mts., 14.VIII.1963, D. Perkins (2 br♀), 14.VIII.1963 (1 br♀), D. Perkins, ex. *Lantana* berries containing seed fly; Wailupe Val., 13.XII.1959, J.W. Beardsley (1 br♀); Waipio, Peninsula, 24.XI.1965, J.B. Beardsley (1 br PT♀, CNC Photo 2016-111). NEOTROPICAL: **Argentina**. Missiones, Parque Nat. Iguazy, Cantera, 200 m, 8.XII.90–6.I.1991, S. & J. Peck (1 br♀ CNC, CNC Photo 2016-108). **Brazil**. Jatai, Goias, I.1977, F.M. Oliveira (1 ma♀ and 1 br♀ CNC).

Yoshimoto (1969) stated that in addition to BPBM paratypes were deposited in BMNH, CNC and USNM, but none were located in the latter three collections.

Description. FEMALE (habitus: Figs 125, 126). Length = 1.9–3.3 mm. Head (Figs 124–126) bright green with limited coppery to reddish-violaceous lusters under some angles of light; in frontal view subquadrate, about 1.1–1.2× as wide as high, and in lateral view about 1.4–1.5× as high as long with frontal surface highly convex; frons sometimes with variably distinct though shallow mediolongitudinal furrow between scrobal depression and median ocellus, but frontovertex otherwise mostly meshlike coriaceous, scrobal depression more coriaceous-imbricate to alutaceous-reticulate with smaller-sized cells, and lower face more coriaceous-granular to distinctly granular with convex cells (Fig. 124); with longer, more conspicuous white setae on lower face and interantennal prominence comparted to darker and much sparser setae on upper face excluding bare scrobal depression; scrobal depression inconspicuously, transversely ∩-shaped, consisting primarily of lateral margin directed dorsally at level of lateral margin of torulus so as to differentiate distinct but short parascrobal region, and shallow scrobe above each torulus, with region above interantennal prominence smoothly merged into frons such that dorsal limit of scrobal depression indistinct but at least widely separated from anterior ocellus (Fig. 124); ratio of OOL: POL: LOL: MPOD = 1.2–1.4: 2.4–3.2: 1.6–1.9: 1.0. Antenna (Fig. 125) with scape yellow (Fig. 126), pedicel yellow to brown dorsally (Fig. 124), and flagellum dark brown; scape spindle-shaped, widest subbasally, with length about 4.8–5.0× as long as wide; pedicel about 2.0–2.3× as long as wide; fl1 slightly longer than wide, fl2–fl4 all distinctly longer than wide, and fl5–fl8 decreasing in length such that apical funicular about 1.3–1.4× as long as wide, and clava about 2.4–3.2× as long as wide (Yoshimoto 1969, fig. 1h). Labiomaxillary complex yellow. Mandibles yellowish basally and reddish apically.

Mesosoma (Figs 130–132) yellowish to orange except pronotal collar dark posterolaterally anterior to spiracle (Fig. 130), mesoscutal lateral lobes sometimes variably extensively dark longitudinally along angulation (Fig. 130), and scutellar-axillar complex sometimes variably extensively yellowish-brown to light brown. Pronotum (Figs 125, 130) completely sclerotized; collar shiny, at most only obscurely meshlike coriaceous, and at least along margins with longer dark setae than on the head though often bare or mostly bare medially. Mesoscutum (Fig. 130) similarly sculptured as pronotum; with anterior margin convex, not reflexed behind pronotum, and with comparatively lowly convex lateral lobes relative to broad and shallowly concave median region, the lateral lobes not carinately margined except sometimes posteriorly near transscutal articulation; dorsally with scattered dark setae, including along inclined outer surface of lateral lobe. Scutellar axillar complex (Fig. 131) with scutellum uniformly convex and elongate-ovate with sides converging anteriorly from frenum to form acute angle only slightly separated from transscutal articulation, quite highly convex above and conspicuously larger than axillae, meshlike coriaceous to coriaceous-imbricate laterally, and with dark setae laterally anterior to frenum; axillae elongate-triangular, almost flat, meshlike coriaceous, with dark setae, and anterior to scutellum separated by only punctiform depression. Fore wing (Figs 127–129) polymorphic in length, color pattern and venation, but entirely setose except for costal cell dorsally. Macropterous female with fore wing extending to about apex of syntergum (Fig. 125), about 3.5–3.8× as long as wide with mv about 1.0–1.3× as long as wing width, and with complete venation including long stigmal vein (Fig. 127; Yoshimoto 1969, fig. 1a, b); basal cell basally very slightly infuscate with at least a few darker setae, but mostly hyaline with white setae extending to level of base of parastigma, and disc hyaline to very slightly infuscate with dark setae except for hyaline cross-band with white setae starting at about mid-length of marginal vein and extending to stigmal vein anteriorly, though both basal and apical margins of band often slightly curved (Fig. 127); cc: mv: stv: pmv = 3.3–5.0: 3.6–5.0: 1.0: 2.0–2.5. Brachypterous female with fore wing variably strongly shortened and narrowed but at most with punctiform stigmal vein and usually venation consisting only of submarginal vein and vein along leading margin extending to near wing apex (Figs 128, 129; Yoshimoto 1969, fig. 1c–e); usually with more or less similar infuscation and setal color patterns as for macropterous female (Fig. 128), but when wing most strongly reduced sometimes with entirely dark setae or with only basal hyaline region with white setae (Fig. 129). Mesopectus with white setae ventrally and anterior to acropleural sulcus dorsolaterally; acropleuron (Fig. 132) posteriorly angulate with posterodorsal margin sinuate anterior to metapleural flange and posteroventral angulation, and only very finely meshlike coriaceous. Metanotum with dorsellum transverse, horizontal (Fig. 131) under protruding scutellar apex (Figs 131, 132). Metapleuron (Fig. 132) with about ventral half setose and dorsal half bare, smooth and shiny, and over about middle third sinuate anterior margin appressed to depression along posterodorsal margin of acropleuron, with ventral margin only slightly reflexed over base of metacoxa, and with linear region between acropleuron and base of metacoxa bare. Legs (Fig. 126) same color as mesosoma except outer surface of metacoxa variably dark brown and outer surface of metafemur sometimes brownish longitudinally; mesotibia with stronger, spine-like setae apically but not pegs; metacoxa with outer surface entirely setose (Fig. 126). Propodeum (Fig. 131) with transverse, carinate ridge medially within about anterior third to half differentiating anterior, medially concave portion under scutellar apex from lunate, concave to inclined posterior surface having variably long median carina and usually longitudinal to oblique carina on either side of median carina; callus with spiracle about in middle of convex region, separated from lateral margin by distance similar to own maximum diameter (Fig. 131), with transverse line of setae anterior to spiracle, laterally, and over almost entire surface posterior of spiracle to posterolateral margin of propodeal foramen and posterior margin of callus.



FIGURES 124–133. *M.* (*Reikosiella*) *melinus* (Yoshimoto) ♀: **124**, head, frontolateral (2016-108); *125 & 126*, habitus: **125**, dorsal (2016-109); **126**, lateral (2016-108). *127–129*, fore wing: **127**, macropterous (2016-110); **128**, brachypterous (2016-111); **129**, brachypterous (2016-108). **130**, pronotum and mesonotum, dorsolateral (2016-108). **131**, scutellar-axillar complex to propodeum, dorsolateral (2016-109). **132**, mesosoma, lateral (2016-108). **133**, syntergum, posterodorsal (2016-108). [sbp = subanal plate, spp = supra-anal plate]

Metasoma with petiole transverse, linear (Fig. 131). Gaster (Figs 125, 126) similarly yellowish to orange as mesosoma except one or more of Gt3–Gt5 with darker brown regions at least laterally and syntergum similarly dark brown dorsally and anterolaterally in subcircular region encompassing cercus; very finely meshlike coriaceous with pale setae on Gt1–Gt3 and laterally on Gt4–Gt5, but dark setae dorsally on Gt4–Gt6 and syntergum; syntergum (Fig. 133) deeply emarginate and dorsally bare except for a couple of long setae along emargination laterally, and with brown supra-anal and subanal plates evident in uncollapsed specimens; ovipositor sheaths (Figs 125, 126) rigid, projecting beyond syntergum by distance equal to about half length of metatibia; banded with thinner basal portion dark (Fig. 126) though region sometimes concealed under syntergum (Fig. 125), and thicker apical portion variably extensively pale basally and variably dark brown apically (Figs 125, 126).

MALE. Unknown.

Distribution. AUSTRALASIAN: Hawaii. NEOTROPICAL: Argentina, Brazil.

Hosts. Uncertain, but reared from fruits of *Psydrax odorata* (Förster) A. C. Sm. & S. P. Darwin (Rubiaceae), purportedly from the larvae or pupae of *Alucita objurgatella* (Walsingham) (Lepidoptera: Alucitidae) (Yoshimoto 1969). Label data also indicates specimens were reared from "*Lantana* berries" (Verbenaceae) containing a "seed fly", and one female is labelled as found on the ground with Argentine ants, *Linepithema humile* (Mayr) (Formicidae).

Although Yoshimoto (1969, p. 631) "surmised" that *M. melinus* was a larval or pupal parasitoid of *A. objurgatella*, it has been reared only once from this host and then only 3 females were mass reared from fruits of *P. odorata*. Reared from the same fruits were 135 specimens of the purported host as well as four other parasitoid species, including 8 specimens of *Euderus* sp. (Chalcidoidea: Eulophidae), 20 specimens of *Eupelmus* sp., 9 specimens of *Fidiobia* sp. (Platygastroidea: Scelionidae) and 3 specimens of *Pristomerus* sp. (Ichneumonoidea: Ichneumonidae), plus mites living within cavities from which moths had emerged. It was also noted that many of the fruits contained one or two entrance holes that probably were made by the moth larvae chewing their way in after hatching from eggs laid externally on the fruit. Species of *Fidiobia* are all egg parasitoids and, according to L. Masner (AAFC, pers. comm.), of eggs of weevils (Coleoptera: Curculionidae). The known biology of *M. excavatus* as a curculionid egg predator that subsequently pupates within the plant associate raises the possibility that this might also be so for *M. melinus*. Even if not, rearing of the other parasitoid species raises the possibility that it might be a hyperparasitoid through one of the other primary parasitoids. Another rearing from *Lantana* berries, purportedly from some seed fly, further suggests a broader host range than just *A. objurgatella*. The association with Argentine ants is definitely unusual, but might simply be an accidental association.

Remarks. Other than *M. melinus*, species of *M.* (*Reikosiella*) are restricted to North, Central, and South America. It is therefore anomalous that the species was described from Hawaii, as the only known species of the genus from the Hawaiian Islands. However, even though *A. objurgatella* is known only from Hawaii, Zimmerman (1901) stated that it is not native and someday its true native range would be discovered elsewhere. The discovery of a brachypterous female of *M. melinus* from Argentina and a macropterous and brachypterous female from the same collecting event in Brazil suggests that *R. melinus* was introduced to Hawaii from South America. Of the Hawaiian eupelmid fauna, only *Eupelmus* is speciose with over 60 described species (Noyes 2016). This suggests a relatively ancient introduction of *Eupelmus* into Hawaii and subsequent explosive diversification within the islands. The presence of *M. melinus* as the only species of *Merostenus* in Hawaii indicates a much more recent introduction. The CNC also has macropterous females of other species of *M.* (*Reikosiella*) from Central and South America that are quite similar in body color pattern to *M. melinus*, which suggests closely related species. However, females of *M. melinus* uniquely have the metapleuron partly setose (Fig. 132) in combination with rigid ovipositor sheaths that are only about half the length of the metatibia and have a dark-pale-dark colour pattern (Fig. 126), though the basal dark region sometimes is hidden under the syntergum (Fig. 125). Further, other macropterous females seen from the Neotropical region with similar body colour patterns have completely hyaline fore wings with dark setae.

Yoshimoto (1969) recognized macropterous females, four intergradations of brachypterous females, and micropterous females. I did not see any females he described and illustrated as micropterous, i.e. with the wing having only a 'rudimentary' vein, apparently restricted to the basal half of the wing (Yoshimoto 1969, fig. 1f). Females listed above under material examined as macropterous have fore wings with complete venation including a distinct stigmal vein angled away from the postmarginal vein (Fig. 127) (= macropterous *sensu* Yoshimoto 1969, fig. 1a, and brachypterous intergradation 1 *sensu* Yoshimoto 1969, fig. 1b). Females with variably strongly shortened fore wings (Figs 128, 129) that either lack a distinct stigmal vein (Yoshimoto 1969, figs 1c–e) or have a punctiform to short stigmal vein that is appressed to the postmarginal vein are considered as brachypterous.

Checklist of species assigned to *Merostenus* Walker

Merostenus (*Capreocauda* Gibson, 1995)

Merostenus (*Capreocauda*) *crisagatra* (Narendran) **n. comb.** from *Reikosiella* (*Cupreocauda*) [sic] *crisagatra* Narendran, 1996: 84–85 [name erroneously cited as *Hirticauda crisagatra* in the abstract]. India.

Merostenus (*Capreocauda*) *gibsoni* (Anil & Narendran) **n. comb.** from *Hirticauda gibsoni* Anil & Narendran, 1991: 21–23, *Reikosiella gibsoni sensu* Narendran, 1996: 85, and *Reikosiella* (*Cupreocauda*) [sic] *gibsoni sensu* Narendran & Sheela, 1996: 82. India.

Merostenus (*Capreocauda*) *napoleoni* (Girault) **n. comb.** from *Eupelmus napoleoni* Girault, 1923a: 98, and *Reikosiella napoleoni sensu* Bouček, 1988: 558. Syntype ♀♀ (QMBA, examined). Australia.

Merostenus (*Capreocauda*) *nonaericeps* (Girault) **n. comb.** from *Eupelmus nonaericeps* Girault, 1923a: 99, and *Reikosiella nonaereiceps* [sic] *sensu* Bouček, 1988: 558. Syntype ♀♀ (QMBA, examined). Australia.

Merostenus (*Capreocauda*) *parvulus* (Risbec) **n. comb.** from *Eupelmus parvulus* Risbec, 1952: 112–113. Holotype ♀ (MNHN, examined). Madagascar.

Merostenus (*Capreocauda*) *tsaratananae* (Risbec) **n. comb.** from *Idoleupelmus tsaratananae* Risbec, 1952: 129–132, and *Reikosiella* (*Capreocauda*) *tsaratananae sensu* Gibson, 1995: 262. Madagascar.

Merostenus (*Incohata* Gibson, 1995)

Merostenus (*Incohata*) *guttatus* (Gibson) **n. comb.** from *Reikosiella* (*Incohata*) *guttata* Gibson, 1995: 264–265. USA.

Merostenus (*Merostenus* Walker, 1837)

Merostenus (*Merostenus*) *alhazeni* (Girault) **n. comb.** from *Eupelmus alhazeni* Girault, 1918: 197–198. Holotype ♀ (QMBA, examined) [all that remains of holotype is the head with one antenna; subgeneric assignment is based on fl2–fl7 being white]. Australia.

Merostenus (*Merostenus*) *andriescui* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *andriescui* Fusu, 2013: 6–9. Canary Islands.

Merostenus (*Merostenus*) *arboris* (Girault) **n. comb.** from *Tineobius arboris* Girault, 1921a: 2, and *Reikosiella arboris sensu* Bouček, 1988: 557. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *bekiliensis* (Risbec) **n. comb.** from *Anastatus bekiliensis* Risbec, 1952: 107–108, and *Reikosiella* (*Hirticauda*) *bekiliensis sensu* Fusu *et al.*, 2015: 463. Madagascar.

Merostenus (*Merostenus*) *bekilyi* (Risbec) **n. comb.** from *Macreupelmus bekilyi* Risbec, 1952: 126–127, and *Reikosiella* (*Hirticauda*) *bekilyi sensu* Gibson, 2016. Madagascar.

Merostenus (*Merostenus*) *bilingae* (Girault) **n. comb.** from *Eupelmus bilingae* Girault, 1923b: 6. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *bilongifasciatus* (Girault) **n. comb.** from *Cerambycobius bilongifasciatus* Girault, 1923a: 97, and *Hirticauda bilongifasciata sensu* Bouček, 1988: 558. Australia.

Merostenus (*Merostenus*) *bolivari* (Kalina) **n. comb.** from *Eupelmus bolivari* Kalina, 1988: 22–23, and *Reikosiella* (*Hirticauda*) *bolivari sensu* Fusu, 2013: 9. Algeria, France, Spain.

Merostenus (*Merostenus*) *claudus* (Girault) **n. comb.** from *Eupelmus claudus* Girault, 1915: 10–11, and *Reikosiella clauda sensu* Bouček, 1988: 557. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *congoensis* Gibson **n. sp.** Democratic Republic of the Congo.

Merostenus (*Merostenus*) *cornutus* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *cornuta* Fusu, 2013: 12–13. South Korea.

Merostenus (*Merostenus*) *distigma* Gibson **n. sp.** Kenya, Tanzania.

Merostenus (*Merostenus*) *excavatus* (Dalman). Palaearctic and Canada (introduced).

Merostenus (*Merostenus*) *gordoni* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *gordoni* Fusu, 2013: 15–18. Greece.

Merostenus (*Merostenus*) *graecus* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *graeca* Fusu, 2013: 18–19. Greece.

Merostenus (*Merostenus*) *hungaricus* (Erdős) **n. comb.** from *Eupelmus hungaricus* Erdős, 1959: 327–330, *E.* (*Eupelmus*) *hungaricus sensu* Askew & Nieves-Aldrey, 2000: 53, 59, and *Reikosiella* (*Hirticauda*) *hungarica sensu* Gibson in Nieves-Aldrey *et al*., 2003: 38. Western Europe.

Merostenus (*Merostenus*) *insularis* (Girault) **n. comb.** from *Anastatus insularis* Girault, 1915: 22, and *Reikosiella insularis sensu* Bouček, 1988: 557. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *koreanus* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *koreana* Fusu, 2013: 21–23. South Korea.

Merostenus (*Merostenus*) *longistylus* Gibson **n. sp.** South Africa.

Merostenus (*Merostenus*) *luxa* (Narendran & Sheela) **n. comb.** from *Reikosiella* (*Hirticauda*) *luxa* Narendran & Sheela, 1996: 82–84. India.

Merostenus (*Merostenus*) *marxi* (Girault) **n. comb.** from *Eupelmus marxi* Girault, 1932: 5, and *Reikosiella marxi sensu* Bouček, 1988: 557. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *mexicanus* Gibson **n. sp.** Mexico.

Merostenus (*Merostenus*) *micropterus* Gibson **n. sp.** Democratic Republic of the Congo.

Merostenus (*Merostenus*) *muironi* (Girault) **n. comb.** from *Eupelmus muironi* Girault, 1925: 3, and *Hirticauda muironi sensu* Bouček, 1988: 558. Australia.

Merostenus (*Merostenus*) *muramura* (Girault) **n. comb.** from *Eupelmus muramura* Girault, 1921b: 187, *Hirticauda muramura sensu* Bouček, 1988: 558, and *Reikosiella muramura sensu* Narendran, 1996: 85. Australia.

Merostenus (*Merostenus*) *pachyscapha* (Girault) **n. comb.** from *Eupelmus pachyscapha* Girault, 1915: 16, *Hirticauda pachyscapha sensu* Bouček, 1988: 558, and *Reikosiella pachyscapha sensu* Narendran, 1996: 85. Australia.

Merostenus (*Merostenus*) *pasteuri* (Girault) **n. comb.** from *Anastatus pasteuri* Girault, 1915: 24, and *Reikosiella* (*Hirticauda*) *pasteuri sensu* Gibson *et al.*, 2012: 55. Australia.

Merostenus (*Merostenus*) *pax* (Girault) **n. comb.** from *Cerambycobius pax* Girault, 1913: 92–93, *Hirticauda pax sensu* Bouček, 1988: 558, and *Reikosiella* (*Hirticauda*) *pax sensu* Gibson, 1995: 259, 261. Australia.

Merostenus (*Merostenus*) *platyscapus* **n. sp.** South Africa.

Merostenus (*Merostenus*) *puellus* (Girault) **n. comb.** from *Finlayia puella* Girault, 1934: 1, and *Hirticauda puella sensu* Bouček, 1988: 558. Australia.

Merostenus (*Merostenus*) *quilonicus* (Narendran) **n. comb.** from *Australoodera quilonica* Narendran, 1996: 82–83, and *Reikosiella* (*Hirticauda*) *quilonica sensu* Gibson, 2004: 154. India.

Merostenus (*Merostenus*) *reticulatus* Gibson **n. sp.** Kenya.

Merostenus (*Merostenus*) *rostratus* (Ruschka) **n. comb.** from *Eupelmus rostratus* Ruschka, 1921: 291–293, and *Reikosiella* (*Hirticauda*) *rostrata sensu* Fusu, 2013: 23. Western Europe.

Merostenus (*Merostenus*) *silvarum* (Girault) **n. comb.** from *Eupelmus silvarum* Girault, 1923b: 6, and *Reikosiella silvarum sensu* Bouček, 1988: 558. Holotype ♀ (QMBA, examined). Australia.

Merostenus (*Merostenus*) *speculum* Gibson **n. sp.** Burundi.

Merostenus (*Merostenus*) *tricolor* (Girault) **n. comb.** from *Anastatus tricolor* Girault, 1915: 22–23, and *Eupelmus tricolor sensu* Girault, 1924: 1 [combination by inference through Girault's listing of specific epithet under *Eupelmus atriflagellum* Girault], and *Reikosiella* (*Hirticauda*) *tricolor sensu* Gibson *et al.*, 2012: 55. Australia.

Merostenus (*Merostenus*) *tripotinorum* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *tripotinorum* Fusu, 2013: 28–30. South Korea.

Merostenus (*Merostenus*) *vanharteni* (Fusu) **n. comb.** from *Reikosiella* (*Hirticauda*) *vanharteni* Fusu, 2013: 30–32. United Arab Emirates.

***Merostenus* (*Reikosiella* Yoshimoto, 1969)**

Merostenus (*Reikosiella*) *biguttus* (Girault) **n. comb.** from *Eupelmus 2-guttus* Girault, 1917: 256 [specific epithet given as *biguttus* in index on p. 494], and *R.* (*Reikosiella*) *bigutta sensu* Gibson, 2011: 79. USA.

Merostenus (*Reikosiella*) *charitopoides* (Girault) **n. comb.** from *Eupelmus charitopoides* Girault, 1916: 244–245, and *R.* (*Reikosiella*) *charitopoides sensu* Gibson, 2011: 80. USA.

Merostenus (*Reikosiella*) *cupreicollis* (Ashmead) **n. comb.** from *Eupelmus cupreicollis* Ashmead, 1900: 260. Holotype ♀ (BMNH, examined). St Vincent & Grenadines.

Merostenus (*Reikosiella*) *marylandicus* (Girault) **n. comb.** from *Eupelmus marylandicus* Girault, 1916: 242–243, and *R.* (*Reikosiella*) *marylandica sensu* Gibson, 1995: 267. USA.

Merostenus (*Reikosiella*) *melinus* (Yoshimoto) **n. comb.** from *Reikosiella melina* Yoshimoto, 1969: 629, and *R.* (*Reikosiella*) *melina sensu* Gibson, 1995: 265. Argentina, Brazil, Hawaii.

Merostenus (*Reikosiella*) *pallidipes* (Ashmead) **n. comb.** from *Eupelmus pallidipes* Ashmead, 1900: 260. Syntype ♀♀ (USNM, examined). St Vincent & Grenadines.

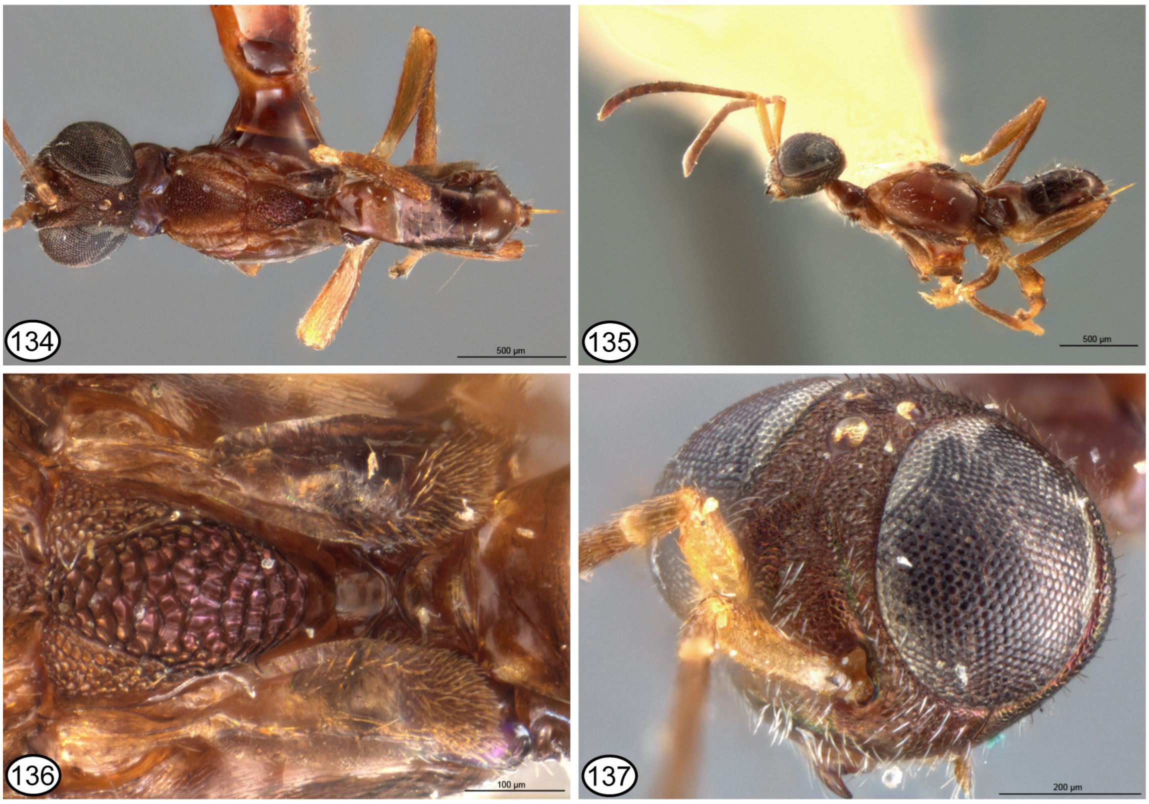
Species excluded from *Merostenus*

Anastatus ferrugineus (Yoshimoto & Ishii) n. comb.

Figs 134–137

Merostenus ferrugineus Yoshimoto & Ishii, 1965: 163. Holotype ♀ (BPBM; type no. 3582).

Type material. This species was established based on the holotype and 11 paratypes in BPBM and USNM. The holotype is labelled "Upi Trail | 5-5-36 Guam / G.H. Swezey | Collector / ex ferns / *Eupelminus* | sp. | det Gahan / [red paper rectangle] / *Merostenus* | *ferrugineus* | Yoshimoto & | Ishii | Det. Yoshimoto / HOLOTYPE ♀ | *Merostenus* | *ferrugineus* | Yoshimoto & Ishii". It is point-mounted, uncontorted, and entire except the left pro- and metatarsi are missing; the right hind leg is also detached with the coxa glued to the point and the remainder of the leg separated from the coxa and glued to the point by the body (Figs 134, 135). The specimen was not labelled originally as the holotype and the last label was added by me. I also labelled the examined BPBM paratypes as such.



FIGURES 134–137. *Anastatus ferrugineus* (Yoshimoto & Ishii), holotype ♀: **134**, dorsal habitus; **135**, lateral habitus; **136**, scutellar-axillar complex to propodeum plus wings; **137**, head, frontolateral.

Remarks. As is evident from figures 134–137, this is a brachypterous species of *Anastatus*. The dorsal and lateral habitus line illustrations given by Yoshimoto & Ishii (1965, fig. 28) are accurate for structure, but insufficient for sculpture and wing setal pattern, of which the latter was not described originally. Of the 11 paratypes, I examined what remained of eight (BPBM). The type series may consist of two species. The holotype and the paratype with the same data, and the female from Pt. Ritidian collected 16 April 1936, have the frontovertex reticulate, as described originally, quite similar in sculpture to the scrobal depression (Fig. 137). However, three examined of five stated paratypes from Guam, and the female from Mt. Santa Rosa, have the frontovertex finely coriaceous between the scrobal depression and posterior ocelli, to partly smooth near the ocelli such that minute setiferous punctures are clearly visible; the vertex posteriorly is also only shallowly meshlike reticulate. Only one middle leg of the other Pt. Ritidian female now remains glued to the point and the female from Yona lacks its head. Except for the conspicuously different frontovertex sculpture patterns, all examined females are quite similar in structure, sculpture and setation except that the ones with a coriaceous frontovertex also appear to have a paler, more whitish clava. The original description described the pronotum as nearly as long as the thorax, which is in error. The description also states the mesoscutum, axillae and scutellum are minutely reticulate, but the mesoscutum and axillae are similarly reticulate as the frontovertex of the holotype except for slightly larger reticulations, whereas the scutella of all the females have much larger, more alveolate- to crenulate-reticulate sculpture (Fig. 136). Also, the scape is more yellowish (Figs 135, 137) than the described reddish-brown. The fore wings (Fig. 136) lack a hyaline cross-band or spots but have about the apical third densely setose with orangish setae, the medial third mostly more sparely setose with similarly orangish setae but bare anteriorly behind the base of the marginal vein and apical half of the submarginal vein, and about the basal third bare.

***Arachnophaga* (*Parasolindenia*) *robusta* (Brues) n. comb.**

Eupelminus robustus Brues, 1907: 50–51. Holotype ♀ (MCPM).
Eupelmella robusta; Hedqvist, 1970: 435.

Type material. This species was established based on a single female collected in Algoa Bay, Cape Colony, South Africa. The holotype is in the collection of the Milwaukee Public Museum, Wisconsin, USA (MCPM) (Noonan 1984).

Remarks. I did not borrow the holotype for this study, but I had studied it for Gibson (1995) and confirm it as a female of *Arachnophaga* (*Parasolindenia* Brues).

***Arachnophaga* (*Parasolindenia*) *tarsata* (Waterston) n. comb.**

Figs 138, 139

Eupelminus tarsatus Waterston, 1916a: 389–392. Holotype ♀ (BMNH; type no. 5.968).
Eupelminus tarsatus; Waterston, 1916b: 123–126. Subsequent description.
Eupelmella tarsata; Hedqvist, 1970: 435.

Type material. This species was based on a single female. The holotype is labelled "Type [circular, red-bordered label] / NYASALAND | LAKE NYASA, | MONKEY BAY, | Pupa taken | 21:V:1915 | Emerged 30:V:15 | DR. W.A. LAMBORN ["112" written along one end of label] / Parasitic on | *Glossina* | *morsitans* | Westw. / J. WATERSTON DET. | *Eupelminus* | *tarsatus*, Wtst. | ♀ / B. M. TYPE | HYM. | 5.968 / NHMUK010353718". It is card-mounted and partly covered by a thin film of glue (Figs 138, 139), is contorted, and is entire except the right antenna beyond fl5, left set of wings, apical three tarsomeres of the left front leg, left middle leg, right hind leg tarsus, and Gt2 and Gt3 are missing; the pronotum is also displaced from the propleura (Fig. 138).

Remarks. Waterston (1961a, fig. 8) provided a dorsal habitus line illustration of the holotype and Waterston (1961b) additional figures of the wings (fig. 1) and dorsal mesosoma of the female (fig. 2, left) as well as the dorsal mesosoma (fig. 2, right) and fore wing (fig. 3) of the male when he newly described the male and provided additional notes on the female. Although the species of *A*. (*Parasolindenia*) are unrevised, one differential feature of females appears to be gastral setal pattern. Unfortunately, Gt2 and Gt3 are now missing from the holotype (Fig. 138). The original description states that "anteriorly the pubescence is sparser, but dense posteriorly (from the fourth segment)" (Waterston 1961a: 392).

FIGURES 138, 139. *Arachnophaga* (*Parasolindenia*) *tarsata* (Waterston), holotype ♀: **138**, dorsal habitus; **139**, scutellar-axillar complex to propodeum plus right fore wing.

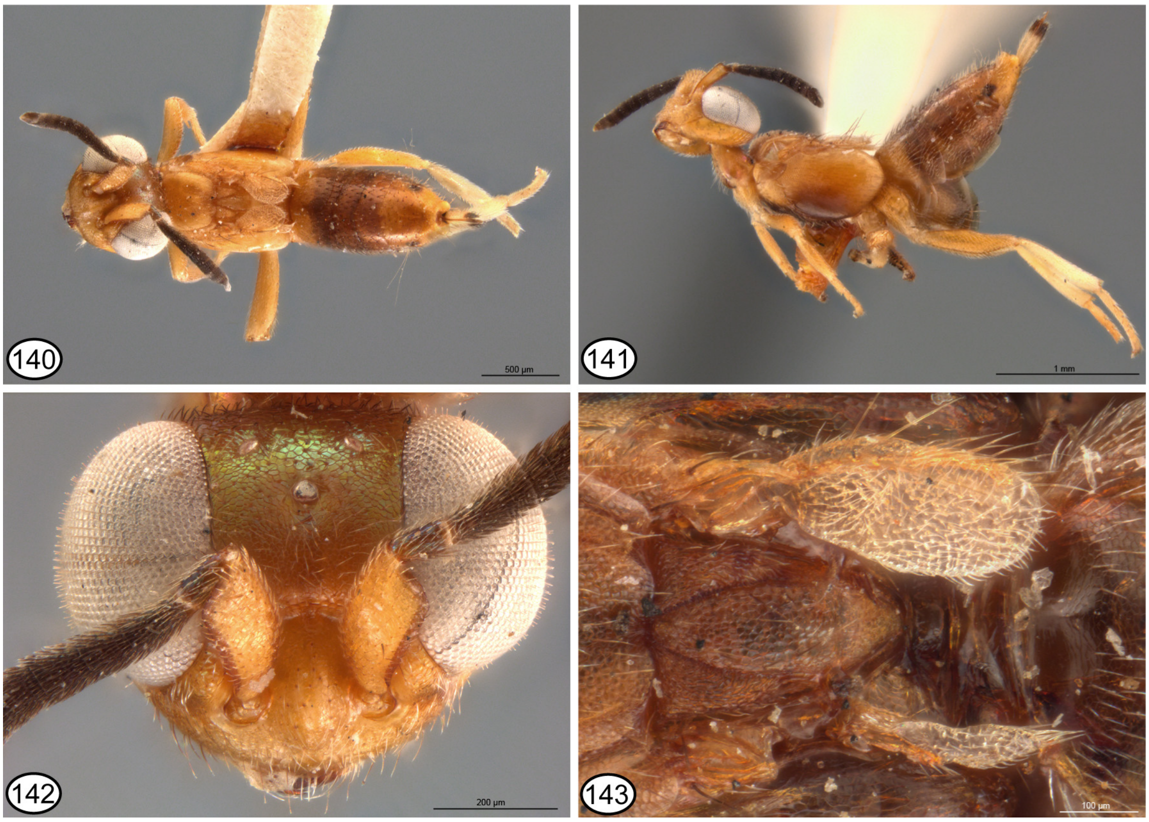
***Eupelmus* (*Eupelmus*) *guamensis* (Yoshimoto & Ishii) n. comb.**
Figs 140–143

Merostenus guamensis Yoshimoto & Ishii, 1965: 159–161. Holotype ♀ (USNM; type no. 67528).

Type material. This species was based on three females, the holotype in USNM and two paratypes in BPBM. The holotype is labelled "Guam I., Marianas | 30 March 1948 / Pacific Sci. Board | Ent. Survey of | Micronesia | H.S. Dybus leg / HOLOTYPE *Merostenus guamensis* Yoshimoto & Ishii [red label, partly printed and partly handwritten]". It is point-mounted, uncontorted, and entire (Figs 140, 141).

Remarks. Although the generic assignment of *E. guamensis* is obvious, its subgeneric classification is less certain. Gibson (1995) differentiated *E.* (*Eupelmus*) from *E.* (*Macroneura*) by females of the latter subgenus displaying apomorphic structures of the pronotum, metanotum and propodeum. Female *E.* (*Macroneura*) have a distinct, transverse pronotal ridge or crest. Furthermore, the metanotum is comparatively large and flat, though more or less concave posterior to the scutellum, and the propodeal plical region has at most a flat, inconspicuous V-shaped plical region. Pronotal structure of *E. guamensis* is characteristic of *E.* (*Eupelmus*) females, lacking both a transverse pronotal ridge or crest and a transverse line of long dark setae on the more convex, anterior part of the collar, though there are long dark setae within the posteriorly concave portion. The fore wings largely conceal the metanotum and propodeum in the holotype (Fig. 140) and the Piti paratype is contorted so that the structures are not visible. However, the Barrigada paratype has a metanotal-propodeal structure (Fig. 143) that is at least superficially similar to that characteristic of *E.* (*Macroneura*) females. Though the metanotum is transverse, obviously wider posteriorly than long laterally, posteriorly there is a transverse-rectangular horizontal region below the level of the propodeum, and anteriorly the metanotum is right-angle bent upwards medially behind the scutellum. Thus the metanotum can be construed as being "concave" behind the scutellum. The propodeal plical region is also strongly transverse with an almost vertical, broad, slender depression behind and above what appears to be a medially differentiated part of the posterior, horizontal part of the metanotum. I suspect the metanotal-propodeal similarities with *E.* (*Macroneura*) females are convergent and the immediate ancestor of *E. guamensis* was some macropterous species of *E.* (*Eupelmus*).

The dorsal and lateral habitus line illustrations given by Yoshimoto & Ishii (1965, fig. 26) are accurate for structure, but insufficient for sculpture and wing setal pattern. The spatulate, hyaline fore wings (Figs 140, 143) are entirely setose with white setae except the costal cell is bare dorsally, the submarginal vein has conspicuously long setae (the longest subequal in length to about 1.2× as long as width of the wing), and there are shorter though still long setae along the leading margin of the wing from about the apex of the costal cell. The frontovertex (Fig. 142) is finely meshlike coriaceous whereas the mesoscutum and scutellar-axillar complex are similarly meshlike reticulate, and the gaster, although quite densely setose with comparatively long, dark setae, is only finely meshlike coriaceous. Mesotibial apical pegs are lacking.



FIGURES 140–143. *E.* (*Eupelmus*) *guamensis* (Yoshimoto & Ishii) ♀. *140–142*, holotype: **140**, dorsal habitus; **141**, lateral habitus; **142**, head, frontal. **143**, Barrigada paratype, scutellar-axillar complex to propodeum plus wings.

***Eupelmus* (*Eupelmus*) *palauensis* (Yoshimoto & Ishii) n. comb.**

Figs 144, 145

Merostenus palauensis Yoshimoto & Ishii, 1965: 161–163. Holotype ♀ (USNM; type no. 67529).

Type material. This species was described based on two females, the holotype in the USNM and a paratype in the BPBM. The holotype is labelled "KOROR I., Palau | Islds.; limestone | ridge S. of inlet | 21 Jan.1948 / Pacific Sci. Board | Ent. Survey of | Micronesia | H.S. Dybus leg / HOLOTYPE *Merostenus palauensis* Yoshimoto & Ishii [red label, partly printed and partly handwritten]". The holotype is point-mounted, entire, and although uncontorted the pronotal collar is not visible because it is covered by the posterior of the head and the right-angled fore wings partly conceal the scutellum and metanotum (Fig. 144).

Remarks. Both the holotype (Fig. 144) and the extensively damaged paratype have the pronotal collar concealed by the head. However, the holotype appears to have a metanotal-propodeal structure similar to that of *E. guamensis* and, as such, *E. palauensis* is provisionally classified in *E.* (*Eupelmus*). Also like *E. guamensis* is that the mesotibia lacks apical pegs. However, females of the two species differ in many other respects, including *E. palauensis* having a reticulate frontovertex and interantennal prominence (Fig. 145) and, atypical for the genus, a flattened head. The frontovertex and interantennal prominence are in a similar flat plane compared to an abruptly angled, comparatively short lower face, and with sinuately produced lower parascrobal regions lateral to each torulus such that head structure is reminiscent of typical *Arachnophaga* Ashmead or some *Lecaniobius* Ashmead females, particularly those with the lower face paler than the frontovertex and interantennal prominence. The original description and dorsal and lateral habitus line illustrations given by Yoshimoto & Ishii (1965, fig. 27) are insufficient for the fore wings. The habitus figures illustrate the fore wings as spatulate and extending only to the base of the gaster, and they are described simply as ribbon-like. In fact, the brownish-infuscate fore wings are right-angle bent at the level of the posterior margin of the scutellum (Fig. 144), with the basal region consisting of the bare basal cell and dorsally bare costal cell, and the right-angle bent disc composed of a wider basal portion whose posterior margin tapers, sinuately, over about the apical half into a very slender region consisting mostly of a vein along the leading margin, without evident stigmal and postmarginal veins; the disc is uniformly setose with dark setae and the vein along the leading margin terminates in 2 or 3 closely set longer setae.

FIGURES 144, 145. *E.* (*Eupelmus*) *palauensis* (Yoshimoto & Ishii) ♀: **144**, lateral habitus (holotype); **145**, head, frontal (paratype).

***Eupelmus* (*Eupelmus*) *subapterus* (Ashmead) n. comb.**

Figs 146, 147

Eupelminus subapterus Ashmead, 1901: 315. Holotype ♀ (BMNH; type no. 5.970).

Type material. This species was based on a single female. The holotype is labelled "Type [circular, red-bordered label] / Waianae Mts. | Oahu, 3000 ft. | Perkins, 4.1892 | beaten from trees / Sandwich [Hawaiian] Is., | 1912—215. / B.M. TYPE | HYM. | 5.970 / *Urocryptus subapterus* Ashm. ♀ Type / NHMUK010353717". It is minutien-mounted through the mesoscutum to a card rectangle, is uncontorted, but lacks the right middle leg beyond the femur and the gaster (Fig. 146); further, the left hind leg including the coxa is detached from the body and glued to the card, with the tarsomeres beyond the basitarsus missing.

FIGURES 146, 147. *E.* (*Eupelmus*) *subapterus* (Ashmead), holotype ♀: **146**, dorsolateral habitus (gaster missing); **147**, head, frontal.

Remarks. This species is more confidently assigned to *E.* (*Eupelmus*) than are *E. guamensis* and *E. palauensis* because not only does the pronotum lack a pronotal ridge but the dorsellum is convex over the scutellar apex and the propodeal plical region is comparatively long and has a distinct V-like depression similar to typical macropterous females of *E.* (*Eupelmus*). Unlike the other two species it also has mesotibial apical pegs. The original description is very brief and in contrast to this both the scape and pedicel of the holotype are yellow (Fig. 147). Other diagnostic features include head not unusually modified, with frontovertex meshlike coriaceous (Fig. 147); pro- and mesothorax dorsally quite shiny and finely meshlike coriaceous; mesoscutum broad and very shallowly concave posterior to slightly upcurved anterior margin and between low-angulate lateral lobes; fore wings right-angle bent at level of base of gaster (Fig. 146) and tapered apically to angulate apex. The wings are glued over one another, but apparently the fore wings are uniformly setose beyond about the level of the parastigma and the venation extends to the apex along the leading margin beyond the costal cell. The original description states that the wings are fuscous with pale margins, but this may be an artefact of the wings being glued together; quite possibly they are hyaline or with only a slight yellowish tinge. The middle leg peg pattern is typical of *E.* (*Eupelmus*), consisting of 6 dark mesotibial apical pegs and dark mesotarsal pegs with those on the basitarsus in two rows.

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