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Table of contents

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Abstract

The neotropical weevil genus *Embates* Chevrolat is revised. New synonyms of *Embates* are *Drepanambates* Jekel, *Batames* Casey, *Macrambates* Casey and *Cholinambates* Casey. Information is provided about the morphology of the immature stages, life history, sexual dimorphism and morphological variability. A total of 69 species is recognized in Middle America, 38 of which are newly described here: *E. aequiperabilis*, *E. aliquantulus*, *E. bicoctura*, *E. burgeri*, *E. callifer*, *E. chelys*, *E.*

clandestinus, *E. consimilis*, *E. cordiger*, *E. crinipes*, *E. discissus*, *E. discordabilis*, *E. euchasma*, *E. euscheme*, *E. flavoplagiatus*, *E. galbinus*, *E. gilvopictus*, *E. gracilis*, *E. intermedius*, *E. kunicus*, *E. maculifer*, *E. marchionis*, *E. mendax*, *E. oculifer*, *E. paludicola*, *E. paucilimbatus*, *E. pauhans*, *E. peperomiae*, *E. politus*, *E. pseudobumbraticus*, *E. pullus*, *E. rutilus*, *E. sagittifolicus*, *E. scambus*, *E. subulirostris*, *E. terrabanicus*, *E. todillofasciatus* and *E. uniformis*. Six new subspecies are described: *E. polymorphus altrimsecus*, *E. polymorphus dotensis*, *E. polymorphus fortunensis*, *E. polymorphus tabulensis*, *E. polymorphus zeledonensis* and *E. leucopleura discolor*. New combinations are *E. belti* (Champion), *E. leucopleura* (Champion) and *E. flavolimbatus* (Voss) [all from *Drepanambates*]. New synonyms are *E. belti* [= *E. triangularis* (Champion)], *E. fasciolatus* (Chevrolat) [= *E. sexpunctatus* (Champion)] and *E. solani* (Champion) [= *E. divisus* (Casey)]. *Embates rugosus* (Hustache) is distinguished from *E. solani* and resurrected as a valid species. New records for Middle America are *E. flavolimbatus* (Voss), *E. justini* (Chevrolat) and *E. rugosus*. Descriptions, line drawings of habitus and male genitalia, geographic distributions, plant associations and keys for identification are provided.

Key words: Revision, Coleoptera, weevils, Piperaceae, Neotropics

Introduction

This taxonomic revision forms part of an ongoing study of weevils associated with neotropical Piperaceae (Prena 2001, 2003a). The investigation commenced originally as a contribution to the Costa Rican National Inventory of Biodiversity carried out by the Instituto Nacional de Biodiversidad (INBio). The scope was extended later to cover the relevant taxa of all Middle America, because the regional restriction stood in obvious conflict with the natural distribution of the species and their tendency to form poorly differentiated morphological complexes over broad spatial scales. Although substantial material was available in the initial phase of the study, numerous species turned out to be inadequately represented in the collections. This dearth was overcome by additional field surveys, in particular in collaboration with the ALAS (Arthropods of La Selva) project. Results of previous and simultaneous botanical investigations (Burger 1971, Marquis 1991, National Inventory, Plant Manual Project) were crucial on this occasion.

In a previous paper (Prena 2003a), I distinguished *Embates* Chevrolat (type species *E. caecus* Chevrolat) from *Ambates* Schönherr (type species *A. pictus* Gyllenhal) based on morphological and genital character states and resurrected *Ambates* as a valid genus. The latter comprises 32 described species, while *Embates* is much more diverse and includes more than 150 species throughout the neotropical region (unpublished personal data). A synopsis of the currently known 69 Middle American species of *Embates* is presented here and concludes the Costa Rican National Inventory of the Ambatini. *Embates simulans* (Chevrolat), described from “Amérique méridionale” and listed in O’Brien & Wibmer (1982), occurs in French Guiana and is not treated here.

Material and Methods

The study covers the area from southern Mexico to Panama (Fig. 238, 239). However, not all regions were surveyed equally well. The greatest proportion of the material came from Costa Rica followed by Panama, whereas few collections were available from Belize and Nicaragua. None of the baridine genera associated with Piperaceae are known to occur in El Salvador and in the Pacific districts of Honduras, where the dry season is more pronounced than in the other parts of the study area. A few species recorded from northern South America may occur in Panama and are included in the keys for identification, where they are designated by square brackets.

Systematic collections concentrating on Piperaceae so far were made only by Robert Marquis at La Selva (206 specimens) and myself in Costa Rica, western Panama, Honduras and Nicaragua (ca. 970 specimens). The remaining material is the result of general collecting by approximately 200 persons. Robert Marquis, Henry Stockwell, George Champion, Charles W. and Lois O'Brien (often assisted by Benn Marshall), Anne and Henry Howden, Elias Rojas, Henry Hespenheide and Lars Huggert were particularly successful collectors. Approximately 2450 specimens were examined from the study area, and approximately 900 from regions in South America.

The following codens are used to refer to the collections in the text: BMNH, The Natural History Museum (British Museum), London (M. Barclay, C. Lyal); CASC, California Academy of Sciences, Los Angeles; CHAH, Henry Hespenheide personal collection, Los Angeles; CMNC, Canadian Museum of Nature, Ottawa (R. Anderson, F. Génier); CNCI, Canadian National Collection of Insects, Ottawa (D. Bright); CWOB, Charles W. O'Brien personal collection, Green Valley, Arizona; DEIC, Deutsches Entomologisches Institut, Müncheberg (L. Zerche, L. Behne); FAUP, Universidad de Panamá, Facultad de Agricultura (H. Barrios); FOEC, Frode Ødegaard personal collection, Trondheim; GBFM, Museo de Invertebrados G.B. Fairchild, Panama (D. Quintero); HAHC, Henry & Anne Howden personal collection, Ottawa (now partially in CMNC); HPSC, Henry P. Stockwell personal collection, Panama; INBC, Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica (A. Solís); JPPC, Jens Prena personal collection, Rostock; MLUH, Martin-Luther-Universität Halle-Wittenberg (K. Schneider); MNHP, Museum National d'Histoire Naturelle, Paris (H. Perrin); MUCR, Universidad de Costa Rica, San José (P. Hanson); MZLU, Zoological Museum Lund (R. Danielsson, via CMNC); NHMW, Naturhistorisches Museum Wien (H. Schönmann); NHRS, Naturhistoriska Riksmuseet Stockholm (P. Lindskog); NMNH, National Museum of Natural History, Washington (J. Pakaluk, S. Lingafelter); RDCC, Ronald D. Cave personal collection, Ft. Pierce, Florida; SEAN, Museo Entomologico León, Nicaragua (J.-M. Maes); SNSD, Staatliche Naturhistorische Sammlungen Dresden (R. Krause); TAMU, Texas Agricultural and Mechanical University, College Station (E. Riley); ZIUH, Zoologisches Institut der Universität Hamburg (R. Abraham); and ZMHB, Museum für Naturkunde der Humbold-Universität, Berlin (J. Schulze, M. Uhlig).

All specimens of *Embates* treated in Champion (1907) and curated at the BMNH bear a printed label "B.C.A. Col. IV.5./ Ambates/ [epithet]/ [author]" in addition to Champion's handwritten text. These are not mentioned in this paper when labels of types are cited.

The methods used for measurements, dissections and illustrations follow Prena (2003a). Measurements were made as follows: total length, from anterior margin of eye to elytral apex in dorsal view; pronotal length, longest dorsal extension in lateral view; elytral length, longest dorsal extension, i.e. between humeri and elytral tip along suture; rostrum, from apex (without mandibles) to anterior margin of eye in lateral view; apical portion of rostrum, from apex (without mandibles) to point of antennal insertion in lateral view. This data is summarized in the text as range (min–max), mean (m) and number of measurements (n). Habitus drawings of each plate of figures were scaled to uniform standard length (anterior margin of pronotum to elytral apex) for better comparison of proportions. Drawings of male genitalia were scaled relative to habitus drawings by factors 2.5 (lateral aspect) and 4.0 (apex, dorsal aspect).

Geographical data were plotted by means of the program PanMap (Bremen University and AWI Bremerhaven). Shore lines were provided by the British Oceanographic Data Center and elevations by the EROS data center of the United States Geological Survey. When not provided by the collector, coordinates of the collecting sites were obtained from Grayum (2004) or the database of the US National Geospatial-Intelligence Agency. Vegetation zones mentioned in the text were adopted from Holdridge (1967)

Embates Chevrolat

Embates Chevrolat 1833: 18. Type species *Embates caecus* Chevrolat 1833, by subsequent designation under erroneous assumption of monotypy (O'Brien & Wibmer 1982). Schönherr 1843: 150, 153 (treated as synonym of *Ambates* Schönherr); Champion 1907 (treated as nomen nudum); Hustache 1938 (treated as nomen nudum); O'Brien & Wibmer 1982 (treated as misspelling of *Ambates* Chevrolat 1835, spelling suppressed); Wibmer & O'Brien 1986 (treated as misspelling of *Ambates* Chevrolat 1835, spelling suppressed); Alonso-Zarazaga & Lyal 1999 (original spelling re-established); Prena 2003a (genus distinguished from *Ambates* Schönherr).

Ambates; Chevrolat 1835 [Appendix with list of species treated in Chevrolat 1833–35]. Not available (deviation from original spelling neither mentioned or explained; see text below)

Ambates; Schönherr 1836: 278 (partim). Type species *Ambates pictus* Gyllenhal 1836, by original designation. Schönherr 1833 (nomen nudum), 1843; Chevrolat 1877, 1879; Gyllenhal 1836; Dejean 1837; Boheman 1843; Erichson 1847; Kirsch 1869, 1874; Pascoe 1880; Jekel 1883; Faust 1892; Champion 1907; Casey 1922; Günther 1936; Hustache 1938, 1939, 1950; Marshall 1946; Voss 1953, 1954; Kuschel 1955, 1983; Blackwelder 1957; Janczyk 1970; O'Brien & Wibmer 1982 (to subjective synonym of *Embates* Chevrolat 1833 and homonym of *Ambates* Chevrolat 1835; original spelling rejected); Wibmer & O'Brien 1986 (cat.); Marquis 1991; Alonso-Zarazaga & Lyal 1999 (synonymized with *Embates* Chevrolat); Prena 2003a (*Ambates* Schönherr distinguished from *Embates* Chevrolat and resurrected).

Drepanambates Jekel 1883 [1882]: 85. Type species *Peridinetus schoenherri* Chevrolat 1882, by subsequent designation (Prena 2003a). Champion 1907 (synonymized with *Ambates* Schönherr 1836); Hustache 1938 (genus resurrected); Casey 1922; Blackwelder 1947; Voss 1953, 1954;

Weidner 1976 (cat.); O'Brien & Wibmer 1982; Wibmer & O'Brien 1986; Alonso-Zarazaga & Lyal 1999. New synonymy.

Batames Casey 1922: 4. Type species *Ambates solani* Champion 1907, by original designation. Hustache 1938 (to subgenus of *Ambates* Schönherr 1836); Voss 1954 (synonymized with *Drepanambates* Jekel); Prena 2003a. New synonymy.

Macrambates Casey 1922: 5. Type species *Ambates melanops* Champion 1907, by original designation. Hustache 1938 (to subgenus of *Ambates* Schönherr 1836); Prena 2003a. New synonymy.

Cholinambates Casey 1922: 6. Type species *Ambates cretifer* Pascoe 1880, by original designation. Hustache 1938 (to subgenus of *Ambates* Schönherr 1836); Prena 2003a. New synonymy.

Ambates (*Ambatodes*) Voss 1954: 302. Type species *Ambates sagax* Voss 1954, by original designation. Wibmer & O'Brien 1986; Prena 2003a (synonymized with *Embates* Chevrolat).

The history of confusions concerning the names *Ambates* and *Embates*, their authorships, type species and interpretations is presented in Prena (2003a) and briefly summarized here. Chevrolat had adopted Schönherr's manuscript name *Ambates* (by explicitly citing its origin) in his own paper, spelled it *Embates* in the text (Chevrolat 1833) and *Ambates* in the appendix of the same work (Chevrolat 1835). This nomenclatural act was generally disregarded in the literature because of supposed absence of a valid description. Subsequent studies in this group of weevils referred to *Ambates* Schönherr (1836). O'Brien & Wibmer (1982) recognized the formal validity of *Embates* Chevrolat, but considered the original spelling a lapsus calami because of its deviation from that used in the appendix. Alonso-Zarazaga & Lyal (1999) considered the suppression of the spelling *Embates* as technically inconsistent with the International Code of Zoological Nomenclature and regarded *Embates* Chevrolat a subjective senior synonym of *Ambates* Schönherr. The latter was distinguished from *Embates* and resurrected in Prena (2003a).

Drepanambates Jekel (1883) is another genus that needs to be addressed in this context, because its cursory description referred to species of *Embates*, *Ambates* and species representing another, still undescribed genus, but failed to designate a type species. In order to preserve Jekel's original intention and to suppress subsequent erroneous interpretations by Champion (1907) and Hustache (1938), I designated *Peridinetus schoenherri* Chevrolat as type species (Prena 2003a). In this sense, *Drepanambates* includes certain species that occur in the coastal rain forests between the Brazilian provinces Bahia and Santa Catarina, i.e. *Ambates callinotus* Chevrolat, *A. ephippius* Chevrolat, *Drepanambates amabilis* Jekel and *Peridinetus schoenherri*. They exhibit a falciform rostrum with a ventrally produced lateral edge, basally parallel pronotal sides and often slightly convergent elytral sides. However, these character states can be found in various combinations in species of *Embates* Chevrolat. My study of approximately 150 species revealed no character state that could be used to divide *Embates* into phylogenetically meaningful subunits. This is not surprising, because the great species diversity of *Embates* and the close relationship to several genera with the same larval host favor a concept of young phylogenetic age. For this reason, I include *Drepanambates* Jekel in *Embates* Chevrolat as a new junior synonym.

The various genera near *Ambates* erected by Casey (1922) were based generally on a cursory study of the figures in Champion (1907) and need no further comment. *Anambates* Casey is a synonym of *Pardisomus* Pascoe (Prena 2003b) and *Pycnambates* Casey is a synonym of *Ambates* Schönherr (Prena 2003a). *Batames* Casey, *Macrambates* Casey and *Cholinambates* Casey are new synonyms of *Embates* Chevrolat.

Recognition. From other genera in the subfamily Baridinae, species of *Embates* can be distinguished by the following combination of character states: total length 3.0–11.2 mm, integument smooth to finely punctate, covered by small scales often forming color-pattern, eyes flat, separated by width of rostrum at base, frontal fovea minute or absent, rostrum curved, 0.8–1.7 × longer than pronotum, basoventral edge of rostrum more or less produced, dorsal margin of antennal scrobe reaching ventral edge of rostrum, antennal club oblong, more than 2 × longer than wide, elytra subparallel to slightly convergent in basal half, at most only elytral interstriae 7–9 costate, some species with callosities in interstriae 3–5, pygidium covered by elytral apices, procoxae contiguous, prosternal channel very shallow or absent, its lateral edge vestigial, femora expanded dorsoventrally, all equally dentate ventrally, aedeagal flagellum longer than body of aedeagus, male sternite 8 entire and 3-lobed.

Redescription of adult. Habitus: moderately elongate to stout, total length 3.0–11.2 mm. Color: integument various shades of rufous to black; basic vestiture of small scales moderately dense, scales sometimes extremely minute, majority of species with pronotal and elytral color-pattern of white, yellow, reddish, brown or black scales (see last section further below about color-pattern), scales variously dense on venter and legs. Head: spherical, retractile to eyes, finely punctate, frons as wide as rostrum at base, frontal fovea minute or absent, transition between head and rostrum slightly depressed, shape of rostrum varied from slender and subcylindrical to moderately thick and falciform, curved, often slightly more so over antennal insertion than at base, basolateral margin roundly edged to distinctly produced, length of rostrum 0.80–1.71 × pronotal length, length of ante-antennal portion of rostrum 0.22–0.58 × total rostral length, antennal insertion in males slightly more distally than in females, dorsal margin of antennal scrobe reaching ventral margin of rostrum; funicle of 7 segments, length of segment 2 subequal to or longer than segment 1, club oblong ovate to subcylindrical, 2–4 × longer than wide. Pronotum: length 0.74–1.07 × maximum width, widest in basal half, sides subparallel to round in basal half, gradually to abruptly narrowed distally and shortly tubulate in front (ventrally more than dorsally), dorsomedian frontal lobe weakly produced, often slightly notched medially; basal margin weakly rounded, disk punctate, interspaces smooth, finely rugose or granulate. Scutellum: well-defined, separate, size moderate, shapes various and variable. Wings: well-developed. Elytra: length 1.23–2.27 × width of humeri, width 1.12–1.65 × maximum pronotal width, sides subparallel to slightly convergent in basal half, gradually to roundly narrowed in distal half, apices conjointly to separately rounded, covering pygidium, preapical callus present, variously developed, striae fine to partially obliterated, strial punctures subtle,

interstriae flat, at most 7–9 finely costate, 3–5 with callosities in some species. Legs: moderately stout to slender (corresponding to body shape), procoxae contiguous, femora moderately expanded dorsoventrally in distal half, pro-, meso- and metafemora equally 1-dentate in distal third (Fig. 5), tibiae variously curved, ventrodistally with cluster of hairs, tibial mucro developed, premucro absent, tarsal segment 3 2-lobed, wider than segments 1 and 2, segment 5 (pretarsus) rounded ventrodistally (pointed in *E. scambus*), tarsus with 2 claws, claws arcuate and separate at base or straight and approximate, secondary (inner) tarsal tooth absent. Venter (Fig. 2): procoxae contiguous, prosternal channel obsolete, feeble lateral ridge usually present; surface between prosternum and mesosternum discontinuous, distal abdominal ventrites short, with sutures flexible. Male (Fig. 6–10): sternite 8 entire, membranous, 3-lobed, lateral lobes pigmented and with fringe of setae; sternite 9 slightly curved, lateral arms asymmetric, short; tegmen with parameres approximate at base or (rarely) fused; body of aedeagus approximately 1.5–4.0 × longer than wide, symmetric, curved in lateral view; apodemes slender, 1.8–4.0 × longer than aedeagus, curved outward in basal third, connection to body of aedeagus sclerotized; internal sac moderately to very long, aedeagal flagellum present, longer than body of aedeagus, sclerotized, base thicker and curved toward front, transition between base and flagellum continuous or abrupt, ejaculatory duct attached to re-curved base of flagellum outside internal sac, inner face of base of flagellum with appendage which is attached to internal sac and holds flagellum in place. Female (Fig. 11–12): sternite 8 symmetric, with 2 basally diverging, sclerotized arms; length of vagina, bursa and spermathecal duct subequal, duct inserted ventrally at midlength of bursa, hemisternite pigmented, stylus with 4–8 distal setae, spermatheca sickle-shaped, sclerotized. Stridulatory organ: present in both sexes, ventral subapical portion of both elytra with stridulatory files, tergite 8 and basal portion of tergite 7 with decumbent scales in coarse, irregular punctures functioning as plectra (Fig. 3).

Description of larva. (Fig. 13–21). Habitus: size of specimen figured 9.0 mm × 1.9 mm, body slightly curved, cylindrical; abdominal segment 8 modified to strongly sclerotized pseudo-caudal segment, segments 9 and 10 moved ventrad; cuticle finely asperate, creamy white; setae light brown, translucent, rather short, inconspicuous. Head: nearly orthognath, amber-brown, without internal epicranial ridge; slightly longer than wide, 1.0 mm wide; both pairs of stemmata distinct (pigments may fade when slide-mounted); accessory appendage of basal antennal segment conical, 2 × longer than wide; frontal suture distinct, endocarinal line half as long as frons; 5 pairs of frontal setae, setae 1–3 very short, setae 4–5 long and subequal; 5 pairs of dorsal epicranial setae, seta 4 very short, seta 2 moderately long, others long and subequal; 2 pairs of long lateral epicranial setae; 4 pairs of very short posterior epicranial setae; 2 pairs of ventral epicranial setae, seta 1 short, seta 2 of moderate length; clypeus 2 × wider than long, subconical, 2 clypeal setae of unequal length; anterior margin of labrum broadly rounded, 3 pairs labral setae, seta 1 longest; labral rods bar-shaped, subparallel, hypopharyngal lining with 2 pairs of broad anteromedian setae, 3 pairs of anterolateral setae 2 × longer than anteromedian

setae, 2 pairs of short median setae and 1 pair of sensilli in between; mandible with two apical teeth of equal size, two setae arranged longitudinally; maxilla with palpus 2-segmented, basal segment with short seta and two sensilli, mala with 3 moderately long and 2 short ventral setae and row of 7 dorsal setae of equal size; labium with palpus 2-segmented, premental sclerite 3-dentate, basal process of moderate length, postlabial seta 2 much longer than setae 1 and 3. Thorax: pronotum partially pigmented, with 3 pairs of long and 7 pairs of short setae, dorsopleural seta absent, 2 ventropleural setae of unequal length, spiracle 2-cameral, air-tubes annulated, arranged vertically, 2 long and 4–5 short pedal setae, 1 pair of short mediosternal setae; meso- and metathorax with 2 pairs of prodorsal and 3 pairs of postdorsal setae, 2 short spiracular (alar) setae, 1 long dorsopleural seta, 1 long ventropleural seta, 2 long and 4 short pedal setae, 1 pair of short mediosternal setae. Abdomen: spiracles 2-cameral, air-tubes annulated, small and horizontal at segments 1-7, vertical on sclerotized caudal plate formed by segment 8, connected with tracheal system and with respiratory function; segments 1–7 with 1 pair of short prodorsal and 5 pairs of postdorsal setae of unequal length, 2 short spiracular (alar) setae, 2 dorsopleural setae of unequal length, 2 ventropleural setae of unequal length, 1 laterosternal seta of moderate length, 2 pairs of short sternal setae; segment 8 sclerotized, surface rugose with elongate dorsolateral and short lateral pits, caudal plate with spherical depressions, 4 pairs of long peripheral setae along edge of disk, 2 pairs of ventrolateral setae of unequal size, 1 pair of ventral setae of moderate size, 0–3 pairs of minute dorsal setae, 1 minute seta on disk below spiracle; segment 9 ventral, with 1 pair of setae of moderate size; anus ventral, with 4 indistinct lobes. Material: 3 putative *E. cretifer* from stem of *P. cenocladum* (here illustrated), 2 putative *E. cordiger* from stem of *P. cenocladum*, 5 putative *E. polymorphus altrimsecus* from stem of *P. obliquum*, 1 putative *E. pseudobumbraticus* from stem of *P. pseudobumbratum*; 3 putative *E. discordabilis* from stem of *P. sanctifelicis*, 1 putative *E. paludicola* or *E. crinipes* from stem of *P. imperiale*; total 15 specimens, 6 of them dissected and slide-mounted; identifications are based on associations with adult specimens and their food-plants. Additional larvae with membranous abdominal segment 8 were collected from stems of *P. augustum* and *P. euryphyllum*. Those may belong to *E. sinuatus* and *E. euchasma*, respectively, or to unidentified species of *Peridinetus*.

Description of pupa (Fig. 22–23). Habitus: length of specimen figured 5.2 mm, pronotum 1.8 mm wide; setae long, on distinct tubercles. Head: retracted, visible in dorsal view, 3 pairs of long setae; rostrum reaching middle of metasternum, 3 pairs of long and 1 pair of moderate setae, mandibular setae absent. Thorax: pronotum slightly transverse, widest in basal one-third, sides rounded toward front, apex slightly tubulate, basal margin very slightly produced, disk convex, 8 pairs of long and 1 pair of short setae; mesonotum with scutellum distinct, 2 pairs of setae; metanotum sulcate medially, 2 pairs of setae; pterotheca 1 with surface of intervals smooth, pterotheca 2 slightly longer than pterotheca 1; femora 1-dentate, each with 2 setae, tarsal setae absent. Abdomen: segments 1–7 with 2 pairs

of postdorsal, 1 pair of lateral and 1 pair of minute ventral (not seen on segments 1–4) setae, segment 8 with 1 pair of long postdorsal and 2 pairs of lateral setae, segment 9 with 1 pair of long lateral setae and dorsolateral pseudocerci. Material: 1 mature specimen of *E. chelys* collected from stem of *P. cenocladum*; identification based on faint color-pattern and association with plant.

Life history. Species of *Embates* occur primarily in disturbed habitats of evergreen forests, generally not above 2600 m. A few species dwell in open habitats, among them *E. solani*, *E. marginatus* and *E. vestitus*. Adult specimens are diurnal and can be found on their host plants throughout the year. Plants in Piperaceae could be confirmed with reasonable confidence as diet for the majority of the Costa Rican species (Marquis 1991, this study) and as larval host for approximately six species. Species of *Piper* (including *Pothomorphe*) represent the principal host plants, while at least *E. flavolimbatus* and *E. peperomiae* are associated with species of *Peperomia*. Most adult species are oligophagous in particular groups of hosts, while some appear to be strictly monophagous. However, local subpopulations of oligophagous species may exhibit a clear preference for a particular species of host plant. A comprehensive concept about the phylogeny of the neotropical species of *Piper* is not available. My experience is that Burger's (1971) provisional arrangement shows much agreement with the plant-weevil associations found by Marquis (1991), and my observations. Species with palmately veined leaves (e.g. *Piper pseudo-lindeni*, *P. retalhuleuense*, *P. reticulatum*, *P. sanctum*; with the notable exception of *P. marginatum*) are visited rarely by species of *Embates*. The remaining species of *Piper* can be divided into two groups based on the mode of their distal growth. The shoot-apex and the new leaf emerge either from within the leaf-base at the flowering nodes, or from within the prophyll and free of the leaf-base at the flowering nodes (Burger 1971). Despite oligophagy, almost all species of *Embates* seem to be restricted to one or the other of the two groups, while size, shape, venation and texture of the leaf exert little influence on the plant selection. The same observation holds for species in *Ambates, Pantoteles* and *Peridinetus* (personal data). Adult weevils of these four genera often can be found feeding or resting in characteristic holes made in the leaf-blade (Fig. 24), thereby exposing their flanks and mimicking fallen flowers, bracts, seeds or excrement. Oviposition has not been observed to my knowledge. The eggs are relatively large, elongate, and produced in low numbers. Larval development takes place in the soft or slightly woody tissue of the stem, rarely in the petiole or in the root. The larva tunnels the interior of the stem without giving any external evidence of its presence except of an indistinct oviposition hole. Debris is disposed within the tunnel, where pupation takes place without a cocoon. The hatched weevil prepares an exit hole for leaving the interior of the host plant. By that time, the infested part of the host can be damaged to a degree that inhibits further terminal growth of the stem. *Embates vanus* is known to affect *Piper nigrum* (a cultivated oriental species) in Bolivia (E. Ramos, pers. comm.). No information is available about the development of the species associated with *Peperomia*.

Sexual dimorphism. Female specimens generally have a slightly longer, less sculptured rostrum with the antenna inserted slightly more basally compared to male specimens. Sexing of specimens can be done in most cases based on the degree of convexity of the basal ventrites. In a few cases, males can be recognized by the 1) more elongate antennal club (e.g. *E. discordabilis*), 2) notched and pilose ventrite 5 (e.g. *E. pseudobumbraticus*), 3) fringe of hairs on the ventral tibial edge (e.g. *E. cretifer*), or 4) enlarged protibial mucro (e.g. *E. sinuatus*). The pronotum is generally of subequal size in both sexes, while it exhibits dimorphism in various species of *Ambates* and *Pardisomus*.

Morphological variation. Apart from a few cases of non-systematic deviation probably caused by injury at immature stages, some systematically occurring variations were observed. Most noteworthy is the significant relationship between the altitude of the collecting site and the body proportion of *E. sinuatus*. Figure 25 illustrates this relationship for specimens collected along a 30 km long transect on the northern slope of Volcan Barva in Costa Rica. Specimens from high elevations are more slender than specimens collected at lower elevations (Fig. 80, 81). The same relationship holds for specimens from other regions (Fig. 25). On the Pacific side of the Costa Rican Cordillera de Talamanca, with more seasonal weather conditions, this effect can be accompanied by a modification of the color-pattern (see next paragraph). It is possible that the local temperature contributes to these variations, for instance by a prolonged larval development in cooler habitats. Similar observations on the possible effects of altitude on the body size were made for species of *Pantoteles* (Prena 2001) and *Ambates* (Prena 2003a). The currently non-quantified contribution of environmental and genetic variables to the prevailing heterogeneity of adult specimens, particularly in geomorphologically heterogeneous habitats, can render the identification of some species a delicate issue when insufficient material is available for comparison.

Color-pattern. The presence of small scales and their frequent arrangement forming intriguing ornamental patterns prevails in most species in and near *Embates*. Champion (1907) used the color-pattern in his key for pragmatic reasons. Nevertheless, he was aware of the close relationship of several species with seemingly unrelated vestiture. Later authors, in particular Casey (1922) and Voss (1953, 1954), implied a greater taxonomic value of the color-patterns and based new genus-group names on them. A more comprehensive study of these patterns now demonstrates their compound nature. The material available gives numerous examples, in particular in complexes of imperfectly separated species, that allow for tracing the origin of the various components of the color-pattern. It is concluded here, that the primitive condition was a dark elytral macula encircled by a thin line of light-colored scales. This condition is preserved in several species near *E. caeca* and *E. sagax*. These species also provide evidence that the light-colored circumambient line disintegrated into single elements (Fig. 26, 28). It was the modification of these elements, in particular the ante-macular and the post-macular elements, that led to the immense diversity of color-patterns in the Ambatini (Fig. 29–33). Modifications included

width, length, shape, bearing and position of each element, as well as color, size and density of the scales. In some cases, the basic vestiture dwindled to microscopic scales, so that the ante- and post-macular elements dominate the color-pattern, such as in *E. cretifer* (Fig. 177) and *E. paludicola* (Fig. 200). In other cases, the ante- and post-macular elements merged with the basic vestiture, such as in *E. burgeri* (Fig. 93) and *E. polymorphus zeledonensis* (Fig. 183d). Slight modifications of a single component may have a tremendous effect in complex color-patterns, for example in *E. sinuatus* and *E. belti*. It can be said generally, that the dark elytral macula (if present) tends to vary rather little, while the adjacent light-colored elements exhibit much more variability, often clinal and occasionally extreme in extent. The nature of this variation is thought to be a combination of environmental factors, such as the weather conditions during larval development and metamorphosis, and various degrees of genetic heterogeneity in the population.

Key to the four groupings of *Embates* species

1 Species occurring in northern Middle America: Mexico, Guatemala, Belize and in cloud forest habitats of Honduras, Nicaragua and possibly El Salvador (Fig. 238) .... Key I
- Species occurring in southern Middle America and Mosquito-Coast: Panama, Costa Rica and lowlands of Honduras and Nicaragua (Fig. 239) 2
2 Dark subspherical to rhomboid elytral macula more or less distinct, ante-macular and post-macular markings of light-colored scales present or not (Fig. 26–28) .....Key II
- Dark elytral macula greatly reduced or modified, elytral color-pattern dominated by markings of light-colored scales derived from modified circumambient line of previously existing dark macula, or vestiture diffuse (Fig. 29–33) 3
3 Elytral color-pattern with dorsolateral markings (so-called vittae) of light-colored scales ..... Key III
- Elytral color-pattern with transverse (so-called fasciae) or round markings of light-colored scales, or markings confined to elytral declivity, or vestiture diffuse..... Key IV

Key I. Species with northern distribution

1 Elytron with color-pattern formed by yellow scales (occasionally reduced in *E. fasciolatus*), dark elytral macula absent, basic vestiture of microscopic, inconspicuous scales 2
- Elytron with dark macula that may be lined by light-colored scales, basic vestiture of larger scales 5
2 Tarsal claws straight in profile and subconnate at base 3
- Tarsal claws arcuate in profile and separate at base 4
3 Elytron with compound dorso-lateral vitta between base and preapical callus (Fig.

152a), or with basal vitta and isolated fascia near preapical callus (Fig. 152b); Mexico and Guatemala east of Isthmus of Tehuantepec ..... 43. *E. heilipoides*

- Elytron with isolated fascia near preapical callus (Fig. 157), basal vitta absent; Mexico west of Isthmus of Tehuantepec ..... 44. *E. obliquus*

4 Elytron with oblique, narrow fascia near middle (may be fragmented or reduced entirely, Fig. 158) ..... 45. *E. fasciolatus*

- Elytron with subapical oval macula of light-colored scales (Fig. 159)..... ..... 46. *E. flavoplagiatus*

5 (1) Tarsal claws straight in profile and subconnate at base 6

- Tarsal claws arcuate in profile and separate at base 7

6 Pronotum with dorsolateral vitta obsolete; Mexico, Atlantic side ..... 12. *E. caecus*

- Pronotum with sharply defined dorsolateral and lateral vittae which continue to dorsal margins of mesepimeron and mesepisternum; Mexico, Pacific side .... 13. *E. bicoctura*

7 Venter with light-colored scales; color-pattern as Fig. 34 ..... 1. *E. ornativentris*

- At most only prosternum with patch of light-colored scales 8

8 Rostrum moderately thick, subcylindrical; prosternum without light-colored vestiture before coxae; elytral macula round to elongate-pyriform, usually lined with light-colored scales; flagellum shorter than aedeagus including apodemes [the differences between the following three species are subtle, and single specimens are difficult to identify without representative material] 9

- Rostrum thick, falciform, basolateral margin notably produced (Fig. 45); prosternum with spot of yellow or whitish scales before coxae; base of elytral macula lined with light-colored scales or not; flagellum distinctly longer than aedeagus 11

9 Elytron with preapical callus produced and interstria 5 subcostate; elytral macula usually narrow and oblique, of variable size, lined with light-colored scales (Fig. 67); male with antenna inserted in apical 32 % of rostrum on average..... 14. *E. ocellatus*

- Elytron with preapical callus moderate, not costate; when elytral macula oblique then with post-macular fascia of light-colored scales wide and ill-defined; male with antenna inserted in apical 36 % of rostrum on average 10

10 Elytral macula round, post-macular fascia narrow if present ..... 15. *E. biguttatus*

- Elytral macula elongate-pyriform, post-macular fascia ill-defined 18. *E. nigronotatus*

11 (8) Integument piceous, post-macular elytral fascia absent (Fig. 40) ..... 3. *E. solani*

- Integument brown, post-macular elytral fascia of light-colored scales generally developed 12

12 Size ca. 4.0 mm; pronotum with sides subparallel, abruptly constricted in front; elytral macula narrow (Fig. 43); known only from vicinity of Guatemala City .... 6. *E. exclamationis*

- Size 4.5–6 mm; pronotum widest near base; elytral macula wide (Fig. 41) 13

13 Elytral macula and post-macular fascia wider, dorsolateral pronotal vitta usually distinct (Fig. 41); size 4.5–5.1 mm ..... 4. *E. bisignatus*

- Elytral macula and post-macular fascia narrower, dorsolateral pronotal vitta reduced; size 6.0 mm 5. ..... *E. duplicatus*

Key II. Southern species with dark elytral macula

14 Metatibia with ventral margin with dense fringe of long, waved yellow hairs in male (Fig. 179); tarsal claws flat, approximate at base; elytral macula ovate (Fig. 175); total length 6.7–8.8 mm; Pacific side of Cordillera de Talamanca in Costa Rica and Panama ..... 54. *E. melanops*

- Metatibia without fringe of long, waved hairs in male; tarsal claws separate or approximate at base; total length <7.6 mm 15

15 Elytral interstria 3 with elongate callosities near base and middle, preapical callus very prominent and costate; dark elytral macula variable in size and shape, but usually present at median callosity (Fig. 128, 132); Costa Rica ..... 35. *E. callifer*

- Elytral interstria 3 without elongate callosities, at most slightly tumid near base 16

16 Venter with white scales; elytral vestiture brownish, disk with black, variously modified macula (Fig. 133, 136, 139, 143); associated with species of *Piper* with shoot-apex emerging from within leaf-base at flowering nodes (host unknown for *E. pullus*) 17

- Ventral vestiture of darker color, or elytral vestiture different; associated with species of *Piper* with shoot-apex emerging from within prophyll at flowering nodes 23

17 Elytral interstria 3 tumid near base; tarsal claws flat, approximate at base 18

- Elytral interstria 3 not tumid near base; tarsal claws curved, separate at base 20

18 Black elytral macula raised, at least post-macular region depressed; preapical callus finely costate 19

- Black elytral macula ill-defined (Fig. 133), not raised; ante- and post-macular fasciae of light-colored scales narrow, not depressed; preapical callus not costate; Costa Rica, Península de Osa ..... 36. *E. pullus*

19 Pronotum gibbous; interstriae 2–5 depressed before elytral macula, color-pattern as Fig. 139; Pacific side of Cordillera de Talamanca in Costa Rica .... 38. *E. sagittifolicus*

- Pronotum not gibbous; only interstria 3 depressed before elytral macula, color-pattern as Fig. 136; Atlantic side of Costa Rica and western Panama ..... 37. *E. chelys*

20 (17) Atlantic side of Costa Rica and Panama 21

- Pacific side of Costa Rica 22

21 Elytral macula small, elongate, usually separated by sutural interval (Fig. 143); claws subconnate at base; body on average larger (5.1–6.5 mm) and more slender ..... 39. *E. euchasma*

- Elytral macula usually fused across suture, subcordate (Fig. 146); claws separate at base; body on average smaller (4.0–5.8 mm) and stouter ..... 40. *E. cordiger*

22 Size 3.7–4.7 mm; vestiture cupreous; rostrum rufous-castaneous, moderately thick ....

..... 42. *E. oculifer*

- Size 6.1–6.5 mm; vestiture light yellow; rostrum black, slender (Fig. 150) .... 41. *E. subulirostris*

23 (16) Elytron with thin dorsolateral vitta of light-colored scales (often vestigial in basal half) 24

- Dorsolateral elytral vitta either broad or absent 26

24 Body very stout (Fig. 51); rostrum thick and falciform, ventral margin strongly produced; elytral macula distinct 25

- Body less stout (Fig. 60); rostrum subcylindrical; elytral macula indistinct .... 11. *E. griseolus* s. l.

25 Ante-macular fascia absent, dorsolateral elytral vitta continuous (Fig. 48); Panama and Colombia ..... 8. *E. vestitus*

- Elytral macula with circumambient line except along suture, humeral streak isolated (Fig. 50); Colombia ..... [*E. claveri* (Hustache 1950)]

26 (23) Rostrum thick and falciform, ventral margin strongly produced (Fig. 45) 27

- Rostrum moderate to slender, ventral margin of rostrum less produced (Fig. 82)..... 28

27 Total length 5.4–7.6 mm; elytral macula elongate (Fig. 37); South America, Panama and Pacific side of Cordillera de Talamanca in Costa Rica ..... 2. *E. rugosus*

- Total length 3.8–6.5 mm; elytral macula shorter (Fig. 40); Mexico to central Panama . ..... 3. *E. solani*

28 Male with strongly developed protibial mucro (Fig. 83) 29

- Both sexes with protibial mucro of normal size 30

29 Size 4.9–7.2 mm; ante- and post-macular fasciae variable in shape, with vestiture much denser than basic elytral vestiture (Fig. 80, 81); associated with *Piper augustum*, *P. arieianum* and *P. phytolaccaefolium*; Honduras to Panama..... 19. *E. sinuatus*

- Size 4.4–5.7 mm; ante- and post-macular fasciae blend into dense basic vestiture of beige scales (Fig. 86); associated with *Piper nudifolium*; Pacific side of Cordillera de Talamanca in Costa Rica and western Panama ..... 20. *E. tetrastigma*

30 Ante- and post-macular elements fused to broad, compound dorsolateral vitta, color-pattern complex (Fig. 218, 221) 31

- Compound dorsolateral vitta absent, elytron with round to rhomboid dark macula .. 32

31 Body more slender (Fig. 218); tibiae wider than antennal club .....65. *E. belti*

- Body stouter (Fig. 221); tibiae as wide as antennal club .....66. *E. politus*

32 Elytral macula round, post-macular element blends with beige basic vestiture; aedeagus with body more elongate and apodemes shorter (Fig. 78) 33

- Elytral macula of various shapes (usually rhomboid), post-macular fascia of yellow scales well-defined but of variable shape (Fig. 102), aedeagus with body short and apodemes long (as Fig. 108) ..... 25. *E. pictipennis*

33 Flank of preapical callus with vestiture beige, body of aedeagus short, apex membranous medially; Atlantic side of Costa Rica ..... 16. *E. paucilimbatus*

- Flank of preapical callus with vestiture dark, body of aedeagus elongate, apex sclerotized medially; Pacific side of Costa Rica ..... 17. *E. mendax*

Key III. Southern species with light-colored elytral vitta

34 Elytral apices rounded separately thereby forming sutural cleft (Fig. 164) 35
- Elytral apices rounded conjointly without notable cleft in between 38
35 Tarsal claws arcuate and separate at base; antenna inserted slightly before middle of rostrum; base of rostrum weakly costate dorsally; aedeagal flagellum longer than apodemes (Fig. 167) 36
- Tarsal claws flat and approximate at base; antenna inserted distinctly before middle of rostrum; base of rostrum costate dorsally and dorsolaterally; aedeagal flagellum shorter than apodemes (Fig. 173) 37
36 Integument coffee-brown, vitta beige, color-pattern as Fig. 164, elytral disk with dark, light-absorbing vestiture; Colombia to Costa Rica .....50. *E. justini*
- Integument rufous-castaneous, vitta yellow, color-pattern as Fig. 168, elytral disk without dark, light-absorbing vestiture .....51. *E. rhombifer*
37 Elytron with well-defined, medially discontinued dorsolateral vitta; central Panama (Fig. 170) ..... 52. *E. consimilis*
- Elytron with ill-defined continuous dorsolateral vitta between humerus and preapical callus (Fig. 174); Atlantic side of Cordillera Central in Costa Rica and western Panama ..... 53. *E. rutilus*
38 (34) Tarsal claws flat, approximate at base; ventral margin of metatibia with distinct fringe of long hairs (Fig. 179); several local populations with different color-patterns (Fig. 182); total length >7 mm .....56. *E. polymorphus*
- Tarsal claws curved, separate at base; metatibial fringe of short hairs or absent; total length <7 mm 39
39 Protibial mucro enlarged in male (Fig. 83); color-pattern as Fig. 80 and Fig. 81 .... 19. *E. sinuatus*
- Protibial mucro not notably enlarged in male 40
40 Body very stout (Fig. 51); apex of aedeagus membranous medially; Pacific side of Cordillera de Talamanca southward to Colombia 41
- Body more elongate (e.g. Fig. 60, 214); apex of aedeagus sclerotized medially..... 43
41 Elytron with subtriangular black macula in distal half 42
- Black elytral macula absent (Fig. 51)..... 9. *E. terrabanicus*
42 Ante-macular fascia absent, dorsolateral elytral vitta continuous (Fig. 48); Panama and Colombia .....8. *E. vestitus*
- Ante-macular fascia present, humeral vitta isolated (Fig. 50); Colombia .... [*E. claveri* (Hustache 1950)]
43 (40) Dorsolateral vitta not continuous between humerus and elytral apex (interrupted

or constricted in middle, or terminating at preapical callus), its compound nature more or less obvious 44

- Dorsolateral vitta perfectly continuous (faded basally in *E. griseolus* s. l.) and parallel-sided between humerus and elytral apex, not betraying its compound nature 53

44 Total length >7.5 mm, body subcylindrical, pronotum nearly as wide as elytra; basic vestiture microscopic 45

- Elytral sides convergent in or before middle, or size smaller, or basic vestiture of larger scales 46

45 Elytral vitta continuous from humerus to preapical callus (Fig. 160) 47. *E. albovittatus*

- Elytral vitta discontinued near middle (Fig. 161) ..... 48. *E. discissus*

46 Elytral sides convergent before middle 47

- Elytra subparallel in basal half 48

47 Legs and antenna rufous, vestiture ochreous, color-pattern as Fig. 217; central Panama ..... 64. *E. intermedius*

- Legs and antenna piceous to black, vestiture yellow, color-pattern as Fig. 214; Atlantic Costa Rica ..... 63. *E. leucopleura discolor*

48 Elytral disk with dark macula, ante-macular vestiture often with light-colored scales along elytral striae (Fig. 218, 221) 49

- Elytral disk without dark macula or, very rarely, macula indistinct 50

49 Body more slender (Fig. 218), tibiae wider than antennal club ..... 65. *E. belti*

- Body stouter (Fig. 221); tibiae slender, as wide as antennal club ..... 66. *E. politus*

50 Metasternum and metepisternum with large, imbricate yellow scales; body of aedeagus elongate (Fig. 195); male with ventral margin of metatibia with fringe of short hairs (Fig. 193); associated with *Piper arboreum* ..... 58. *E. latevittatus*

- Flank without large, imbricate yellow scales; body of aedeagus short (Fig. 108); male with metatibia with few hairs; associated with species of *Piper hispidum* complex; (*E. pictipennis*-group) 51

51 Metatibia parallel-sided, ventral margin straight (Fig. 107); elytral vitta distinct but variable (Fig. 105); aedeagal flagellum longer than aedeagus including apodemes; widely dispersed on Atlantic side in Costa Rica and western Panama ..... 26. *E. discordabilis*

- Ventral margin of metatibia more or less produced in distal third (Fig. 103); elytral vitta reduced or, if present, elytra with indistinct dark macula (Fig. 102c); aedeagal flagellum not longer than apodemes 52

52 Elytral vitta more or less reduced (Fig. 109), basic vestiture with yellow scales along elytral striae; size 4.8–6.6 mm; montane habitats in Cordilleras Central and Talamanca ..... 27. *E. euscheme*

- Elytral vitta distinct, vestiture very similar to that of *E. discordabilis* but with ill-defined dark elytral macula (Fig. 102c); size 4.2–5.0 mm; Pacific lowlands in Costa Rica, Manuel Antonio National Park ..... 25. *E. pictipennis* s. l.

53 (43) Dorsolateral elytral vitta fused distally with additional vitta in interstriae 9–10 (Fig. 232); antenna inserted apicad of middle of rostrum; associated with *Peperomia* sp.; Costa Rica to Peru ..... 69. *E. flavolimbatus*

- Elytron without additional vitta in interstriae 9–10 (except in two South American populations of *E. circumcinctus* complex); antenna inserted at midlength of rostrum; associated with *Piper* sp. 54

54 Body very slender (Fig. 204); elytral interstria 9 not costate 55

- Body less slender; elytral interstria 9 costate or not..... 56

55 (54; 80) Ventrolateral vestiture continuous; funicular segment 2 slightly longer than 1 (Fig. 206); Panama and Pacific side of Cordillera de Talamanca .....61. *E. aliquantulus*

- Ventrolateral vestiture discontinued on ventrite 1; funicular segment 2 distinctly longer than 1 (Fig. 209); montane habitats in Cordillera Central .62. *E. aequiperabilis*

56 Body stout (Fig. 60); dorsolateral elytral vitta of light-colored scales often fading in basal half; body of aedeagus curved evenly in basal third ..... 11. *E. griseolus* s. l.

- Body less stout (e.g. Fig. 191, 235); body of aedeagus curved abruptly in basal third (not known in *E. clandestinus*) 57

57 Male with ventral margin of metatibia with fringe of hairs 58

- Both sexes with ventral margin of metatibia distally with short cluster of hairs 59

58 Size 4.4–5.8 mm; associated with *Piper arboreum*; Panama and Costa Rica .... 58. *E. latevittatus*

- Size 6.0–7.5 mm; associated with *Piper imperiale*; Costa Rica, Atlantic side .... 57. *E. crinipes*

59 Size 4.5–5.3 mm, sides of pronotum constricted basally (Fig. 229)..... 60

- Size 5.2–8.8 mm, sides of pronotum subparallel at base in small-sized specimens (Fig. 210) 61

60 Elytral vitta directed toward elytral apex (Fig. 229); Costa Rica, Atlantic side .... 68. *E. clandestinus*

- Elytral vitta curved inward immediately before preapical callus, with or without additional apical vitta in elytral intervals 9–10; South America, one subpopulation of uncertain status in Panama (Cerro Campana) and Colombia .... [*E. circumcinctus* (Casey 1922) s. l.]

61 Elytral vitta light-yellow, as wide as two interstriae combined (Fig. 235); basal appendage of aedeagal flagellum short (Fig. 237); western Panama, La Fortuna Reserve ..... 70. *E. gilvopictus*

- Elytral vitta yellow, little wider than one interstria or obliterated; basal appendage of aedeagal flagellum elongate (Fig. 216) 62

62 Integument nearly black, basic vestiture with inconspicuous microscopic and few yellow scales; Panama and Pacific side of Cordillera de Talamanca .... 63. *E. leucopleura* s. str.

- Integument brown, basic vestiture of medium-sized cupreous and yellow scales, dor-

solateral vitta variously reduced; Costa Rica, Atlantic side of Cordillera Central .... 63. *E. leucopleura discolor*

Key IV. Southern species with light-colored transverse or round markings, with markings restricted to elytral declivity, or with diffuse vestiture

63 Male with ventral margin of metatibia with fringe of long hairs (Fig. 179, 184); tarsal claws flat, approximate at base; total length 7.6–11.2 mm 64
- Male with tibial fringe indistinct or absent; tarsal claws arcuate, separate at base (indistinctly approximate in small-sized *E. thoracicus*) 66
64 Pro- and metatibiae with fringe of dark hairs; color-pattern of yellow scales similar to that of *E. cretifer* (Fig. 177); Colombia .....[*E. salamandra* (Kirsch 1869)]
- Metatibia with fringe of light-colored hairs; Nicaragua to Panama 65
65 Metatibial fringe with waved hairs (Fig. 179); basic vestiture of microscopic scales, elytron and prothorax with yellow (lowlands) or whitish (around 1000 m altitude) markings (Fig. 177); apex of aedeagus membranous medially; Atlantic side of Cordillera Central ..... 55. *E. cretifer*
- Metatibial fringe with straight hairs (Fig. 184); prothorax with dorsolateral vitta of yellow scales or vestiture uniform; apex of aedeagus sclerotized; Cordilleras Central and Talamanca at 900–2500 m; several allopatric subpopulations with different color-patterns (Fig. 183) .....56. *E. polymorphus*
66 (63) Pretarsus (claw-bearing segment) pointed ventrodistally (Fig. 57), tibiae curved; integument rufous, elytra with ill-defined V-shaped fasciae or (rarely) vestiture diffuse (Fig. 55); size 7.5–10.5 mm .....10. *E. scambus*
- Pretarsus not pointed ventrodistally, tibiae curved or not, vestiture different 67
67 Pronotal disk with vestiture dense, dorsolateral pronotal vitta of light-colored scales not discernable 68
- Pronotal disk with vestiture sparse, dorsolateral pronotal vitta of light-colored scales present (may be obsolete in *E. leucopleura discolor*) 70
68 Elytra with fascia of black scales (Fig. 93); Atlantic lowlands in Costa Rica ....22. *E. burgeri*
- Elytra without fascia of black scales; premontane forests in Costa Rica and Panama 69
69 Elytral flank black below subapical callus (Fig. 124) .....33. *E. galbinus*
- Vestiture uniform, dorsum with yellow and venter with whitish scales 28. *E. uniformis*
70 (67) Elytral color-pattern of light-colored scales confined to apical portion (additional median spot present in *E. apicalis*); size 3.0–5.7 mm 71
- Elytral color-pattern not confined to apical portion, or vestiture diffuse..... 73
71 Elytral interstriae 7 and 9 subcostate, striae fine; elytron often with indistinct median spot of light-colored scales (Fig. 100); size 3.0–4.8 mm .....24. *E. apicalis*
- At most elytral interstria 9 subcostate, striae moderate; median elytral spot absent; size

4.1–5.7 mm 72

72 Preapical callus moderate, dorsolateral pronotal vitta narrow; Colombia, French Guiana, Venezuela, Trinidad & Tobago ..... [*E. tergosignatus* (Chevrolat 1877)]

- Preapical callus notably produced, dorsolateral pronotal vitta wide (Fig. 97); Nicaragua to Colombia ..... 23. *E. thoracicus*

73 (70) Basic vestiture reduced to microscopic scales, elytron with large oval markings of imbricate yellow to whitish scales (Fig. 162, 200), integument black, elytral striae very subtle; size 7.8–9.8 mm 74

- Basic vestiture of larger scales, color-pattern different if integument black, striae distinct; size usually smaller 75

74 Mesepimeron with yellow to orange scales, prothorax glabrous, color-pattern as Fig. 200 ..... 60. *E. paludicola*

- Mesepimeron glabrous, flank of prothorax with yellow scales, color-pattern as Fig. 162 ..... 49. *E. championi*

75 Male with enlarged protibial mucro (Fig. 83); black elytral maculae present on disk and below preapical callus, ante- and post-macular fasciae blend with dense basic vestiture of beige scales (Fig. 86); Pacific side of Cordillera de Talamanca .... 20. *E. tetrastigma*

- Both sexes with protibial mucro of normal size 76

76 Elytral color-pattern diffuse or with small subspherical markings of light-colored scales, elytral fascia absent 77

- Elytral color-pattern with oblique or transverse fascia of light-colored scales 81

77 Body stout, elytra convergent in basal half; dorsal color-pattern with 8–10 spots of yellow scales (Fig. 225) ..... 67. *E. maculifer*

- Body more elongate, elytra parallel-sided in basal half; at most with few indistinct spots of light-colored scales 78

78 Elytral interstria 3 with elongate callosities near base and middle, preapical callus very prominent and costate ..... 35. *E. callifer*

- Elytral interstria 3 without elongate callosities, preapical callus not very prominent 79

79 Male genitalia of *E. leucopleura*-type: apodemes short compared to body of aedeagus (Fig. 213); body size 5.5–7.3 mm: specimens of *E. leucopleura discolor* with reduced dorsolateral vitta (Fig. 214) 55

- Male genitalia of *E. pictipennis*-type: apodemes long compared to body of aedeagus (Fig. 108); body <5.5 mm at low elevations and more slender at high elevations 80

80 Size 3.3–4.3 mm, rostrum (Fig. 113) and legs relatively stout; elytral interstria 5 with median and subapical spots (Fig. 112), basic vestiture without yellow scales along interstriae; Costa Rica, Atlantic lowlands ..... 29. *E. gracilis*

- Size 4.8–6.6 mm, rostrum (Fig. 110) and legs slender; dorsolateral vitta in interstriae 4 and 5 short, or disintegrated to spots (Fig. 109), or entirely absent, basic vestiture with yellow scales along interstriae; montane habitats in Cordilleras Central and Talamanca

..... 27. *E. euscheme*

81 (76) Basic vestiture of brown and ochreous scales dense, elytral disk with two light-colored V-shaped fasciae (Fig. 117); size 6.2–9.1 mm; Costa Rica, Atlantic side .... 31. *E. marchionis*

- Basic vestiture sparse, at most with subapical elytral fascia; on average of smaller size 82

82 Elytral fascia transverse, narrow (Fig. 114) ..... 30. *E. todillofasciatus*

- Elytral fascia oblique, wide 83

83 Elytral fascia spanning across elytron; pronotal vitta obsolete 84

- Elytral fascia confined to some interstriae and separated by elytral suture; pronotal vitta present or not 85

84 Fascia curved toward elytral apex (Fig. 44), prothorax subconical; associated with *Piper hispidum* complex; Costa Rica, premontane habitats ..... 7. *E. pauhans*

- Fascia not reaching elytral apex (Fig. 89), sides of prothorax round; associated with *Piper pseudobumbratum*; Costa Rica, Atlantic lowland ..... 21. *E. pseudobumbraticus*

85 Sides of prothorax round, greatest width shortly behind middle (Fig. 105); associated with *Piper* sp.; habitats below 1200 m 86

- Greatest width of prothorax near base, habitus slender (Fig. 121); associated with *Peperomia* sp.; montane habitats above 1600 m ..... 32. *E. peperomiae*

86 Rostrum relatively stout, antennal club elongate in male (Fig. 106), apex of aedeagus sclerotized medially, aedeagal flagellum longer than aedeagus including apodemes; Costa Rica: Limón and Panama: Bocas del Toro ..... 26. *E. discordabilis*

- Rostrum slender (Fig. 197), antennal club subequal in both sexes, apex of aedeagus membranous, aedeagal flagellum shorter than apodemes; Panama: San Blás .... 59. *E. kunicus*

1. Embates ornativentris (Champion)

(Fig. 34–36, 240)

Ambates ornativentris Champion 1907: 167. Lectotype female, Mexico, here designated, labeled: "Type", "♀", "Toxpam/ Mexico/ Salle Coll." (BMNH). Paralectotypes 8 (supposedly 9 acc. Champion), here designated: Toxpam [may refer to Tuxpan in Veracruz or Toxpalam in Puebla] (BMNH 2), Cerro de Plumas (BMNH 4, NMNH), Zapote (BMNH). Hustache 1938 (cat.); Blackwelder 1947 (cat.); O'Brien & Wibmer 1982 (cat.)

Embates [*ornativentris*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 34, total length 6.2–8.0 mm (m=7.1, n=13). Color: integument piceous, antenna dark rufous; basic vestiture cupreous, scales velvety black in elytral macula between interstriae 2–4(5), both maculae combined approximately as long as wide (Fig. 34), scales ochreous in oblique post-macular fascia and spots around macula; venter

with whitish scales on prosternum, mesosternum, mesepisternum, mesepimeron and in median portion of ventrites 1–2, vestiture cupreous elsewhere. Head: frontal fovea absent, rostrum rather thick, falciform (as Fig. 45), subcostate dorsomedially and rugose laterally, basolateral margin strongly produced, length of rostrum ♂♂ 1.10–1.25 × (m=1.18, n=8), ♀♀ 1.19–1.25 × (m=1.22, n=4) pronotal length, length of ante-antennal portion ♂♂ 0.31–0.35 × (m=0.34, n=8), ♀♀ 0.36–0.38 × (m=0.37, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club ovate (♀♀) or subcylindrical (♂♂). Pronotum: length 0.78–0.84 × (m=0.81, n=13) maximum width, greatest width at or near base, sides gradually converging in basal third, anterior portion roundly narrowed and tubulate in front; disk densely punctate, intervals granulose to rugose. Elytra: length 1.41–1.54 × (m=1.48, n=13) width at humeri, width 1.38–1.47 × (m=1.38, n=13) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures moderate, interstriae flat, 9 costate, 5 and 7 subcostate at preapical callus. Legs: tibiae slightly curved, ventral margin slightly bisinuate, distally with indistinct fringe (♂♂) and cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 35), body of aedeagus relatively short, curved in lateral view, apodemes 2.9 × longer than body of aedeagus, flagellum very thin, twice as long as aedeagus including apodemes, transition to curved base gradual, basal appendage of moderate length, curved, projecting beyond base (Fig. 36).

Plant association. Not known.

Distribution. Southern Mexico and Guatemala, Atlantic side (Fig. 240).

Material examined. MEXICO. Chiapas: 11.6 mi SE Pichucalco (TAMU); 105 km SE Palenque, Bonampak road (CMNC). Oaxaca: Cerro de Plumas (BMNH 4, NMNH); Temascal (CWOB). San Luis Potosí: Taman, 10 mi SW Tamazunchale (CMNC). Veracruz: Fortín de las Flores (CWOB 2, NMNH); Misantla (JPPC, ZMHB); Tuxpan? [labeled Toxpam] (BMNH 3). Without location: (MNHP, SNSD 2). GUATEMALA. Guatemala: Zapote (BMNH). BELIZE. Cayo: 4 mi S Belmopan (CWOB). Total 24 specimens.

Discussion. The long aedeagal flagellum places *E. ornativentris* with *E. rugosus* and relatives, as suggested already by Champion (1907) and Casey (1922). It is the only species in this group with white ventral vestiture.

2. Embates rugosus (Hustache), resurrected name

(Fig. 37–39, 245)

Ambates solani var.; Champion 1907: 166

Ambates rugosus Hustache 1950: 3 [*rufulus*, lapsus; not *rufulus* Hustache 1950: 4]. Lectotype, sex not determined, Ecuador, upper of two specimens on same pin, here designated, labeled: “Equateur/ S° Domingo”, “Type”, “Ambates/ rugosus/ m.” (MNHP). Paralectotypes 6, here

designated: Ambato and Santo Domingo (MNHP 6). Kuschel 1955: 273 (synonymy with *A. solani*); Wibmer & O'Brien 1986

Embates [*rugosus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 37, total length 5.4–7.6 mm (m=6.5, n=17). Color: integument piceous, legs dark rufous in subpopulation of Cordillera de Talamanca; basic vestiture cupreous, occasionally intermixed with few white scales, scales velvety black in elytral macula between interstriae 2–5, both maculae combined longer than wide (Fig. 37), scales white to ochreous in fuzzy dorsolateral pronotal vitta and in obsolete post-macular fascia; venter with dense spot of ochreous scales in ante-coxal portion of prosternum, ventral vestiture sparse. Head: frontal fovea absent, rostrum thick, falciform (as Fig. 45), costate dorsomedially and rugose laterally, basolateral margin strongly produced, length of rostrum ♂♂ 1.27–1.43 × (m=1.35, n=10), ♀♀ 1.28–1.44 × (m=1.38, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.35–0.40 × (m=0.38, n=10), ♀♀ 0.41–0.43 × (m=0.42, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club ovate (♀♀) to subcylindrical (♂♂). Pronotum: length 0.80–0.88 × (m=0.84, n=17) maximum width, greatest width near base, sides subparallel or gradually converging in basal half, anterior portion roundly narrowed and tubulate in front; disk densely punctate, intervals granulose to rugose. Elytra: length 1.41–1.69 × (m=1.60, n=17) width at humeri, width 1.39–1.50 × (m=1.44, n=17) maximum pronotal width, sides subparallel or slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures distinct, interstriae flat, 9 costate. Legs: tibiae slightly curved, ventral margin bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle sclerotized, anterolateral portion membranous (Fig. 38), body of aedeagus relatively short, curved in lateral view, apodemes 2.8 × longer than body of aedeagus, flagellum very thin, approximately twice as long as aedeagus including apodemes, transition to curved base gradual, basal appendage slender and elongate, projecting far beyond base (Fig. 39).

Plant association. *Piper hispidum* s. l. (Prena 3), *P. augustum* (Prena 2).

Distribution. Pacific side of Ecuador northward to Pacific side of Cordillera de Talamanca in Costa Rica (Fig. 245).

Material examined. COSTA RICA. Puntarenas: Las Alturas, 1500 m (INBC 2); Las Mellizas, 1300 m (INBC 2, JPPC); Sector Altamira, 1350 m (INBC); Est. Altamira, 1900 m (JPPC). San José: Las Nubes de Santa Elena, 1200 m (INBC); Cerro Chucuyo, 12 km NE San Isidro, 1350 m (JPPC 4). PANAMA. Chiriquí: Volcán (BMNH 3); 15 km NW Volcán, 1350 m (HPSC); Santa Clara, Hartmann's finca (CMNC). Panamá: Llano-Cartí rd km 9, 350 m (HPSC). ECUADOR. Chimborazo: Balzapamba (ZMHB). Manabí: El Carmen (CWOB). Pichincha: Santo Domingo (MNHP 5); Tinalandia, 12 km E Santo Domingo, 850 m (MZLU, TAMU 2); Río Palenque, 47 km S Santo Domingo (CMNC 4,

HAHC); Maquipucuna For. Res., 50 km NW Quito (CMNC). Tungurahua: Ambato (MNHP). Total 35 specimens.

Discussion. Hustache described *E. rugosus* without reference to *E. solani*. The great similarity of the two species, together with the variable size and the wide distribution of *E. solani* appear to give reasonable justification to place them in synonymy as done by Kuschel (1955). The collections from Panama and the Pacific side of the Cordillera de Talamanca now provide new information relevant to this issue. The material includes two Middle American populations, which correspond with Champion's concept of *E. solani* and *E. solani* var. They differ in size, antennal insertion and color-pattern. *Embates solani* var. approaches morphologically *E. rugosus*, but is slightly more slender. The records available suggest, that *E. rugosus* occurs on the Pacific side of the Andes and radiates northward to Panama (one record from Llano-Cartí road), while *E. solani* var. occurs on the Pacific side of the Cordillera de Talamanca above 1200 m. *Embates solani* is widely distributed in Middle America, but has not been collected east of the Canal Zone. The meristic and zoogeographic data support a distinction of *E. solani* and *E. rugosus*, and the latter is resurrected here as a valid species. *Embates solani* var. belongs to *E. rugosus* rather than to *E. solani*. It is possible that the slender shape of this population is simply an effect of cooler temperature at high altitudes.

3. Embates solani (Champion)

(Fig. 40, 244–245)

Ambates solani Champion 1907: 166. Lectotype male, Mexico, here designated, labeled: "Type", "♂", "Teapa/ Tabasco/ Feb. H.H.S." (BMNH). Paralectotypes 46, here designated: Teapa (BMNH 5); Guatemala: San Jerónimo (BMNH), San Juan (BMNH 6), Tamahú (BMNH 4), Sinanjá (BMNH), Telemán (BMNH), Panzós (BMNH); Nicaragua: Chontales (BMNH 2); Costa Rica: Arcángeles (BMNH 4), San Carlos (BMNH); San José (BMNH); Panama: David (BMNH), Bugaba (BMNH 10, NMNH 3), Volcán (BMNH 3, NHRS, NMNH). Hustache 1938 (cat., *Batames* to subspecies); Blackwelder 1947 (cat.); Kuschel 1955 (synonymy with *A. rugosus*); O'Brien & Wibmer 1982 (cat.); Wibmer & O'Brien 1986 (cat., misidentification of *E. callinotus*); Marquis 1991 (plant association)

Batames solani (Champion). Casey 1922: 4

Batames divisus Casey 1922: 5. Holotype sex not determined, PANAMA, labeled: "Bugaba/ Panama/ Champion", "Casey/ bequest/ 1925", "Type NMNH/ 44921", "Ambates/ solani Ch", "Batames/ divisus/ Csy." (NMNH). New synonymy

Ambates divisus (Casey). Hustache 1938 (cat., *Batames* to subspecies); Blackwelder 1947 (cat.); O'Brien & Wibmer 1938 (cat.)

Embates [*solani*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 40, total length 3.8–6.5 mm (m=5.1, n=39). Color: integument piceous, antenna and legs partially rufous; basic vestiture cupreous intermixed with few white scales, scales velvety black in elytral macula between interstriae 2–5, both mac-

ulae combined approximately as long as wide (Fig. 40), scales ochreous and white in fuzzy dorsolateral pronotal vitta and in obsolete post-macular fascia; venter with spot of ochreous scales in ante-coxal portion of prosternum, ventral vestiture sparse. Head: frontal fovea absent, rostrum thick, falciform (as Fig. 45), costate dorsomedially and rugose laterally, basolateral margin strongly produced, length of rostrum ♂♂ 1.21–1.39 × (m=1.32, n=21), ♀♀ 1.25–1.40 × (m=1.35, n=17) pronotal length, length of ante-antennal portion ♂♂ 0.34–0.36 × (m=0.35, n=20), ♀♀ 0.36–0.40 × (m=0.38, n=17) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate (♀♀) to subcylindrical (♂♂). Pronotum: length 0.76–0.91 × (m=0.82, n=39) maximum width, greatest width at or near base, sides subparallel or gradually converging in basal half, anterior portion roundly narrowed and tubulate in front; disk densely punctate, intervals granulose to rugose. Elytra: length 1.43–1.65 × (m=1.53, n=39) width at humeri, width 1.38–1.59 × (m=1.47, n=39) maximum pronotal width, sides subparallel or slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures distinct, interstriae flat, 9 costate, 7 subcostate. Legs: tibiae curved, ventral margin weakly bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. rugosus*.

Plant association. Several species of *Piper* with the shoot-apex emerging from within the prophyll at flowering nodes: *Piper hispidum* s. l. (Prena 16), *P. bisasperatum* (Marquis 1, Prena 4), *P. lanceaefolium* (Prena 5), *P. reticulatum* (Marquis 1), *P. sancti-felicis* (Marquis 1), *P. epigynium* (Prena 1), *P. peltatum* (Prena 1), *P. auritum* (Marquis 1). Observations on *Conostega lanceolata* (Nevermann, label data) and Solanaceae (Biolley cited by Champion 1907) are probably accidental.

Distribution. Widely dispersed in semi-open woodland habitats from southern Mexico to central Panama (Fig. 244, 245).

Material examined. MEXICO. Chiapas: Lagos de Montebello, Laguna Pojol, 1500 m (HAHC). Tabasco: Teapa (BMNH 6, NMNH). GUATEMALA. Izabal: Cerro San Gil, 8 km N Las Escobas (HAHC). Alta Verapaz: Panzós (BMNH); San Jerónimo (BMNH); San Juan (BMNH 6); Senahú (ZIUH); Sinanjá (BMNH); Tamahú (AMNH, BMNH 4); Telemán (BMNH); Trece Aguas (BMNH, NMNH). HONDURAS. Atlántida: Tela, Lancetilla (JPPC 7, RDCC). Comayagua: Siguatepeque (NMNH). Cortés: Lago de Yojoa (NMNH 2). Gracias a Dios: Río Plátano, Las Marías (JPPC 6). Olancho: La Unión, P.N. La Muralla (JPPC). Santa Bárbara: Las Vegas (JPPC 2). Yoro: Pico Pijol (JPPC 3). NICARAGUA. Chontales: Santo Domingo, 400 m (BMNH 2). Matagalpa: Matagalpa, Fuente Pura, 1400 m (JPPC). Río San Juan: 7 km SE El Castillo, 50 m (SEAN). COSTA RICA. Alajuela: San Carlos, 800 m (BMNH, NMNH); R. B. San Ramon, Río San Lorencito, 900 m (INBC 3, JPPC 2); La Peña, 1300 m (CWOB). Cartago: Turrialba, 700 m (DEIC 2, SNSD, NMNH 4); Guayabo N.M., 1100 m (INBC, JPPC 10); Tucurrique, 770 m (NMNH); La Palma (NMNH); P.N. Tapantí, 1200 m (INBC). Guanacaste: Est. Pitilla, S

Sta. Cecilia, 700 m (INBC 13, JPPC 3); Est. Cacao, 1100 m (INBC 8, JPPC 2); Río San Lorenzo, 1050 m (INBC 5). Heredia: Puerto Viejo, La Selva, 100 m (CWOB, INBC 21, JPPC 4, NMNH 17, TAMU); Virgen del Seguro, 200 m (NMNH); Río Sarapiquí, Ceiba, 50 m (JPPC 4); Barra Colorado, 10 m (INBC 5); Cerro Tortuguero, 50 m (INBC); Chilamate, 50 m (CWOB); P.N. Braulio Carrillo, El Ceibo, 400 m (INBC 6), Cantarrana, 300 m (JPPC 3). Limón: Amubri, 70 m (INBC); Cerro Cocorí, 100 m (INBC 18, JPPC 2); Hitoy Cerere, 100 m (JPPC 2). Puntarenas: Monteverde, 1500 m (CMNC, CWOB, INBC 12, JPPC 3, ZMHB); P.N. Carara, 50 m (INBC); San Vito, 1100 m (CHAH, JPPC 5); Osa, 2.5 mi SW Rincón, 100 m (CHAH, JPPC); Osa, Rancho Quemado, 200 m (INBC); Piedras Blancas (CWOB); Quepos, P.N. M. Antonio, 50 m (JPPC 3, INBC). San José: San José, 1100 m (BMNH, NMNH 2); Zurquí de Moravia, 1400–1600 m (CWOB, JPPC 4, SNSD); Ciudad Colón, 1200 m (JPPC 3); Valle de los Arcángeles, 1300 m (BMNH 4). PANAMA. Bocas del Toro: Corriente Grande, 100 m (HPSC); Chiriqui Grande, 50 m (HPSC); Almirante (HPSC); Changuinola 15 km SSW, 300 m (JPPC 2). Canal Zone: Gatun (HPSC 2); Coco Solo Hospital (HPSC 4, TAMU). Chiriquí: Bugaba (BMNH 10, NMNH 3); David (BMNH); Volcán (BMNH, NHRS, NMNH 3); Las Lagunas, 4 km W Hato del Volcán, 1360 m (HPSC 4); N Sta. Clara (HPSC); Reserva La Fortuna, 1100 m (CMNC, HPSC 2, JPPC 2); Mina Cerrro Colorado, 1600 m (HPSC); Palo Alto, 1400–1600 m (FOEC). Coclé: La Mesa above El Valle, 850 m (HPSC 3). Colón: 5 km SE Piña, 20 m (CMNC). Veraguas: Santa Fe, 850 m (CMNC, HPSC). Total 300 specimens.

Discussion. *Embates solani* is distributed widely in open woodland habitats of Middle America and occurs on both Atlantic and Pacific sides of the Cordilleras, but has not been collected east of the Canal Zone. It is associated primarily with species of the *Piper hispidum* complex. Two other species approach *E. solani* and may occur sympatrically: The Mexican *E. bisignatus* can be distinguished from *E. solani* by less elongate elytral maculae and usually parallel-sided tibiae. The predominantly South American *E. rugosus* can be distinguished from *E. solani* by its greater size and more elongate elytral macula. *Batames divisus* Casey is merely a small specimen of *E. solani*.

4. Embates bisignatus (Chevrolat)

(Fig. 41, 244)

Ambates bisignatus Chevrolat 1877: 341. Holotype female, Mexico, labeled: "Paratypus", "Ambates/ bisignatus Chevr./ Prena det. 1996", green label at bottom of box "Mexico Corina/ D. Sallé" (NHRS). Champion 1907: 165; Hustache 1938 (cat., *Batames* to subgenus); O'Brien & Wibmer 1982 (cat.)

Batames bisignatus (Champion). Casey 1922: 4

Embates [*bisignatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 41, total length 4.5–5.3 mm (m=5.0, n=13). Color: integu-

ment piceous, legs partially rufous; basic vestiture of beige and brown scales, scales black in elytral macula between interstriae 2–5 (Fig. 41), scales yellow in thin dorsolateral pronotal vitta and in variously developed post-macular fascia; venter with spot of yellow scales in ante-coxal portion of prosternum, vestiture sparse elsewhere. Head: frontal fovea absent, rostrum thick, falciform (as Fig. 45), costate dorsomedially and rugose laterally, basolateral margin strongly produced, length of rostrum ♂♂ 1.29–1.37 × (m=1.35, n=9), ♀♀ 1.31–1.40 × (m=1.36, n=4) pronotal length, length of ante-antennal portion ♂♂ 0.31–0.35 × (m=0.33, n=9), ♀♀ 0.34–0.37 × (m=0.36, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate (♀♀) to subcylindrical (♂♂). Pronotum: length 0.74–0.83 × (m=0.80, n=13) maximum width, greatest width near base, sides gradually converging in basal half, anterior portion roundly narrowed and tubulate in front; disk densely punctate, intervals granulose to rugose. Elytra: length 1.49–1.56 × (m=1.53, n=13) width at humeri, width 1.43–1.52 × (m=1.47, n=13) maximum pronotal width, sides gradually converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures distinct, interstriae flat, 9 costate, 7 and 8 subcostate. Legs: tibiae curved and parallel-sided, distally with cluster of yellow hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. rugosus*.

Plant association. Not known.

Distribution. Atlantic side of southern Mexico (Fig. 244).

Material examined. MEXICO. Without site: (NHRS, SNSD 2). Chiapas: 3 mi S Solusuchiapa (TAMU); 7.4 km N Bochil (CWOB). Puebla: 15.5 mi S Tenampulco (RDCC 2, JPPC). Queretaro: El Lobo to Río Tarcuilin, 1100 m (CWOB). Tabasco: Teapa (BMNH, NMNH 2, ZMHB 2). Veracruz: Córdoba (BMNH, NMNH); Lake Catemaco (CNCI); Los Tuxtlas (CMNC 2, CWOB 2, JPPC); San Andrés Tuxtla (BMNH); La Palma (CNMC); Tebanca (CWOB); Orizaba (NHMW); Tuxpan? [labeled Toxpam] (BMNH); Corinto? [labeled Corina] (NHRS). Total 28 specimens.

Note. The single specimen of *E. bisignatus* in the Chevrolat Collection (NHRS) has no label attached (except a paratype label) and is pinned next to a green bottom label with handwritten text. I believe, that this is the type specimen of *Ambates bisignatus*, because Champion (1907, p.165) gave no collecting site for the type but did so for all other specimens.

Discussion. *Embates bisignatus* is a close relative of *E. solani*, from which it can be distinguished by less elongate elytral maculae and usually parallel-sided tibiae.

5. Embates duplicatus (Champion)

(Fig. 42, 244)

Ambates duplicatus Champion 1907: 165. Holotype female, Mexico, labeled: “Type”, “♀”, “Cerro de Plumas/ Mexico/ Hoege” (BMNH). Hustache 1938 (cat., *Batames* to subspecies); O’Brien

& Wibmer 1982 (cat.)
Batames duplicatus (Champion). Casey 1922: 4
Embates [*duplicatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Diagnosis. Agrees with *E. bisignatus* in all details except: total length 6.1 mm; elytral macula of black scales narrower, only anterior portion extending to interstria 5; post-macular fascia of light yellow scales restricted to interstriae 2–3 (Fig. 42).
Plant association. Not known.

Material examined. MEXICO. Oaxaca: Cerro de Plumas (BMNH); 30 km S Suchixtepec, 1300 m (CMNC). Total 2 specimens.

Discussion. This taxon is known from two nearby locations in Oaxaca, Mexico (Fig. 244). It is not clear, whether or not *E. duplicatus* represents a species distinct from *E. bisignatus*. The latter species is smaller, while its vestiture appears variable enough to justify the inclusion of *E. duplicatus*. More material is needed to resolve this issue.

6. Embates exclamationis (Champion)
(Fig. 43, 244)

Ambates exclamationis Champion 1907: 165. Lectotype female?, Guatemala, right specimen of two glued on card, here designated, labeled: "Type", "♀♂", "Zapote/ Guatemala/ C. Champion" (BMNH). Paralectotypes 5, Guatemala, here designated: Zapote (BMNH 4, NMNH). Hustache 1938 (cat., *Batames* to subspecies); O'Brien & Wibmer 1982 (cat.)
Batames exclamationis (Champion). Casey 1922: 4
Embates [*exclamationis*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 43, total length 3.9 mm (all meristic data were taken from female paratype of NMNH). Color: integument piceous, antenna and tarsi rufous; basic vestiture of cupreous scales, scales black in irregularly shaped elytral macula between interstriae 2–5 (Fig. 43), scales creamy white in thin dorsolateral pronotal vitta and in post-macular fascia between interstriae 3–4 and 8–9 (vestigial), ante-macular fascia faintly visible in outer elytral interstriae; venter with spot of creamy white scales in ante-coxal portion of prosternum, vestiture sparse elsewhere. Head: frontal fovea absent, rostrum moderately thick, moderately falciform, costate dorsomedially, basolateral margin produced, length of rostrum 1.11 × pronotal length, length of ante-antennal portion 0.37 × total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.89 × maximum width, sides parallel in basal half, then abruptly constricted and tubulate in front; disk densely punctate, intervals granulose. Elytra: length 1.67 × width at humeri, width 1.45 × maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures rather indistinct,

interstriae flat, 9 subcostate. Legs: tibiae curved, ventral margin weakly bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: not examined.

Plant association. Not known.

Material examined. GUATEMALA. Guatemala: Zapote (former suburb of Guatemala City now engulfed by municipality, Fig. 244) (BMNH 5, NMNH).

Discussion. *Embates exclamationis* is known only from the type series collected by Champion. Those six specimens are very similar in size and vestiture, and nothing is known about the variability of the species. The outer elytral interstriae exhibit traces of ante- and post-macular elements.

7. Embates pauhans **Prena sp. n.**
(Fig. 44–47, 260)

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA. Prov. San José,/ Cascajal, P.N.B.C., E. Zurquí,/ 0.500Km antes Túnel Zurquí, 1500m./ OCT 1990–ABR 1991. G. Maass./ Intersección. L_N_535200_226800", INB0003162539 (INBC).

Paratypes 11 (7 males, 4 females), labeled: "Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m/ 16.2.2000, leg. Prena" (JPPC 2); same data except 13.2.2000 (CMNC, MUCR); "COSTA RICA, S. Jose,/ Zurquí de Moravia,/ 1600 m, malaise trap/ VI-1995, P. Hanson" (CWOB); "Costa Rica: San Jose/ Zurqui de Moravia/ 1400m VIII 92/ W. Eberhard" (JPPC); "COSTA RICA, Prov. San José:/ Zurquí de Moravia,/ 10° 03' N 84° 01' W, 1500m", "1.5.2004/ leg. J. Prena" (JPPC); "Costa Rica, CARTAGO:/ 7 km N Turrialba, M.N./ Guayabo, 1100 m/ 4/5.4.2000, leg. Prena" (JPPC, NMNH); "COSTA RICA Cartago/ P.N. Guayabo, 6 Sept/ 1991. R.W. Flowers" (CWOB); "Monumento Nacional Guayabo, A.C./ Amistad, Prov. Carta, COSTA RICA, 1100/ m. Jun 1994, G. Fonseca, L N/ 217400_570000 #2989", INBio CRI001 882635 (INBC).

Description. Habitus: Fig. 44, total length 4.3–5.8 mm (m=5.1, n=12). Color: integument piceous or dark rufous, appendices dark rufous; basic vestiture of small cupreous and few light yellow scales, scales light yellow in vestigial dorsolateral pronotal vitta and in broad compound post-macular fascia consisting of former post-macular element and apical streak in interstriae 1–2 (Fig. 44); venter with creamy white scales on prosternum and along flank. Head: frontal fovea absent, rostrum moderate, moderately falciform, costate dorsomedially, subcostate dorsolaterally, basolateral margin produced, length of rostrum ♂♂ 1.29–1.40 × (m=1.34, n=8), ♀♀ 1.31–1.34 × (m=1.33, n=4) pronotal length, length of ante-antennal portion ♂♂ 0.29–0.31 × (m=0.30, n=8), ♀♀ 0.32–0.34 × (m=0.33, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 very slightly longer than 1, club oblong ovate. Pronotum: length 0.82–0.88 × (m=0.86, n=12) maximum width, trapezoid, greatest width at base, sides gradually converging in basal half, anterior portion roundly narrowed and tubulate in front; disk densely

punctate, intervals granulose, partially confluent. Elytra: length 1.56–1.67 × (m=1.64, n=12) width at humeri, width 1.43–1.52 × (m=1.47, n=12) maximum pronotal width, sides very slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae moderate, punctures indistinct, interstriae flat, 9 costate, 7 and 8 subcostate (costation indistinct in specimens from Guayabo). Legs: tibiae curved and parallel-sided, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle sclerotized, anterolateral portion membranous (Fig. 46), body of aedeagus relatively short, curved in lateral view, apodemes 2.7 × longer than body of aedeagus (Fig. 47), flagellum very thin, approximately three times as long as aedeagus including apodemes, transition to curved base gradual, basal appendage slender and elongate, projecting far beyond base (as Fig. 39).

Plant association. *Piper hispidum* (Prena 2), *P. bisasperatum* (Prena 2), *P. tenuimucronatum* (Prena 1).

Distribution. Costa Rica, Atlantic side of Cordillera Central between 1100 and 1800 m (Fig. 260).

Specific epithet. The name is a cryptogram and used as a noun. I dedicate this species to Dr. Paul Hanson for his long-lasting, generously given support to the entomological community working on Costa Rican insects.

Discussion. *Embates pauhans* is very distinctive through its color-pattern. The shape of the aedeagus and the very long flagellum place this species in the *E. solani* complex, a group with strikingly different color-pattern.

8. Embates vestitus (Chevrolat)

(Fig. 48–49, 262)

Ambates vestitus Chevrolat 1877: 344. Holotype male, Colombia, labeled: “Typus”, “Ambates/ vestitus/ Chevr.”, “233/ 58”, green label at bottom of box “N. Grenada/ Magdalena/ D.A. Deyrolle” (NHRS). Hustache 1938 (cat.); Kuschel 1983: 35 (synonymy with *A. circumductus*); Wibmer & O’Brien 1986 (cat.)

Ambates circumductus Champion 1907: 166. Lectotype, sex not determined [probably male], Panama, right of two specimens glued on same card, here designated, labeled: “Type”, “♀♂”, “Sp. figured”, “David/ Chiriqui/ Champion” (BMNH). Paralectotypes 14, here designated: David (BMNH 2, NMNH 2, SNSD), Caldera (BMNH 7, NHRS), Tolé (BMNH). Hustache 1938 (cat.); O’Brien & Wibmer 1982 (cat.)

Embates [*vestitus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: total length 3.8–5.2 mm (m=4.4, n=22). Color: integument piceous; basic vestiture moderately dense, cupreous to light yellow; scales light yellow in thin dorsolateral pronotal vitta, humeral streak, arcuate post-macular elytral fascia and, less dense, in ill-defined dorsomedian pronotal vitta and distal half of sutural interstria, scales velvety black in subtriangular elytral macula between interstriae 2–5 (Fig. 48); ven-

ter predominantly with whitish scales. Head: frontal fovea absent, rostrum moderately thick, subcylindrical, costate dorsomedially, basolateral margin produced, length of rostrum ♂♂ 1.16–1.28 × (m=1.22, n=15), ♀♀ 1.21–1.29 × (m=1.25, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.37–0.42 × (m=0.39, n=15), ♀♀ 0.41–0.44 × (m=0.42, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate (♀♀) to subcylindrical (♂♂). Pronotum: length 0.75–0.80 × (m=0.77, n=22) maximum width, sides subparallel in basal third, anterior portion roundly narrowed and tubulate in front; disk densely punctate, intervals granulose. Elytra: length 1.23–1.37 × (m=1.33, n=22) width at humeri, width 1.36–1.43 × (m=1.40, n=22) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures distinct, interstriae flat, 7 and 9 costate. Legs: tibiae curved, ventral margin weakly bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle and anterolateral portions membranous (as Fig. 53), body of aedeagus of moderate size, curved in lateral view, apodemes 1.4 × longer than body of aedeagus, flagellum thin, slightly shorter than apodemes, transition to curved base gradual, basal appendage minute, barely projecting beyond base (Fig. 49).

Plant association. *Piper marginatum* (Stockwell 3).

Distribution. Northwest Colombia and Panama, not on Atlantic side of Cordillera de Talamanca (Fig. 262).

Material examined. PANAMA. Canal Zone: numerous locations (BMNH, CHAH, CWOB 11, GBFM, HAHC, HPSC 8, JPPC 5, NMNH 2, TAMU). Chiriquí: David (BMNH 3, NMNH 2, SNSD 4); Caldera, 400 m (BMNH 7, NHRS); Tolé, 200 m (BMNH). Coclé: El Valle, 800 m (CHAH, HPSC). Colón: 4 km NW Escobal (CHAH); Portobelo (NMNH 8). Darién: Cana, 450 m (CMNC, HPSC); Mortí, 20 m (HPSC, TAMU). Panamá: Las Cumbres (CWOB 3); Majé Station (CWOB, HPSC 3); 38 km E Majé Bridge (CWOB 2); Chepo (CWOB); Cerro Azul, 700 m (HPSC); Cerro Campana, 850 m (HPSC, HAHC 2); Punta Vacamonte (CWOB); Ipetí (CMNC); Llano-Cartí rd. (CMNC). Veraguas: La Yeguada Power Plant, 300 m (HPSC). Location unresolved: XX-Plantation (NMNH 5). COLOMBIA. [Río] Magdalena (NHRS). Total 88 specimens.

Discussion. *Embates vestitus* is a small, notably stout species related to numerous South American species near *E. rufipes* (Kirsch) and *E. griseolus* (Erichson). The Colombian *E. claveri* (Hustache) is very similar but lacks the continuous dorsolateral vitta (Fig. 50). The distribution of *E. vestitus* (and *E. thoracicus*) seems to follow that of *Piper marginatum*, a widespread plant in wet situations of semi-open, seasonally dry habitats.

9. Embates terrabanicus Prena sp. n.

(Fig. 51–54, 251)

Holotype male (dissected), Costa Rica, labeled: “Rancho Quemado, 200 m,/ Peninsula de Osa, Prov./ Puntarenas, Costa Rica/ Dic 1992, F. Quesada/ L-S 292500, 511000”, CRI000 822531 (INBC).

Paratypes 5 (all female), Costa Rica, labeled: same label as holotype, CRI000 822532 (INBC), CRI000 822536 (CMNC); “Costa Rica, PUNTA.: P.N./ Corcovado, Est. Agujas, 8°/ 32' N 83° 25' W, 300 m,/ 15–16.3.2000, leg. Prena” (CWOB); same label except 19–21.3.2000 (JPPC 2).

Description. Habitus: Fig. 51, total length 4.2–4.9 mm (m=4.6, n=6). Color: integument dark brown; basic vestiture rather dense, dark brown with few yellow scales; scales yellow in well-defined dorsolateral vitta between head and elytral apices running just proximad of preapical callus (Fig. 51); venter with yellow scales on prosternum and flank. Head: frontal fovea minute or absent, rostrum moderately thick, subcylindrical (Fig. 52), not costate dorsomedially, basolateral margin roundly edged, length of rostrum ♂ 1.33x, ♀♀ 1.25–1.31 × (m=1.28, n=5) pronotal length, length of ante-antennal portion ♂ 0.43x, ♀♀ 0.45–0.47 × (m=0.46, n=5) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.80–0.82 × (m=0.81, n=6) maximum width, sides subparallel in basal third, then roundly narrowed and tubulate in front; disk densely punctate, intervals granulose. Elytra: length 1.40–1.45 × (m=1.43, n=6) width at humeri, width 1.38–1.44 × (m=1.42, n=6) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus weak, striae fine, punctures indistinct, interstriae flat, 7 (distally) and 9 subcostate. Legs: tibiae curved, ventral margin bisinuate, distally with cluster of brown hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle and anterolateral portion membranous (Fig. 53), body of aedeagus of moderate size, curved in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, slightly shorter than apodemes, transition to narrowly curved base gradual, basal appendage elongate, projecting beyond base (Fig. 54).

Plant association. *Piper terrabanum* (Prena 3).

Distribution. Costa Rica, Osa Peninsula (Fig. 251).

Specific epithet. The name is a Latin adjective derived from the name of the plant.

Discussion. *Embates terrabanicus* is related closely to *E. vestitus* (Chevrolat) and *E. claveri* (Hustache). All three are notably stout species of the *E. rufipes* complex, a predominantly South American group with a membranous aedeagal apex.

10. Embates scambus **Prena sp. n.**
(Fig. 55–59, 261)

Holotype male (dissected), Costa Rica, labeled: "P.N. Tapanti, Rio Dos Amigos, A.C./ Amistad, Prov. Carta, COSTA RICA, 1480/ m. Mar 1994, G. Mora, A. Solís, E. Ulate, L/ N 187600-560250 #2782", CRI001 964066 (INBC).

Paratypes 8 (3 males, 5 females), Costa Rica and Panama, labeled: "C. Chompipe 2100 m/ San Rafael HDIA/ 31 jul 1993/ MA Zumbado", CRI001 116186 (INBC); "Ref. Nac. Fauna Silv./ Tapanti, 1150 m Prov./ Cart., COSTA RICA, G/ Mora, F. Quesada, Ene/ 1992, L-N-194000, 559800", CRI000 529669 (JPPC); "COSTA RICA, Cart./ 5 km. NE. Pacayas,/ 4300 m [ft.], roadside,/ V-25-1995, J. Rifkind" (CWOB, JPPC); "PANAMA: Chiriqui/ 8 km NW Boquete/ 25–26 June 1981/ B. Gill 1700 m" (CWOB, HAHC 2); "PANAMA, Chiriqui/ Prov. 2 km W. Cerro Punta 1720M 8° 51' N/ 82° 36' W 19–23.V.77/ H. & A. Howden" (JPPC).

Description. Habitus: Fig. 55, total length 7.5–10.5 mm (m=9.1, n=9). Color: integument rufous to castaneous; basic vestiture of small khaki scales of variable densities, scales condensed in two ill-defined, oblique elytral fasciae and on pronotal flank, dorsal vestiture occasionally almost uniform or absent (Fig. 55); venter with broad, imbricate creamy white scales except on median portion. Head: frontal fovea distinct, rostrum moderate, subcylindrical (Fig. 56), subcostate dorsomedially, basolateral margin roundly edged, length of rostrum ♂♂ 1.18–1.27 × (m=1.24, n=5), ♀♀ 1.22–1.32 × (m=1.30, n=4) pronotal length, length of ante-antennal portion ♂♂ 0.35–0.39 × (m=0.37, n=5), ♀♀ 0.38–0.41 × (m=0.40, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.77–0.87 × (m=0.82, n=9) maximum width, sides variously rounded, widest in basal third, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.79–1.89 × (m=1.83, n=9) width at humeri, width 1.36–1.47 × (m=1.40, n=9) maximum pronotal width, sides very slightly diverging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, none costate. Legs: tibiae curved, ventrodistally with indistinct fringe of yellow hairs, tarsal segment 5 (pretarsus) pointed ventrodistally (Fig. 57), tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle membranous, anterolateral portion sclerotized (Fig. 58), body of aedeagus relatively short, basal third slightly angular in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum thin, slightly shorter than apodemes, transition to tumid base gradual, basal appendage thick, not much projecting beyond base (Fig. 59).

Plant association. Not known.

Distribution. Costa Rica and Panama, evergreen montane forests between 1150 and 2100 m (Fig. 261).

Specific epithet. The name is a Latin adjective for "curved".

Discussion. *Embates scambus* can be recognized by its large size, rufous integument, often notably curved tibiae and ventrodistally pointed tarsal segment 5. The distal margin of the pygidium is notched in the males. The relationship to the other species of *Embates* remains uncertain. Based on genital character states and general habitus, I would place this species near the large-sized species of the *E. rufipes* complex, such as *E. cholidiformis* (Chevrolat).

11. Embates griseolus (Erichson)

(Fig. 60–63)

Ambates griseolus Erichson 1847: 131. Holotype not seen, Peru (current location unknown, possibly Santiago de Chile). Jekel 1883; Hustache 1938 (cat.); Kuschel 1955; Kuschel 1983; Wibmer & O'Brien 1986 (cat.)

Ambates arcuatus Hustache 1939: 178. Kuschel 1983 (synonymy with *A. griseolus*); Wibmer & O'Brien 1986 (cat.)

Ambates arcuatus ssp. *immaculatus* Hustache 1939: 179. Kuschel 1983 (synonymy of nominal form with *A. griseolus*); Wibmer & O'Brien 1986 (cat.)

Ambates bolviensis Hustache 1950: 7. Kuschel 1955 (synonymy with *A. arcuatus*); Wibmer & O'Brien 1986 (cat.)

Embates [*griseolus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription (based on Middle American specimens possibly representing a taxon distinct from the nominal form): Habitus: Fig. 60, total length 4.9–6.2 mm (m=5.3, n=12). Color: integument dark brown; basic vestiture rather dense, dark brown with few light yellow to ochreous scales; scales light yellow to ochreous in thin dorsolateral vitta between head and elytral apices, usually ill-defined in anterior elytral half (Fig. 60); venter with widely spaced light yellow scales. Head: frontal fovea absent, rostrum moderately thick, subcylindrical (Fig. 61), costate dorsomedially, basolateral margin produced, length of rostrum ♂♂ 1.35–1.46 × (m=1.40, n=5), ♀♀ 1.34–1.47 × (m=1.39, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.38–0.40 × (m=0.39, n=5), ♀♀ 0.38–0.40 × (m=0.39, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.78–0.83 × (m=0.81, n=12) maximum width, widest in basal third, sides rounded or (rarely) subparallel in basal third; disk densely punctate, intervals granulose. Elytra: length 1.52–1.64 × (m=1.58, n=12) width at humeri, width 1.34–1.43 × (m=1.39, n=12) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 7 and 9 subcostate. Legs: tibiae curved, ventral margin bisinuate, distally with cluster of brown hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral membranous portion narrow (Fig. 62), body of aedeagus relatively short, curved in lateral view, apodemes 2.7 × longer than body of aedeagus, flagellum thin,

slightly shorter than apodemes, transition to narrowly curved base gradual, basal appendage elongate, minute, not much projecting beyond base (Fig. 63).

Plant association. Not known.

Distribution. Various local populations with slightly deviating color-patterns [see below] occur in Panama, Colombia, Ecuador, Peru, Brazil and Bolivia.

Material examined. PANAMA. Canal Zone: Coco Solo Hospital (HPSC). Darién: Cana, 450 m (CMNC). Panamá: Cerro Campana, 850 m (CNCI, CWOB 2, HAHC, HPSC 3, JPPC 2, NMNH). COLOMBIA. Cundinamarca: Guayabetal (CWOB). Total 13 specimens.

Discussion. *Embates griseolus* represents a complex of several local populations. I have not seen the type of *E. griseolus*, and the true identity of the nominal form remains uncertain for the time being. The population of Panamanian and Colombian specimens referred to here exhibits an anteriorly fading dorsolateral elytral vitta [similar to *E. arcuatus* (Hustache)] and faint traces of a dark elytral macula [similar to *E. vanus* (Hustache), although much weaker]. The complex needs to be examined in more detail in connection with other poorly differentiated species near *E. apicatus* (Voss) and *E. rufipes* (Kirsch). The species near *Embates rufipes* (Kirsch) differ from *E. griseolus* by greater size, more distal antennal insertion and apically membranous aedeagus.

12. Embates caecus Chevrolat

(Fig. 1–10, 242)

Embates caecus Chevrolat 1833 [1834]: 18. Lectotype male, here designated, upper of two specimens on same pin, Mexico, labeled: “Typus”, “Ambates/ caecus Chevr./ Prena det. 1996”, green label in box: “coecus Chevr. cit Mex/ caesus Boh., Mexico“ (NHRS). Paralectotype 1, same pin underneath lectotype (NHRS). Alonso-Zarazaga & Lyal 1999 (cat.); Prena 2003a

Ambates caecus. Chevrolat 1835 [1834] (table in appendix); Dejean 1837 (cat.); Boheman in Schönherr 1843: 153 [as *A. caesus*]; Lacordaire 1863: 513; Hustache 1938 (cat.); Blackwelder 1947 (cat.); O’Brien & Wibmer 1982 (cat.); Wibmer & O’Brien 1986 (cat.)

Redescription. Habitus: Fig. 1, total length 5.6–7.7 mm (m=6.7, n=16). Color: integument piceous, basic vestiture of ochreous scales, pear-shaped elytral macula of black velvety scales behind middle, scales light yellow around elytral macula, in small clusters along elytral striae, and in indistinct dorsolateral pronotal vitta (Fig. 1). Head: frontal fovea absent, rostrum moderately slender, subcylindrical (Fig. 4), subcostate dorsomedially and dorsolaterally, basolateral margin edged, length of rostrum ♂♂ 1.16–1.28 × (m=1.21, n=10), ♀♀ 1.20–1.30 × (m=1.26, n=6) pronotal length, length of ante-antennal portion ♂♂ 0.35–0.39 × (m=0.37, n=10), ♀♀ 0.37–0.41 × (m=0.40, n=6) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 slightly longer than 1, club oblong ovate. Pronotum: length 0.84–0.92 × (m=0.89, n=16) maximum width, sides subparallel in basal third, then gradually rounded to front; disk

densely and shallowly punctate, intervals variously confluent. Elytra: length 1.75–1.92 × (m=1.84, n=16) width at humeri, width 1.16–1.28 × (m=1.22, n=16) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures moderate, interstriae flat, 9 costate in distal half. Legs: tibiae slightly curved, ventral margin slightly bisinuate, distally with cluster of cupreous hairs, tarsal claws flat and connate. Male: apex of aedeagus broadly rounded, middle sclerotized, anterolateral portion membranous (Fig. 9), body of aedeagus relatively short, basal third angular in lateral view, apodemes 2.4 × longer than body of aedeagus, flagellum thin, shorter than apodemes, transition to curved base abrupt, basal appendage moderate, fused laterally with base of flagellum, projecting beyond base (Fig. 10).

Plant association. Not known.

Distribution. Mexico, Atlantic side, west of Isthmus of Tehuantepec (Fig. 242).

Material examined. MEXICO. Hidalgo: 33 mi NE Jacala, 1200 m (CWOB); Hwy 85, 40 mi NW Jacala, 1000 m (CWOB); Santa Maria (CMNC). Oaxaca: Temescal (CMNC 3, CWOB 2, NMNH). Tamaulipas: Rancho del Cielo, near Gomzez Varias (CMNC). Veracruz: Córdoba (HPSC, NMNH 2); 2.8 mi SE Tebanca, E of Catemaco (CWOB); 5 mi S Lake Catemaco (CWOB); 9.5 mi W Orizaba (CNCI); Playa Vicente (BMNH 14, NMNH 2, SNSD); Sontecomapan (BMNH); Tuxpan? [labeled Toxpam] (BMNH 2). Without location: (BMNH 7, DEIC, JPPC, MNHP, NHRS 2, SNSD 6). COLOMBIA (suspect). Valle del Cauca: Buga, 1700 m (CWOB). Total 55 specimens.

Discussion. *Embates caecus* is the type species of *Embates* Chevrolat. The text includes a valid description and indication, a fact not acknowledged by Champion (1907) and Hustache (1938). The epithet used in the description (Chevrolat 1833) and in the appendix of the same paper (Chevrolat 1835) is *caecus*. Other spellings, such as *caesus* or *coecus*, are unjustified emendations. The species has been collected in numbers at various locations in southern Atlantic Mexico. The single record from Colombia is suspect (identification correct, but provenance doubtful) and needs confirmation. *Embates sagax* (Voss), a South American sibling species (Fig. 26), differs from *E. caecus* through the dense, light-colored ventral vestiture and details of the male genitalia.

13. Embates bicoctura **Prena sp. n.**
(Fig. 64–66, 242)

Holotype male (dissected), Mexico, labeled: “MEX: Oax. 30.6 km. S./ Suchixtepec 1294 m 87-16/ 12.vii.87 R. Anderson/ wet oak-pine forest” (CMNC).

Paratypes 3 (1 male, 2 females), Mexico, labeled: “MEXICO. Oaxaca/ 5 miles south/ Candelaria Loxicha/ July 18–19, 1974/ Clark, Murray,/ Ashe, Schaffner” (JPPC); “MEXICO. Oaxaca/ 4.7 mi. s. San/ Gabriel Mixtepec/ July 16, 1985/ Jones, Schaffner” (TAMU); “MEXICO. Oaxaca, 2 mi/ N Candelaria Loxicha/ VII-17-1985, Woolley/ & Zolnerowich, 85/068” (TAMU).

Description. Habitus: Fig. 64, total length 4.8–5.4 mm (m=7.3, n=4). Color: integument piceous, basic vestiture of ochreous and light yellow scales, the latter variously clustered; elytra with subcircular macula of black velvety scales immediately behind middle (Fig. 64); scales light yellow and dense at base of rostrum, in dorsolateral and lateral pronotal vittae which extend along distal edge of mesosternum and mesepisternum, in indistinct transverse line on pronotal disk, around elytral macula, and on venter (except median portion). Head: frontal fovea minute or absent, rostrum moderately thick, subcylindrical, costate (♂♂) or subcostate (♀♀) dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.17–1.26 × (n=2), ♀♀ 1.24–1.25 × (n=2) pronotal length, length of anteantennal portion ♂♂ 0.33 × (n=2), ♀♀ 0.37 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 slightly longer than 1, club ovate. Pronotum: length 0.83–0.88 × (m=0.86, n=4) maximum width, sides parallel in basal half, then abruptly narrowed and tubulate in front; disk densely and moderately deeply punctate, intervals variously confluent to transverse wrinkles. Elytra: length 1.70–1.74 × (m=1.72, n=4) width at humeri, width 1.24–1.37 × (m=1.31, n=4) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus well developed, striae fine, punctures relatively large and distinct, interstriae flat, 9 costate in distal half. Legs: tibiae slightly curved, ventral margin slightly bisinuate, distally with cluster of cupreous hairs, tarsal claws flat and connate. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 65), body of aedeagus of moderate length, curved in lateral view, apodemes 1.7 × longer than body of aedeagus, flagellum very thin, as long as apodemes, transition to curved base abrupt, basal appendage moderate, fused laterally with base of flagellum, projecting beyond base (Fig. 66).

Plant association. Not known.

Distribution. Southern Mexico, Pacific side (Fig. 242).

Specific epithet. The name is a Latin compound noun meaning “two brands” or “two stigmata”.

Discussion. *Embates bicoctura* has been confused in collections with *E. caecus* and *E. biguttatus*. The species seems to be restricted to the Pacific side, while the other two occur on the Atlantic side. It shares the subconnate claws with *E. caecus*, and can be distinguished from all other “oculate” species by the narrow lateral vitta above the procoxae. The specimens of the type series agree in all details. However, two syntypes of *E. biguttatus*, from Yolotepec, seem to belong to *E. bicoctura* at least in the wider sense. They are noticeably larger (6.5–7.8 mm) and deviate in details of the color-pattern. This type of deviation is paralleled in other species of *Embates* and *Ambates*, and may or may not be an effect of the temperature conditions during metamorphosis. Because of this uncertainty, I have not included those two specimens from Yolotepec in the type series of *E. bicoctura*.

14. Embates ocellatus (Champion)

(Fig. 67–70, 242)

Ambates ocellatus Champion 1907: 163. Lectotype male, Mexico, here designated, labeled: "sp. figured", "Type", "♂", "Teapa/ Tabasco/ Feb. H.H.S." (BMNH). Paralectotypes 2, here designated: Teapa (BMNH), Mexico, Bowring Coll. (BMNH). Hustache 1938 (cat.); Blackwelder 1947 (cat.); O'Brien & Wibmer 1982 (cat.)

Embates [*ocellatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 67, total length 5.4–7.0 mm (m=6.1, n=9). Color: integument piceous, basic vestiture of brown and beige scales, the latter variously clustered; elytra with oblique, semi-circular to pear-shaped macula of black velvety scales immediately behind middle (Fig. 67a, b); scales beige to ochreous in dorsolateral pronotal vitta and around elytral macula. Head: frontal fovea absent, rostrum moderately thick, subcylindrical (Fig. 68), costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.04–1.32 × (m=1.17, n=5), ♀♀ 1.08–1.30 × (m=1.19, n=2) pronotal length, length of anteantennal portion ♂♂ 0.31–0.34 × (m=0.33, n=5), ♀♀ 0.33–0.40 × (m=0.36, n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.82–1.00 × (m=0.90, n=9) maximum width, shape variable, sides subparallel or rounded in basal half, narrowed toward front, widest in basal half, frontal portion tubulate; disk densely and moderately deeply punctate, intervals granulose. Elytra: length 1.64–1.79 × (m=1.71, n=9) width at humeri, width 1.35–1.56 × (m=1.46, n=9) maximum pronotal width, sides subparallel or slightly converging in basal half, then gradually narrowed toward apex, apices rounded conjointly, preapical callus well developed, striae fine, variously punctate, interstriae flat, 7 (at preapical callus) and 9 costate. Legs: tibiae nearly straight and parallel-sided, ventral margin of metatibia distally with (frequently abraded) fringe (♂♂) or cluster (♀♀) of cupreous hairs, tarsal claws curved and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 69), body of aedeagus of moderate length, angular in basal third, apodemes 1.9 × longer than aedeagus, flagellum thin, shorter than apodemes, transition to curved base gradual, basal appendage moderate, fused laterally to base of flagellum, slightly (aberrant population from Valle Nacional) or distinctly (typical form) projecting beyond base (Fig. 70).

Plant association. Not known.

Distribution. Southern Mexico to Honduras, Atlantic side (Fig. 242).

Material examined. MEXICO. Without location: (BMNH, MNHP, NMNH). Chiapas: Palenque (TAMU); 10 km S Rayon (CWOB 3, JPPC). Tabasco: Teapa (BMNH 2). Veracruz: Los Tuxtlas Biol. St., 20 mi E Catemaco (CMNC). GUATEMALA. Izabal: Cerro San Gil, 8 km N Las Escobas, 800 m (HAHC). Verapaz: 7 km NE Purulhá, 1500 m (HAHC 2). HONDURAS. Santa Bárbara: 13 km SE El Mochito (CWOB). Total 15 specimens. Provisionally, I include here following similar but larger specimens: MEXICO.

Oaxaca: Hwy 175, 40 km S Valle Nacional, 2250 m (CWOB); 47.5 km SW Valle Nacional, km 100.5, 2125 m (CMNC). GUATEMALA. Quezaltenango: Cerro Zunil (BMNH).

Discussion. *Embates ocellatus* is related closely to the *E. biguttatus* complex. In the majority of cases, specimens of *E. ocellatus* can be recognized by the elongate-pyriform elytral macula and the produced and subcostate subapical elytral callus. In doubtful cases, the slightly more distal insertion of the antenna should be indicative. The specimens here included under *E. ocellatus* exhibit notable variation in body shape and meristic data, both within and between local populations. Most noteworthy, the three specimens from high elevations in Oaxaca and Quezaltenango are notably larger than the others, and the elytral maculae are of deviating shape and size.

15. Embates biguttatus (Champion)

(Fig. 71–74, 243)

Ambates biguttatus Champion 1907: 164. Lectotype female, here designated, Mexico, labeled: "Sp. figured", "♀", Mexico./ Salle Coll., "Yolotepec" (BMNH). Paralectotypes 5, here designated: Group A (*E. biguttatus*): Sinanjá (BMNH, NMNH), Playa Vicente (BMNH); Group B (*E. bicoctura* s. l.): Yolotepec (BMNH 2); Group C (*E. ocellatus* s. l.): Cerro Zunil (BMNH). Two specimens from Teapa, labeled as variety, are not regarded as type specimens. Two specimens from Trece Aguas, Guatemala (BMNH, NMNH) were identified by Champion, but do not belong to the type series. O'Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Embates [*biguttatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: similar to Fig. 1 (figured in original description), total length 4.2–6.1 mm (m=5.1, n=18). Color: integument piceous, basic vestiture of light brown scales; elytron with black subcircular macula slightly behind middle, macula usually bordered by ochreous scales to various degrees, distal margin with variously developed oblique fascia of light yellow scales (Fig. 72); pronotum with dorsolateral vitta of ochreous scales. Head: frontal fovea absent, rostrum slender, subcylindrical (Fig. 71), costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.17–1.48 × (m=1.28, n=7), ♀♀ 1.11–1.36 × (m=1.24, n=10) pronotal length, length of ante-antennal portion ♂♂ 0.31–0.39 × (m=0.36, n=7), ♀♀ 0.35–0.40 × (m=0.39, n=10) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.80–1.00 × (m=0.91, n=18) maximum width, sides rounded, widest in basal third, anterior portion tubulate; disk densely punctate, with isolated granula. Elytra: length 1.67–1.85 × (m=1.75, n=18) width at humeri, width 1.32–1.54 × (m=1.42, n=18) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct to moderate, interstriae flat, 9 (7 partially) subcostate. Legs: tibiae almost straight, ventral margin slightly bisinuate, metatibia ventrodistally with

cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle sclerotized, anterolateral portion membranous (Fig. 73), body of aedeagus of moderate length, angular in basal third, apodemes 1.7 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage slender, slightly projecting beyond base of flagellum, fused laterally (Fig. 74).

Plant association. *Piper* sp. (Prena 2).

Distribution. Southern Mexico (Atlantic side) to northern Nicaragua (Fig. 243).

Material examined. MEXICO. Chiapas: 8.6 km S Rayón (CWOB 9, JPPC); 8.9 mi S Tapilula, 1600 m (CMNC). Oaxaca: Yolotepec (BMNH); Vista Hermosa (CWOB). Puebla: Teziutlán (CMNC, HAHC 2). Tabasco: Teapa (BMNH 2). Yucatan: 7 km S Oxkutzcab (CMNC). Veracruz: Playa Vicente (BMNH). GUATEMALA. Izabal: Cerro San Gil, 8 km N Las Escobas, 800 m (HAHC). Verapaz: Trece Aguas (BMNH, NMNH); Sinanjá (BMNH, NMNH). Zacapa: La Unión, 1500 m (CMNC, CWOB). HONDURAS. Cortés: Cusuco N.P., 20 km W San Pedro Sula, 1500 m (JPPC 2). NICARAGUA. Matagalpa: 7 mi N Matagalpa, 1600 m (CWOB). Total 30 specimens.

Discussion. Champion assigned to *E. biguttatus* seven specimens with almost circular black elytral macula from Mexico and Guatemala, and recognized an unnamed "variety" from Teapas, Mexico. The seven syntypes appear to belong to three distinct taxa. Two of the taxa (groups B and C in the lectotype designation further above) cannot be classified with confidence for the time being. Four of the syntypes belong to the taxon figured in Champion (1907, plate 9, fig. 31), and it is desirable to choose one of them as lectotype of *E. biguttatus*. Since the only male included is an aberrant specimen with very short rostrum, I chose the female specimen figured in the original description. *Embates biguttatus*, as here understood, is a relatively small species with separate claws and circular elytral macula with variable but consistently narrow circumambient line. Often, the post-macular portion of the latter is slightly expanded and modified to an oblique fascia. Even under the new definition, the species still exhibits considerable variability in terms of body proportion and vestiture. The specimens from Rayón are included under *E. biguttatus* in the wider sense. The distinction from other species of the complex remains unsatisfying and will need further refinement when more material becomes available. This applies particularly to *E. nigronotatus* and the new Costa Rican species *E. paucilimbatus* and *E. mendax*.

16. Embates paucilimbatus **Prena sp. n.**

(Fig. 75–78, 253)

Holotype male (dissected), Costa Rica, labeled: "Sect. San Ramon de Dos Rios, Prov./ Alaju, COSTA RICA. 620m. 28 ABR–11/ MAY 1995. C. Cano,/ L N 318100 381900 #5277", CRI002 207591 (INBC).

Paratypes 3 (1 male, 2 females), labeled: "C.R.: Cartago:/ Turrialba/ upper forest", "(CATIE)/ 6.VIII.1980/ DRWhitehead" (JPPC, NMNH); "Costa Rica: Turrialba, 650m, 29 Feb 1980, H&A Howden, afternoon" (HAHC).

Description. Habitus: similar to Fig. 1, total length 4.1–4.8 mm (m=4.6, n=3). Color: integument piceous, funicular segments and legs rufous, basic vestiture of light brown scales; elytron with black subcircular macula slightly behind middle (Fig. 76); scales light yellow to brown in ill-defined post-macular element, preapical callus with normal basic vestiture. Head: frontal fovea minute or absent, rostrum moderately slender, subcylindrical (Fig. 75), subcostate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.25–1.28 × (m=1.27, n=2), ♀ 1.31 × pronotal length, length of ante-antennal portion ♂♂ 0.40–0.41 × (m=0.41, n=2), ♀ 0.42 × total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.87 × (n=3) maximum width, proportionately larger than in *E. biguttatus*, sides rounded, widest in basal third, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 1.72–1.79 × (m=1.75, n=3) width at humeri, width 1.30–1.35 × (m=1.33, n=3) maximum pronotal width, sides subparallel (or very slightly converging) in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus little produced, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae almost straight, ventral margin slightly bisinuate, metatibia ventrodistally with indistinct fringe (♂♂) or cluster (♀♀) of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus broad, middle membranous, anterolateral portion sclerotized (Fig. 77), body of aedeagus relatively short, curved evenly in lateral view, apodemes 2.5 × longer than body of aedeagus, flagellum thin, slightly longer than apodemes, transition to curved base gradual, basal appendage moderately elongate, fused laterally with base of flagellum, projecting beyond base (Fig. 78).

Plant association. Not known.

Distribution. Atlantic side of Costa Rica (Fig. 253).

Specific epithet. The name is a compound adjective derived from paucus and limbatus meaning “sparsely bordered”.

Discussion. *Embates paucilimbatus* is a member of the *E. biguttatus* complex. The species occurs in Costa Rica on the Atlantic side of the Cordillera Central. *Embates mendax*, a very similar Costa Rican species from the Pacific side, is comparatively slender, and the distinctly produced preapical callus has its flank with black rather than with light brown scales.

17. Embates mendax **Prena sp. n.**
(Fig. 253)

Holotype male (dissected), Costa Rica, labeled: “Est. Pittier, Prov. Punta, COSTA RICA./ 1670m. 22–28 JUN 1995. A. Picado,/ L_S_330900_577400 #5899”, CRI002 338075 (INBC).

Paratype 1 (male), labeled: “Costa Rica, PUNTA.: P.N./ Corcovado, Est. Agujas, 8°/ 32' N 83° 25' W, 300 m,/ 19–21.3.2000, leg. Prena” (JPPC).

Description. Habitus: similar to Fig. 1, total length 5.2–5.4 mm (m=5.3, n=2). Color: integument piceous, funicular segments and legs rufous, basic vestiture of light brown scales; elytron with black subcircular macula slightly behind middle; scales light brown to ochreous in post-macular element and dorsolateral pronotal vitta, flank of preapical callus black. Head: frontal fovea minute or absent, rostrum moderately slender, subcylindrical, subcostate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.14–1.17 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.41–0.42 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.97–0.98 × (n=2) maximum width, proportionately larger than in *E. biguttatus*, sides rounded, widest in basal third, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 1.71–1.82 × (n=2) width at humeri, width 1.29–1.37 × (n=2) maximum pronotal width, sides subparallel (or very slightly converging) in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus produced, striae fine, punctures indistinct, interstriae flat, 9 (7 partially) subcostate. Legs: tibiae almost straight, ventral margin slightly bisinuate, metatibia ventrodistally with fringe (♂♂) of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle sclerotized, anterolateral portion membranous (as Fig. 73), body of aedeagus angular in basal third, apodemes 1.7 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage moderate, fused laterally with base of flagellum, projecting beyond base (as Fig. 74).

Plant association. *Piper* sp. (Prena 1).

Distribution. Costa Rica, Pacific side of Cordillera de Talamanca (Fig. 253).

Specific epithet. The name is a Latin noun meaning “fake”.

Discussion. *Embates mendax* belongs to the *E. biguttatus* complex. A character state useful for rapid recognition of *E. mendax* is the black vestiture below the post-macular elytral fascia. The species is very similar to its Atlantic sibling species *E. paucilimbatus*. The latter species has a short, evenly curved and medially membranous aedeagus.

18. Embates nigronotatus (Champion)

(Fig. 79, 243)

Ambates nigronotatus Champion 1907: 163. Holotype male, Guatemala, labeled: “Type”, “♂”, “sp. figured”, “Zapote/ Guatemala/ G. Champion” (BMNH). O’Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Embates [*nigronotatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 1, total length 5.3–5.8 mm (n=2). Color: integument piceous, basic vestiture of brown and beige scales, the latter variously clustered; elytra with oblique, pear-shaped macula of black velvety scales immediately behind middle (Fig. 79);

scales beige to ochreous in dorsolateral pronotal vitta, around elytral macula and on flank. Head: frontal fovea absent, rostrum moderately thick, subcylindrical, costate dorsomedially, basolateral margin edged, length of rostrum ♂ 1.18 ×, ♀ 1.28 × pronotal length, length of ante-antennal portion ♂ 0.35 ×, ♀ 0.40 × total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.87–0.90 × (n=2) maximum width, widest in basal third, frontal portion tubulate; disk densely and moderately deeply punctate, intervals granulose or rugose. Elytra: length 1.81–1.85 × (n=2) width at humeri, width 1.33–1.35 × (n=2) maximum pronotal width, sides subparallel in basal half, then gradually narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 7 (at preapical callus) and 9 costate. Legs: tibiae nearly straight and parallel-sided, ventral margin of metatibia distally with cluster of cupreous hairs, tarsal claws curved and separate at base. Male: not examined.

Plant association. Not known.

Distribution. Guatemala, Pacific side (Fig. 243).

Material examined. GUATEMALA. Guatemala: Zapote (BMNH). Suchitepequez: Zapotitlán, Finca Las Nubes, 1525 m (CWOB). Total 2 specimens. Provisionally, I include here following similar but larger specimens: MEXICO. Oaxaca: Hwy. 175, 25 km S Valle Nacional, 1600 m (CWOB). Chiapas: 10.2 km E Rayon (JPPC). GUATEMALA. Alta Verapaz: 51 km SE Coban, 2000 m (CWOB).

Discussion. *Embates nigronotatus* belongs to the *E. biguttatus* complex. I include here two specimens from the Pacific side of Guatemala and, in the wider sense, three notably larger specimens from the Atlantic side of Guatemala and Mexico with the antenna inserted further basad. All differ from *E. biguttatus* by the broader post-macular fascia and the resulting narrower shape of the elytral macula. The status of the three large-sized specimens is as unclear as that of similarly aberrant specimens found in *E. bicoctura* and *E. ocellatus*. *Embates mendax* and *E. paucilimbatus* occur along the slopes of the Cordilleras Central and Talamanca, and seem to be isolated geographically from *E. nigronotatus* and *E. biguttatus* by the Nicaraguan lowlands. Specimens of *E. ocellatus* can be distinguished from *E. nigronotatus* by the consistently narrow circumambient macular line and more distally inserted antenna.

19. Embates sinuatus (Champion)

(Fig. 25, 80–85, 250)

Ambates sinuatus Champion 1907: 159. Lectotype female, Panama, here designated, labeled: “sp. figured”, “Type”, “♀”, “Bugaba/ Panama/ Champion” (BMNH). Paralectotypes 3, here designated: Bugaba (BMNH), Volcán (BMNH 2). O’Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Ambates sp. 5. Marquis 1991: 200

Embates [*sinuatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 80–81, total length 4.7–7.3 mm (m=5.9, n=217). Color: integument piceous, legs and antenna variously rufous; scales ochreous and black, pronotum with broad dorsolateral vitta of ochreous scales (occasionally with thin dorsomedian vitta), elytral vestiture variable: ochreous scales condensed in compound dorsolateral vitta formed by post-macular, ante-macular and humeral elements (Fig. 80), same scales with various densities in inner elytral interstriae and dorsomedian portion of pronotum; scales black in elytral macula and on preapical callus; venter with yellow scales except medially, frequently condensed on metasternum. Head: frontal fovea absent, rostrum moderately stout, subcylindrical, with sides slightly attenuated between apex and antennal insertion, curved (Fig. 82), costate dorsomedially, basolateral margin produced, length of rostrum ♂♂ 0.95–1.25 × (m=1.10, n=128), ♀♀ 1.03–1.33 × (m=1.20, n=89) pronotal length, length of ante-antennal portion ♂♂ 0.30–0.39 × (m=0.34, n=128), ♀♀ 0.36–0.42 × (m=0.38, n=89) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.88–1.03 × (m=0.96, n=217) maximum width, sides rounded, widest in basal half, anterior portion tubulate; punctation dense and confluent, intervals granulose. Elytra: length 1.77–2.04 × (m=1.88, n=216) width at humeri, width 1.15–1.42 × (m=1.27, n=216) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae nearly straight, ventrodistally with fringe (♂♂) or cluster (♀♀) of yellow hairs, protibial mucro notably produced (Fig. 83), tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt or indistinctly notched, anterolateral portion membranous (Fig. 84), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum very thin, as long as apodemes, transition to curved base gradual, basal appendage slender, imperfectly fused subdistally with base of flagellum, projecting beyond base (Fig. 85).

Plant association. *Piper augustum* (Marquis 2, Prena 51): La Selva, P.N. Braulio Carrillo, San Ramon, P.N. Tapantí, M.N. Guayabo, Península de Osa, Cerro Chucuyo, Dúrika, San Vito, Chriqui Grande, La Fortuna; *P. arieianum* (Marquis 10, Prena 27): Bartola, La Selva, P.N. Braulio Carrillo; *P. biseriatum* (Marquis 2): La Selva; *P. phytolaccaefolium* (Prena 7): Península de Osa, Las Mellizas; *P. riparense* (Marquis 1): La Selva.

Distribution. Atlantic side of Honduras southward (probably entire Mosquito coast) to central Panama (Fig. 250).

Material examined. HONDURAS. Gracias a Dios: Río Plátano, 30 km S Las Marías, 150 m (JPPC 3, RDCC). NICARAGUA. Río San Juan: 7 km SE El Castillo, Refugio Bartola, 30 m (JPPC, SEAN). COSTA RICA. Alajuela: Est. San Ramon, 620 m (INBC); Río San Lorencito, 5 km N Colonia Palmarena, 900 m (INBC, JPPC 9). Cartago: 7 km N Turrialba, M.N. Guayabo, 1100 m (JPPC 2); Turrialba, 700 m (CWOB); Tucurrique, 770 m (NMNH); P.N. Tapantí, Quebrada Segunda, 1300 m (JPPC 7). Guanacaste: Tierras Morenas, Río San Lorenzo, 1050 m (INBC 4); 9 km S Santa Cecilia, Est. Pitilla, 700 m (INBC

3). Heredia: 3 km S Puerto Viejo, Est. La Selva (CHAH 2, CMNC, CWOB 2, INBC 2, JPPC 31, NMNH 23); P.N. Braulio Carrillo, 200 m (INBC 3), 300 m (INBC 8, JPPC 9), 500 m (CNCI, INBC 4, JPPC 19), 600 m (INBC 4, JPPC 11), 700 m (JPPC 8), 1070 m (INBC 4, JPPC 5), 1500 m (INBC). Limón: P.N. Tortuguero (INBC 3); 30 km N Cariari (INBC 3, JPPC); Finca Hamburgo, 50 m (NMNH). Puntarenas: P.N. Corcovado, Est. Agujas, 300 m (JPPC 4), Cerro Rincón, 700 m (JPPC), Los Chiles (INBC), Los Patos (JPPC 2); 24 km W Piedras Blancas (CWOB); Fila Cruces, 1200–1400 m (INBC 4); 4 km S San Vito (INBC, JPPC 5, SNSD); P.N. Amistad, Mellizas, 1400 m (JPPC); Altamira, 1400 m (INBC), 1900 m (JPPC 5); Fundación Dúrika, 1700 m (JPPC 2); Est. Pittier, 1600 m (INBC 2); Monteverde, 1500 m (CMNC, CWOB). San José: 12 km NE San Isidro, Cerro Chucuyo, 1350 m (JPPC 10). PANAMA. Bocas del Toro: Corriente Grande (HPSC 3); 4 km W Chiriquí Grande, 50 m (JPPC 3). Chiriquí: Volcán (BMNH 2); Bugaba (BMNH 2); Reserva La Fortuna, 1100 m (CNIC, CWOB 2, FAUP, JPPC 10); 6 km N Boquete, 1450 m (CMNC). Coclé: La Mesa above El Valle, 850 m (HPSC). Panamá: Cerro Campana, 850 m (BMNH, CHAH, CWOB, HPSC, TAMU). San Blás: Nusagandi, 200 m (CWOB). Veraguas: Cerro Tute, Santa Fe, 680 m (FAUP). Total 256 specimens.

Discussion. *Embates sinuatus* and *E. tetrastigma* form a morphological complex that is defined by the possession of a strongly developed protibial mucro in the males (Fig. 83). The classification of the various subpopulations is not without problems. *Embates sinuatus* is a common species in the evergreen forests between eastern Honduras and central Panama. A preliminary survey in the initial phase of the study revealed a frustrating degree of heterogeneity, and subsequent field work was designated to explore its nature. It turned out, that *E. tetrastigma* is monophagous on *Piper nudifolium* and that its occurrence is restricted to the Pacific side of the Cordillera de Talamanca, where it co-occurs with *E. sinuatus*. The aedeagus of *E. tetrastigma* is larger (relative to body size) and notched apically, and the flagellum is longer than in *E. sinuatus*. This is sufficient evidence to consider *E. tetrastigma* a distinct species. *Embates sinuatus* feeds primarily on *Piper augustum* and, alternatively, on *P. phytolaccaefolium* on the Pacific side, and *P. arieianum* on the Atlantic side of the Cordilleras, respectively. The various local populations of *E. sinuatus* exhibit notable variability in their color-patterns and body shapes. Statistical analyses demonstrated a significant effect of elevation on body shape ($p<0.001$, $r^2=0.48$, $n=215$). Fig. 25 illustrates this relationship for four subsets of data, and the effect can be demonstrated even for the merely 30 km long ALAS transect in Braulio Carrillo National Park, Costa Rica. In other words, specimens from high elevations are on average more slender than specimens from the lowlands of both sides of the Cordilleras. The variability in the body proportion is accompanied by modifications of the color-pattern. It is important to take into account the compound nature of the elytral vitta, which consists of post-macular, antemacular and humeral elements. Each single element may vary in length, width, position, bearing and size of scales, thereby affecting the size and the shape of the dark elytral macula. Thus modified, the latter comes in a variety of shapes ranging from rhomboid, triangu-

lar to oval, and frequently is affected additionally by the variously dense vestiture on the inner elytral interstriae. As morphological variability can be explained at least partially by environmental variables, and the distinction of local color varieties seems without practical value, I lump the material together under the name *E. sinuatus*, but maintain *E. tetrastigma* as a distinct species.

20. Embates tetrastigma (Champion)

(Fig. 86–88, 249)

Ambates tetrastigma Champion 1907: 162. Holotype, sex not determined, Panama, labeled "sp. figured", "Type", "Bugaba/ 800–1500 ft" (BMNH). O'Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Embates [*tetrastigma*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Similar to Fig. 81, total length 4.4–5.7 mm (m=5.2, n=10). Color: integument piceous, rostrum, legs and antenna variously rufous; ochreous scales in broad dorsolateral pronotal vitta and prevailing on elytron, scales black in elytral macula and on subapical callus (Fig. 86); venter with yellow scales except medially. Head: frontal fovea absent, rostrum moderately stout, subcylindrical, with sides slightly attenuated between apex and antennal insertion, curved (similar to Fig. 82), costate dorsomedially, basolateral margin produced, length of rostrum ♂♂ 1.11–1.26 × (m=1.16, n=9), ♀ 1.21 × (n=1) pronotal length, length of ante-antennal portion ♂♂ 0.34–0.37 × (m=0.36, n=9), ♀ 0.39 × (n=1) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.90–0.97 × (m=0.93, n=10) maximum width, sides rounded, widest in basal half, anterior portion tubulate; punctation dense and confluent, intervals granulose. Elytra: length 1.75–1.89 × (m=1.81, n=10) width at humeri, width 1.26–1.38 × (m=1.33, n=10) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae nearly straight, ventrodistally with indistinct fringe (♂♂) or cluster (♀♀) of yellow hairs, protibial mucro notably produced in males, tarsal claws arcuate and separate at base. Male: apex of aedeagus broadly rounded, notched, incompletely fused medially, anterolateral portion more or less sclerotized (Fig. 87), body of aedeagus of moderate size, angular in basal third, apodemes 2.7 × longer than body of aedeagus, flagellum very thin, as long as aedeagus, transition to curved base gradual, basal appendage slender, imperfectly fused subdistally with base of flagellum, projecting beyond base (Fig. 88).

Plant association. *Piper nudifolium* (Prena 12).

Distribution. Costa Rica and Panama, Pacific side of Cordillera de Talamanca (Fig. 249).

Material examined. COSTA RICA. Puntarenas: 4 km S San Vito, 1100 m (HAHC, JPPC); Osa, P.N. Corcovado, 100–300 m (CHAH, HPSC, JPPC 8); 24 km W Piedras Blancas, 200 m (CWOB). San José: 12 km NE San Isidro, Cerro Chucuyo, 1350 m (JPPC 2). PANAMA. Chiriquí: Bugaba (BMNH). Total 16 specimens.

Discussion. *Embates tetrastigma* is related very closely to *E. sinuatus* (see discussion there). Both species co-occur on the Pacific side of the Cordillera de Talamanca, where they are associated with different hosts. Without genital dissection, they can be distinguished readily by their color-patterns. However, it should be kept in mind that this pragmatic character state should be used with caution (see discussion of *E. belti* and *E. triangularis*).

21. Embates pseudobumbraticus Prena sp. n.
(Fig. 89–92, 261)

Ambates sp. 4. Marquis 1991: 200.

Holotype male, Costa Rica, labeled: “COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 17.–23.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003229812 (INBC).

Paratypes 64 (46 males, 18 females). Same label as holotype except INB0003229813–14 (JPPC 2), 11.–16.3.2003, INB0003229885–88 (JPPC 4), 17.–20.3.2003, INB0003229962–66 (INBC 5), 8.–13.4.2003, INB0003230039–42 (INBC 4), 14.–20.4.2003, INB0003230179–82 (JPPC 4); “COSTA RICA: Prov. Heredia:/ 11km SE La Virgen, 450–/ 550m, 10°20'N 84°04'W/ 16.4.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003230223–24 (JPPC 2); “COSTA RICA: Prov. Heredia:/ 12km SE La Virgen, 550–/ 650m, 10°19'N 84°05'W/ Prena, 15.III.2001/ INBio-OET-ALAS transect” (JPPC 3); same label except 2.3.2000 (JPPC 4, TAMU); “COSTA RICA: Prov. Heredia:/ 11km ESE La Virgen, 250-/ 350m, 10°21'N 84°03'W/ leg. J. Prena, 6.–11.4.2004/ INBio-OET-ALAS transect” (INBC 8, JPPC 5, SNSD), same label except 12.-18.4.2004 (CWOB 2, JPPC 3); COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. [#] [date]/ R.J. Marquis coll.”, with the following identifiers and dates: 86, 1-IX 1980; 368, 30-IV 1981; 688, 26-XI 1981; 778, 26-I 1982 (NMNH 4); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis, coll./ No. [#] [date]”, with following identifiers and dates: 119, 19-X 1980; 916, 25-IV 1982; 1052, 28-VI 1982; 1058, 30-VI 1982; 1182, 14-IX 1982 (NMNH 5); “COSTA RICA: Prov./ Herdia, F. La Selva/ 3 km S Pto. Viejo/ 10° 26' N 84° 01' W”, “28.vii.1976/ J. Solomon” (CHAH); “COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100m/ 20°26'N 84°01'W”, “19-22.2.2000” (JPPC); same label except 20.IV.2001 (JPPC); “Est. Magsasay, 200 m, P. N./ Braulio Carrillo, Prov. Here.,/ COSTA RICA. Jul 1991. A./ Fernández. L-N-264600, 531000”, CRI001 378322 (INBC); “COSTA RICA, Prov. Alajuela, Rio/ San Lorencito,

800 m. 31 MAY/ 1997. I.A. Chacón./ L_N_245000_472000 #46891", CRI002 567115 (INBC); "Rio San Lorencito, 900 m/ Res. For. Sn Ramon. 5 km N/ Col. Palmarena, Alajuela/ COSTA RICA. Mar 1990/ Curso Carabidae/ 244500–470700", CRI000 158228 (INBC); "COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°39'W,/ 4–6.iv.2003, leg. J. Prena" (JPPC).

Description. Habitus: Fig. 89, total length 4.8–6.3 mm (m=5.6, n=22). Color: integument piceous, basic vestiture of small, light brown scales; scales ochreous in broad, oblique subapical fascia (Fig. 89); pronotum with indistinct dorsolateral vitta of ochreous scales. Head: frontal fovea minute, rostrum moderately robust, subcylindrical, curved (Fig. 90), costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.00–1.08 × (m=1.03, n=15), ♀♀ 1.07–1.19 × (m=1.13, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.27–0.30 × (m=0.29, n=15), ♀♀ 0.31–0.34 × (m=0.32, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.83–0.92 × (m=0.88, n=22) maximum width, sides rounded, greatest width close behind middle, anterior portion tubulate; disk densely punctate, intervals partially confluent. Elytra: length 1.65–1.79 × (m=1.74, n=22) width at humeri, width 1.23–1.33 × (m=1.28, n=22) maximum pronotal width, sides subparallel or very slightly converging in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 costate. Legs: tibiae slightly curved, ventral margin of metatibia slightly bisinuate, metatibia ventrodistally with fringe (♂♂) or short cluster (♀♀) of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 91), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage moderate, angular, fused laterally with base of flagellum, projecting beyond base (Fig. 92).

Plant association. *Piper pseudobumbratum* (Marquis 9, Prena 51).

Distribution. Costa Rica, Atlantic side (Fig. 261).

Specific epithet. The name is a compound adjective adopted from that of the host plant.

Discussion. *Embates pseudobumbraticus* has been collected in two Atlantic provinces of Costa Rica, primarily in lowland habitats from young specimens of *Piper pseudobumbratum*. The South American *E. obliquatus*, of the *E. elongatus* group, has a very similar color-pattern, but this group differs generally by the more elongate rostrum and subconnate claws. *Embates pseudobumbraticus* may be related to the species near *E. biguttatus*, and is quite distinctive among the Middle American species through the well developed post-macular fascia. The male ventrite 5 is sulcate and densely ciliate (as in *E. gracilis*), and the distal margin of the pygidium is emarginate.

22. Embates burgeri Prena sp. n.
(Fig. 93–96)

Ambates sp. 1. Marquis 1991: 200.

Holotype male (dissected), Costa Rica, labeled: “COSTA RICA, Pr. Heredia/ Pto.Viejo-La Selva B.S./ No.827 10–I 1982/ R.J. Marquis coll.”, “Piper/ carrilloanum”, “Ambates/ #1/ det. DRWhitehead” (NMNH).

Paratypes 3 (females), labeled: “COSTA RICA, Pr. Heredia/ Pto.Viejo-La Selva B.S./ No.701 26–XI 1981/ R.J. Marquis coll.”, “Piper/ urophyllum” (INBC); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis coll./ No.1277 18 XII 1982”, “Piper/ carrilloanum”, “Voucher” (NMNH); “COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 1.3.2000/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena” (JPPC).

Description. Habitus: Fig. 93, total length 5.3–5.9 mm (m=5.6, n=4). Color: integument black, vestiture of light yellow and black scales, the latter condensed in subapical elytral fascia and at elytral apices (Fig. 93); sides of pronotum, humeri and some ventral portions with microscopic scales and appearing black. Head: frontal fovea minute, rostrum moderately slender, subcylindrical, curved (Fig. 94), costate dorsomedially, basolateral margin edged, length of rostrum ♂ 1.05 ×, ♀♀ 1.13–1.21 × (m=1.16, n=3) pronotal length, length of ante-antennal portion ♂ 0.40 ×, ♀♀ 0.41–0.43 × (m=0.42, n=3) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.91–0.95 × (m=0.93, n=4) maximum width, sides rounded, greatest width close behind middle, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 1.89–1.92 × (m=1.90, n=4) width at humeri, width 1.18–1.27 × (m=1.23, n=4) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus weak, striae fine, punctures indistinct, interstriae flat, 9 subcostate below preapical callus. Legs: slender, ventral side ciliated in male, tibiae variously curved, ventral margin bisinuate, distally with fringe of dark hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus triangular, middle sclerotized, anterolateral portion membranous (Fig. 95), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 1.8 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage moderate, angular, fused laterally with base of flagellum, projecting beyond base (Fig. 96).

Plant association. *Piper carrilloanum* (Marquis 2, Prena 1), *P. urophyllum* (Marquis 1).

Distribution. Costa Rica, Atlantic side (lower part of ALAS-transect in Fig. 239).

Specific epithet. I dedicate this (my favorite) species to Dr. William Burger, botanist and curator at the Field Museum, in grateful recognition of his outstanding contributions to the knowledge of the Costa Rican flora in general, and the Piperaceae in particular.

Discussion. *Embates burgeri* is known only from the northern foot of Volcan Barva. The characteristic color-pattern of this species derives from two previously isolated elytral maculae (as still present in *E. biguttatus*), which were merged across the suture to an almost perfectly transverse band.

23.Embates thoracicus (Chevrolat)

(Fig. 97–99, 261)

Ambates thoracicus Chevrolat 1877: 344. Holotype female[?], Colombia, labeled: "Nov. Gren./ Magd.", "Typus", "Ambates/ thoracicus/ Chevr.", "232/58" (NHRS). Champion 1907; Hustache 1938 (cat.); O'Brien & Wibmer 1982 (cat.); Wibmer & O'Brien 1986 (cat.)

Ambates vitticollis Chevrolat 1879: CXLIX. Holotype sex not determined, Colombia, labeled: "Honda", "Nova Grenada/ J. Goudot", "Paratypus" [lapsus?], "A. vitticollis/ Chev N. Grenada", "Ambates/ vitticollis", "234/58" (NHRS). Kuschel 1955 (synonymy)

Embates [*thoracicus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 97, total length 4.1–5.7 mm (m=5.0, n=21). Color: integument black, partially piceous; basic vestiture of black scales, white and ochreous scales in apical portion of elytron, in broad dorsolateral and thin dorsomedian pronotal vittae, and some ventral and lateral portions. Head: frontal fovea absent, rostrum rather stout, subcylindrical, curved, subcostate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.05–1.20 × (m=1.13, n=5), ♀♀ 1.08–1.23 × (m=1.15, n=16) pronotal length, length of ante-antennal portion ♂♂ 0.38–0.42 × (m=0.40, n=5), ♀♀ 0.41–0.45 × (m=0.43, n=15) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.78–0.89 × (m=0.81, n=21) maximum width, sides rounded, greatest width close behind middle, anterior portion tubulate. Disk densely and shallowly punctate, intervals forming isolated granula. Elytra: length 1.64–1.82 × (m=1.70, n=21) width at humeri, width 1.21–1.30 × (m=1.25, n=21) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus strongly produced, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae variously curved, expanded dorsoventrally (particularly in males), ventral margin slightly bisinuate, distally with fringe of hairs, tarsal claws small, subconnate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 98), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum thin, half as long as apodemes, transition to curved base gradual, basal appendage moderate, fused subdistally with base of flagellum, projecting beyond base (Fig. 99).

Plant association. *Piper marginatum* (Prena 5)

Rearing records. Stem of *Piper marginatum* (Prena 1)

Distribution. Nicaragua to Brazil, moist situations of disturbed habitats (Fig. 261).

Material examined. NICARAGUA. Managua: El Crucero, 800 m (JPPC, SEAN). Rivas: Isla de Ometepe, Volcán Madera, 200 m (JPPC 2, SEAN). COSTA RICA. Alajuela: Upala, Colonia Libertad, 450 m (MUCR). Guanacaste: Los Almendros, Guanacaste N.P. (INBC); Cerro El Hacha, 600 m (INBC); S Sta. Cecilia, Est. Pitilla, 700 m (INBC). Heredia: Puerto Viejo, Est. La Selva, 100 m (INBC). Puntarenas: Quepos, Manuel Antonio N.P., 80 m (CNCI, JPPC). San José: 2 km S Ciudad Colón, 1100 m (HAHC, JPPC 2). PANAMA. Canal Zone: numerous locations (BMNH, CHAH 4, CMNC 3, CNCI, FAUP, FOEC 3, GBFM 4, HPSC 10, JPPC, NMNH 15, TAMU 2). Coclé: El Valle, 650–700 m (HPS 2, BMNH). Colón: Gatun Lake, north shore (CMNC); Portobelo (NMNH 18). Darién: Cana, 450 m (HPSC 4); Río Tuquesa, 20 m (HPSC); Villa Darién (GBFM). Los Santos: Cerro Canajagua, 800 m (HPSC). Panamá: Cerro Campana, 800–850 m (HPSC 4, NMNH); Ipetí, 150 m (HPSC); Chepo, Altos de Majé (HPSC 5); Llano-Carti rd. km 9, 350 m (HPSC 2); Isla Taboga (BMNH, NMNH 2). COLOMBIA. Río Magdalena (NHRS). Cundinamarca: Bogota (MNHP); Villeta (CWOB). Nariño: Pasto (NMNH). Without location (BMNH 3, MLUH, NMNH). BRAZIL. Espírito Santo [on Río Ica?] (MNHP 2). Total 91 specimens.

Discussion. *Embates thoracicus* is related to *E. tergosignatus* and *E. apicalis*, and can be distinguished from those by its predominantly black vestiture and the notably produced preapical callus. The species appears to be absent in most areas of the Atlantic side of the Cordilleras Central and Talamanca. The distribution matches well with that of its primary host, *Piper marginatum*, a common plant in weedy habitats and in moist situations of deciduous dry forests between Guatemala and Brazil (Burger 1971). The discontinuity in the distributional records between central Panama and northwest Costa Rica (Fig. 261) may have resulted from incomplete sampling.

24. Embates apicalis (Champion)

(Fig. 100–101, 253)

Ambates apicalis Champion 1907: 168. Holotype female, Panama, labeled: "Type", "♀"; "sp. figured", "Bugaba/ Panama/ Champion" (BMNH). Hustache 1938 (cat.); O'Brien & Wibmer 1982 (cat.)

Ambates sp. 2. Marquis 1991: 200

Embates [*apicalis*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 100, total length 3.0–4.8 mm (m=3.9, n=30). Color: integument piceous; basic vestiture of brown and some slender, ochreous scales; ochreous scales condensed in small macula at elytral interstria 5 (indistinct at 3), in apical portion of elytron and in dorsolateral pronotal vitta; venter with slender, light-colored scales. Head: frontal fovea absent, rostrum moderately stout, subcylindrical, curved, subcostate dorso-

medially and dorsolaterally, basolateral margin edged, length of rostrum ♂♂ 1.10–1.23 × (m=1.17, n=11), ♀♀ 1.08–1.23 × (m=1.18, n=17) pronotal length, length of ante-antennal portion ♂♂ 0.39–0.41 × (m=0.41, n=11), ♀♀ 0.39–0.46 × (m=0.42, n=17) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.84–0.94 × (m=0.89, n=29) maximum width, sides rounded, greatest width close behind middle, anterior portion tubulate. Disk densely and shallowly punctate, intervals isolated. Elytra: length 1.56–1.75 × (m=1.67, n=27) width at humeri, width 1.23–1.43 × (m=1.32, n=29) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae moderate, punctures indistinct, interstriae flat, 7 and 9 subcostate. Legs: tibiae variously curved, ventral margin slightly bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (as Fig. 98), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum thin, half as long as apodemes, transition to curved base gradual, basal appendage moderate, fused subdistally to base of flagellum, projecting beyond base (Fig. 101).

Plant association. *Piper hispidum* (Prena 2), *P. urostachyum* (Prena 8).

Distribution. Honduras to central Panama, secondary forests (Fig. 253).

Material examined. HONDURAS. Gracias a Dios: Río Plátano, 5 km W Las Marías (JPPC 3, RDCC). NICARAGUA. Río San Juan: 10 km SE El Castillo (JPPC). Rivas: Isla de Ometepe, Volcán Madera (SEAN). COSTA RICA. Alajuela: 25 km SE Arenal (CWOB). Cartago: Turrialba, 700 m (NMNH). Guanacaste: S Sta. Cecilia, Est. Pitilla, 700 m (INBC). Heredia: Puerto Viejo, La Selva, 100 m (CHAH, CWOB, INBC, JPPC 7, NMNH 23, SNSD); Sarapiquí, Chilamante (CMNC); Braulio Carrillo N.P., Est. Cantarrana, 300 m (JPPC 3), Est. El Ceibo, 500 m (INBC 2, JPPC 3), without site (CNCI 3); 30 km N Cariari, 100 m (INBC). Limón: Tortuguero N.P., 50 m (INBC 5, JPPC 4); Res. Hitoy Cerere, 300 m (JPPC). Puntarenas: Monteverde (CWOB); Osa, P.N. Corcovado, 50 m (INBC). San José: Zurquí de Moravia, 1600 m (CNCI). PANAMA. Bocas del Toro: 4 km W Chiriquí Grande, 200 m (JPPC 2); 15 km SSW Changuinola, 200 m (JPPC). Canal Zone: Fort Sherman (CWOB 4, TAMU); Gatun dam (HPSC); Coco Solo Hospital (CWOB 2, CMNC, HPSC 2). Chiriquí: Bugaba (BMNH). Coclé: El Valle, 700–850 m (HPSC 2). Total 86 specimens.

Discussion. *Embates apicalis* can be confused with several species of equally small size. *Embates tergosignatus* and *E. thoracicus* are slightly stouter, have very narrow elytral striae and flat interstriae. *Embates gracilis* is more slender, and has a shorter rostrum. *Embates todillofasciatus* is larger and more elongate. The distinction of these species is straight forward when the vestiture is intact and can be used for identification.

25. Embates pictipennis (Champion)
(Fig. 102–104, 255)

Ambates pictipennis Champion 1907: 164. Holotype male, Panama, labeled: "Type", "♂", "Spec. figured", "Bugaba 800–1500 ft/ Champion" (BMNH). Paralectotypes 2, here designated: Volcán (BMNH 2). Hustache 1938 (cat., *Batames* to subgenus); O'Brien & Wibmer 1982 (cat.)
Batames pictipennis (Champion). Casey 1922: 4
Embates [*pictipennis*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Similar to Fig. 109, illustrated in original description, total length 4.2–5.8 mm (m=4.8, n=53). Color: integument rufous-castaneous to piceous, basic vestiture of brown and some yellow scales; elytron with variously shaped black macula slightly behind middle, yellow scales condensed in oblique post-macular fascia of various lengths and curvature (Fig. 102), in short streak near elytral apices and dorsolateral pronotal vitta. Head: frontal fovea minute or absent, rostrum slender, subcylindrical, slightly more curved over antennal insertion, costate dorsomedially, basolateral margin roundly edged, length of rostrum ♂♂ 1.15–1.38 × (m=1.28, n=23), ♀♀ 1.19–1.43 × (m=1.34, n=30) pronotal length, length of ante-antennal portion ♂♂ 0.36–0.41 × (m=0.38, n=23), ♀♀ 0.38–0.45 × (m=0.41, n=30) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.89–1.00 × (m=0.94, n=53) maximum width, sides subparallel to slightly rounded, apical portion rather strongly narrowed and tubulate in front; punctation dense and shallow. Elytra: length 1.85–2.04 × (m=1.95, n=53) width at humeri, width 1.26–1.52 × (m=1.39, n=53) maximum pronotal width, sides subparallel in basal half (sometimes slightly diverging), then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 subcostate distally. Legs: tibiae nearly straight, ventral margin of metatibia more or less curved (Fig. 103), ventrodistally with cluster or indistinct fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus broadly rounded, middle sclerotized, anterolateral portion membranous (Fig. 104), body of aedeagus short, basal third angular, apodemes approximately 4.0 × longer than body of aedeagus, flagellum very thin, nearly as long as apodemes, transition to curved base gradual, basal appendage slender, fused laterally with base of flagellum, barely projecting beyond base (as Fig. 108).

Plant association. *Piper sancti-felicis* (Prena 6), *P. hispidum* s. l. (Prena 14), *P. dilatatum* (Prena 11), *P. glabrescens* (Prena 5), *P. pseudo-fuligineum* (Prena 3), *P. tenuimucronatum* (Prena 2).

Distribution. Costa Rica and Panama, both sides of Cordilleras (Fig. 255).

Material examined. COSTA RICA. Alajuela: Dos Ríos, 600 m (INBC); R.B. San Ramon, Río San Lorencito, 900 m (JPPC 2). Cartago: Turrialba, M.N. Guayabo, 1100 m (JPPC); Tuís, 900 m (JPPC 2). Guanacaste: Est. La Casona, 1520 m (INBC). Heredia: P.N. Braulio Carrillo, Est. El Ceibo, 400 m (INBC 3, JPPC 4). Puntarenas: Buenos Aires, Est.

Altamira (INBC, JPPC 2); Fundación Dúrika, 1700 m (JPPC 8); 6 km S San Vito (CHAH, JPPC 12, SNSD); Osa Península, P.N. Corcovado (CHAH, INBC 2, JPPC 13, NMNH); 12 km NE San Isidro, Cerro Chucuyo, 1350 m (JPPC 13); Manuel Antonio N.P., 80 m (INBC 4, JPPC 8); Monteverde, 1500 m (CMNC 2, CWOB, HAHC). PANAMA. Chiriquí: Volcán, 1300–2000 m (BMNH 2); N Sta Clara (HPSC 2); Las Lagunas, 4 km W Hato del Volcán, 1360 m (CWOB, HAHC 3, HPSC 2); Cerro Punta (CWOB). Total 99 specimens.

Discussion. *Embates pictipennis* represents a puzzling complex of several local populations with black elytral macula, variously developed oblique post-macular fascia and more or less completely reduced ante-macular fascia (occasionally vestigial in interstriae 5 and 6) (Fig. 102). The short median lobe of the aedeagus, the meristic data and transitions in the color-pattern suggest a relationship to several species without black elytral macula, such as *E. discordabilis*, *E. euscheme*, *E. todillofasciatus* and *E. gracilis*. From species of the *E. biguttatus* complex, *E. pictipennis* can be distinguished by its usually more slender shape and the short aedeagus.

26. Embates discordabilis Prena sp. n.

(Fig. 105–108, 254)

Ambates sp. 8. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: “COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 8.-13.4.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003230077 (INBC).

Paratypes 113 (60 males, 53 females), labeled: same label as holotype except 1.3.2000 (JPPC 3), 17.-23.2.2003, INB0003229773–75 (INBC 3); “COSTA RICA: Prov. Heredia:/ 12km SE La Virgen, 550–/ 650m, 10°19'N 84°05'W/ Prena, 15.III.2001/ INBio-OET-ALAS transect” (INBC, JPPC); “COSTA RICA, Pr. Heredia/ Pto.Viejo-La Selva B.S./ No. 402 21-V 1981/ R.J. Marquis coll.”, “Piper sancti-felicis”; same labels with following identifiers, collecting dates, plants: 427, 29.5.81, P. sancti-felicis I; 121, 19.10.80, P. sancti-felicis II; 650, 31.10.81, P. sancti-felicis II; 689, 24.11.81, P. sancti-felicis II; 687, 24.11.81, P. sancti-felicis I; 579, 17.10.81, P. sancti-felicis I; 537, 7.10.81, P. sancti-felicis I (NMNH 8); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis, coll./ No. 948 28.IV.1982”, “Piper sancti-felicis I”; same labels with following identifiers, collecting dates: 882, 6.4.82; 948, 27.4.82; 948, 8.5.82 (NMNH 4); “COSTA RICA. Prov./ Heredia F. La Selva/ 3 km S Pto. Viejo/ 10° 26' N 84° 01' W”, “16.iii.1983/ H.A. Hespenheide” (CHAH); “COSTA RICA. Prov./ Heredia F. La Selva/ 3 km S Pto. Viejo/ 10° 26' N 84° 01' W”, “4.iv.1983/ H.A. Hespenheide” (CHAH); “COSTA RICA.Heredia/ 10 km W. Puerto Viejo/ 170 m. 4.III.1991/ H. & A. Howden” (HAHC); “COSTA RICA, Her.,/ Biol. Sta. La Selva, 50m,/ STR Trail, IX-1-1998,/ C.W. & L.B. O’Brien” (CWOB 2); “Costa Rica, HEREDIA: 3/ km S Puerto Viejo, Est./ Biol. La Selva, 100 m,/ 19.–22.2.2000, leg.

Prena" (JPPC 25); "COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100m/ 10°26'N 84°01'W", "16.III.2001/ leg. J. Prena" (JPPC 2); same labels with following dates: 4 × 18.3.2001, 6 × 7.4.2001, 16.4.2001, 20.4.2001 (JPPC 13, SNSD); "COSTA RICA/ La Virgen del/ Seguro/ Prov. Heredia", "R.J. Marquis coll./ No. 945 7-V-1982", "Piper bisasperatum"; same labels with following identifiers, dates, plants: 1011, 10.6.1982, –; 2 × 941, 8.5.1982, P. epigynium (NMNH 4); "COSTA RICA Here./ Prov., Sarapiqui/ Dist., Chilamate,/ Selva Verde Lod./ II-13/17-1990,/ 50 m., Rifkind & Gum" (CMNC); "COSTA RICA/ F. NEVERMANN/ I X 35", "GUAPILES/ Sta Clara/ 250–300 m" (NMNH); "C.R. Alajuela/ Peñas Blancas/ 9.V.1987/ E. Cruz MT" (HAHC); "Alajuela/ Upala, Faidas/ N.E.V. Tenorio/ 700 m, 19 Ab 1988/ Gonzalez/ Soto, Ureña" (MUCR); "Est. San Ramón Oeste. Prov. Alaju, COSTA/ RICA. 620 m. 3–19 Abr 1994. F. Quesada,/ L N 318100_381900 #2817", CRI001 777234 (INBC); "Sect. San Ramon de Dos Rios, Prov./ Alaju,/ COSTA RICA. 620m. 3–24 ABR/ 1995. M. Chinchilla,/ L N 318100 381900 #5328", CRI002 250589 (INBC); "Sect. San Ramón de Dos Rios, Prov./ Alaju, COSTA RICA, 620m. 18/ MAR–13 ABR 1995. F. A. Quesada,/ L_N_318100_381900 #5274", CRI002 247014 (INBC); "COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°39'W,/ 4–6.iv.2003, leg. J. Prena" (JPPC 5); "COSTA RICA. Cart.-/Limon border. 500m/ 40 km NE Turrialba/ 18 May 1979/ H & A Howden" (HAHC 2); "Costa Rica, CARTAGO:/ 17 km SE Cartago, P.N./ Tapantí, 1200 m,/ 7/ 8.4.2000, leg. Prena" (JPPC 3); "Rio San Lorenzo, 1050m,/ Tierras Morenas, Z.P./ Tenorio, Prov. Guanacaste/ Costa Rica. A.Marin/ 23 mar a 21 abr 1992/ L-N 287800, 427600", CRI000 413279, CRI000 413214 (INBC 2); "Sector Cocori, 30 km al N. de Cariari/ Prov. Limón, COSTA RICA, 100m. Dic/ 1993. E. Rojas,/ L N 286000_567500 #2495", CRI001 647576 (INBC); "Sector Cerro Cocori, Fca./ de E. Rojas, 150 m, Prov./ Limon, Costa Rica, 26 jun/ a 16 jul 1992, E. Rojas/ L-N 286000, 567500", CRI000 702971 (INBC); "Sector Cerro Cocori, Finca de E. Rojas,/ Prov. Limón, COSTA RICA. 150m. Set/ 1993. E. Rojas,/ L N 286000_567500 #2347", CRI001 142512, CRI001 142513, CRI001 142540 (INBC 3); "COSTA RICA. Limón P./ Valle de la Estrella/ Pandora.17–20 Feb.1984/ H & A Howden (HAHC 2); "COSTA RICA, Limón: Hitoy/ Cerere Biol. Res., Valle de la/ Estrella, 300m, 21.–29.i.1996,/ leg. J. Prena" (JPPC 3); "COSTA RICA. Punt./ Monteverde Reserve/ 1500 m 24.V.1979/ H & A Howden" (HAHC); "Panamá: Panamá Pr./ Cerro Campana, 850m/ 8°40'N, 79°56'W/ 30 May '70 H.Stockwell" (HPSC), same label except "12 Mar. '72 Stockwell" (HPSC), 29 May '72 W. Bivin" (NMNH 2); "PANAMA, Pan.2700'/ Cerro Campana/ May 23,1978 CW&LB/ O'Brien & Marshall" (CWOB); "PANAMA/ Cerro Campana/ 12 June, 1975", "Henk & Wim Wolda/ & Miguel Estribi" (CWOB); "PANAMA. Chiriqui Pr./ Mina Cerro Colorado/ 8° 33'N, 81° 49'W./ Elev. 1600 m./ 3 Aug 93 H. Stockwell" (HPSC 2); "PANAMA, Chiriquí: Res./ La Fortuna, 1100 m,/ 8° 44'N 82° 14'W", "Queb. Aleman/ 4.7.1995" (FAUP); "PANAMA, Chiriquí: Res./ La Fortuna, 1100 m,/ 8° 44'N 82° 14'W", "Camino IRHE/ 22.7.1995" (FAUP); "PANAMA, Chiriqui,/ Trail Fortuna to/ Soledad, S-facing/ slope May 20, 1978", "C.W. &

L.B. O'Brien/ & G.B. Marshall (CWOB); "PANAMA, Chiriqui/ Fortuna, 82° 15'W/ 8° 44'N, May 16, 1978/ O'Brien & Marshall (CWOB); "PANAMA, Chiriquí: Res./ La Fortuna, 1100 m,/ 8° 44'N 82° 14'W,/ 21.–25.3.2001, lg. Prena" (JPPC); "PANAMA, Bocas del Toro:/ 15 km SSW Changinola,/ 300 m, 9° 21'N 82° 36'W/ 30.3.–4.4.2001, lg. Prena" (JPPC).

Description. Habitus: Fig. 105, total length 3.2–5.3 mm (m=4.3, n=84). Color: integument piceous, basic vestiture of brown and some scattered yellow scales; yellow scales condensed in dorsolateral pronotal and elytral vittae, distal portion occasionally modified to oblique subapical fascia (Fig. 105). Head: frontal fovea minute or absent, rostrum moderately stout, subcylindrical, costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.03–1.24 × (m=1.13, n=40), ♀♀ 1.08–1.32 × (m=1.19, n=44) pronotal length, length of ante-antennal portion ♂♂ 0.35–0.44 × (m=0.40, n=39), ♀♀ 0.40–0.47 × (m=0.43, n=43) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate (female) or subcylindrical (male, Fig. 106). Pronotum: length 0.79–0.96 × (m=0.89, n=83) maximum width, sides subparallel or slightly rounded in basal half, apical portion rather strongly narrowed and tubulate in front; punctation dense and shallow. Elytra: length 1.75–1.96 × (m=1.86, n=83) width at humeri, width 1.22–1.50 × (m=1.30, n=83) maximum pronotal width, sides subparallel in basal half (sometimes slightly diverging), then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 costate distally. Legs: tibiae nearly straight, ventral margin not sinuate (Fig. 107), ventrodistally with cluster or indistinct fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle sclerotized, anterolateral portion membranous (similar to Fig. 115), body of aedeagus short, basal third angular in lateral view, apodemes approximately 4.0 × longer than body of aedeagus, flagellum very thin, longer than aedeagus including apodemes, transition to curved base gradual, basal appendage slender, fused laterally with base of flagellum, projecting beyond base (Fig. 108).

Plant association. Several species near *Piper hispidum*, such as *P. sancti-felicis* (Marquis 12, Prena 34), *P. epigynium* (Marquis 2, Prena 6), *P. bisasperatum* (Marquis 1, Prena 4).

Distribution. Costa Rica, Atlantic side and western Panama (Fig. 254), possibly Pacific side of Colombia and Ecuador (1 specimen in HAHC, not included in type series).

Specific epithet. The name is a Latin adjective meaning "not corresponding".

Discussion. *Embates discordabilis* is a poorly differentiated complex of local populations with variously developed ante-macular fasciae, which usually blend with the post-macular element to a continuous, dorsolateral vitta. Specimens with a discontinuous dorsolateral vitta (Fig. 105b) occur in the border region of the provinces of Limón (Costa Rica) and Bocas del Toro (Panama). Continuous dorsolateral vittae are present in a number of other species, such as *E. latevittatus* and the *E. leucopleura* complex. In doubtful cases,

those species can be distinguished by the more elongate aedeagus and the shorter flagellum. *Embates discordabilis* is related closely to *E. pictipennis* and *E. euscheme*, and some of their subpopulations approach each other notably. The appendages of *E. discordabilis* are generally stouter than in those two species, but this difference fades in populations from the eastern part of the Cordillera de Talamanca. The type specimen represents the rather uniform and widely distributed population present in the northern Atlantic lowlands of Costa Rica.

27. Embates euscheme **Prena sp. n.**
(Fig. 109–110, 254)

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA. Prov. Heredia, Tajo/ Zurquí, entrando por San Luis, 1500–/ 1600m, 17 ABR 2002, R. González/ Tenorio, Libre, L_N_225053_533910/ #68939", INB0003476599 (INBC).

Paratypes 20 (5 males, 15 females), labeled: "Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m,/ 13.2.2000, leg. Prena" (JPPC 2); same data, except "15.2.2000" (INBC, JPPC), "26.2.2000" (NMNH); "COSTA RICA, S. Jose/ Zurquí de Moravia,/ 1600 m, malaise trap/ III-1996, P. Hanson" (CWOB); "COSTA RICA. Punta./ Monteverde Reserve/ 1500m 29.V.1979/ H & A Howden" (HAHC 2); "COSTA RICA, Punt./ Monteverde, Hotel Bel-/mar, cloud forest, ca./ 4500';V-28.VI-1-1994", "Collectors:/ J. Rifkind, P. Gum" (CWOB); "COSTA RICA, Punt./ Monteverde, Santa/ Elena Preserve,/ 5000', cloud forest", "V-30-1994/ J. Rifkind, P. Gum" (CWOB); "Costa Rica, GUAN/ Sta. Elena Reserve/ 10.22N 84.48W 1400 m/ 3.4.1996 leg. J. Prena" (JPPC, INBC); "Costa Rica, CARTAGO:/ 17 km SE Cartago, P.N./ Tapantí, 1200 m,/ 7/8.4.2000, leg. Prena" (JPPC 2); "PANAMA, Chiriqui,/ Fortuna, 82° 15' W/ 8° 44' N, May 17, 1978/ O'Brien & Marshall" (CWOB, JPPC 2); same data, except "May 19, 1978" (CWOB); "PANAMA. Chiriqui Pr/ 7 km SE Fortuna Dam/ 30 May '93, 1200 m./ A. Gillogly" (HPSC).

Description. Habitus: Fig. 109, total length 4.8–6.6 mm (m=5.8, n=21). Color: integument piceous, legs partially rufous, basic vestiture of brown scales; elytron without dark macula behind middle; yellow scales scattered along elytral striae, condensed in dorsolateral pronotal vitta and on venter, some subpopulations with more or less disintegrated elytral vitta at interstriae 4 and 5 (Fig. 109a, b). Head: frontal fovea absent, rostrum slender, subcylindrical (Fig. 110), costate dorsomedially, basolateral margin roundly edged, length of rostrum ♂♂ 1.28–1.44 × (m=1.33, n=7), ♀♀ 1.32–1.54 × (m=1.44, n=14) pronotal length, length of ante-antennal portion ♂♂ 0.38–0.42 × (m=0.40, n=7), ♀♀ 0.40–0.45 × (m=0.42, n=14) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.93–1.03 × (m=0.97, n=21) maximum width, subconical, sides slightly rounded, anterior portion tubulate; punctation dense and shallow. Elytra: length 1.87–2.08 × (m=2.00, n=21) width at humeri, width 1.29–1.55 × (m=1.44, n=21) maximum pronotal

width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 subcostate distally. Legs: tibiae almost straight, ventral margin straight to bisinuate, metatibia ventrodistally with short fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. pictipennis*.

Plant association. *Piper bisasperatum* (Prena 4), *P. epigynium* (Prena 2).

Distribution. Costa Rica and Panama, evergreen montane forests between 1200 and 1800 m (Fig. 254).

Specific epithet. The name is a Greek adverb meaning “elegant”.

Discussion. I include under *E. euscheme* specimens from four locations in the Cordilleras Central and Talamanca. Those from Monteverde and Cerro Zurquí agree in all details, while the others are smaller and exhibit traces of elytral vittae. The population from La Fortuna includes the smallest specimens (4.8–5.2 mm), which approach morphometrically a sympatrically occurring aberrant subpopulation of *E. discordabilis*, but disagree in the color-pattern. Typical *E. euscheme* occur in Monteverde together with aberrant *E. pictipennis*, the latter approaching the color-pattern of *E. euscheme* but deviating morphometrically. The type of *E. euscheme* is chosen from the material without elytral vitta, and the material from Tapantí and La Fortuna is included under this species in the wider sense. *Embates euscheme* belongs to the large, poorly differentiated complex of species near *E. pictipennis*.

28. Embates uniformis Prena sp. n.

(Fig. 111, 248)

Holotype male, Costa Rica, labeled: “COSTA RICA: Prov. Heredia:/ 6km ENE Vara Blanca, 1950–/ 2050m, 10°11'N 84°07'W/ 15.–16.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003230243 (INBC).

Paratypes 2 (male), labeled: “COSTA RICA, Prov. Cartago:/ Genesis II, 4 km E Cañon,/ 2350m, 9°42.5'N 83°55'W/ 7.3.2005, leg. J. Prena” (JPPC); “COSTA RICA: Heredia/ Cerro Chompipe/ 10°05'20"N, 84°04'30"W/ ca. 2km. N. Monte de la/ Cruz, 2000m, 12.VI.1997/ R. Anderson, cloud forest/ beating, 97-012-X” (CMNC).

Description. Habitus: Similar to Fig. 109, total length 5.3–6.1 mm (m=5.6, n=3). Color: integument dark rufous; basic vestiture of uniform, yellowish scales, flanks and venter with whitish scales. Head: frontal fovea absent, rostrum slender, subcylindrical, costate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.36–1.39 × (m=1.37, n=3) pronotal length, length of ante-antennal portion ♂♂ 0.39–0.40 × (m=0.40, n=3) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.89–0.93 × (m=0.91, n=3) maximum width, relatively small, subconical, greatest width at base, anterior portion tubulate, punctation dense and shallow. Elytra: length 1.89–1.94 ×

(m=1.92, n=3) width at humeri, width 1.43–1.46 × (m=1.45, n=3) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus strongly developed, costate, striae fine, punctures moderate, interstriae flat, 5, 7 and 9 costate subdistally, middle portion of disc slightly raised and with interstriae convex (Fig. 111). Legs: tibiae slightly curved and parallel-sided, distally with cluster and indistinct fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. pictipennis*.

Plant association. *Piper tenuimucronatum* (Prena 2).

Distribution. Costa Rica, evergreen montane forests between 2000–2350 m (Fig. 248).

Specific epithet. The name is a Latin adjective.

Discussion. *Embates uniformis* belongs to the *E. pictipennis* group, as indicated by the short body of the aedeagus and the slender habitus. It can be similar to specimens of *E. euscheme* with reduced elytral vitta, but generally has lighter scales ventrally and laterally, and the preapical callus is raised and costate.

29. Embates gracilis Prena sp. n.
(Fig. 112–113)

Ambates sp. 3. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: “COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100 m/ 20°26'N 84°01'W”, “17.IV.2001/ leg. J. Prena” (INBC).

Paratypes 34 (17 males, 17 females), labeled: as holotype (JPPC 6); as holotype except 19.IV.2001 (JPPC), 7.IV.2003 (JPPC); “COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. [#] [date]/ R.J. Marquis coll.”; with following identifiers and dates: 1, 16-VII 1980 (INBC 3); 84, 31-VIII 1980; 128, 23-X 1980; 405, 26-V 1981; 406, 26-V 1981; 407, 26-V 1981; 517, 1-X 1981; 538, 17-X 1981 (NMNH 6); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis, coll./ No. [#] [date]”, with following identifiers and dates: 188, 28-II 1981; 256 20-III 1981; 259, 21-III 1981; 291, 3-IV 1981; 316, 11-4 1981; 538, 7-X 1981; 838, 15-II 1982 (NMNH 7); “COSTA RICA, Her./ Biol. Sta. La Selva, 50 m./ STR Trail, IX-1-1998,/ W.W. & L.B. O’Brien” (CWOB 5); “COSTA RICA. Prov./ Heredia, F. La Selva/ 3 km S Pto Viejo/ 10° 26' N 84° 01' W”, “2.iv.1980/ H.A. Hespenheide”; same label except “28.iii.1980/ H.A. Hespenheide” (2 ×); “IV-V.1993/ P. Hanson/ Malaise Trap” (CHAH 4).

Description. Habitus: similar to Fig. 105 (sides of pronotum less curved), total length 3.3–4.3 mm (m=3.8, n=35). Color: integument piceous, basic vestiture of medium-sized, irregularly clustered ochreous and brown scales, the former condensed in two small spots at elytral interstria 5 (Fig. 112) and in dorsolateral pronotal vitta. Head: frontal fovea absent, rostrum moderately stout, subcylindrical (Fig. 113), costate dorsomedially and dorsolaterally, basolateral margin edged, length of rostrum ♂♂ 1.03–1.26 × (m=1.12, n=18),

♀♀ 1.08–1.26 × (m=1.15, n=17) pronotal length, length of ante-antennal portion ♂♂ 0.30–0.37 × (m=0.34, n=17), ♀♀ 0.38–0.41 × (m=0.39, n=16) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.75–0.90 × (m=0.86, n=35) maximum width, sides subparallel in basal half, anterior portion tubulate; disk densely and shallowly punctate. Elytra: length 1.76–1.96 × (m=1.88, n=35) width at humeri, width 1.24–1.40 × (m=1.31, n=35) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures moderate, interstriae flat, 7 and 9 partially costate. Legs: tibiae nearly straight, ventral margin slightly bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: similar *E. pictipennis*, with apodemes 3.5 × longer than body of aedeagus.

Plant association. *Piper* sp. near *sancti-felicis* (Marquis 16, Prena 10), *Piper glabrescens* (Marquis 1), *Piper* sp. (Hespenheide 3).

Distribution. Costa Rica, Atlantic side (lower part of ALAS-transect in Fig. 239).

Specific epithet. The name is a Latin adjective meaning “slender”.

Discussion. *Embates gracilis* is one of the smallest species of the genus. Specimens were collected only at La Selva, where they occur on a probably undescribed species near *Piper hispidum* (in the herbarium of La Selva labeled as a form of *P. sancti-felicis*). This piper has leaves very similar to those of *P. sancti-felicis*, but lacks a ligular bract and the stem is covered with short tubercles. The plant seems to be uncommon, and I could not find any specimens outside La Selva. The short body of the aedeagus, the habitus and the plant association place *E. gracilis* near *E. discordabilis*, *E. pictipennis* and *E. euscheme*.

30. Embates todillofasciatus **Prena sp. n.**

(Fig. 114–116, 257)

Holotype male (dissected), Costa Rica, labeled: “COSTA RICA, Prov. Alajuela, A.C.A./ San Ramón, Reserva Biol Alberto/ Brenes, Rio San Lorencito. 850m./ 19–26 MAR 1999. R. A. Zuñiga./ Manual (red libre) #52478”, INB0003025806 (INBC).

Paratypes 12 (7 males, 5 females), labeled: “COSTA RICA. Prov. San José,/ Cascajal, P.N.B.C., E. Zurquí,/ 0.500Km antes Túnel Zurquí, 1500m./ OCT 1990–ABR 1991. G. Maass./ Intersección. L_N_535200_226800”, INB0003162434 (INBC); “COSTA RICA/ F NEVERMANN”, “TURRIALBA/ 800 M/ SLG. SCHILD” (NMNH); “COSTA RICA, Prov. Cartago:/ P.N. Tapantí, Quebr. Segunda,/ 1200m, 9° 46' N 83° 47' W”, “3.-5.5.2004/ leg. J. Prena” (JPPC); “COSTA RICA, Puntarenas Prov./ Monteverde/ 26 March 1987/ W.E. Steiner” (NMNH); “R. San Lorenzo, 1050m,/ R.F. Cord. Guanacaste/ (Tenorio), Prov. Guan./ COSTA RICA. C./ Alvarado, Jun 1991,/ L-N-287800, 427600”, CRI000 602011 (INBC); “Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m, 26.2.2000,/ leg. Prena” (JPPC), same label except 1.4.2000 (JPPC); “COSTA RICA: Prov.

Heredia:/ 16km SSE La Virgen, 1050–/ 1150m, 10°16'N 84°05'W/ 10.–14.III.2001/ INBio-OET-ALAS transect"; "handcollecting/ leg. J. Prena", INB0003209858 (JPPC), same label except 10.–14.IV.2001, INB0003209941 (INBC); "PANAMA, Chiriqui:/ Palo Alto 1400–1600m/ 10. August 1995/ leg.: F. Oedegaard" (FOEC); "PANAMA, Chir., Res./ For. La Fortuna, Quebra-/ da Aleman, 7-21-1995/ C.W.& L.B. O'Brien" (CWOB); "PANAMA, Chiriquí: Res./ La Fortuna, 1100 m/ 8° 44'N 82°14'W/ 21.–25.3.2001, lg. Prena" (HPSC).

Description. Habitus: similar to Fig. 109, total length 4.2–5.8 mm (m=5.0, n=13). Color: integument piceous, basic vestiture of brown and some light-colored scales, yellow scales condensed in narrow subapical elytral fascia, small spots at interstria 6 (Fig. 114) and dorsolateral pronotal vitta, scales light yellow ventrally. Head: frontal fovea absent, rostrum slender, subcylindrical, curved (similar to Fig. 110), costate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.23–1.37 × (m=1.29, n=8), ♀♀ 1.26–1.34 × (m=1.31, n=5) pronotal length, length of ante-antennal portion ♂♂ 0.38–0.40 × (m=0.39, n=8), ♀♀ 0.41–0.43 × (m=0.42, n=5) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.89–0.99 × (m=0.95, n=13) maximum width, subconical, widest in basal third, anterior portion tubulate; disk densely and shallowly punctate. Elytra: length 1.74–1.85 × (m=1.79, n=13) width at humeri, width 1.35–1.50 × (m=1.41, n=13) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus costate, striae fine, punctures moderate, interstriae flat, 9 costate. Legs: tibiae nearly straight and parallel-sided, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus broadly rounded, middle sclerotized, anterolateral portion membranous (Fig. 115), body of aedeagus short, basal third angular in lateral view, apodemes approximately 2.8 × longer than body of aedeagus, flagellum thin, shorter than apodemes, transition to curved base gradual, basal appendage moderate, fused laterally with base of flagellum, projecting beyond base (Fig. 116).

Plant association. *P. glabrescens* (Prena 2), *P. aequale* (Prena 1), *P. tenuimucronatum* (Prena 1), *P. dotanum* (Prena 1).

Distribution. Costa Rica and Panama, evergreen montane forests of Atlantic side between 800 and 1800 m (Fig. 257).

Specific epithet. The name is a compound Latin participle derived from todillus (thin) and fasciatus (striped).

Discussion. *Embates todillofasciatus* is an uncommon species of the premontane forests in the Cordilleras Central and Talamanca. It belongs to the complex of slender species near *E. pictipennis*, and can be recognized easily by its color-pattern (Fig. 114). The narrow transverse line of light-colored scales derives from the post-macular element of a former elytral macula. The hypothesized ancestral color-pattern can be seen in the South American *E. delicatulus* (Hustache) (Fig. 27).

***31. Embates marchionis* Prena sp. n.**
(Fig. 117–120, 255)

Ambates sp. 6. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: “Sector Cocori, 30 km N. de Cariari, Finca/ E. Rojas, Prov. Limón, COSTA RICA./ 150 m. Abr 1994. E. Rojas,/ L N 286000_567500 #2824”, CRI001 786208 (INBC).

Paratypes 36 (26 males, 10 females), labeled: “Sector Cerro Cocori, Fca. de E./ Rojas, 150 m, Prov. Limón,/ COSTA RICA. Mar 1993. E. Rojas/ L-N-286000 567500”, CRI001 406484 (INBC); “COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. [#] [date]/ R.J. Marquis coll.”, with the following identifiers and dates: 160, 16-II 1982; 529, 7-X 1981; 534, 7-X 1981; 615, 15-X 1981; 746, 10-I 1982 (NMNH 6); 179, 25-II 1980; 431, 31-V 1981; 448, 1-VI 1981; 708, 29-XI 1981 (INBC 4); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis, coll./ No. [#] [date]”, with following identifiers and dates: 24, 17-VII 1980; 454, 3-VI 1981; 483, 27-V 1982; 1004, 6-VI 1982 (NMNH 4); 89, 24-IX 1980 (INBC); “COSTA RICA: Prov./ Heredia, F. La Selva/ 3 km S Pto. Viejo/ 10° 26' N 84° 01' W”; “13.vii.1982/ H.A. Hespenheide”; same label except 1.iv.1985, 4.iv.1985 (2 ×), 16.vi.1985, 16.vii.1993 (3 ×), 26.vii.1996, 31.vii.1993, 25.vi.1991 (CHAH 10); “COSTA RICA: La Selva/ Biol. Sta., successional/ plot: 3–4 years, 26.III.2002/ D. Furth” (CMNC); “Costa Rica, HEREDIA: 3/ km S Puerto Viejo, Est./ Biol. La Selva, 100 m,/ 19.–22.2.2000, leg. Prena” (JPPC 2); “COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100 m/ 20°26'N 84°01'W”, “16.III.2001/ leg. J. Prena”; same label except 17.IV.2001 (3 ×), 19.IV.2001 (3 ×), (CWOB, JPPC 6).

Description. Habitus: Fig. 117, total length 6.2–9.1 mm (m=7.5, n=34). Color: integument piceous; basic vestiture of brown and ochreous scales, the latter condensed along elytral striae, scales light yellow in two V-shaped elytral fasciae (Fig. 117), in dorsolateral and dorsomedian pronotal vittae and on flank. Head: frontal fovea absent, rostrum stout, subcylindrical (Fig. 118), subcostate dorsomedially in males, basolateral margin rounded, length of rostrum ♂♂ 0.80–0.95 × (m=0.88, n=25), ♀♀ 0.90–0.98 × (m=0.93, n=9) pronotal length, length of ante-antennal portion ♂♂ 0.27–0.33 × (m=0.30, n=25), ♀♀ 0.33–0.36 × (m=0.34, n=9) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.85–0.93 × (m=0.89, n=34) maximum width, sides rounded, greatest width shortly behind middle, anterior portion tubulate, disk densely and shallowly punctate. Elytra: length 1.75–1.90 × (m=1.82, n=33) width at humeri, width 1.12–1.25 × (m=1.18, n=33) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae straight and parallel-sided, distally with cluster of yellow hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus subtriangular, middle sclerotized, anterolateral portion membranous (Fig. 119), body

of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base abrupt, basal appendage moderate, fused laterally with base of flagellum, projecting beyond base (Fig. 120).

Plant association. *Piper colonense* (Marquis 1, Prena 10), *P. culebranum* (Marquis 2), *P. decurrens* (Marquis 1), *P. sancti-felicis* (Marquis 1), *P. sinugaudens* (Marquis 2), *Piper* sp. (Hespenheide 4, Marquis 2).

Distribution. Costa Rica, Atlantic side (Fig. 255).

Specific epithet. The species name is the genitive case of marchio, Latin for Marquis. I dedicate this species to Dr. Robert J. Marquis, St. Louis for his studies on the interactions of insects with species of *Piper* at La Selva.

Discussion. *Embates marchionis* is recognized readily by its color-pattern, large size and short rostrum. The relationship to the other species of the genus remains unclear.

32. Embates peperomiae **Prena sp. n.**
(Fig. 121–123, 246)

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA: Prov. Heredia:/ 6km ENE Vara Blanca, 1950–/ 2050m, 10°11'N 84°07'W/ 10./11.3.2000/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena" (INBC).

Paratypes 17 (12 males, 5 females), labeled: as holotype (JPPC 3); as holotype except 20.4.2002, 20/RG/RVC/011 (INBC 2, JPPC), 21.4.2002, 20/M/03/083 (INBC); "Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m, 1.4.2000,/ leg. Prena" (INBC, JPPC); "COSTA RICA, Prov. Heredia:/ P.N. Braulio Carrillo, Cerro/ Zurquí, 5 km N San Isidro,/ 1700 m, 10°03'N 84°01'W/ 10.3.2005, leg. J. Prena" (JPPC); "COSTA RICA, Cartago/ 4 km. NE. Cañon Genesis/ II, 2350 m, VI-1995,/ malaise trap, P. Hanson" (CWOB); "COSTA RICA, Cart. 4/ km. NE. Cañon, Gene-/ sisII, 2350m. VIII-27-/ 1998, C.W. & L. O'Brien" (CWOB); "COSTA RICA: Prov. San José:/ R.F. Los Santos, Fca. E./ Serrano, Hwy. km 70, 2600-/ 2700m, 9°38'N 83°51'W/ leg. J. Prena, 13.-16.5.2004" (JPPC); "COSTA RICA, Prov. Limón:/ P.N. La Amistad, Valle del/ Silencio, 10km NE Altamira,/ 2500 m, 9°08'N 82°58'W,/ 26.2.05, coll. R.S. Anderson" (CMNC 3); "PANAMA: Chiriqui/ 6 km. N.E. Boquete/ 14–19.VI.1996, 1650 m/ J. Ashe & R. Brooks/ F.I.T. #180" (CMNC).

Description. Habitus: Fig. 121, total length 4.4–5.8 mm (m=5.0, n=14). Color: integument rufous to piceous, legs and rostrum rufous or partially piceous; basic vestiture of cupreous and some light-colored scales, yellow scales condensed in oblique subapical elytral fascia, dorsolateral pronotal vitta (Fig. 121) and on prosternum. Head: frontal fovea minute or absent, rostrum slender, subcylindrical (female as Fig. 125, apex more curved in male), costate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.16–1.41 × (m=1.32, n=10), ♀♀ 1.30–1.41 × (m=1.35, n=4) pronotal length, length of

ante-antennal portion ♂♂ 0.35–0.40 × (m=0.37, n=10), ♀♀ 0.39 × (m=0.39, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.96–1.04 × (m=1.00, n=14) maximum width, subparallel in basal third, then more or less gradually converging, anterior portion tubulate; disk moderately punctate, intervals confluent. Elytra: length 1.85–1.96 × (m=1.91, n=14) width at humeri, width 1.47–1.57 × (m=1.53, n=14) maximum pronotal width, sides subparallel in basal fourth, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus rather strongly developed, not costate, striae fine, punctures moderate, interstriae flat, none costate. Legs: tibiae slightly curved, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle membranous, anterolateral portion sclerotized (Fig. 122), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.2 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage elongate, fused subdistally with base of flagellum, projecting far beyond base (Fig. 123).

Plant association. *Peperomia lancifolia* (Prena 8), *P. alata* (Prena 2), *P. dotana* (Prena 1).

Distribution. Costa Rica and Panama, evergreen montane forests between 1650 and 2600 m (Fig. 246).

Specific epithet. The name is a Latin noun, first declension, genitive singular, derived from that of the host plant.

Discussion. *Embates peperomiae* is related to *E. galbinus*, with which it occurs in cloud forest habitats of the Cordilleras Central and Talamanca. The association of *E. peperomiae* with *Peperomia* is paralleled by *E. flavolimbatus*, a species without particular relationship to *E. peperomiae*.

33. Embates galbinus Prena sp. n.

(Fig. 124–127, 258)

Holotype male, Costa Rica, labeled: “COSTA RICA: Prov. Heredia:/ 6km ENE Vara Blanca, 1950–/ 2050m, 10°11'N 84°07'W/ 15.–16.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003230241 (INBC).

Paratypes 10 (8 males, 2 females), labeled: as holotype except INB0003230242 (JPPC), 9.3.2000 (JPPC); “Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m,/ 13.2.2000, leg. Prena” (JPPC); “COSTA RICA, Cartago:/ 4 km NE Cañon, Genesis2,/ 2300m, 9°42'N 83°54'W,/ 7.iii.2003, leg. J. Prena” (JPPC); “COSTA RICA, Puntarenas:/ Fundación Dúrika, shelter, 2100m, 9°29'N 83°29'W,/ 2–3.iii.2003, leg. J. Prena” (CWOB, INBC, JPPC 2); “PANAMA. Chiriqui/ 6 km. N.E. Boquete/ 14–19.VI.1996, 1650 m/ J.Ashe & R.Brooks/ F.I.T. #180” (CMNC); “PANAMA. Chiriqui/ 12 km. N.E. Santa Clara/ Cerro Pando, 8° 54.74' N/ 82° 43.29' W, 1875 m/ 17–18.VI.1996, R. Brooks/ F.I.T. #185” (CMNC).

Description. Habitus: Fig. 124, total length 4.6–7.4 mm (m=6.2, n=11). Color: integument rufous, lateral portions piceous; basic vestiture of yellowish scales which turn white toward metasternum, separated from lateral portions by dark scales on pronotum and below preapical callus. Head: frontal fovea minute, rostrum slender, subcylindrical (Fig. 125), costate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.17–1.29 × (m=1.24, n=9), ♀♀ 1.27–1.35 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.37–0.40 × (m=0.39, n=9), ♀♀ 0.43 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.96–1.03 × (m=0.99, n=11) maximum width, subparallel or rounded (large specimens) in basal third, then more or less gradually converging, anterior portion tubulate, punctation dense and shallow. Elytra: length 1.77–1.89 × (m=1.81, n=11) width at humeri, width 1.36–1.48 × (m=1.43, n=11) maximum pronotal width, sides subparallel in basal fourth, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus rather strongly developed, not costate, striae fine, punctures moderate, interstriae flat, none costate. Legs: tibiae slightly curved or straight, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 126), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.2 × longer than body of aedeagus, flagellum thin, nearly as long as aedeagus including apodemes, transition to curved base gradual, basal appendage elongate, fused subdistally with base of flagellum, projecting far beyond base (Fig. 127).

Plant association. *Piper pittieri* (Prena 7), *P. obliquum* (Prena 2).

Distribution. Costa Rica and Panama, evergreen montane forests between 1650 and 2350 m (Fig. 258).

Specific epithet. The name is a Latin adjective meaning “greenish yellow”.

Discussion. *Embates galbinus* is related to *E. peperomiae*, with which it occurs in cloud forest habitats of the Cordilleras Central and Talamanca. The species is quite distinct through its color-pattern.

34. Embates callifer **Prena sp. n.**
(Fig. 128–132, 259)

Holotype male (dissected), Costa Rica, labeled: “Rio San Lorenzo, 1050m./ Tierras Morenas, Z.P./ Tenorio, Prov. Guanacaste/ Costa Rica. M. Segura/ 23 mar a 21 abr 1992/ L-N 287800, 427600”, CRI000 422773 (INBC).

Paratypes 5 (3 males, 2 females), Costa Rica, labeled: “R. Sn Lorenzo, 1050m./ Tierras Morenas, R.F./ Cord. Guanacaste, Prov./ Guan. COSTA RICA./ C. Alvaro, Set 1991,/ L-N-287800, 427600”, CRI000 572337 (JPPC); “R. San Lorenzo, 1050m,/ R.F. Cord. Guanacaste/ (Tenorio), Prov. Guan./ COSTA RICA. C./ Alvaro, Abr 1991,/ L-N-287800, 427600”, CRI000 443589 (INBC); “COSTA RICA: Prov. Heredia:/ 6km ENE Vara

Blanca, 1950–/ 2050m, 10°11'N 84°07'W/ 15.–16.2.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003230244 (JPPC); "COSTA RICA: Hered./ Cerro Chompipe, 10km/ NNE Heredia, 2100m/ 12-27.VI.1997, S.&J./ Peck, ex. montane/ forest, f.i.t., 97-21" (CMNC); "PANAMA, B. del Toro:/ 4 km V Boquete 1700 m/ 9. August 1995/ leg.: F. Oedegaard" (JPPC).

Description. Habitus: Fig. 128 and 132, total length 4.4–7.4 mm (m=6.0, n=6). Color: integument rufous, partially piceous; basic vestiture light yellow, dorsolateral pronotal vitta moderately broad, ill-defined, scales cupreous to dark brown in variable, irregularly shaped elytral macula (Fig. 132b) or only at raised portions of interstriae 2–5 (Fig. 128, 132a) and below subapical callosity; venter with creamy white to light yellow scales. Head: frontal fovea minute or absent, rostrum moderate (Fig. 129) but more slender at high elevations, subcylindrical, costate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.02–1.42 × (m=1.21, n=4), ♀♀ 1.10–1.42 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.36 × (m=0.34, n=4), ♀♀ 0.36–0.37 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.92–1.03 × (m=0.99, n=6) maximum width, sides subparallel to slightly rounded in basal third, anterior portion tubulate; punctation of disk confluent. Elytra: length 1.79–1.82 × (m=1.80, n=3) width at humeri, width 1.34–1.49 × (m=1.44, n=6) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus strongly developed, striae fine, punctures indistinct, interstriae flat, 9 costate, 3, 5 and 7 costate subdistally, callosities at base (interval 3), middle (intervals 2–3) and occasionally in basal third of interval 5. Legs: slender, tibia slightly curved and parallel-sided, ventral margin with distal cluster of yellow hairs, tarsal claws curved and separate at base. Male: apex of aedeagus round, anterolateral portion sclerotized, median portion membranous or narrowly sclerotized (Fig. 130), body of aedeagus relatively short [more elongate in slender specimens], basal third curved in lateral view, apodemes 2.8 × [2.0 × in slender specimens] longer than body of aedeagus, flagellum thin, longer than apodemes, transition to curved base gradual, basal appendage large, pointed, fused distally with base of flagellum, projecting far beyond base (Fig. 131).

Plant association. *Piper tenuimucronatum* (Prena 1).

Distribution. Costa Rica and western Panama, evergreen (pre)montane forests between 1050 and 2100 m (Fig. 259).

Specific epithet. The name is a Latin compound adjective derived from callus (callosity) and fero (to bear).

Discussion. The scarce material available and its morphological heterogeneity combine to uncertainties in the definition of *E. callifer*. The three specimens from Tierras Morenas are larger, stouter, and have a shorter rostrum than the specimens from higher elevations. This may or may not account for the variable proportions of the aedeagus. The specimen from Boquete has a more uniform color-pattern compared to the others, while the dark elytral macula is rather well-defined in the two specimens from elevations above 2000 m in Braulio Carrillo N. P. (Vara Blanca, Chompipe).

35. Embates pullus **Prena sp. n.**
(Fig. 133–135, 259)

Holotype male (dissected), Costa Rica, labeled: "Sirena, Corcovado N.P./ Puntarenas Province/ COSTA RICA. 0–100 m./ G. Fonseca. Nov 1989/ 270500, 508300", CRI000 114108 (INBC).

Paratypes 2 (1 male, 1 female), labeled: "Est. Sirena, P.N. Corco-/ vado, 0–100 m, Prov. Punt.,/ COSTA RICA. G. Fonseca/ Oct 1989,/ L-S 270500, 508300", CRI000 659864 (JPPC); "COSTA RICA. Prov. Puntarenas,/ Golfito, P.N. Corcovado, Est. Sirena,/ Send. Espavel, Bque Primario. 0–100m./ 15 FEB 2001. A. Azofeifa. de Luz./ L S_508300_270500 #61465", INB0003128178 (INBC).

Description. Habitus: total length 5.9–7.2 mm (m=6.4, n=3). Color: integument piceous, antenna and legs dark rufous; basic vestiture of light yellow, ochreous and brown scales, scales velvety black in ill-defined elytral macula between interstriae 2–4, scales white to light ochreous in dorsolateral pronotal vitta and ante- and post-macular elytral fasciae (Fig. 133); venter with whitish scales except on distal 3 ventrites. Head: frontal fovea absent, rostrum moderate, subcylindrical, curved evenly, costate dorsomedially, subcostate dorsolaterally, basolateral margin slightly edged, length of rostrum ♂♂ 1.05–1.12 × (n=2), ♀ 1.20 × pronotal length, length of ante-antennal portion ♂♂ 0.38–0.39 × (n=2), ♀ 0.44 × total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.89–0.95 × (m=0.92, n=3) maximum width, sides rounded, widest in basal third, front tubulate; disk very densely punctate, intervals granulose. Elytra: length 1.72–1.79 × (m=1.75, n=3) width at humeri, width 1.20–1.33 × (m=1.27, n=3) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae moderate, punctures indistinct, interstriae flat, 9 costate. Legs: tibiae slightly curved, ventral margin slightly bisinuate, distally with indistinct fringe of light hairs, tarsal claws flat and connate at base. Male: apex of aedeagus blunt, anterolateral and median portions membranous (Fig. 134), body of aedeagus of moderate length, curved in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum as long as aedeagus and apodemes combined, transition to curved base gradual, basal appendage large, hatchet-shaped, projecting beyond base (Fig. 135).

Plant association. Not known.

Distribution. Costa Rica, Pacific side, Península de Osa (Fig. 259).

Specific epithet. The name is a Latin adjective meaning "dark colored".

Discussion. The relationship of *E. pullus* to other species of *Embates* remains uncertain. Meristic and morphological data indicate a relationship to the Mexican *E. caecus* and several South American species, among them *E. sagax*. The color-pattern bears similarities to those of *E. pusillus* and *E. ornativentris*.

***36. Embates chelys* Prena sp. n.**
(Fig. 136–138, 259)

Ambates sp. 13. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: “Sector Cerro Cocori, Fca./ de E. Rojas, 150m, Prov./ Limon, COSTA RICA, E. Rojas/ Abr 1991,/ L-N-286000, 567500”, CRI000 688348 (INBC).

Paratypes 133 (91 males, 42 females), Costa Rica and Panama, labeled: same label as holotype except: CRI000 688352, CRI000 688355, CRI000 688511, CRI000 688516, CRI000 688525; Jul 1991: CRI000 597103, CRI000 597012, CRI000 597017; CRI000 597261; Set 1991, CRI000 558745; Oct 1991: CRI000 462279, CRI000 488722; Nov 1991: CRI000 566675, CRI000 566677, CRI000 566683, CRI000 566684, CRI000 566689, CRI000 566702; Oct 1992: CRI000 923947–48, CRI000 934855, CRI000 934857; 9 a 30 nov 1992: CRI000 862353, CRI000 862370, CRI000 862372 (INBC 26); “Sector San Ramón, Prov. Alaju, COSTA/ RICA, 620m. 13–28 Mar 1994. D. García,/ L N 318100_381900 #2766”, CRI001 738754 (INBC); “COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°39'W,/ 4–6.iv.2003, leg. J. Prena” (JPPC); “Alajuela/ Upala, Dos Rios/ Orilla R. Cucaracho/ 400m 31 marz 1986/ Gonzalez, Soto/ Quiros” (MUCR); “COSTA RICA, Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis coll./ No. 1018 11-VI 1982”; same label except: No. 387, 7-V 1981; No. 476, 10-IX 1981; No. 810, 7-II 1982; No. 984, 30-V 1982; No. 1018, 11-VI 1982; No. 1047, 23-VI 1982; No. 1068, 4-VII 1982; No. 1103, 9-VIII 1982; No. 1268, 17-XI 1982; No. 1280, 20-XII 1982 (NMNH 11); “COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. 703 28-XI 1981/ R.J. Marquis coll.”; same label except: No. 78, 19-VIII 1981; No. 137, 1-XI 1980; No. 233, 6-III 1981; No. 277, 29-III 1981; No. 315, 11-IV 1981; No. 545, 10-X 1981; No. 678, 30-VI 1979; No. 780, 26-I 1982; No. 810, 7-II 1982 (NMNH 10); “COSTA RICA, La/ Selva, 1-V 1989/ on Piper cenoclada/ D. Letourneau” (CWOB 2); “COSTA RICA: Prov./ Heredia, F. La Selva/ 3 km S Pto. Viejo/ 10°26'N 84°01'W”, “4 V 1980/ H.A. Hespenheide” (CHAH); “COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100m/ 20°26'N 84°01'W”, “20.II.2000/ leg. J. Prena” (JPPC 8, TAMU), same label except 7.IV.2001 (JPPC 2); “COSTA RICA: Prov. Heredia:/ 11km ESE La Virgen, 250-/ 350m, 10°21'N 84°03'W/ leg. J. Prena, 6.–11.4.2004/ INBio-OET-ALAS transect” (INBC 6, JPPC 3, SNSD), same label except 12.–18.4.2004 (JPPC 2); “COSTA RICA, Prov. Heredia:/ 16km SSE La Virgen, 1050–/ 1150m. 10°16'N 84°05'W/ 10.–14.III.2001/ INBio-OET-ALAS transect”, INB0003209859–62 (JPPC 4); same label except line 4: “Prena, 3.III.2000”, without code (JPPC 3); “COSTA RICA: Prov. Heredia:/ 13km SE La Virgen, 650–/ 750m, 10°18'N 84°05'W/ 22.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003229863–64 (JPPC 2); “COSTA RICA: Prov. Heredia:/ 12km SE La Virgen, 550–/ 650m, 10°19'N 84°05'W/ 22.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003229850 (JPPC); same label

except line 4: “Prena, 15.III.2001”, INB0003210002–03 (INBC, JPPC), without code (JPPC); “COSTA RICA: Prov. Heredia:/ 11km SE La Virgen, 450–/ 550m, 10°20'N 84°04'W/ 12.4.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003230138–39 (JPPC 2); “COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 17.–23.2.2003/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, INB0003229776–83 (JPPC 8); same label except 11.–16.3.2003, INB0003229879–84, INB0003229933 (INBC 5, JPPC 2); 8.–13.4.2003, INB0003230076 (JPPC); “Est. Magsasay, 200 m, P.N./ Braulio Carrillo, Prov. Here.,/ COSTA RICA. Jul 1991. A./ Fernández. L-N-264600, 5321000”, CRI001 337866 (INBC); “Est. Magsasay, 200 m, P.N./ Braulio Carrillo, Prov. Here.,/ COSTA RICA. May 1991. M.A./ Zumbado. L-N-264600, 531000”, CRI001 311157 (INBC); “Est. El Ceibo Braulio/ Carrillo, N.P. Heredia, Pr./ COSTA RICA. 400–600m./ Oct 1989, R. Aguilar &/ M. Zumbado 527700,/ 256500”, CRI000 077801 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guanacaste,/ Costa Rica, 22 set a 14/ oct 1992, C. Moraga,/ L-N 330200, 380200”, CRI000 824449 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, Prov. Guan./ COSTA RICA. C. Moraga/ & P. Rios, Mar 1991,/ L-N-330200, 380200”, CRI000 341960 (INBC); “Estac. Pitilla, 700m, 9km S/ Santa Cecilia, Guanacaste/ COSTA RICA. Mar 1990/ P. Rios, C. Moraga &/ R. Blanco, 330200-380200”, CRI000 212035 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guan. COSTA/ RICA. P. Rios, Ago 1991/ L-N-330200, 380200”, CRI000 608171 (INBC); “Estación Pitilla, 9 km S. Sta. Cecilia, Prov./ Guana. COSTA RICA. 700m. Abr 1994. C./ Moraga, L N 330200_380200 #2841”, CRI001 789830 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guanacaste,/ Costa Rica, 24 ago a 11/ set 1992, P. Rios/ L-N 330200, 380200”, CRI000 845872 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guana. COSTA/ RICA, C. Moraga, 4–25/ Nov 1991./ L-N 330200, 380200”, CRI000 657699 (INBC); “Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guana. COSTA/ RICA, C. Moraga, Jul 1991/ L-N-330200, 380200”, 2 specimens on same pin, CRI000 505846 (INBC 2); “Costa Rica, Pr. Guanacaste/ Est. Pitilla, 9km S Sta. Cecilia/ 700m, P.N. Guanacaste/ 6–12.3.1996 leg. Prena” (JPPC); “COSTA RICA, Limón/ 16 km W. Guápiles/ 400m, IV-V 1989/ col. Paul Hanson”, CRI001 108306 (INBC); “Rio Sardinas, R.N.F.S. Barra del Colorado,/ Prov. Limón, COSTA RICA. 10m. 10–12/ Nov 1993. F. Araya,/ L N 291500_564700 #2446”, CRI001 170189 (INBC); “Est. Hitoy Cerere, 100m, R. Cerere, Res. Biol. Hitoy/ Cerere, Prov. Limon,/ COSTA RICA, G. Garballo/ 7–26 Ene 1992,/ L-N-184200, 643300”, CRI000 870757 (INBC); “PANAMA: CHIRIQUI/ La Fortuna, Hydrologica/ trail, 1150m, 23.V.-9.VI./ 1995, J.S. Ashe &/ R. Brooks, ex: f.i.t. (156)” (CMNC 2); “PANAMA: CHIRIQUI/ La Fortuna, Hydrological/ Trail, 1150m, 21.V.-23.V.1995/ J.S. & A.K. Ashe, #051/ ex F.I.T.” (CMNC); “PANAMA: CHIRIQUI/ Bocas del Toro Border/ La Fortuna, 0.6km/ Contin. divide trail 1150m/ 9–12.VI.1995/ J. Ashe &/ R. Brooks, ex: f.i.t. (186)” (CMNC); “PANAMA: CHIRIQUI/ La Fortuna, 0.5km N./ Contin. divide trail 1080m/ 21–23.V.1995, J.S. & A.K./ Ashe, ex: f.i.t. (043)” (CMNC, HPSC,

JPPC); “PANAMA: CHIRIQUI/ Bocas del Toro Border/ La Fortuna, 0.5km N./ Contin. divide trail, 1100m/ 23.V-9.VI.1995, J. Ashe &/ R. Brooks, ex: f.i.t. (156)” (JPPC 2); “PANAMA, Chiriquí: Res./ La Fortuna, 1100 m,/ 8° 44'N 82°14'W,/ 21.–25.3.2001, lg. Prena” (JPPC).

Description. Habitus: total length 4.1–5.8 mm (m=5.1, n=92). Color: integument piceous, legs and antenna rufous; basic vestiture moderately dense, cupreous, dorsolateral pronotal vitta of cupreous scales moderately broad, ill-defined, elytral vestiture complex: black macula framed by lyre-shaped fascia of beige scales, beige scales in elongate marking in interstria 3, inner striae lined with cupreous scales ("strings of lyre"), indistinct fascia of white scales between metepisternum and subapical callus (Fig. 136); venter with white scales on prosternum and along flank. Head: frontal fovea absent, rostrum moderate, subcylindrical (Fig. 137), apex slightly expanded laterally, costate dorsomedially, subcostate dorsolaterally, basolateral margin edged, length of rostrum ♂♂ 1.02–1.15 × (m=1.09, n=59), ♀♀ 1.04–1.20 × (m=1.12, n=33) pronotal length, length of ante-antennal portion ♂♂ 0.32–0.36 × (m=0.34, n=58), ♀♀ 0.34–0.40 × (m=0.36, n=32) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.94–1.07 × (m=0.99, n=92) maximum width, sides subparallel to slightly rounded in basal third, anterior portion tubulate; disk densely punctate, intervals granulose, subcostate dorsomedially. Elytra: length 1.56–1.67 × (m=1.63, n=88) width at humeri, width 1.34–1.48 × (m=1.41, n=90) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 7 and 9 costate, 5 costate at subapical callus. Legs: slender, tibia slightly curved and parallel-sided, ventral margin with distal cluster of cupreous hairs, tarsal claws curved and separate at base. Male: apex of aedeagus round, anterolateral portion membranous (similar to Fig. 147), body of aedeagus of moderate length, basal third slightly angular in lateral view, apodemes 2.5 × longer than body of aedeagus, flagellum thin, nearly as long as aedeagus including apodemes, transition to curved base gradual, basal appendage elongate, fused distally with base of flagellum, projecting beyond base (Fig. 138a); specimens from La Fortuna with anterolateral portion of aedeagus sclerotized, median portion membranous, basal appendage of flagellum curved, pointed (Fig. 138b).

Plant association. Species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes: *P. cenocladum* (Marquis 13, Prena 24, Letourneau 2), *P. imperiale* (Marquis 3, Prena 1), *Piper* sp. nr. *melanocladum* (Prena 4), *P. biseriatum* (Marquis 2, Prena 1), *P. melanocladum* (Marquis 1, Prena 1), *P. obliquum* (Prena 1), *P. sinugaudens* (Marquis 1).

Rearing records. Stem of *P. cenocladum* (Letourneau 1).

Distribution. Costa Rica and Panama, Atlantic side (Fig. 259).

Specific epithet. The name is a Greek noun for lyre.

Discussion. *Embates chelys* is one of the more common species in Atlantic Costa Rica.

The specimens from La Fortuna, Panama are included under this name, despite deviations in details of the male genitalia. I observed that *Piper cenocladum* is the primary host plant everywhere. *Embates sagittifolicus* is a very similar but distinct species from the Pacific side of the Cordillera de Talamanca, and is associated with *Piper sagittifolium*.

37. Embates sagittifolicus **Prena sp. n.**
(Fig. 139–142, 259)

Holotype male (dissected), Costa Rica, labeled: “Fila Madre, 3 Km SO de Cerro Rincon,/ Prov. Punta, COSTA RICA. 710m. 25/ MAY 1995. A. Azofeifa,/ L S 273000 520000 #5292”, CRI002147000 (INBC).

Paratypes 23 (14 males, 9 females), Costa Rica, labeled: “COSTA RICA, Puntar./ Golfo Dulce, 24km W./ Piedras Blancas, 200m/ II-1992 Hanson (MUCR)”; “Rancho Quemado, 200 m,/ Peninsula de Osa, Prov. Punt.,/ COSTA RICA. 12 a 24 may 1993./ A. Gutiérrez. L-S-292500, 511000”, CRI001 188553 (INBC); “COSTA RICA, San/ Vito, 25–5–1983/ D. Letourneau” (CWOB); “COSTA RICA. Prov. Puntarenas. Coto/ Brus. San Vito. Las Cruces. 1200 m. 6/ JUN 1996. I. A. Chacon. Manual./ L_S_305500_578200 #63316”, INB0003335231–35 (INBC 5); “COSTA RICA, Cañas/ Gordas, Coto Brus/ on *Piper* foliage/ D. Letourneau” (CWOB); “COSTA RICA, Cañas/ Gordas, 3–IX-1988/ feeding on ant-*Piper*,/ D. Letourneau” (CWOB); “COSTA RICA, Prov. Puntarenas, Fila/ Cruces, Fca. Ilama, 1200m, 13 MAY/ 1996. I.A. Chacón./ L_S_303100_568250 #8239”, CRI002 448149; same label, except CRI002 448152 (INBC); “COSTA RICA, Prov. Puntarenas, Fila/ Cruces, Fca. Ilama, 1200m, 6 MAY/ 1996. I.A. Chacón./ L_S_303100_568250 #8237”, CRI002 448050 (INBC); “Costa Rica, PUNTA.: P.N./ Corcovado, Cerro Rincon, 8°/ 31'N 83° 26'W 700 m, 17–/ 19.3.2000, leg. Prena” (JPPC 6, TAMU); “Costa Rica, SAN JOSÉ: 12/ km NE San Isidro, Cerro/ Chucuyo, 9° 26' 15" N 83°/ 36' 55" W, 1350 m./ 28/29.3.2000, leg. Prena” (JPPC 3).

Description. Habitus: total length 4.2–6.6 mm (m=5.7, n=19). Color: integument piceous, legs and antenna rufous; basic vestiture moderately dense, cupreous, dorsolateral and dorsomedian pronotal vittae of light-colored scales thin, elytral vestiture complex, similar to that of *E. chelys* (Fig. 139), black macula bordered anteriorly and posteriorly by fascia of minute scales; venter with white scales on prosternum and along flank, rostrum with erect scales when viewed in profile. Head: frontal fovea absent, rostrum moderate, subcylindrical (Fig. 140), finely costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 0.94–1.05 × (m=0.99, n=12), ♀♀ 0.98–1.11 × (m=1.05, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.34–0.38 × (m=0.36, n=12), ♀♀ 0.35–0.39 × (m=0.37, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.96–1.07 × (m=1.02, n=19) maximum width, gibbous, depressed dorsomedially, sides round, greatest width before middle, anterior portion tubulate; disk densely punctate, intervals

granulose. Elytra: length 1.59–1.82 × (m=1.67, n=19) width at humeri, width 1.27–1.42 × (m=1.35, n=19) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 7 and 9 costate, 5 costate at subapical callus. Legs: slender, tibia slightly curved and parallel-sided, ventral margin with distal cluster of cupreous hairs, tarsal claws curved and separate at base. Male: apex of aedeagus blunt, sides converging, anterolateral portion membranous (Fig. 141), body of aedeagus relatively short, basal third angular in lateral view, apodemes 3.4 × longer than body of aedeagus, flagellum longer than aedeagus and apodemes combined, transition to curved base gradual, basal appendage elongate, fused distally with base of flagellum, projecting beyond base (Fig. 142).

Plant association. *Piper sagittifolium* (Prena 10).

Distribution. Costa Rica (and probably Panama), Pacific side of Cordillera de Talamanca (Fig. 259).

Specific epithet. The name is a Latin adjective derived from that of the host plant.

Discussion. *Embates sagittifolicus* is a sibling species of *E. chelys*. The species can be recognized by the gibbous, medially depressed pronotum, converging elytral sides, erect scales on the venter of the rostrum and the ante-macular fascia.

38. Embates euchasma Prena sp. n.
(Fig. 143–145, 249)

Holotype male (dissected), Costa Rica, labeled: “COSTA RICA, Prov. Alajuela, San/ Ramón, Est Res Biol Alberto Brenes,/ R. San Lorencito. 850m. 19–26 MAR/ 1999. J. Rodrígez. Manual (red, libre)/ L N 245500 470800 #52440”, INB0003053835 (INBC).

Paratypes 42 (23 males, 19 females), Costa Rica and Panama, labeled: “Rio Sn Lorencito, 900m/ Res. For. Sn Ramon, 5 km N/ Col. Palmarena, Alajuela/ COSTA RICA. Mar 1990/ Curso Carabidae/ 244500-4707000”, CRI000 159859 (INBC); “COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°36'W,/ 4.–6.iv.2003, leg. J. Prena” (JPPC); “Orozi/ Costarica”, “1912/ 18”, “Staatl. Museum für/ Tierkunde Dresden” (SNSD); “Costa Rica, CARTAGO:/ 17 km SE Cartago, P.N./ Tapantí, 1200 m,/ 7/ 8.4.2000, leg. Prena” (JPPC); “COSTA RICA, Limón: Hitoy/ Cerere Biol. Res., Valle de la/ Estrella, 300m, 21.–29.i.1996,/ leg. J. Prena” (JPPC); “Est. Hitoy Cerere, 100m,/ R. Cerere, Res. Biol. Hitoy/ Cerere, Prov. Limon,/ COSTA RICA, G. Garballo/ 6–25 Nov 1991,/ L-N-184200, 643300”, CRI000 498875 (INBC); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis coll./ No. 936 8-V-1982”, “Piper/ imperiale” (NMNH); “COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 1.3.2000/ INBio-OET-ALAS transect”, “handcollecting/ leg. Jens Prena”, without barcode (JPPC 4); same label except 17.–23.2.2003, INB0003229807–11 (INBC 5), 11.–16.3.2003, INB0003229889–91 (INBC 3), 17.–20.3.2003, INB0003229967–71 (JPPC 5), 8.–13.4.2003, INB0003230057–65 (CWOB 2, JPPC 7), 14.–20.4.2003,

INB0003230149–51 (CHAH, INBC 2); "COSTA RICA, Prov. Heredia:/ 12km SE La Virgen, 550–/ 650m, 10°19'N 84°05'W/ Prena, 15.III.2001/ INBio-OET-ALAS transect", INB0003210004 (JPPC); "COSTA RICA: Prov. Heredia:/ 13km SE La Virgen, 650–/ 750m, 10°18'N 84°05'W/ 22.2.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003229862 (INBC); "COSTA RICA, Prov. Heredia:/ 16km SSE La Virgen, 1050–/ 1150m, 10°16'N 84°05'W/ 10.–14.III.2001/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003209857 (JPPC); same label except 10.–14.IV.2001, INB0003209942 (INBC); "PANAMA: Cocle Prv./ La Mesa ab. El Valle/ Cerro Caracoral/ 15 Nov 92; el. 800 m/ col. H. Stockwell" (HPSC, JPPC).

Description. Habitus: Fig. 143, total length 4.9–6.5 mm (m=5.7, n=22). Color: integument rufous-castaneous, venter piceous; basic vestiture moderately dense, cupreous, with few clusters of light yellow scales, dorsolateral pronotal vitta indistinct, scales velvety black in variously shaped, oblique elytral macula between interstriae (1)2–5, usually separated from each other by sutural interstriae (Fig. 143a, b); venter with white scales on prosternum and along flank. Head: frontal fovea absent, rostrum rather slender, subcylindrical (Fig. 144), apex slightly expanded laterally, subcostate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 0.97–1.12 × (m=1.06, n=13), ♀♀ 1.06–1.19 × (m=1.14, n=9) pronotal length, length of ante-antennal portion ♂♂ 0.36–0.41 × (m=0.39, n=13), ♀♀ 0.42–0.44 × (m=0.43, n=9) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 slightly longer than 1, club oblong ovate. Pronotum: length 0.95–1.02 × (m=0.99, n=22) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, subcostate dorsomedially or not. Elytra: length 1.75–1.89 × (m=1.83, n=22) width at humeri, width 1.21–1.35 × (m=1.28, n=22) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 9 costate, 7 subcostate near subapical callus. Legs: slender, tibia nearly straight and parallel-sided, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: aedeagus with anterolateral membranous portion variously developed, apex round to notched, middle sclerotized (Fig. 145, or as Fig. 147), body of aedeagus of moderate size, curved in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum thin, longer than apodemes, transition to curved base gradual, basal appendage elongate, slightly curved, fused subdistally with base of flagellum, projecting far beyond base (as Fig. 148).

Plant association. Species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes: *P. euryphyllum* (Prena 24), *P. imperiale* (Marquis 1, Prena 5), *P. biseriatum* (Prena 2), *P. cenocladum* (Prena 1), *P. obliquum* (Prena 1).

Distribution. Costa Rica, Atlantic side and central Panama (Fig. 249).

Specific epithet. The name is a Greek compound noun (chasma = cleft, rip).

Discussion. *Embates euchasma* forms a complex with *E. subulirostris*, *E. cordiger* and *E. oculifer*. The distribution of *E. euchasma* and *E. cordiger* overlaps in Atlantic Costa

Rica (Fig. 249, 258), where *E. euchasma* occurs primarily on *Piper euryphyllum* and *E. cordiger* on *P. cenocladum*. Both species differ in body size, shape of tarsal claws and color-pattern.

39. Embates cordiger **Prena sp. n.**
(Fig. 146–148, 258)

Ambates sp. 12. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: "Sector Cocori, Fca/ de E. Rojas, 150m, Prov./ Limon, COSTA RICA, E/ Rojas, Nov 1991,/ L-N-286000, 567500", CRI000 566428 (INBC).

Paratypes 79 (16 males, 26 females, 37 not sexed), Costa Rica, labeled: same collecting site as holotype (with variants in wording) with following dates and barcodes: Jul 1991, CRI000 597164; Ago 1991: CRI000 582009, CRI000 582022; Nov 1991: CRI000 503445, CRI000 525124, CRI000 525126, CRI000 503442, CRI000 503446, CRI000 566701, CRI000 566703; Ene 1992, CRI000 333405; Mar 1992, CRI000 364783; 26.3–24.4.1992, CRI000 767366; 26.6.–16.7.1992, CRI000 702789; 10.–30.9.1992, CRI000 989589; 9.–30.11.1992, CRI000 862369; Ene 1994: CRI001 855750, CRI001 855796; Feb 1994: CRI001 846605–07; Mar 1994, CRI001 740178 (INBC 23); "COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva", "R.J. Marquis coll./ No. 1056 28-VI 1982", "Piper/ cenocladum"; same label except: No. 931, 2-V 1982; No. 988, 29-V 1982; No. 1068, 4-VII 1982; No. 1033, 20-VII 1982; No. 984, 30-V 1982 (4 ×); No. 237, 9-IV 1981, P. arieianum (NMNH 10); "COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. 266 22-III 1981/ R.J. Marquis coll.", "Piper/ cenocladum" (NMNH); "Costa Rica, HEREDIA: 3/ km S Puerto Viejo, Est./ Biol. La Selva, 100 m,/ 19.–22.2.2000, leg. Prena" (CWOB 2, JPPC 7); "Est. Pitilla, 700m, 9km S/ Sta. Cecilia, P.N. Guana-/ caste, Prov. Guan, COSTA/ RICA, C. Moraga,/ Set 1991/ L-N-330200, 380200", CRI000 519646 (INBC); "Costa Rica, Pr. Guanacaste/ Est. Pitilla, 9km S Sta. Cecilia/ 700m, P.N. Guanacaste/ 6–12.3.1996 leg. Prena" (JPPC); "Rio Sardinas, R.N.F.S. Barra del Colorado,/ Prov. Limón, COSTA RICA. 10 m. 1–14/ Feb 1994, F.V. Araya, L N/ 291500_564700 #2607", CRI001 876874 (INBC); "Rio San Lorenzo, 1050m,/ Tierras Morenas, Z.P./ Tenorio, Prov. Guanacaste/ Costa Rica, C. Alvarado/ 10–20 feb 1992/ L-N 287800, 427600", CRI000 768255 (INBC); "COSTA RICA: Prov. Heredia:/ 11km ESE La Virgen, 250–/ 350m, 10°21'N 84°03'W/ leg. J. Prena, 6.–11.4.2004/ INBio-OET-ALAS transect" (INBC); "COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 17.–23.2.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003229770–72 (JPPC 3); same label except 11.–16.3.2003, INB0003229902–06 (INBC 5), 17.–20.3.2003, INB0003229979–81 (INBC 3), 8.–13.4.2003, INB0003230045–56 (JPPC 12), 14.–20.4.2003, INB0003230152, INB0003230156–60

(INBC 6); "COSTA RICA: Prov. Heredia:/ 12 km SE La Virgen, 550–/ 650m, 10°19'N 84°05'W/ Prena, 9.II.2001/ INBio-OET-ALAS transect", INB0003209979 (INBC); "Alajuela/ Upala, Faldas N./ E.U. Tenorio/ 750 m, 19 Ab 1988/ Gonzalez,/ Soto" (MUCR).

Description. Habitus: total length 4.0–5.8 mm (m=4.7, n=42). Color: integument rufous-castaneous; basic vestiture moderately dense, cupreous, dorsolateral pronotal vitta of cupreous scales moderately broad, ill-defined, scales velvety black in heart-shaped elytral macula (Fig. 146); venter with white scales on prosternum and along flank. Head: frontal fovea absent, rostrum rather slender, curved, subcylindrical (as Fig. 144), apex slightly expanded laterally, subcostate dorsolaterally but not medially, basolateral margin slightly edged, length of rostrum ♂♂ 1.04–1.15 × (m=1.08, n=16), ♀♀ 1.00–1.20 × (m=1.11, n=26) pronotal length, length of ante-antennal portion ♂♂ 0.36–0.39 × (m=0.38, n=16), ♀♀ 0.39–0.44 × (m=0.41, n=26) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.95–1.02 × (m=0.98, n=42) maximum width, sides subparallel to slightly rounded in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, subcostate dorsomedially or not. Elytra: length 1.65–1.82 × (m=1.73, n=41) width at humeri, width 1.26–1.38 × (m=1.33, n=41) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 9 costate, 7 subcostate at subapical callus. Legs: slender, tibia nearly straight and parallel-sided, ventral margin with distal cluster of cupreous hairs, claws separate at base. Male: aedeagus as *E. euchasma*, with apex of aedeagus round (Fig. 147).

Plant association. *Piper cenocladum* (Marquis 10, Prena 27), *P. arieianum* (Marquis 1; association probably accidental).

Distribution. Costa Rica, northern lowlands, Atlantic side (Fig. 258).

Specific epithet. The name is a compound Latin adjective derived from cor (heart) and gero (to exhibit).

Discussion. *Embates cordiger* belongs to the *E. euchasma* complex. The species is restricted to the Atlantic lowlands of Costa Rica (and probably Nicaragua), and can be distinguished from sympatrically occurring *E. euchasma* by the heart-shaped elytral macula, separated tarsal claws and smaller size. They are associated with different plants.

40. Embates subulirostris Prena sp. n.
(Fig. 149–150, 258)

Holotype female, Costa Rica, labeled: "Costa Rica, PUNTA.: 4/ km S San Vito, Wilson/ Bot. Garden, 1100 m,/ 26.3.2000, leg. Prena" (INBC).

Paratype 1, female, labeled: "Costa Rica, San Vito/ V-15–1981/ J.E. Wappes" (CWOB).

Description. Habitus: total length 6.1–6.5 mm (n=2). Color: integument piceous,

antenna rufous; basic vestiture moderately dense, light yellow, dorsolateral pronotal vitta vestigial, scales velvety black in heart-shaped elytral macula (Fig. 149); venter with creamy white scales on prosternum and along flank. Head: frontal fovea absent, rostrum slender, awl-shaped, base slightly incrassate (Fig. 150), apex expanded laterally, base subcostate dorsomedially, basolateral margin slightly edged, length of rostrum ♀♀ 1.13–1.15 × (n=2) pronotal length, length of ante-antennal portion 0.45–0.47 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 slightly longer than 1, club oblong ovate. Pronotum: length 0.97–0.99 × (n=2) maximum width, sides rounded, widest in basal half, anterior portion notably tubulate; disk densely punctate, intervals granulose, subcostate dorsomedially or not. Elytra: length 1.83–1.89 × (n=2) width at humeri, width 1.36–1.38 × (n=2) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 9 costate, 7 subcostate near subapical callus. Legs: slender, tibia nearly straight and parallel-sided, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base.

Plant association. Not known.

Distribution. Costa Rica, Pacific side, Fila Costeña (Fig. 258).

Specific epithet. The name is a compound Latin adjective derived from subula (awl) and rostrum.

Discussion. *Embates subulirostris* can be recognized within the *E. euchasma* complex by its dark integument and the slender, awl-shaped rostrum. Its morphometrical data agree with those of the smaller-sized *E. oculifer*, but deviate significantly from those of the Atlantic sibling species *E. euchasma* and *E. cordiger.*

41. Embates oculifer **Prena sp. n.**
(Fig. 151, 258)

Holotype male (dissected), Costa Rica, labeled: “Costa Rica, SAN JOSÉ: 12/ km NE San Isidro, Cerro/ Chucuyo, 9° 26' 15" N 83°/ 36' 55" W, 1350 m,/ 28/29.3.2000, leg. Prena” (INBC).

Paratypes 10 (8 males, 2 females), Costa Rica, same label (CWOB, INBC 2, JPPC 7).

Description. Habitus: total length 3.7–4.7 mm (m=4.1, n=11). Color: integument rufous-castaneous, venter piceous; basic vestiture moderately dense, cupreous, dorsolateral pronotal vitta of cupreous scales broad, ill-defined, scales velvety black in pentagonal elytral macula (Fig. 151); venter with white scales on prosternum and along flank. Head: frontal fovea absent, rostrum rather slender, curved, subcylindrical (as Fig. 144), apex slightly expanded laterally, subcostate dorsomedially, basolateral margin slightly edged, length of rostrum ♂♂ 1.11–1.27 × (m=1.18, n=9), ♀♀ 1.18–1.24 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.42–0.45 × (m=0.43, n=9), ♀♀ 0.47–0.49 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of

funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.95–1.01 × (m=0.98, n=11) maximum width, sides subparallel to slightly rounded in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, subcostate dorsomedially. Elytra: length 1.83–1.92 × (m=1.88, n=11) width at humeri, width 1.32–1.39 × (m=1.35, n=11) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, 9 costate, 7 subcostate near subapical callus. Legs: slender, tibia nearly straight and parallel-sided, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: aedeagus as *E. euchasma*, with apex round (as Fig. 147).

Plant association. Species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes: *P. maxonii* (Prena 6), *P. imperiale* (Prena 4), *P. fimbriculatum* (Prena 1).

Distribution. Costa Rica, Pacific side, one location near San Isidro (Fig. 258).

Specific epithet. The name is a Latin compound adjective derived from oculus (spot, stigma) and fero (to bear).

Discussion. The meristic data indicate that *E. oculifer* is related more closely to the larger-sized *E. subulirostris* rather than to the similarly small *E. cordiger* from the Atlantic side. Both small-sized species differ significantly ($p<0.001$) in the length of the rostrum, antennal insertion, elytral proportion and total length. However, *E. oculifer* and *E. subulirostris* differ in total length only ($p<0.001$). I infer that *E. subulirostris* and *E. oculifer* are Pacific relict populations that became isolated geographically by climatic changes in the past. It should be noted, that male *E. oculifer* have medially depressed ventrites, while this character state is unreliable for sexing *E. cordiger.*

42. Embates heilipoides (Chevrolat)

(Fig. 152–154, 241)

Ambates heilipoides Chevrolat 1877: 343. Holotype male, Mexico, labeled: "1107", "Teapa", "322", "Paratypus" [lapsus?]; "heilipoides Chevr" (NHRS). Hustache 1938 (cat., *Cholinambates* to subgenus); Blackwelder 1947 (cat.); O'Brien & Wibmer 1982 (cat.)

Cholinambates heilipoides. Casey 1922:6

Embates [*heilipoides*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 152, total length 6.3–8.8 mm (m=7.9, n=5). Color: integument dark brown; basic vestiture of minute scales; scales yellow to creamy white in broad dorsolateral pronotal and compound elytral vittae (Fig. 152a, b); venter with small yellow scales on prosternum and along flank. Head: frontal fovea deep, rostrum moderate, subcylindrical (Fig. 153, 154), sides attenuated between apex and antennal insertion, subcostate dorsomedially (♂♂) or not (♀♀), basolateral margin slightly edged, length of rostrum ♂♂ 1.22–1.39 × (n=2), ♀♀ 1.39–1.46 × (m=1.44, n=3) pronotal length, length of ante-antennal

portion ♂♂ 0.35 × (n=2), ♀♀ 0.39–0.43 × (m=0.41, n=3) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.80–0.88 × (m=0.85, n=5) maximum width, sides subparallel in basal third, then roundly narrowed, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.72–1.92 × (m=1.81, n=5) width at humeri, width 1.21–1.35 × (m=1.29, n=5) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 conve × distally. Legs: slender, tibia slightly curved, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known.

Distribution. Southern Mexico, Atlantic side, east of Isthmus of Tehuantepec (Fig. 241).

Material examined. MEXICO. Without site: (MNHP). Tabasco: Teapa (BMNH 4, NHRS, NMNH). Chiapas: Solusuchiapa (CWOB 2); El Bosque (CNCI); Tuxtla Gutiérrez (BMNH, interpreted as San Andrés Tuxtla by Champion); Ocozocoautla, Parque Laguna Bélgica (CWOB). GUATEMALA. Alta Verapaz: Telemán (BMNH). Total 11 specimens.

Discussion. *Embates heilipoides* is related very closely to *E. obliquus*. The records available indicate that *E. heilipoides* occurs in mountainous habitats east of the Isthmus of Tehuantepec, and that *E. obliquus* occurs in mountainous habitats to the west and in the Atlantic lowlands north of the isthmus (Fig. 241). Two specimens, from Telemán and Ocozocoautla, have the ante-macular element of the elytral color-pattern reduced and discontinued from the post-macular element, but fit otherwise in the distribution of *E. heilipoides*.

43. Embates obliquus (Champion)

(Fig. 155–157, 241)

Ambates obliquus Champion 1907: 161. Lectotype male, Mexico, upper of two specimens on same pin, labeled: “Type”, “♂♀”, “Mexico/ Sallé Coll.”, “Toxpam” (BMNH). Paralectotypes supposedly 5 (only 3 located), here designated: Toxpam (BMNH); Sontecomapan (BMNH 2). Hustache 1938 (cat.); Blackwelder 1947 (cat.); Wibmer & O’Brien 1986 (cat.)

Ambates sallei; Jekel in litt.

Embates [*obliquus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: as Fig. 152, total length 8.5–10.5 mm (m=9.4, n=15). Color: integument dark brown; basic vestiture of minute scales; scales yellow in subapical elytral fascia (Fig. 155) and variously developed dorsolateral pronotal vitta; venter with small yellow scales on prosternum and along flank. Head: frontal fovea deep, rostrum moderate, subcylindrical (as Fig. 153, 154), sides attenuated between apex and antennal insertion,

subcostate dorsomedially (♂♂) or not (♀♀), basolateral margin slightly edged, length of rostrum ♂♂ 1.24–1.40 × (m=1.30, n=8), ♀♀ 1.42–1.51 × (m=1.45, n=7) pronotal length, length of ante-antennal portion ♂♂ 0.35–0.38 × (m=0.36, n=8), ♀♀ 0.41–0.45 × (m=0.43, n=7) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.77–0.86 × (m=0.82, n=15) maximum width, sides subparallel in basal third, then roundly narrowed, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.72–1.92 × (m=1.80, n=15) width at humeri, width 1.20–1.31 × (m=1.25, n=15) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 conve × distally. Legs: slender, tibia slightly curved, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 156), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 1.9 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage of moderate length, fused subdistally with base of flagellum, projecting beyond base (Fig. 157).

Plant association. Not known.

Distribution. Southern Mexico, Atlantic side, west of Isthmus of Tehuantepec (Fig. 241).

Material examined. MEXICO. Without location: (BMNH 10, MNHP, NMNH, SNSD 2, ZMHB 3). Veracruz: Sontecomapan (BMNH 2, CWOB 2, TAMU); Catemaco area (CMNC, CNCI 2, CWOB 3, HAHC 2); Fortin de las Flores (CWOB); Córdoba (NMNH); El Tropico (CWOB); La Palma (CMNC). Oaxaca: Valle Nacional (HAHC). Veracruz: Tuxpan? [labeled Toxpam]. The Nicaraguan record of *A. obliquus* in O'Brien & Wibmer (1982) refers to *E. flavoplagiatus*. Total 39 specimens.

Discussion. *Embates obliquus* is very closely related to *E. heilipoides*. The records available indicate that both populations are separated geographically by the Isthmus of Tehuantepec (Fig. 241). Single elements of the elytral color-pattern may be modified or reduced in both species. *Embates obliquus* exhibits consistently a subapical elytral fascia of yellow scales, and in some specimens a dorsolateral pronotal vitta. Humeral and antemacular elements are absent in the color-pattern.

44. Embates fasciolatus (Chevrolat)

(Fig. 158, 240)

Ambates fasciolatus Chevrolat 1877: 241. Holotype, sex not determined, Mexico, labeled: "Typus", "Sallé" (NHRS). Champion 1907: 160 (as sp. n. in head-line, lapsus)

Ambates sexpunctatus Champion 1907: 161. Lectotype male, here designated, Mexico, labeled: "sp. figured", "Type", "♂", "Misantla/ Mexico/ Hoege", "B.C.A. Col. iv.5/ Ambates/ sexpunctatus/ Champ." (BMNH). Paralectotype 1, here designated: Misantla (BMNH). New synonymy

Embates [*fasciolatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: figured in Champion (1906–09), total length 9.1–10.1 mm (n=2). Color: integument dark brown; basic vestiture of minute, cupreous scales; scales yellow in thin, variously reduced elytral fascia (Fig. 158a, b); venter with small scales on prosternum and along flank, clustered locally. Head: frontal fovea deep, rostrum moderate, subcylindrical, sides attenuated between apex and antennal insertion, costate dorsomedially, subcostate dorsolaterally (probably not in females), basolateral margin moderately edged, length of rostrum ♂♂ 1.23–1.28 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.32–0.34 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 distinctly longer than 1, club oblong ovate. Pronotum: length 0.88–0.89 × (n=2) maximum width, widest in basal fourth, then roundly narrowed, anterior portion tubulate; disk finely punctate, intervals rugose. Elytra: length 1.75–1.88 × (n=2) width at humeri, width 1.25–1.36 × (n=2) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 convex. Legs: slender, tibia nearly straight, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known.

Distribution. Southern Mexico, Atlantic side, west of Isthmus of Tehuantepec (Fig. 240).

Material examined. MEXICO. Veracruz: Catemaco (CNCI, NMNH); Sontecomapan (BMNH); Misantla (BMNH 2). Oaxaca: San Mateo Yetla (CWOB). Total 6 specimens.

Discussion. The thin elytral fascia is derived from a previous ante-macular element. It is variously reduced in the specimens from Yetla and Misantla. Champion described the latter form as a distinct species, *E. sexpunctatus*. He recognized its close relationship with *E. fasciolatus*, and included *E. obliquus* in this group. However, the elytral fascia of the latter is derived from a previous post-macular element, and the species has different tarsal claws. *Embates obliquus* is related more closely to *E. heilipoides*.

45. Embates flavoplagiatus **Prena sp. n.**

(Fig. 159, 240)

Holotype male (dissected), Nicaragua, labeled: “NICARAGUA, Mat. 7 mi./ N. Matagalpa, 4900'/ VII-15-1974 C.W. & L./ O’Brien & Marshall” (CWOB).

Paratypes 5 (3 males, 2 females), Nicaragua and Honduras, labeled: “Nica (Matagalpa):/ Fuente Pura/ 10–iv-94/ Col. J.M. Maes &/ A. De La Fuente” (JPPC); “Nica (Matagalpa):/ Fuente Pura/ 26–vi-94/ Maes/Tellez &/ Johnson” (SEAN); “HONDURAS: Dept. Atlantida/ Rio Congregal, 10 km S./ Januca, 400 ft. 27–V-1993/ coll. M.C. Thomas” (CWOB); “HONDURAS:/ La Ceiba/ May 23–30, 1978/ Garry V. Manley” (NMNH); “HONDURAS: El Paraiso/ Los Lavanderos/ Guinope/ 5 June 1988/ RD Cave colr” (JPPC).

Description. Habitus: as Fig. 152, total length 8.6–10.4 mm (m=9.4, n=6). Color: integument dark brown; basic vestiture of minute, cupreous scales; scales light yellow in ovate elytral fascia (Fig. 159); venter with slender whitish scales. Head: frontal fovea deep, rostrum moderate, subcylindrical, sides attenuated between apex and antennal insertion, costate dorsomedially, subcostate dorsolaterally in males, basolateral margin moderately edged, length of rostrum ♂♂ 1.12–1.48 × (m=1.29, n=4), ♀♀ 1.46–148 × (n=2) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.43 × (m=0.39, n=4), ♀♀ 0.37–0.39 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 distinctly longer than 1, club oblong ovate. Pronotum: length 0.79–0.90 × (m=0.84, n=6) maximum width, widest in basal fourth, then roundly narrowed, anterior portion tubulate; disk finely punctate, intervals rugose. Elytra: length 1.79–1.94 × (m=1.85, n=6) width at humeri, width 1.17–1.32 × (m=1.25, n=6) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine to obsolete, punctures distinct, interstriae flat, 9 convex. Legs: slender, tibia nearly straight, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known.

Distribution. Honduras and Nicaragua, evergreen montane forests (Fig. 240).

Specific epithet. The name is a compound Latin participle derived from flavus (yellow, blond) and plagiatus (spotted).

Discussion. *Embates flavoplagiatus* is related most closely to *A. fasciolatus*. The two specimens from Honduras exhibit a slightly shorter rostrum than the specimens of the corresponding sex from Nicaragua.

46. Embates albovittatus (Champion)

(Fig. 160, 256)

Ambates albovittatus Champion 1907: 158. Lectotype male, here designated, Panama, labeled "sp. figured", "Type", "♂", "Bugaba/ Panama/ Champion", "Genus Cholinambates Casey 1922" (BMNH). Paralectotype 1, here designated: Bugaba (BMNH). Hustache 1938 (cat., *Cholinambates* to subgenus)

Cholinambates albovittatus. Casey 1922: 6

Embates [*albovittatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: as Fig. 162, total length 7.9–8.8 mm (m=8.4, n=5). Color: integument piceous, almost black; basic vestiture of minute, yellow to cupreous scales; scales yellow in continuous (actually compound) dorsolateral vitta between anterior margin of pronotum and preapical callus including metepisternum and flank of metasternum (Fig. 160). Head: frontal fovea minute, rostrum moderate, subcylindrical (as Fig. 163), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin

moderately edged, length of rostrum ♂♂ 1.17–1.20 × (m=1.19, n=4), ♀ 1.17–1.31 × (n=1) pronotal length, length of ante-antennal portion ♂♂ 0.35 × (n=4), ♀ 0.38 × (n=1) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 distinctly longer than 1, club oblong ovate. Pronotum: length 0.82–0.87 × (m=0.84, n=5) maximum width, widest in basal third, then roundly narrowed, anterior portion tubulate; disk densely punctate, intervals slightly rugose, dorsomedially subcostate or not. Elytra: length 1.79–1.89 × (m=1.81, n=5) width at humeri, width 1.14–1.22 × (m=1.18, n=5) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 convex. Legs: rather stout, tibia nearly straight, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known.

Distribution. Costa Rica and Panama, Pacific side (Fig. 256).

Material examined. COSTA RICA. Puntarenas: Res. Biol. Carara, Est. Quebrada Bonita, 50 m (INBC, JPPC); P.N. Corcovado (CHAH, INBC); Piedras Negras (SNSD). PANAMA. Chiriquí: Bugaba (BMNH 2). Total 7 specimens.

Discussion. This is one example where similarities in the color-patterns were used to establish unacceptable relationships between species of *Embates*. The Pacific *E. albovittatus* is a sibling species of *E. championi*, from the Atlantic side of the Cordillera Central. The continuous dorsolateral vitta consists of several single elements, which are variously separated from another in the related *E. discissus* and *E. championi*. Single elements of the color-pattern were merged to compound patterns several times in the genus, and this should be interpreted as a convergence rather than a synapomorphy.

47. Embates discissus **Prena sp. n.**
(Fig. 161, 256)

Holotype male (dissected), Panama, labeled: “3 mi W Cocoli/ Panamá”, C.Z. / 30 Aug. ‘74/ H.P. Stockwell” (CMNC).

Paratypes 7 (1 male, 6 females), Panama, labeled: “Panamá: Canal Zone/ Madden Forest Mi. 2.5/ 9° 05' N 79° 39' W”, “12.viii.” (CHAH); “Fort San Lorenzo/ Canal Zone/ 9° 20' N 80° 0' W/ 30 VI 73 Engleman” (CMNC, HPSC) ; “CANAL ZONE,/ Ft. Gulick, on/ weed, Aug. 1979/H. J. Harlan” (CWOB); “Canal Zone,/ Pipeline Road/ May 12, 1978, CW&LB/ O’Brien & Marshall” (CWOB); “7 km SE Gamboa/ Panamá, C.Z./ 8 Oct. ‘80/ H.P. Stockwell”, “♀” (JPPC); “R. Belzer/ Cerro/ Campana/ May 24, 71” (NMNH).

Description. Habitus: as Fig. 162, total length 9.3–10.2 mm (m=9.6, n=5). Color: integument piceous, almost black; basic vestiture of minute, yellow to cupreous scales; scales yellow in dorsolateral pronotal vitta, in compound post-humeral elytral vitta reaching metepisternum and flank of metasternum, and in oblique subapical elytral fascia (Fig. 161). Head: frontal fovea minute, rostrum moderate, subcylindrical (as Fig. 163), sides

attenuated between apex and antennal insertion, subcostate dorsomedially (♂) or not (♀♀), basolateral margin moderately edged, length of rostrum ♂ 1.17 × (n=1), ♀♀ 1.17–1.32 × (n=4) pronotal length, length of ante-antennal portion ♂ 0.34 × (n=1), ♀♀ 0.36–0.38 × (m=0.37, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 distinctly longer than 1, club oblong ovate. Pronotum: length 0.84–0.87 × (m=0.85, n=5) maximum width, widest in basal third, then roundly narrowed, anterior portion tubulate; disk densely punctate, intervals slightly rugose, dorsomedially subcostate or not. Elytra: length 1.75–1.85 (m=1.83, n=5) width at humeri, width 1.15–1.24 (m=1.19, n=5) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 convex to subcostate distally. Legs: rather stout, tibia nearly straight, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known (probably large-leaved species of the *P. imperiale* group, with the shoot-apex emerging from within the leaf-base at flowering nodes).

Distribution. Central Panama (Fig. 256).

Specific epithet. The name is a Latin participle of discindo meaning separated or disconnected.

Discussion. *Embates discissus* is related very closely with *A. albovittatus* and *A. championi*. All specimens of the type series are larger than the *A. albovittatus* I have seen, and the post- and ante-macular elements of the dorsolateral vestiture are separated consistently from each other. Slight differences are apparent also in the shape and sculpture of the rostrum.

48. Embates championi (Casey)

(Fig. 162–163, 256)

Ambates cretifer Pascoe 1880. Champion 1907: 156 (as var., misidentified).

Cholinambates championi Casey 1922: 6. Holotype female, Costa Rica, labeled "♀", "sp. figured", "Holotype", "16339", "Collection/ Schild-Burgdorf/ Costa Rica/ Turrialba", "Cholinambates/ championi/ type 1922 Casey" (BMNH)

Ambates (Cholinambates) championi (Casey). Hustache 1938 (cat.)

Embates [*championi*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 162, total length 7.8–9.8 mm (m=8.8, n=17). Color: integument almost black; basic vestiture of microscopic scales; scales yellow (lowlands) to creamy white (around 1000 m elevation) on prosternum, in lateral pronotal marking and two oblique elytral fasciae (Fig. 162), anterior fascia reaching metasternum. Head: frontal fovea deep, rostrum moderate, subcylindrical (Fig. 163), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin slightly edged, length of

rostrum ♂♂ 1.12–1.25 × (m=1.18, n=7), ♀♀ 1.18–1.34 × (m=1.27, n=10) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.40 × (m=0.36, n=7), ♀♀ 0.37–0.43 × (m=0.40, n=10) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 distinctly longer than 1, club oblong ovate. Pronotum: length 0.83–0.89 × (m=0.86, n=17) maximum width, widest in basal third, then roundly narrowed, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.82–1.96 × (m=1.88, n=17) width at humeri, width 1.13–1.26 × (m=1.20, n=17) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures distinct, interstriae flat, 9 convex. Legs: rather stout, tibia nearly straight, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. obliquus*.

Plant association. Not known.

Distribution. Costa Rica, Atlantic side (Fig. 256).

Material examined. COSTA RICA. Alajuela: Guápiles, 250 m (NMNH). Cartago: Tucurrique, 770 m (SNSD); Turrialba, 500–600 m (BMNH, JPPC, SNSD); Cachí, 1050 m (CWOB). Guanacaste: A.C. Guanacaste, Est. Cacao, 1100 m (INBC 2), Est. Maritza, 600 m (INBC 2); Rincón de la Vieja, Est. Pailas, 800 m (INBC 4). Limón: Res. Biol. Hitoy Cerere, 100 m (INBC); Waldeck, 300 m (NMNH). Puntarenas: Monteverde, 1000–1520 m (CHAH, INBC 3). Total 21 specimens.

Discussion. Champion (1907) assigned the single specimen as a variety to *E. cretifer.* This was one of the very few errors in this otherwise remarkably thorough study of the genus. Casey (1922) gave the specimen a name by referring to Champion's illustration. *Embates championi* is a sibling species of *E. albocinctus* and distinct from *E. cretifer, E. paludicola* and *E. salamandra,* all species with similar color-pattern.

49. Embates justini (Chevrolat)

(Fig. 164–167, 246)

Ambates justini Chevrolat 1877: 343. Holotype female, Colombia, labeled: "Honda", "N 'Grenade/ J 'Goudot", "Typus", "Ambates/ justini/ Chevr.", "228/58" (NHRS). Hustache 1938 (cat.); Blackwelder 1947 (cat.); Wibmer & O'Brien 1986 (cat.)

Embates [*justini*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: similar to Fig. 168, total length 6.3–8.7 mm (m=7.4, n=16). Color: integument castaneous to piceous; scales beige in broad dorsolateral pronotal and elytral vittae (Fig. 164), scales cupreous or brown elsewhere, light-absorbing when viewed from above; venter with beige scales on prosternum and along flank. Head: frontal fovea absent, rostrum moderate, subcylindrical (Fig. 165), sides attenuated between apex and antennal insertion, subcostate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.25–1.30 × (m=1.27, n=7), ♀♀ 1.27–1.37 × (m=1.31, n=9) pronotal length, length of ante-

antennal portion ♂♂ 0.42–0.46 × (m=0.44, n=6), ♀♀ 0.43–0.50 × (m=0.47, n=8) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.88–0.94 × (m=0.91, n=16) maximum width, sides subparallel or slightly rounded in basal half, then roundly narrowed, anterior portion tubulate; disk densely punctate, intervals rugose, subcostate dorsomedially or not. Elytra: length 1.89–2.04 × (m=1.96, n=16) width at humeri, width 1.20–1.32 × (m=1.26, n=16) maximum pronotal width, sides subparallel or very slightly converging in basal half, apices rounded separately, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: moderately stout, tibia slightly bisinuate, ventral margin with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, anterolateral portion membranous, middle sclerotized (Fig. 166 or as Fig. 169), body of aedeagus elongate, basal third angular in lateral view, apodemes 2.2 × longer than body of aedeagus, flagellum very thin, half as long as apodemes, transition to base gradual, basal appendage of moderate length, fused laterally with base of flagellum, not much projecting beyond base (Fig. 167).

Plant association. Not known (probably species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes).

Distribution. Northern Costa Rica to Colombia (Fig. 246).

Material examined. COSTA RICA. Guanacaste: Guanacaste N.P., Est. Cacao, 1000–1400 m (INBC 2, JPPC); Guanacaste N.P., Est. Pitilla, 9 km S Santa Cecilia, 700 m (INBC). Puntarenas: R.B. Carara, Sector Laguna Meándrica, 100 m (INBC); Est. Quebrada Bonita, 50 m (JPPC). PANAMA. Canal Zone: Gamboa 2 mi SSE (CMNC, HPSC 2, JPPC 2). Coclé: La Mesa ab. El Valle, 850 m (HPSC). Colón: Piña Beach (CHAH). Darién: Río Tuquesa, 20 m (HPSC). Panamá: Cerro Campana, 820 m, VI/1975, V/1980 (CWOB, HPSC). COLOMBIA. Cundinamarca: Honda, 230 m (NHRS). Total 17 specimens.

Discussion. *Embates justini* has not been recognized in any collection since its description. The above records extend its known range of distribution into Middle America, to the northwestern spur of the Cordillera Central. Recent collections from South America are not known to me. Two specimens from Colombia (BMNH) belong to *E. justini* in the wider sense, with the elytral vitta more or less disintegrated to three single fasciae.

50. Embates rhombifer (Champion)

(Fig. 168–169, 248)

Ambates rhombifer Champion 1907: 159. Lectotype male, here designated, Panama, labeled: "Type", "♂", "V. de Chiriqui/ below 4000 ft" (BMNH). Paralectotypes 2, here designated: Volcán (BMNH 2). Hustache 1938 (cat.); Blackwelder 1947 (cat.); O'Brien & Wibmer 1982 (cat.)

Embates [*rhombifer*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 168 and Fig. 30, total length 5.7–8.2 mm (m=6.8, n=20). Color: integument rufous-castaneous; basic vestiture of minute, translucent scales, scales yellow in broad dorsolateral and lateral pronotal vittae, compound elytral vitta and apical streak (Fig. 168a, b); venter with minute scales. Head: frontal fovea absent or obsolete, rostrum moderate, subcylindrical, sides attenuated between apex and antennal insertion, not costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.22–1.42 × (m=1.32, n=12), ♀♀ 1.32–1.46 × (m=1.41, n=8) pronotal length, length of ante-antennal portion ♂♂ 0.42–0.46 × (m=0.44, n=12), ♀♀ 0.46–0.49 × (m=0.47, n=8) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 little longer than 1, club oblong ovate (♀♀) to subcylindrical (♂♂). Pronotum: length 0.82–0.92 × (m=0.88, n=20) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk densely punctate, intervals rugose, subcostate dorsomedially or not. Elytra: length 2.00–2.14 × (m=2.07, n=20) width at humeri, width 1.18–1.29 × (m=1.24, n=20) maximum pronotal width, sides subparallel in basal half, apices rounded separately, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate distally. Legs: moderately stout, tibia slightly curved, ventral margin with distal cluster (♀♀) and indistinct fringe (♂♂) of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. justini*, apex less broadly rounded on average (Fig. 169).

Plant association. *Piper arboreum* (Prena 9).

Distribution. Costa Rica and Panama, Pacific side of Cordillera de Talamanca between 1200 and 1720 m (Fig. 248).

Material examined. COSTA RICA. Puntarenas: P.N. Amistad, Las Mellizas, 1300–1440 m (INBC 10, JPPC 9); Sector Altamira, 1200 m (INBC); Las Tablas, 1250 m (INBC). PANAMA. Chiriquí: Volcán de Chiriquí, 800–1300 m (BMNH 3); Las Lagunas, 4 km W Hato del Volcán, 1360 m (HPSC 10, HAHC 12, BMNH 2, TAMU, CWOB, CMNC); 2 km N Santa Clara, 1300 m (HAHC); 2 km W Cerro Punta, 1720 m (HAHC). Total 53 specimens.

Discussion. *Embates rhombifer* belongs to a complex of slender, mostly South American species with more or less separately rounded elytral apices. The complex is represented in Middle America by *E. justini*, *E. rhombifer*, *E. consimilis* and *E. rutilus*. The first two species have separated claws and a short aedeagal flagellum with short basal appendage, while the latter two species have subconnate claws and a more elongate flagellum with projecting basal appendage. *Embates rhombifer* is another example for a spatially isolated population on the Pacific side of the Cordillera de Talamanca, that demonstrates close relationship to South American species.

51. Embates consimilis **Prena sp. n.**
(Fig. 170–173, 248)

Holotype male (dissected), Panama, labeled: “Panamá: Panamá Pr./ Cerro Campana, 850 m/ 8° 40' N, 79° 56' W/ 29 Apr. ‘70 Stockwell” (CMNC).

Paratypes 25 (12 males, 13 females), Panama, labeled: “PANAMA C.Z./ Barro Colorado/ 11–17 Dec 1964/ K.W. Cooper” (NMNH 2); “CANAL ZONE, Barro/ Colorado Island/ II-6-1975/ H. Wolda” (JPPC 2); “Panama: Canal Zone/ Barro Colorado Is./ 9° 10' N 79° 50' W”, “12.vii.1969/ H.A. Hespenheide” (CHAH); “Madden Forest/ Panama C.Z./ 9 Jan. ‘70/ H.P. Stockwell” (JPPC); “Panamá: Canal Zone/ Madden Forest/ 9° 05' N 79° 39' W/ 7 Mar. ‘74 W. Bivin” (NMNH); “PANAMÁ: Colon Prov./ Sta. Rita Ridge 250 m/ 9° 23' N 79° 45' W/ 16 Dec. ‘72” (HPSC); “PANAMA: Pma Pr./ Cerro Campana 600 m, 8° 40', 79° 56' W./ 26 May 96 Stockwell” (HPSC); “Panamá: Panamá Pr./ Cerro Campana, 850 m/ 8° 40' N, 79° 56' W/ 27 Feb. ‘71 Stockwell” (CMNC); “PANAMA: Panama Prov./ Cerro Campana/ May 11–15, 1980: E.G./ Riley & D. LeDoux” (CWOB); “PANAMA/ Cerro Campana/ VI-29-1974 C.W. & L./ O’Brien & Marshall” (CWOB), same label except VII-5-1974 and VII-6-1974 (CWOB 2); “PANAMA, Panama,/ Cerro Campana,/ V-17-1993, 850 m./ E.G. Riley” (CWOB); “PANAMÁ: Pmá. Prov./ Cerro Campana 820 m/ 8° 40' N, 79° 56' W/ Stockwell 3 Jun. ‘75” (HPSC); “Cerro Campana, 800 m/ Panamá Prov., R.P./ 29 Apr. ‘70/ H.P. Stockwell” (HPSC); “Panamá: Panamá Pr./ Cerro Campana, 850 M/ 8° 40' N 79° 56' W”, “18.vii.7[6]”, two specimens on the same pin (CHAH 2); “PANAMÁ: Pmá. Prov./ Cerro Campana 820 m/ 8° 40' N 79° 56' W”, “18 July ‘76/ Stockwell” (JPPC), same label except 5 Sept. ‘77 (HPSC); “Cerro Campana 800 M/ Distr. Chame, PANAMÁ/ 3-V-1981/ Col: H.D. Engleman” (CWOB); “PANAMA, Pan./ Cerro Campana/ VII-29-1995/ W.W. & L.B. O’Brien” (CWOB); “PANAMA, San Blas,/ Nusagandi, Ina Trail/ 250–350 m. 7-26-1995/ C.W. & L.B. O’Brien” (JPPC); “PANAMA: San Blas/ Nusagandi, 450 m/ 9° 19' N, 78° 55' W/ 18–21 May 1993/ H.P. Stockwell” (JPPC).

Description. Habitus: Fig. 170, total length 6.8–9.4 mm (m=8.4, n=24). Color: integument rufous-castaneous; basic vestiture of minute, translucent scales, scales yellow in dorsolateral pronotal vitta, compound basal elytral vitta and subapical fascia (Fig. 170a, b); venter with yellow scales on prosternum and along flank. Head: frontal fovea minute, rostrum moderate, subcylindrical (Fig. 171), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.11–1.29 × (m=1.20, n=13), ♀♀ 1.22–1.38 × (m=1.28, n=11) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.44 × (m=0.37, n=12), ♀♀ 0.39–0.44 × (m=0.41, n=12) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.87–0.92 × (m=0.89, n=24) maximum width, sides subparallel to rounded in basal third, then roundly narrowed, anterior portion tubulate; disk densely and very shallowly punctate, intervals very narrow, subcostate dorsomedially or not. Elytra: length 1.79–1.96 × (m=1.87, n=24) width at humeri, width 1.28–1.35 × (m=1.31, n=24) maximum pronotal width, sides sub-

parallel or very slightly converging in basal half, apices rounded separately, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate distally. Legs: moderately stout, tibia slightly curved, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: sides of apex converging gradually, anterolateral portion membranous, apex sclerotized (Fig. 172), body of aedeagus elongate, basal third angular in lateral view, apodemes 1.9 × longer than body of aedeagus, flagellum thin, longer than apodemes, transition to base gradual, basal appendage elongate, fused subdistally with base of flagellum, projecting beyond base (Fig. 173).
Plant association. *Piper cordulatum* (Stockwell 1)

Distribution. Central Panama (Fig. 248).

Specific epithet. The name is a Latin adjective meaning "quite similar".

Discussion. *Embates consimilis* is a close relative of *E. rhombifer*, with some similarities to *E. latevittatus*. The species can be recognized by separately rounded elytral apices, subconnate claws and the color-pattern. In small specimens, the subapical fascia may blend with the dorsolateral elytral vitta, so the color-pattern approaches that of *E. latevittatus*.

52. Embates rutilus Prena sp. n.
(Fig. 174, 248)

Ambates sp. 7. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: "Est. Pitilla, 700 m, 9 km S Sta./ Cecilia, P.N. Guanacaste, Prov./ Guan., COSTA RICA. Feb a mar/ 1993. P. Ríos. L-N-330200, 380200", CRI001 188027 (INBC).

Paratypes 57 (29 males, 28 females), Costa Rica and Panama, labeled: "Sect. San Ramon de Dos Rios, Prov./ Alaju, COSTA RICA, 620m, 25 MAR-12/ ABR 1995. C. Cano./ L N 318100 381900", CRI002 204767 (INBC); "Est. Pitilla. 9 km S. Santa Cecilia, P.N./ Guanacaste, Prov. Guana, COSTA RICA./ 700 m. May 1994, C. Moraga, L N/ 330200_380200 #2999", CRI001 906787 (INBC); "Est. Pitilla, 700m, 9 km S Sta./ Cecilia, P.N. Guanacaste, Prov./ Guana., COSTA RICA. 18 abr a 9/ may 1993. C. Moraga./ L-N-330200 380200", CRI001 308249 (INBC); "Est. Pitilla, 700m, 9 km S/ Sta Cecilia, Prov. Guana./ COSTA RICA. C. Moraga/ Abr 1991./ L-N-330200 380200", CRI000 687160 (INBC); "Estacion Pitilla 9 km S. de Santa/ Cecilia, Prov. Guana, COSTA RICA./ 700 m. JUL 1995. C. Moraga./ L N 329950 380450 #5352", CRI002 173129 (INBC); "Estac. Pitilla, 700m, 9 km S/ Santa Cecilia, Guanac. Pr/ COSTA RICA. Oct 1989/ C. Moraga & P. Rios/ 330200, 380200", CRI000 131966 (INBC); "Est. Pitilla, 700m. 9 km S/ Santa Cecilia, P.N. Guana-/ caste, Prov. Guan. COSTA/ RICA, P. Rios, Set 1991,/ L-N-330200, 380200", CRI000 610372 (INBC); "Rio San Lorenzo, 1050m,/ Tierras Morenas, Z.P./ Tenorio, Prov. Guanacaste/ Costa Rica, Abr 1992/ F. Quesada/ L-N 287800,427600",

CRI000 868149 (INBC); “Rio Sn Lorencito, 900m/ Res. For. Sn Ramon, 5 km N/ Col. Palmarena, Alajuela/ COSTA RICA. Mar 1990/ Curso Carabidae/ 244500-470700”, CRI000 158221 (INBC); “R. San Lorencito, 900 m, R. F. San/ Ramón, 5 km N de Colonia/ Palmareña, Prov. Alaju., COSTA/ RICA. 13–18 Jun 1993. I Curso/ Scarabaeidae. L-N-244500, 470700”, CRI001 365076 (INBC); “Alajuela/ Colonia Libertad,/ Upala (Bosque)/ 450 m, 6-May 1988/ H. Lezama” (MUCR); “Guanacaste/ Parque Nat. Rincon/ de la Vieja, Liberia/ 810 m, 22-Nov 1987/ H. Lezama” (MUCR); “COSTA RICA Prov. Limón, No/ protegida. Hitoy Cerere, Send. Hacia/ Rio Moín. 400 m. 28 SEP 2000. W./ Arana./ L_S_400350_573200 #63419” (INBC); “COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B.S./ No. 83 31-VIII 1980/ R.J. Marquis coll.”, “Piper/ cenocladum”; same label except: No. 234 9-III 1981; No. 678 30-VI 1979; No. 222 6-VII 1981, Piper imperiale; No. 568 15-X-1981, Piper imperiale; No. 752 I-10-1982, Piper biseriatum; No. 660 8-XI 1981, Piper biseriatum; No. 443 VI-1-1981, Piper biseriatum; No. 365 1-V-1981, Piper biseriatum (NMNH 10); “COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva”, “R.J. Marquis coll./ No. 649 1-XI 1981”, “P. melanocladum”; same label except: No. 453, 1-VI 1981; No. 374, 5-V 1981; No. 281, 1-IV 1981; No. 279, 29-III 1981; No. 106, 6-X 1980; No. 57, 30-VII 1980; No. 1321, 5-IX 1979; No. 847, 16-II 1982; No. 1296, 27-IX 1983, Piper #11; No. 1107, 10-VIII 1982, Piper #3; No. 386, 6-V 1981, P. imperiale; No. 935, 28-IV 1982, P. biseriatum; No. 626, 28-X 1981, P. biseriatum; No. 84, 7-II 1982, P. obliquum; No. 637, 29-X 1981, P. arboreum (NMNH 16); “COSTA RICA, Heredia:/ Est. Bio. La Selva, 50–/ 150m, 10°26'N 84°01'W/ Sept 1992, INBio-OET”, CRI001 216979; same label except Aug 1994, CRI001 245333 (INBC 2); “COSTA RICA, Heredia: La Selva Biol. Sta./ 3 km S Pto. Viejo, 100m/ 20°26'N 84°01'W”, “21.IV.2001/ leg. J. Prena”; same label except 19-22.2.2000; 20.IV.2001 (2 ×); 22.IV.2001; 16.III.2001; 18.III.2001 (CHAH, JPPC 6); “COSTA RICA, Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 1.3.2000/ INBio-OET-ALAS transect” (JPPC), 17.–23.2.2003, INB0003229806 (JPPC), 11.–16.3.2003, INB0003229876–77 (INBC 2), 14.–20.4.2003, INB0003230165 (JPPC); “Tucurrique/ Costa Rica”, “Coll Schild/ & Burgdorf” (NMNH); “PANAMA: Chiriqui Pr./ Reserva la Fortuna/ Cont. Divide Trail/ 17-VI-1994, 1200m./ A.R. Gillogly” (HPSC); “PANAMA, Chiriquí: Res./ La Fortuna, 1100 m./ 8° 44'N 82° 14'W, 21.–25.3.2001, lg. Prena” (JPPC); “PANAMA: Chiriqui/ Continental divide trail/ 17 May 1996/ R. Turnbow” (CMNC).

Description. Habitus: as Fig. 170, total length 6.3–8.2 mm (m=7.3, n=51). Color: integument rufous-castaneous; basic vestiture of small to medium-sized cupreous scales, scales yellow in broad dorsolateral pronotal and fuzzy elytral vittae between humerus and preapical callus (Fig. 174); venter with yellow scales on prosternum and along flank. Head: frontal fovea minute or obsolete, rostrum moderate, subcylindrical (as Fig. 171), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.15–1.38 × (m=1.23, n=26), ♀♀ 1.20–1.41 × (m=1.29, n=25) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.39 ×

(m=0.36, n=26), ♀♀ 0.40–0.46 × (m=0.42, n=25) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.82–0.95 × (m=0.89, n=51) maximum width, sides subparallel to slightly rounded in basal half, then roundly narrowed, anterior portion tubulate; disk densely and very shallowly punctate, intervals very narrow, subcostate dorsomedially or not. Elytra: length 1.75–1.98 × (m=1.87, n=48) width at humeri, width 1.26–1.42 × (m=1.32, n=51) maximum pronotal width, sides subparallel in basal half, apices rounded separately, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: moderately stout, tibia slightly curved, ventral margin with distal cluster of cupreous hairs, tarsal claws flat and approximate at base. Male: aedeagus as *E. consimilis*.

Plant association. Several species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes: *P. biseriatum* (Marquis 7, Prena 4), *P. melanocladum* (Marquis 9, Prena 2), *P. cenocladum* (Marquis 3, Prena 3, Letourneau 1, Lezama 1), *P. imperiale* (Marquis 3), *P. euryphyllum* (Marquis 1, Prena 1), *P. arboreum* (Marquis 1), *P. hastigerum* (Prena 1), *P. obliquum* (Marquis 1).

Rearing records. *Piper cenocladum* (Letourneau 1).

Distribution. Costa Rica and Panama, Atlantic side of Cordilleras (Fig. 248).

Specific epithet. The name is a Latin adjective meaning “reddish”.

Discussion. *Embates rutilus* belongs to a group of species with singularly rounded elytral apices, represented in Middle America by *E. justini*, *E. rhombifer* and *E. consimilis*. The elytral vitta is ill-defined in the specimens from the lowlands, but well-limited in the specimens from La Fortuna, at higher elevations.

53. Embates melanops (Champion)

(Fig. 175–176, 262)

Ambates melanops Champion 1907: 162. Lectotype male, here designated, Panama, labeled “sp. figured”, “Type”, “V. de Chiriqui/ 25–4000 ft/ Champion” (BMNH). Paralectotpyes 36, Panama, here designated: Volcán (BMNH 23, NHRS 2, SNSD 4, NMNH 5, ZMHU 2). Hustache 1938 (cat., *Macrambates* to subgenus); Blackwelder 1947 (cat.); O’Brien & Wibmer 1982 (cat.)

Macrambates melanops. Casey 1922: 4 (table) and 5

Embates [*melanops*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: as Fig. 177, total length 6.7–8.8 mm (m=8.0, n=22). Color: integument black (specimen from Cerro Chucuyo castaneous); basic vestiture of minute cupreous and small white scales, pronotal vitta evanescent, scales velvety black in ovate elytral macula (Fig. 175); venter with medium-sized white to cupreous scales on prosternum and along flank. Head: frontal fovea usually deep (absent in specimen from Cerro Chucuyo),

rostrum moderate, subcylindrical (as Fig. 178), sides attenuated between apex and antennal insertion, costate (♂♂) or subcostate (♀♀) dorsomedially, basolateral margin indistinctly edged, length of rostrum ♂♂ 1.00–1.13 × (m=1.05, n=17), ♀♀ 1.11–1.19 × (m=1.15, n=5) pronotal length, length of ante-antennal portion ♂♂ 0.36–0.41 × (m=0.39, n=17), ♀♀ 0.40–0.43 × (m=0.42, n=5) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 little longer than 1, club oblong ovate. Pronotum: length 0.85–0.91 × (m=0.88, n=18) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk punctate, intervals confluent and rugose. Elytra: length 1.69–1.85 × (m=1.79, n=18) width at humeri, width 1.18–1.31 × (m=1.24, n=18) maximum pronotal width, sides very slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine or obsolete, punctures distinct, interstriae flat, 9 subcostate distally. Legs: slender, tibia slightly curved, ventral margin of metatibia with fringe of long, waved yellowish hairs in ♂ (Fig. 179) and of short straight hairs in ♀, tarsal claws flat and approximate at base. Male: apex of aedeagus notched, middle, anterolateral portion and tectum sclerotized (Fig. 176), body of aedeagus of moderate length, basal third slightly angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, nearly as long as apodemes, transition to curved base abrupt, basal appendage thick, fused subdistally with base of flagellum, projecting beyond base (as Fig. 181).

Plant association. *Piper imperiale* (Prena 4), *P. fimbriculatum* (Prena 2).

Distribution. Costa Rica and Panama, Pacific side of Cordillera de Talamanca (Fig. 262).

Material examined. COSTA RICA. Puntarenas: 5 km S San Vito, 1200 m (CHAH 2, CMNC, CWOB, INBC 3, JPPC, TAMU); Cañas Gordas, 1200 m (CWOB 7); Fundación Dúrika, 1700 m (JPPC); Península de Osa, Rancho Quemado, 200 m (INBC 2); Osa, 2.5 mi SW Rincón (CHAH 2); Osa, Fila Madre, Cerro Rincón, 600–700 m (INBC, JPPC); Osa, Fila Matahambre, Est. Agujas, 300 m (JPPC 2). San José: 12 km NE San Isidro, Cerro Chucuyo, 1350 m (JPPC). PANAMA. Chiriquí: Bugaba (SNSD 4, NMNH 4); Volcán, 800–1300 m (BMNH 24, NHRS 2, NMNH, ZMHU 2). Total 63 specimens.

Discussion. *Embates melanops* is related closely to *E. cretifer.* I consider the elytral color-pattern of *E. melanops* as the primitive condition, and that of *E. cretifer* as derived from a previous circumambient line of the elytral macula. The post-macular element of the latter is present in the specimen from Cerro Chucuyo.

54. Embates cretifer (Pascoe)

(Fig. 177–181, 262)

Ambates cretifer Pascoe 1880: 177. Holotype male, Nicaragua, labeled “Type”, “Chontales”, “Pascoe Coll/ 93–60.”, “Ambates cretifer Pasc.”, “Genus (type)/ Cholinambates/ Casey 1922” (BMNH). Champion 1907: 156/57; Hustache 1938 (cat., *Cholinambates* to subgenus); Black-

welder 1947 (cat.); O'Brien & Wibmer 1982 (cat.); Marquis 1991: 181 (illustration), 200 (plant association)

Cholinambates cretifer. Casey 1922: 4 (in table) and 6

Embates [*cretifer*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 177, total length 7.6–11.0 mm (m=9.2, n=31). Color: integument black; basic vestiture microscopic, often abraded; scales yellow (in lowlands) to creamy white (above 800 m elevation) in pronotal and elytral fasciae (Fig. 177), on prosternum, metasternum, metepisternum and sides of ventrite 2, other ventral portions nude. Head: frontal fovea deep, rostrum moderate, subcylindrical (Fig. 178), sides attenuated between apex and antennal insertion, curved, not costate dorsomedially, basolateral margin indistinctly edged, length of rostrum ♂♂ 0.98–1.11 × (m=1.04, n=16), ♀♀ 1.12–1.24 × (m=1.17, n=15) pronotal length, length of ante-antennal portion ♂♂ 0.40–0.43 × (m=0.41, n=16), ♀♀ 0.42–0.45 × (m=0.44, n=15) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.85–0.94 × (m=0.89, n=31) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.64–1.82 × (m=1.75, n=31) width at humeri, width 1.16–1.34 × (m=1.24, n=31) maximum pronotal width, sides very slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine or obsolete, punctures distinct, interstriae flat, 9 convex distally. Legs: slender, tibia slightly curved, ventral margin of metatibia with fringe of long, waved yellowish hairs in ♂ (Fig. 179) and of short straight hairs in ♀, tarsal claws flat and approximate at base. Male: apex of aedeagus membranous, anterolateral portion sclerotized (Fig. 180), body of aedeagus of moderate length, basal third slightly angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, nearly as long as apodemes, transition to curved base abrupt, basal appendage thick, fused subdistally with base of flagellum, projecting beyond base (Fig. 181).

Plant association. *Piper cenocladum* (Marquis 5, Prena 12), *P. biseriatum* (Marquis 7, Prena 4), *P. otophorum* (Marquis 2), *Piper imperiale* (Prena 1), *P. sancti-felicis* (Marquis 1, association probably accidental).

Distribution. Costa Rica and Nicaragua, Atlantic side (Fig. 262); old records from San José Province unconfirmed.

Material examined. NICARAGUA. Chontales: Santo Domingo, 400 m (BMNH 4, NMNH). COSTA RICA. Alajuela: Cariblanco, La Virgen, 400 m (NMNH 2); Carriblanca [=Cariblanco?], Sarapiquí, 835 m (BMNH); Upala, Las Camelias (laguna), 25 m (MUCR); R.F. San Ramón, 5 km N Colonia Palmareña, Río San Lorencito, 900 m (INBC 2); San Carlos, 800 m (BMNH, SNSD); San Cristobal (INBC 2). Cartago: Turrialba, CATIE, 600 m (CWOB, HAHC); Tuís, 720 m (BMNH). Guanacaste: P.N. Rincón de la Vieja (MUCR); Upala, 10 km SW Dos Ríos (INBC); Tierras Morenas, Río San Lorenzo, 1050 m (INBC 2); 9 km S Sta. Cecilia, Est. Pitilla, 700 m (INBC); Río Naranjo, 500 m

(CWOB). Heredia: Puerto Viejo, La Selva, 100 m (CMNC, CHAH, INBC, JPPC 2, NMNH 13); 16 km SSE La Virgen, 1070 m (INBC); 11 km ESE La Virgen, 300 m (INBC 2, JPPC 3); 10 km SE La Virgen, 500 m (INBC 4, JPPC 10). Limón: Cerro Cocorí, 150 m (INBC 2); Guápiles, 350 m (INBC); Reventazon, Hamburg Farm, 50 m (NMNH). Puntarenas: Monteverde, 1400 m (CWOB). San José: (SNSD); Savanillas de Pirrís, 100 m (BMNH). Without location: (BMNH 2). Total of 71 specimens.

Discussion. *Embates cretifer* is an Atlantic species related to *E. melanops*. The "varietal form" of Champion (1907) named *Cholinambates championi* by Casey (1922) is related to *E. albovittatus*. It should be noted, that the color of the scales is yellow in specimens from the lowlands but white in specimens from elevations above 800 m.

55. Embates polymorphus (Champion)

(Fig. 182–186, 247)

Ambates polymorphus Champion 1907: 157. Lectotype male, Panama, here designated, labeled: "sp. figured", "Type", "♂", "V. de Chiriqui/ 25–4000 ft.", "Genus/ Cholinambates/ Casey 1922" (BMNH). Paralectotypes 3, Panama, here designated: Volcán de Chiriquí, without varietal status (5 specimens labeled as var. No. 1–2 are not considered to be type specimens; all BMNH). Hustache 1938 (cat., *Cholinambates* to subgenus)

Cholinambates polymorphus. Casey 1922: 6

Embates [*polymorphus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 182, total length 6.8–11.2 mm (m=9.2, n=59). Color: integument rufous to black; basic vestiture of minute to medium-sized cupreous scales variously intermixed with yellow scales along elytral striae, light yellow to red ochreous scales condensed in dorsolateral and ventrolateral pronotal vittae; compound elytral color-pattern different from place to place (Fig. 183, see diagnosis of subspecies further below); venter with light yellow to red ochreous scales on metasternum, metepisternum and sides of ventrites 2–4. Head: frontal fovea minute or absent, rostrum moderate, subcylindrical (as Fig. 178), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.15–1.40 × (m=1.27, n=39), ♀♀ 1.25–1.41 × (m=1.32, n=20) pronotal length, length of ante-antennal portion ♂♂ 0.33–0.39 × (m=0.37, n=39), ♀♀ 0.36–0.42 × (m=0.39, n=20) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 much longer than 1, club oblong ovate. Pronotum: length 0.79–0.91 × (m=0.86, n=59) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk finely punctate, intervals smooth. Elytra: length 1.82–2.00 × (m=1.93, n=59) width at humeri, width 1.28–1.45 × (m=1.34, n=59) maximum pronotal width, sides subparallel in basal half or slightly converging, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, none costate. Legs: tibiae variously curved, ventral

margin slightly bisinuate, distally with fringe of yellow to brown hairs, tarsal claws flat and approximate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion and tectum membranous (Fig. 185), body of aedeagus of moderate length, basal half angular in lateral view, apodemes 1.9 × longer than body of aedeagus (Fig. 186), flagellum thin, nearly as long as apodemes, transition to curved base abrupt, basal appendage thick, fused subdistally with base of flagellum, projecting beyond base (as Fig. 181).

Plant association. Associated with various large-leafed species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes. Adult specimens hide frequently in the leaf sheath of the petiole.

Distribution. Costa Rica and Panama, evergreen montane forests between 900 and 2500 m (Fig. 247).

Discussion. *Embates polymorphus* can be recognized by the fringe of bristly hairs present on the ventral metatibial edge. Champion included under this name three "varietal forms" with different color-patterns. Those and three others agree well in morphometrical and genital character states. Specimens with different color-pattern usually exhibit allopatry (Fig. 247). All local populations themselves demonstrate various degrees of heterogeneity in the color-pattern. Some color-patterns appear to have very little in common, but these extremes are bridged by intermediate forms of other local populations. There is no question, that *E. polymorphus* is about to disintegrate into an Atlantic and a Pacific complex, but complete separation seems not to have been accomplished yet as evidenced by two specimens of *E. polymorphus* aff. *altrimsecus* from Tierras Morenas. Despite the enormous heterogeneity of the color-pattern, I follow Champion in his opinion and lump the entire material under one species with the apt name *E. polymorphus*, but distinguish the following six subspecies based on the color-pattern and the geographic distribution.

Embates polymorphus polymorphus (Champion)

Diagnosis. Basic vestiture sparse; elytron with dorsolateral vitta of yellow scales continuous (Fig. 182), not connected with metepisternal macula.

Plant association. *Piper imperiale* (Prena 2), *P. obliquum* (Prena 4), *P. pittieri* (Prena 1).

Distribution. Costa Rica and Panama, Pacific side of Cordillera de Talamanca (Fig. 247).

Material examined. COSTA RICA. Puntarenas: Est. Pittier, 1700 m (INBC 2); above Altamira Station, 2100 m (INBC, JPPC); San Vito area, 1100–1450 m (CMNC, CWOB, HAHC, INBC 3, JPPC 2); Fila Cruces, Laguna Gamboa, 1400 m (INBC); Fundación Dúrika, 1900–2100 m (HPSC, JPPC 3). PANAMA. Chiriquí: Volcán, 700–1350 m (BMNH 4); 12 mi NW Rovira, 1300 m (CWOB); Santa Clara, 1300 m (CWOB). Total 23 specimens.

***Embates polymorphus tabulensis* Prena ssp. n.**

Holotype male, Costa Rica, labeled: "COSTA RICA, Prov. Puntarenas, Coto/ Brus, Z.P. Las Tablas, Cerro Chai,/ 2100m, 11 MAY 2002, M. Alfaro,/ Libre, L_S_324100_592100 #69441", INB0003484605 (INBC).

Paratypes 5 (3 males, 2 females), Costa Rica and Panama, labeled: "Punt. Coto Brus, Las/ Tablas, Rio Coton/ 1700m, 8 feb. 1989/ Col. A. Solis", CRI001 044664 (JPPC); "Est. Las Alturas, 1 Km. Norte de Las/ Alturas, Prov. Puntarenas, COSTA/ RICA. 1500m. 12–19 AGO 1995. M./ A. Zumbado, L_S_322700_591400/ #6271", CRI002 388697 (JPPC); "COSTA RICA, Prov. Puntarenas. Coto/ Brus, Z.P. Las Tablas, Sendero a Cerro/ Echandi. 2500m. 16 MAY 2000. M./ Alfaro. Manual. L_S_328900_593000/ #57453", INB0003168840 (INBC); "COSTA RICA, Prov. Puntarenas, P. Int./ La Amistad, Cerro Frantzius, 2134m, 5/ JUL 2003, R. González, Libre,/ L S 334150 574450 #74156", INB0003723889 (INBC); "♀", "Panama/ Chiriqui", "71037" (BMNH); "sp. figured", "♂", "Bugaba,/ 800-1,500 ft./ Champion." (BMNH).

Diagnosis. Basic vestiture sparse; elytron with dorsolateral vitta of yellow scales discontinued, median (ante-macular) element oblique (Fig. 183b) and continued ventrad to metepisternum.

Plant association. Not known.

Distribution. Costa Rica and Panama, Pacific side of Cordillera de Talamanca (Fig. 247).

Additional material. Specimens intermediate between *E. p. polymorphus* and *E. p. tabulensis* were studied from the vicinity of Volcán, 1350-2000 m (BMNH 2) and from Cerro Pittier, 1670–1750 m (INBC, JPPC).

Subspecific epithet. A Latin adjective referring to Las Tablas (latinized to tabula) and modified by suffix.

***Embates polymorphus fortunensis* Prena ssp. n.**

Holotype male, Panama, labeled: "PANAMA, Chir., Res./ For. La Fortuna, Quebra-/ da Aleman, 7–21–1995/ C.W. & L.B. O'Brien", "C.W. O'BRIEN/ COLLECTION" (CASC, presently as long-term loan in CWOB).

Paratypes 6 (2 males, 4 females), Panama, labeled: "PANAMA: Chiriqui/ La Fortuna, Co. Dv. Tr./ 8° 45' N, 82° 14' W/ 1100m; 9-V-1995/ H.P. Stockwell", "on stem/ Piper sp." (HPSC); "PANAMA, Chiriquí: Res./ La Fortuna, 1100 m,/ 8° 44' N 82° 14' W,/ 21.–25.3.2001, lg. Prena" (JPPC 2); "PANAMA: Chiriqui/ Continental Divide Trail/ 3–8 July 1997/ J. Huether" (CMNC); "PANAMA Chiriqui Prv/ Cont'l Divide Trail/ 3600' 16,17 May 1996/ Wappes Huether & Morris" (CMNC); "PANAMA: CHIRIQUI/ Bocas del Toro Border/ La Fortuna, 0.5 km N./ Contin. divide trail, 1100m/ 23.V-9.VI.1995, J. Ashe &/ R. Brooks, ex: f.i.t. (155)" (CMNC).

Diagnosis. Basic vestiture sparse; elytron with four markings of orange and yellow scales at base, apex and in two fasciae (Fig. 183c), metepisternal marking separate; color-pattern disintegrated and fuzzy in two male paratypes.

Plant association. *Piper fimbriculatum* (Prena 1), *P. pittieri* (Prena 1), *Piper* sp. (Stockwell 1).

Distribution. Panama, La Fortuna Reserve (Fig. 247).

Subspecific epithet. A Latin adjective referring to the Reserva La Fortuna and modified by suffix.

***Embates polymorphus altrimsecus* Prena ssp. n.**

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA, Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 10.-14.IV.2001/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003209943 (INBC).

Paratypes 53 (32 male, 16 female, 5 not sexed), labeled: as holotype, except INB0003209946 (JPPC); 10.-14.III.2001, INB0003209891–98 (INBC 4, JPPC 4); "COSTA RICA: Prov. Heredia:/ 6km ENE Vara Blanca, 1950–/ 2050m, 10°11'N 84°07'W/ Prena, 31.3.2003/ INBio-OET-ALAS transect" (JPPC), same label except 21.4.2002 (INBC), 21.–25.4.2004 (CHAH, HPSC, JPPC 4); "Costa Rica, HEREDIA:/ 5 km N San Isidro,/ Cerro Zurquí, 1800 m,/ 1.4.2000, leg. Prena" (JPPC 2); "COSTA RICA, Cartago:/ 4 km NE Cañon, Genesis2,/ 2300m, 9°42'N 83°54'W,/ 7.iii.2003, leg. J. Prena" (JPPC 3); "Costa Rica, CARTAGO:/ 17 km SE Cartago, P.N./ Tapantí, 1200 m,/ 7/8.4.2000, leg. Prena" (JPPC); "COSTA RICA, Prov. Cartago:/ P.N. Tapantí, Quebr. Segunda,/ 1200m, 9° 46' N 83° 47' W", "3.–5.5.2004, leg. J. Prena" (CWOB 2, JPPC 3); "COSTA RICA, Prov. Cartago, Paraiso,/ P. N. Tapantí, E. Queb. Segundo, Send/ a Rancho Negro. 1700m. 7 OCT 1999./ M. Alfaro. Manual (red. libre)/ L N 186200 560000 #53834", INB0003049336 (INBC); "Grano de Oro, 1120 m,/ Chirripo, Turrialba, Prov./ Cartago, Costa Rica,/ Set 1992, P. Campos/ L-N 200250, 595900", CRI000 919031–32, 919047, 936000–01 (INBC 5); "COSTA RICA, Prov. Cartago:/ Tuís, Rancho Naturalista,/ 700m, 9° 51' N 83° 35' W/ 8.5.2004, leg. J. Prena" (JPPC); "Turrialba, 900 m/ Costa Rica/ A. Heyne" (ZMHU 3); "Costa Rica/ A.H. Fassl 13 N.39 [?", "Orosi/ 1500 m" (SNSD 2); "R. San Lorencito, 900 m, R. F. San/ Ramón, 5 km N de Colonia Palmareña, Prov. Alaju., COSTA/ RICA. 13–18 Jun 1993. I Curso/ Scarabaeidae. L-N-244500, 470700", CRI001 364934 (INBC); "COSTA RICA, Prov. Puntarenas,/ Monteverde, R. Biol. Monteverde,/ 1540–1840m, 11–14 JUN 2000./ Pape, T. Desconocido./ L N_255900_447900 #63146 (INBC); "Est. La Casona, 1520m,/ Res. Biol. Monteverde/ Prov. Puntarenas, Costa/ Rica, May 1992, N. Obando/ L-N 253250, 449700", CRI000 728762 (INBC); "Orosi/ Costarica" (BMNH); "sp. figured", "♀", "Irazu,/ 6–7000 ft./ H. Rogers." (BMNH).

Diagnosis. Basic vestiture of yellow scales moderately dense (lowland) to sparse (highland); elytron with dorsolateral vitta of yellow scales continuous (Fig. 183a), occa-

sionally slightly disintegrated behind humeri, median portion continued ventrad to metepisternum.

Plant association. *Piper biseriatum* (Prena 10), *P. cenocladum* (Prena 2), *P. melanocladum* (Prena 1), *P. obliquum* (Prena 4), *P. pittieri* (Prena 8).

Distribution. Costa Rica, Atlantic side of Cordilleras Central and Talamanca (Fig. 247).

Additional material. Specimens intermediate between *E. p. altrimsecus* and *E. p. dotensis* were studied from Guanacaste, Tierras Morenas, Río San Lorenzo, 1050 m (INBC, JPPC).

Subspecific epithet. A Latin adverb meaning "on the opposite side".

***Embates polymorphus dotensis* Prena ssp. n.**

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA. San José:/ San Gerardo de Dota,/ 2400m, 9°32'N 83°49'W,/ 9.iii.2003, leg. J. Prena" (INBC).

Paratypes 7 (2 males, 5 females), same data and label (BMNH, CMNC, CWOB, INBC, JPPC 2).

Diagnosis. Basic vestiture of yellowish scales moderately dense to sparse; elytron with dark fascia faintly visible, humeral and ante-macular elements obsolete, post-macular element of yellow scales oblique (Fig. 183e).

Plant association. *Piper obliquum* (Prena 6).

Distribution. Costa Rica, Pacific side of Cordillera de Talamanca in Río Savegre valley (Fig. 247).

Subspecific epithet. A Latin adjective referring to Dota and modified by suffix.

***Embates polymorphus zeledonensis* Prena ssp. n.**

Holotype male, Costa Rica, labeled: "Est. Santa Elena, Las Nubes, Prov./ San J. COSTA RICA. 1210m. 28/ JUL–6 AGO 1995. E. Alfaro./ L_S_371750_507800 #6144", CRI002 352411 (INBC).

Paratypes 3 (3 males), Costa Rica, labeled: "Finca El Gringo, Est. Las Nubes de/ Santa Elena, San Jose, Costa Rica./ 1500m. 31 MAR 1996. M. Segura,/ L_S_370700_508850 #7606", CRI002 400691 (INBC); "Costa Rica, SAN JOSÉ: 12/ km NE San Isidro, Cerro/ Chucuyo, 9° 26' 15" N 83°/ 36' 55" W, 1350 m,/ 28/29.3.2000, leg. Prena" (JPPC 2).

Diagnosis. Basic vestiture of khaki scales dense; pronotum without dorsolateral vitta, elytron with dark fascia near middle (Fig. 183d); vestiture of metepisternum similar to basic vestiture.

Plant association. *Piper imperiale* (Prena 2).

Distribution. Costa Rica, Pacific side of Cordillera de Talamanca north San Isidro (Fig. 247).

Subspecific epithet. A Latin adjective referring to Pérez Zeledón [the old name of San Isidro del General] and modified by suffix.

***56. Embates crinipes* Prena sp. n.**
(Fig. 187–190, 252)

Ambates sp. 10. Marquis 1991: 200

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100 m/ 20°26'N 84°01'W", "20.IV.2001/ leg. J. Prena" (INBC).

Paratypes 56 (35 males, 21 females), Costa Rica and Panama, labeled: as holotype except 16.III.2001 (7 ×), 16.IV.2001, 7.IV.2001 (6 ×), 20.IV.2001, 21.IV.2001 (4 ×), 24.II.2003 (2 ×) (CWOB 2, HPSC, INBC 2, JPPC 15, SNSD); "COSTA RICA, Pr. Heredia/ Pto. Viejo-La Selva B. S./ No. 356 29-IV 1981/ R.J. Marquis coll.", "Piper/ imperiale"; same label except No. 248, 16-III 1981; No. 692, 25-XI 1981; No. 1002, 6-VI 1982; No. 1249, 29-X 1982; No. 846, 13-II 1982; No 217, 6-III 1981 (NMNH 7); "Costa Rica, HEREDIA: 3/ km S Puerto Viejo, Est./ Biol. La Selva, 100 m,/ 19.–22.2.2000, leg. Prena" (CHAH); "COSTA RICA: Prov. Heredia:/ 11km ESE La Virgen, 250-/ 350m, 10°21'N 84°03'W/ leg. J. Prena, 6.–11.4.2004/ INBio-OET-ALAS transect" (INBC 6, JPPC 6), same label except 12.–18.4.2004 (JPPC 2); "COSTA RICA, Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ Prena, 15.III.2001/ INBio-OET-ALAS transect", INB0003209998 (INBC); same data except 8.–13.4.2003, INB0003230073–74 (JPPC 2); "COSTA RICA, Prov. Heredia:/ 11km SE La Virgen, 450–/ 550m, 10°20'N 84°04'W/ 21.2.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003229835 (JPPC); same data except 12.4.2003, INB0003230142 (JPPC); 11.–16.3.2003, INB0003229892 (JPPC); 16.4.2003, INB0003230225 (JPPC); "Cuatro Esquinas, P.N./ Tortuguero, Prov. Limon/ COSTA RICA. 0 m. Octob./ 1989. J. Solano/ 280000, 590500", CRI000 108429; same label except CRI000 053018, Set. 1989; CRI001 341284, Abr 1993, R. Delgado (INBC 3) "Costa Rica, CARTAGO:/ 7 km N Turrialba, M.N./ Guayabo, 1100 m,/ 4/5.4.2000, leg. Prena" (JPPC); "COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°36'W,/ 4.–6.iv.2003, leg. J. Prena" (JPPC); "PortoBello [Portobelo]/ PanFeb 20-11", "E.A. Schwarz/ Collector" (NMNH).

Description. Habitus: Fig. 187, total length 6.0–7.5 mm (m=6.6, n=36). Color: integument piceous; basic vestiture of minute dark scales intermixed with few yellow scales along elytral striae, yellow scales condensed in broad dorsolateral vitta between head and preapical callus, from there variously expanded to elytral apices; venter with light yellow scales on prosternum and along flank. Head: frontal fovea minute or absent, rostrum moderate, subcylindrical (Fig. 188), sides between apex and antennal insertion not (♂♂) or slightly (♀♀) attenuated, costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.23–1.30 × (m=1.26, n=24), ♀♀ 1.22–1.33 × (m=1.28, n=12) pronotal length,

length of ante-antennal portion ♂♂ 0.43–0.47 × (m=0.46, n=24), ♀♀ 0.47–0.49 × (m=0.48, n=12) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.86–0.95 × (m=0.91, n=36) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, costate dorsomedially. Elytra: length 1.79–1.90 × (m=1.83, n=36) width at humeri, width 1.28–1.37 × (m=1.31, n=36) maximum pronotal width, sides subparallel in basal third or slightly converging behind humeri, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 costate. Legs: tibiae nearly straight, ventral margin slightly bisinuate, distally with cluster (♀♀) or fringe (♂♂) of yellow hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 189), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.2 × longer than body of aedeagus, flagellum thin, as long as apodemes, transition to curved base gradual, basal appendage elongate, fused subdistally with base of flagellum, projecting far beyond base (Fig. 190).

Plant association. *Piper imperiale* (Marquis 7, Prena 45), *P. obliquum* (Prena 1).

Distribution. Costa Rica, Atlantic side and central Panama (Fig. 252).

Specific epithet. The name is a Latin compound noun derived from crinis (hair) and pes (foot).

Discussion. *Embates crinipes* is related to the smaller-sized *E. latevittatus* and the larger-sized *E. polymorphus*. All three species have ciliated metatibia in the male sex and occur on species of *Piper* with the shoot-apex emerging from within the leaf-base at flowering nodes. Typical *E. crinipes* occur on the Atlantic side of the Cordillera Central in Costa Rica, while the specimen from Portobelo, Panama deviates by the evanescent subapical portion of the dorsolateral vitta (Fig. 187b). The species occurs sympatrically with *E. leucopleura discolor*, and the identification of the females may pose problems in rare cases of *E. l. discolor* with microscopic basic vestiture. Both species occur primarily on *P. imperiale*.

57. Embates latevittatus (Champion)

(Fig. 191–195, 260)

Ambates latevittatus Champion 1907: 159. Lectotype male, Panama, here designated, labeled: "sp. figured", circular plate with red margin "Type", "♂", "V. de Chiriqui/ 25–4000 ft." (BMNH). 12 Paralectotypes, Panama, here designated: Volcán (BMNH 9, NHRS, SNSD, NMNH). Hustache 1938 (cat.); Blackwelder 1947 (cat.); Wibmer & O'Brien 1986 (cat.)

Ambates sp. 9. Marquis 1991: 200

Embates [*latevittatus*]. Alonso-Zarazaga & Lyal 1999 (global combination of all species of *Ambates* Schönherr 1836 with *Embates* Chevrolat 1833)

Redescription. Habitus: Fig. 191, total length 4.4–5.8 mm (m=5.0, n=18). Color: integu-

ment rufous to piceous; basic vestiture of dark brown scales intermixed with few yellow scales along elytral striae, yellow scales condensed in narrow to broad dorsolateral vitta between head and preapical callus or on to elytral apices, vitta compound and not always with continuous outline, light yellow scales in lateral pronotal vitta; venter with light yellow scales on prosternum and along flank (restricted to metasternum and epimera in specimens from La Selva). Head: frontal fovea minute or absent, rostrum moderate, subcylindrical (Fig. 192), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 0.97–1.13 × (m=1.05, n=11), ♀♀ 1.08–1.24 × (m=1.17, n=8) pronotal length, length of ante-antennal portion ♂♂ 0.31–0.36 × (m=0.33, n=10), ♀♀ 0.32–0.36 × (m=0.34, n=8) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.88–0.97 × (m=0.92, n=18) maximum width, sides rounded, widest in basal half, anterior portion tubulate; punctures confluent. Elytra: length 1.75–1.85 × (m=1.80, n=17) width at humeri, width 1.13–1.36 × (m=1.27, n=17) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae curved, ventral margin slightly bisinuate, distally with cluster (♀♀) or fringe (♂♂, Fig. 193) of yellow hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 194), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, shorter than apodemes, transition to curved base gradual, basal appendage of moderate size, fused laterally with base of flagellum, not much projecting beyond base (Fig. 195).

Plant association. *Piper arboreum* (Marquis 2, Prena 4), *P. imperiale* (Marquis 1), *P. sancti-felicis* (Marquis 1, association probably accidental).

Distribution. Costa Rica and Panama, scattered (Fig. 260).

Material examined. COSTA RICA. Heredia: Puerto Viejo, La Selva, 100 m (JPPC, NMNH 3). Puntarenas: Las Mellizas, 1300 m (INBC 6, JPPC 4); Buenos Aires, Sector Altamira, 1150–1400 m (INBC). PANAMA. Chiriquí: Volcán, below 1300 m (BMNH 10, NHRS, NMNH, SNSD). Coclé: La Mesa above El Valle, 850 m (CWOB, HPSC). Colón: Portobelo, 50 m (NMNH). Darién: Cana, 450 m (HPSC). Total 32 specimens.

Discussion. Champion applied the name to a population occurring on the Pacific side of the Cordillera de Talamanca. A few specimens are known now from other sites, such as from the provinces of Heredia and Darién. Those specimens show modifications in the color-pattern: the dorsolateral vitta is narrower and does not always reach the elytral apices; the ventral vestiture of the specimens from Heredia is confined to metasternum and epimera. Despite those differences I believe that they all belong to *E. latevittatus* in the wider sense. *Piper arboreum* seems to be the primary host plant on both sides of the Cordilleras. A more detailed study of those deviating populations would require additional material from other sites.

***58. Embates kunicus* Prena sp. n.**
(Fig. 196–199, 257)

Holotype male (dissected), Panama, labeled: "PANAMA, San Blas:/ Nusagandi, 280 m,/ 2.8.1995, Coll. Univ. Panama" (CMNC).

Paratypes 2 (female), Panama, labeled: "PANAMA, San Blas,/ Nusagandi, Nusagandi/ Tr. 150–350m, 7-27-95/ C.W. & L.B. O'Brien" (CWOB); "PANAMA: Pma Pr./ 2 km SW Cerro Jefe/ 9° 12'N 79° 25'W/ 24 May 94 el. 700 m/ H.P. Stockwell" (HPSC).

Description. Habitus: Fig. 196, total length 4.4–5.5 mm (n=3). Color: integument piceous, legs and rostrum partially rufous, basic vestiture of brown and some scattered yellow scales; yellow scales condensed in dorsolateral pronotal vitta, humeral vitta and short, oblique subapical elytral fascia. Head: frontal fovea absent, rostrum slender, subcylindrical (Fig. 197), costate dorsomedially, basolateral margin roundly edged, length of rostrum ♂ 1.23 × (n=1), ♀♀ 1.24–1.26 × (n=2) pronotal length, length of ante-antennal portion ♂ 0.35 × (n=1), ♀♀ 0.39–0.40 × (n=2) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.90–1.01 × (m=0.96, n=3) maximum width, widest in basal third, sides gradually rounded toward front, anterior portion tubulate; punctation dense with isolated granula. Elytra: length 1.87–1.89 × (m=1.88, n=3) width at humeri, width 1.27–1.29 × (m=1.28, n=3) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus moderate, striae fine, punctures indistinct, interstriae flat, 9 subcostate distally. Legs: tibiae with ventral margin almost straight, metatibia ventrodistally with short fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus membranous, anterolateral portion sclerotized (Fig. 198), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.5 × longer than body of aedeagus, flagellum thin, shorter than apodemes, transition to curved base gradual, basal appendage elongate, fused laterally with base of flagellum, not much projecting beyond base (Fig. 199).

Plant association. Not known.

Distribution. Central Panama (Fig. 257).

Specific epithet. The name is derived from the ethnic tribe of the Kuna.

Discussion. *Embates kunicus* is a relatively slender species and seems to be related to the species near *E. pictipennis* and *E. leucopleura*. The elytral color-pattern is reduced to a short subapical fascia (derived from the post-macular element) and a humeral streak. The dark elytral macula is very faint.

***59. Embates paludicola* Prena sp. n.**
(Fig. 200–203, 257)

Holotype male (dissected), Costa Rica, labeled: "COSTA RICA, Heredia:/ La Selva Biol. Sta./ 3 km S Pto. Viejo, 100m/ 20°26'N 84°01'W", "20.IV.2001/ leg. J. Prena" (INBC).

Paratypes 27 (14 males, 13 females), Costa Rica and Panama, labeled: as holotype (CHAH, JPPC 5), as holotype except 16.III.2001 (INBC), 7.IV.2001 (INBC 2), 21.IV.2001 (CWOB, JPPC 4), 22.IV.2001 (INBC), 24.II.2003 (SNSD); "COSTA RICA/ Pr. Heredia/ Puerto Viejo/ Finca La Selva", "R.J. Marquis, coll./ No. 370 2-V-1981", "Piper imperiale", "Voucher", "Ambates/ #14/ det. DR Whitehead" (NMNH); "COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 11.–16.3.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003229878 (JPPC), same data except 17.–20.3.2003, INB0003229973–5 (INBC 3), 8.–13.4.2003, INB0003230072 (JPPC); "PANAMA. Panamá Pr./ Cerro Campana 850 m./ 8° 40' N, 79° 56' W/ 22 Feb.'75 Stockwell", "Ambates sp. #1" (CMNC); "PANAMÁ. Pmá Prov./ Cerro Campana 820 m/ 8° 40' N, 79° 56' W/ 3 Jun.'75 Stockwell" (HPSC); "PANAMA: Coclé Prv./ La Mesa ab. El Valle/ Cerro Caracoral/ 15 Nov 92; el. 800 m/ col. H. Stockwell", "Piper/ imperiale" (HPSC); "El Copé, Coclé/ Rep. PANAMÁ/ 14 Junio 1990/ col. A. Quintero" (GBFM).

Description. Habitus: Fig. 200, total length 7.9–10.2 mm (m=8.8, n=28). Color: integument black; basic vestiture of microscopic scales; scales yellow in two elytral fasciae (Fig. 200), on prosternum, mesepimeron and flank of metasternum. Head: frontal fovea minute, rostrum rather slender, cylindrical (Fig. 201), subcostate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.18–1.39 × (m=1.27, n=15), ♀♀ 1.22–1.39 × (m=1.28, n=13) pronotal length, length of ante-antennal portion ♂♂ 0.40–0.43 × (m=0.42, n=15), ♀♀ 0.43–0.47 × (m=0.45, n=13) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.85–0.94 × (m=0.89, n=28) maximum width, widest in basal half, then roundly narrowed, anterior portion tubulate; disk punctate, intervals smooth. Elytra: length 1.67–1.89 × (m=1.76, n=28) width at humeri, width 1.33–1.42 × (m=1.38, n=28) maximum pronotal width, sides subparallel in basal third, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures distinct, interstriae flat, 9 subcostate. Legs: slender, tibia nearly straight, ventral margin slightly bisinuate, with distal cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: sides of aedeagus converging to round apex, anterolateral portion sclerotized (Fig. 202), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.4 × longer than body of aedeagus, flagellum thin, longer than apodemes, transition to curved base gradual, basal appendage elongate, fused subdistally with base of flagellum, projecting beyond base (Fig. 203).

Plant association. In very wet habitats on *Piper imperiale* (Marquis 1, Prena 22, Stockwell 1).

Distribution. Costa Rica and Panama, scattered (Fig. 257).

Specific epithet. The name is a compound Latin noun derived from palus (swamp) and colo (to dwell).

Discussion. It is surprising that this showy species has escaped collectors for so long, particularly as it occurs at frequently visited sites. Based on meristic data and structural

details of the male genitalia, I place *E. paludicola* near *E. leucopleura*. The color-pattern is convergent to those of *E. championi*, *E. cretifer* and *E. salamandra*, with the latter species forming their own morphological complexes (see discussion of relationships there).

60. *Embates aliquantulus* Prena sp. n.
(Fig. 204–208, 252)

Holotype male (dissected), Costa Rica, labeled: “Cerro de Oro, Rio Nino, Prov. Punta,/ COSTA RICA. 140m, 5 MAY 1995. A./ Azofeifa. L S 279300 519000 #5293”, CRI002 234505 (INBC).

Paratypes 63 (27 males, 36 females), Costa Rica and Panama, labeled: “Panamá: Panamá Pr./ Cerro Campana, 850 m./ 8° 40' N, 79° 56' W”, “18 Jul ‘76/ H.P. Stockwell”, “Ambates/ 21”; same label except “17 July ‘77/ Stockwell”, “3 Jun. ‘75/ H.P. Stockwell”, “31 May ‘75/ Stockwell”, “23.V.1970/ H.A. Hespenheide”, “14.VII.1974/ H.A. Hespenheide”, “26.VI.1971/ H.A. Hespenheide”, “8.IV.1970/ H.A. Hespenheide”, “14.VII.1971/ H.A. Hespenheide”, “30 May ‘70 H. Stockwell”, “3 Jun. ‘72 Stockwell”, “12 Mar. ‘72 Stockwell”, “10 Feb. ‘73 Stockwell”, “4 Jan. ‘92 Stockwell”, “25 May ‘74 Stockwell” (CHAH 5, CMNC, HPSC 6, JPPC 3); “Cerro Campana/ 800m R. de Pan./ 8° 40' N 79° 56' W/ 25 Apr 73 Engleman” (HPSC); “Cerro Campana,/ 3000', Panama./ July 30, 1970,/ H. & A. Howden” (HAHC); same label except July 29, 1970 (HAHC); “PANAMA: Panama/ Cerro Campana/ 21 June 1981/ B. Gill 900 m” (JPPC); “PANAMA: Panama/ Cerro Campana/ 26 May ‘73 454m./ Ginter Ekis” (CWOB); “PANAMA, Panama,/ Cerro Campana,/ V-17-1993, 850m./ E.G. Riley” (CWOB 4); “PANAMA, Pan./ Cerro Campana/ VII-29-1995/ C.W. & L.B. O’Brien” (CWOB); “PANAMÁ: Panamá,/ Cerro Campana,/ VI-20-1985, E./ Riley & D. Rider” (JPPC); “PANAMA: Pma P.:/ Cerro Campana/ 8° 40' N, 79° 56' W/ 26 May 1971/ R. Belzer” (NMNH); “PANAMA/ Cerro Campana/ VI-29-1974 C.W. & L./ O’Brien & Marshall” (JPPC); “PANAMA, Pan., 2700'/ Cerro Campana,/ May 13, 1978 CW & LB/ O’Brien & Marshall” (JPPC); “PANAMA: PANAMÁ/ Cerro Campana, 900/ –950m, 5.VI.1995–04, R.S./ Anderson, wet mont. for.” (CMNC); “PANAMA: Panama Prov./ Cerro Campana, 850m/ 8*40'N 79*56'W/ 1.vii.1972/ Gard Otis” (HAHC); “PANAMA: Coclé Prv./ 5 km N of El Copé/ Cont Div-850 m elev/ Stockwell & Windsor”, “Coll-td/ 15 Jun. ‘91” (HPSC); “PANAMA: COCLÉ/ 7.2 km N.E. El Copé/ 730m, 20.V–7.VI.1995/ J. Ashe & R. Brooks/ ex: f.i.t. (140)” (JPPC); “PANAMA: Canal Area/ Fort Sherman/ 10 Jun ‘95 Stockwell” (HPSC); “PANAMA, Colon, C.Z.,/ Ft. Sherman, Old Ft. San/ Lorenzo Rd. 7-31-1995/ C.W. & L.B. O’Brien” (CWOB); “PortoBello/ PanFeb 28-11”, “EA Schwarz/ Collector”, “Ambates/ leucopleura/ var. Champ.” (NMNH); “PANAMÁ, 700m./ El Valle/ May 17, 1973/ P.D. Ashlock” (CWOB); “PANAMÁ: Panamá,/ Cerro Jefe,/ June 9, 1985/ E. Riley & D. Rider” (CWOB); “V. de Chiriqui/ below 4,000 ft.,/ Champion.” (BMNH); “V. de Chiriqui/ 25–4000 ft./ Champion.” (BMNH 2); “Bugaba,/ Panama./ Champion.” (BMNH 2); “Bugaba,/ Panama./ Champion.”, “♂”,

"GCChampion/ Determined", "Ambates/ leucopleura/ small form Ch" (NMNH); "PANAMÁ: Chiriquí,/ Hartmann's finca,/ St. Clara, VI-15-/ 18-85 Riley & Rider" (CWOB); "PANAMA, Chiriqui/ Prov. 2 km N Sta./ Clara, 1300m, 8° 51' N,/ 82° 46' W Hartmann's/ Finca 30–31.V.77/ H. & A. Howden" (HAHC); "PANAMA: Chiriqui/ N. Sta. Clara/ 8° 51' N; 82° 46' W./ 31 May '77 Stockwell" (HPSC); same label except 20 May '77 (HPSC); "PANAMA: Chiriqui Prov./ nr. Candela, el. 1300 m/ 24 AUG 1982 H. Stockwell" (HPSC 2); "PANAMÁ: Chiriquí Prov./ Las Lagunas, El. 1360 m./ 4 km W. Hato del Volcán", "22 May '77/ H.P. Stockwell" (HPSC); "PANAMA, Chir., Res./ For. La Fortuna, Cont./ Divide Tr., 7-20-1995/ C.W. & L.B. O'Brien" (CWOB); "Sector Altamira, Buenos Aires, PILA, Prov./ Punta, COSTA RICA. 1400 m. Jul 1994, R./ Delgado, L S 332700_572400 #3137", CRI001 988734 (INBC); "P.N. Manuel Antonio, 80m/ Quepos, Prov. Punt./ COSTA RICA./ G. Varela, Oct 1991,/ L-S-370900, 448800", CRI000 501554 (INBC); "Quepos, 80m, P.N. Man-/ uel Antonio, Prov. Punt./ COSTA RICA, R. Zuniga, Abr 1991./ L-S-370900, 448800", CRI000 577938 (JPPC); "P.N. Manuel Antonio, 80m/ Quepos, Prov. Punt. COSTA/ RICA. Jul 1991. G. Varela. / L-S-370900, 448800", CRI001 413177 (INBC); "Costa Rica, San José, 8.3 mi N San Isidro de General" (TAMU); Costa Rica, Puntarenas, Est. Pittier, sendero a Rio Canasta, 1750-1800m, 6-28 Marzo 1996, M Moraga, Trampa sombrereta, L_S 332100_576800, CRI002 372085 (INBC); Costa Rica, Puntarenas, Fila Cruces, Laguna Gamboa, 1400m, 1 May 1996, I.A Chacón, L_S_3042200_574850, CRI002 447897 (INBC); "COSTA RICA, Punt, R./ F. Golfo Dulce, 10 m, 3k./ S. Rincon, vii-1991, ma-/ laise trap, P. Hanson" (CWOB); "COSTA RICA, Melleza [Las Mellizas]/ 1300m (nr. Candelas,/ Pan.) 7.VI.1977/ H. & A. Howden" (JPPC); "C.R.: Puntarenas:/ P. N. Corcovado/ D. R. Whitehead/ 10–20. VIII. 1980", "Ambatini/ #4/ det. DR Whitehead" (NMNH); "Costa Rica, Puntarenas/ Osa, Rio Rincón/ 29.12.1995 lg. Prena" (JPPC).

Description. Habitus: Fig. 204, total length 4.0–7.3 mm (m=5.7, n=58). Color: integument piceous; basic vestiture of small cupreous and occasionally some yellow scales along distal portion of striae, yellow scales condensed in well-defined dorsolateral vitta between head and elytral apices; venter with dense vestiture of light yellow scales on prosternum and along flank. Head: frontal fovea minute or absent, rostrum slender, subcylindrical (Fig. 205), costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.21–1.41 × (m=1.31, n=25), ♀♀ 1.23–1.56 × (m=1.33, n=33) pronotal length, length of ante-antennal portion ♂♂ 0.48–0.52 × (m=0.50, n=24), ♀♀ 0.50–0.53 × (m=0.52, n=32) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 slightly longer than 1 (Fig. 206), club oblong ovate. Pronotum: length 0.88–1.04 × (m=0.97, n=57) maximum width, sides rounded, widest in basal third, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 1.96–2.13 × (m=2.07, n=57) width at humeri, width 1.17–1.29 × (m=1.22, n=57) maximum pronotal width, sides subparallel in basal half, then increasingly converging toward apex, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures indistinct,

interstriae flat, none costate. Legs: tibiae moderately (Cerro Campana) to slightly (elsewhere) curved, ventrodistally with short fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus blunt, middle sclerotized, anterolateral portion membranous (Fig. 207), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.3 × longer than body of aedeagus, flagellum thin, longer than apodemes, transition to curved base gradual, basal appendage elongate, curved, fused laterally with base of flagellum, projecting far beyond base (Fig. 208).

Plant association. Not known.

Distribution. Costa Rica, Pacific side to central Panama (Fig. 252).

Specific epithet. The name is a Latin adjective meaning "fairly little".

Discussion. This is Champion's "small variety" of *E. leucopleura*. The rich material now available demonstrates highly significant differences not only in the size, but also in body proportion and antennal insertion. The elytra of *E. aliquantulus* are parallel-sided in the basal half rather than being narrowed from near the base as in *E. leucopleura*. *Embates aequiperabilis* is very similar and can be recognized by the nude flank of the first ventrite.

61. Embates aequiperabilis **Prena sp. n.**

(Fig. 209, 252)

Holotype male (dissected), Costa Rica, labeled: "Rio San Lorenzo, 1050m,/ Tierras Morenas, Z.P./ Tenorio, Prov. Guanacaste/ Costa Rica, M. Segura/ 28 mar a 21 abr 1992/ L-N 287800, 427600", CRI000 775821 (INBC).

Paratypes 10 (5 males, 5 females), Costa Rica, labeled: as holotype except A Marin, CRI000 413258 (INBC); "Rio San Lorenzo, 1050 m, Tierras/ Morenas, Z.P. Tenorio, Prov./ Guan. COSTA RICA. Abr 1991. C./ Alvarado. L-N-287800, 427600", CRI001 398329 (JPPC); "COSTA RICA, Punt./ Monteverde Reserve/ 1500m, 18.VIII.1987/ H. & A. Howden" (HAHC); same data except 27.V.1979 (HAHC 2); "COSTA RICA, Punt./ Monteverde, Hotel Bel-/ mar, cloud forest, ca./ 4500', V-28.VI-1-1994", "Collectors/ J. Rifkind, P. Gum" (CWOB); "San Luis, Monteverde, A. C. Arenal, Prov./ Puntarenas, Costa Rica, 900 m, Jun 1993,/ Z. Fuentes, L N 250850_449250 #2198", CRI001 918254" (INBC); Costa Rica, Puntarenas, Monteverde [no label attached, data retreived from database], INB0003030789 (INBC); "COSTA RICA, S. Jose,/ Zurquí de Moravia,/ 1600m. malaise trap/ V-1995, P. Hanson" (CWOB); "Costa Rica, HEREDIA: 5/ km N San Isidro, Cerro/ Zurquí, 1800 m/ 15.2.2000, leg. Prena" (JPPC).

Description. Habitus: similar to Fig. 204, total length 4.8–8.0 mm (m=6.7, n=11). Color: integument piceous, two specimens from Cerro Zurquí partially rufous; basic vestiture of small cupreous and some yellow scales scattered along striae, yellow scales condensed in narrow, well-defined dorsolateral vitta between head and elytral apices; venter with dense vestiture of light yellow scales on prosternum and along flank (except ventrite 1). Head: frontal fovea absent, rostrum slender, subcylindrical, slightly more curved than

in *E. aliquantulus* (Fig. 205), costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.26–1.32 × (m=1.29, n=6), ♀♀ 1.30–1.39 × (m=1.34, n=5) pronotal length, length of ante-antennal portion ♂♂ 0.48–0.50 × (m=0.49, n=6), ♀♀ 0.49–0.53 × (m=0.52, n=5) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 distinctly longer than 1 (Fig. 209), club oblong ovate. Pronotum: length 0.99–1.06 × (m=1.03, n=11) maximum width, sides subparallel in basal third, then roundly narrowed, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 2.11–2.27 × (m=2.17, n=11) width at humeri, width 1.27–1.34 × (m=1.30, n=11) maximum pronotal width, sides subparallel in basal half, then increasingly converging toward apex, apices rounded conjointly, preapical callus weakly developed, striae fine, punctures indistinct, interstriae flat, none costate. Legs: tibiae curved, ventrodistally with short fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: aedeagus as *E. aliquantulus*.

Plant association. *Piper aequale* (Prena 1).

Distribution. Costa Rica, Cordillera Central between 900 and 1800 m (Fig. 252).

Specific epithet. The name is a Latin adjective meaning “comparable”.

Discussion. *Embates aequiperabilis* is a notably slender species near *E. aliquantulus*. From this and other species with well-defined dorsolateral elytral vitta, it can be distinguished readily by the nude first ventrite, where the lateral vestiture is discontinued abruptly. All specimens were collected in premontane and montane forests of the Cordillera Central.

62. Embates leucopleura (Champion), comb. n.

(Fig. 210–216, 251)

Ambates leucopleura Champion 1907: 158. Lectotype male, Panama, here designated, labeled: “sp. figured”, “Type”, “♂”, “V. de Chiriqui,/ 25–4000 ft./ Champion.”, “Genus/ Cholinambates” (BMNH). Paralectotype 1, Costa Rica, here designated: Carrillo (now *E. leucopleura discolor* ssp. n., BMNH); 6 specimens labeled as variety (now *E. aliquantulus*) are not considered to be type specimens (BMNH 5, NMNH)

Drepanambates leucopleura; Champion 1907: 155 (footnote). Hustache 1938 (cat.); O’Brien & Wibmer 1982 (cat.)

Cholinambates leucopleura. Casey 1922: 6

Redescription. Habitus: Fig. 210 (Pacific side of Cordillera de Talamanca) and Fig. 214 (elsewhere), total length 5.2–9.9 mm (m=7.3, n=56). Color: integument piceous to black, antenna and legs may be partially rufous; basic vestiture of minute to moderate cupreous scales, clusters of yellow scales along elytral striae and mid-line of pronotum or not, light yellow scales variously condensed in dorsolateral vitta between head and elytral apices; venter with light yellow scales on prosternum, along flank and on last ventrite (large specimens only). Head: frontal fovea absent, rostrum slender, subcylindrical (Fig. 211), sides

attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.10–1.28 × (m=1.20, n=34), ♀♀ 1.14–1.28 × (m=1.23, n=22) pronotal length, length of ante-antennal portion ♂♂ 0.41–0.47 × (m=0.44, n=34), ♀♀ 0.41–0.48 × (m=0.46, n=22) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 slightly longer than 1, club oblong ovate. Pronotum: length 0.88–1.00 × (m=0.95, n=56) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, often confluent dorsomedially. Elytra: length 1.75–1.94 × (m=1.83, n=56) width at humeri, width 1.25–1.36 × (m=1.30, n=56) maximum pronotal width, sides converging shortly behind humeri, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 (7 frequently near callus) costate. Legs: tibiae nearly straight, metatibia bisinuate, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle sclerotized, anterolateral portion membranous (Fig. 212), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.2 × longer than body of aedeagus, flagellum thin, slightly shorter than apodemes, transition to curved base gradual, basal appendage elongate, curved, fused laterally with base of flagellum, projecting beyond base (Fig. 213).

Discussion. The type series of *Ambates leucopleura* encompasses two specimens, each of them representing a distinct, allopatric taxon. The one occurs from the Pacific side of the Cordillera de Talamanca down to the Pacific side of Colombia, and is recognizable by the usually indistinct basic vestiture of minute scales and the sharply limited dorsolateral vitta. The other taxon occurs in Atlantic Costa Rica, and exhibits a more fuzzy color-pattern, with the dorsolateral vitta ill-defined or reduced. Here, I select the male specimen from Volcán de Chiriquí, illustrated in Champion (1907), as lectotype of *Ambates leucopleura*. It should be noted, that the specimens from high elevations of the Pacific side of the Cordillera de Talamanca are more slender than those from central Panama and Colombia. The Atlantic population from Costa Rica is regarded a subspecies of *E. leucopleura*. The specimens of Champion's "small variety" belong to *E. aliquantulus*.

Embates leucopleura leucopleura (Champion)

Diagnosis. Basic vestiture of minute scales, dorsolateral vitta of yellow scales well-defined (Fig. 210); basal appendage of aedeagal flagellum distinctly curved (Fig. 213); allopatric on Pacific side of Cordillera de Talamanca to Colombia.

Plant association. *Piper imperiale* (Prena 1), *P. fimbriculatum* (Prena 2).

Distribution. Costa Rica to Colombia, Pacific side of Cordillera de Talamanca and Andes (Fig. 251).

Material examined. COSTA RICA. Puntarenas: 5 km S San Vito, 1200 m (CWOB, HAHC 2); Fila Cruces, Fca. Ilama (INBC 3); 12 km NE San Isidro, Cerro Chucuyo,

1350 m (JPPC). PANAMA. Chiriquí: Volcán (BMNH); La Fortuna (CWOB, JPPC 2); [Alto?] Lino [or Monte Lirio?], 800 m (SNSD). Coclé: 7 km NE El Copé, 730 m (CMNC). Panamá: Cerro Campana, 800 m (CHAH 4, CWOB 10, HAHC 3, HPSC 2, TAMU, NMNH 2); 8 km NE Cerro Jéfe, 700 m (CMNC). Veraguas: Cerro Tute (CMNC). COLOMBIA. Valle: Anchicaya Dam, 70 km E Buenaventura, 400 m (HAHC 4). Total 41 specimens.

***Embates leucopleura discolor* Prena ssp. n.**

Holotype male (dissected), Costa Rica, labeled: "Estac. Pitilla, 700m, 9km S/ Santa Cecilia, Guanacaste/ COSTA RICA. Feb 1990/ P. Rios, C. Moraga &/ R. Blanco, 330200-/ 380200", CRI000 172975 (INBC).

Paratypes 16 (7 males, 9 females), labeled: "Estac. Pitilla, 700m, 9km S/ Santa Cecilia, Guanac. Pr./ COSTA RICA. DIC 1989/ C. Moraga & P. Rios/ 330200, 380200"; CRI000 173524 (INBC); "Sector Cerro Cocori, Fca. de E./ Rojas, 150 m, Prov. Limón,/ COSTA RICA. Abr 1993. E. Rojas/ L-N-286000, 567500", CRI001 345471 (INBC); "Sector Cocori, 30 Km N. de Cariari, Finca/ E. Rojas, A. C. Tortuguero, Prov. Limón,/ COSTA RICA. 100 m. May 1994, E. Rojas,/ L N 286000_567500 #2917", CRI001 880521 (INBC); "COSTA RICA, Limón/ 16Km W Guápiles/ 400m, IV/1989/ col. Paul Hanson", CRI001 108285 (INBC); "Sector Cedrales de la Rita, 3 Km N./ del Puente Rio Suerte, Ruta Puerto/ Lindo, Limon, Costa Rica, 10m. ABR/ 1996. E. Rojas, Amarilla/ L_N_278600_566500 #7233", CRI002 463578 (INBC); "COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 17.–23.2.2003/ INBio-OET-ALAS transect", "handcollecting/ leg. Jens Prena", INB0003229805 (INBC); same data except 11.–16.3.2003, INB0003229893–94 (JPPC 2); 17.–20.3.2003, INB0003229972 (JPPC), 8.–13.4.2003, INB0003230075 (INBC); "COSTA RICA, Alajuela: R. B./ A. Brenes, Rio San Lorencito,/ 900m, 10°13'N 84°36'W,/ 4.–6.iv.2003, leg. J. Prena" (CWOB, JPPC); "Costa Rica, CARTAGO:/ 7 km N Turrialba, M.N./ Guayabo, 1100 m,/ 4/5.4.2000, leg. Prena" (JPPC); "♂", "Carrillo,/ Costa Rica./ Underwood." (BMNH); "Tuis/ Costa Rica", "G.C. Champion./ Brit. Mus./ 1925–42." (BMNH); "Lino/ Panama" [probably Atlantic slope opposite Alto Lino, Boquete], "G.C. Champion./ Brit. Mus./ 1925–42." (BMNH).

Diagnosis. Basic vestiture of cupreous scales relatively dense, dorsolateral vitta of yellow scales ill-defined or reduced (Fig. 214); basal appendage of flagellum less curved than in nominal form (Fig. 216); allopatric on Atlantic side of Cordillera Central.

Plant association. *Piper imperiale* (Prena 8).

Distribution. Costa Rica, Atlantic side below 1100 m (Fig. 251).

Subspecific epithet. The name is a compound Latin noun meaning "of different color".

***63. Embates intermedius* Prena sp. n.**
(Fig. 217, 249)

Holotype male (dissected), Panama, labeled: “Panamá: Panamá Pr./ Cerro Campana, 850m/ 8° 40' N, 79° 56' W/ 27 Feb ‘71 H. Stockwell”, “24 ♂”, “Ambates #8” (CMNC).

Paratypes 24 (19 males, 5 females), Panama, labeled: “as holotype except 25 May ‘74, 12 Sept. ‘70, 25 May ‘74, 8 Apr. ‘72, 22 Feb. ‘95, 31 Jul ‘74” (CMNC, HPSC 5); “PANAMA: Panama/ Cerro Campana/ 21 June 1981/ B. Gill 900 m” (HAHC 2); “PANAMÁ: Panamá, / Cerro Campana/ VI-20-1985, E./ Riley & D. Rider” (JPPC); “PANAMA: Panamá Prov./ Cerro Campana/ May 11–15, 1980: E.G./ Riley & D. LeDoux” (CWOB); “PANAMA, Pan., 2700'/ Cerro Campana,/ May 13, 1978 CW & LB/ O’Brien & Marshall” (CWOB 2); “PANAMA/ Cerro Campana”, “V-8-1975/ H. Wolda” (CWOB); “Panamá: Panamá Pr./ Cerro Campana, 850M/ 8° 40' N 79° 56' W”, “14.vii.1971/ H.A. Hespenheide” (CHAH); same label for locality except 9.ix.1974/ H.A. Hespenheide (JPPC), 29.iv.1970/ H.A. Hespenheide (CHAH); “Panamá: Panamá Pr./ Cerro Campana, 850m, / 8° 40' N 79° 56' W/ 21 May ‘71 W. Bivin” (JPPC); “Panamá: Pmá Prov./ Cerro Campana, 850m, / 8° 40' N 79° 56' W/ 27 May ‘72 W. Bivin” (JPPC); “Panamá: Canal Zone/ Madden Forest, Mi. 3.5/ 9° 05' N 79° 37' W”, “15.VI.71/ PIPER” (JPPC); “PANAMA: C. Z.;/ Madden Forest/ 9° 05' N, 79° 27' W/ 24 June 1971/ W. Bivin” (NMNH), same data except 29 July 1971 (NMNH); “Panamá: Canal Zone/ 5 mi NW Gamboa/ 9° 09' N 79° 43' W”, “27.II.1970/ H.A. Hespenheide” (CHAH); “PANAMA: Panama Pr./ La Eneida, beyond/ Cerro Jefe, 700 m”, “2-vii-1971/ H.A. Hespenheide” (CHAH).

Description. Habitus: Fig. 217, total length 5.5–7.3 mm (m=6.4, n=20). Color: integument piceous, legs and antenna predominantly rufous; basic vestiture of small cupreous scales, ochreous scales condensed in broad dorsolateral vitta between head and elytral apices, in narrow dorsomedian pronotal vitta and along elytral striae 1 and (partially) 2; venter with light yellow scales along flank. Head: frontal fovea absent, rostrum slender, subcylindrical (as Fig. 211), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.13–1.20 × (m=1.16, n=15), ♀♀ 1.17–1.21 × (m=1.19, n=5) pronotal length, length of ante-antennal portion ♂♂ 0.41–0.48 × (m=0.45, n=15), ♀♀ 0.47–0.49 × (m=0.48, n=5) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 longer than 1, club oblong ovate. Pronotum: length 0.92–1.00 × (m=0.97, n=20) maximum width, sides subparallel in basal third, then roundly narrowed, anterior portion tubulate; disk densely punctate, intervals granulose. Elytra: length 1.74–1.89 × (m=1.83, n=20) width at humeri, width 1.27–1.35 × (m=1.31, n=20) maximum pronotal width, sides subparallel in basal fourth, then increasingly converging toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 costate. Legs: tibiae nearly straight, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: similar *E. leucopleura*, with basal appendage of aedeagal flagellum straight (as Fig. 216).

Plant association. Not known.

Distribution. Central Panama (Fig. 249).

Specific epithet. The name is a Latin compound adjective meaning “intermediate”.

Discussion. *Embates intermedius* is related very closely to *E. leucopleura*, with a color-pattern not unlikely that of *E. belti*. All three species co-occur in central Panama. *Embates intermedius* and *E. leucopleura* differ from each other in vestiture and color, while *E. belti* exhibits different body proportions. Genital differences are minor between all of them.

64. Embates belti (Champion), comb. n.

(Fig. 218–220, 246)

Ambates belti Champion 1907: 160. Lectotype female, Nicaragua, here designated, labeled: “sp. figured”, “type”, “♀”, “Chontales/ Nicaragua/ T. Belt” (BMHN). Paralectotype 1, Nicaragua, here designated: Chontales (BMNH)

Drepanambates belti; Champion 1907: 155 (footnote). O’Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Ambates triangularis Champion 1907: 160. Lectotype male, Panama, here designated, labeled: “type”; “♂”, “V. de Chiriqui/ 4000–6000 ft/ Champion” (BMHN). Paralectotypes 2, Panama, here designated: Bugaba (BMNH 2). O’Brien & Wibmer 1982 (cat.); Hustache 1938 (cat.)

Ambates sp. 11. Marquis 1991: 200

Redescription. Habitus: Fig. 218, total length 4.2–6.0 mm (m=5.1, n=73). Color: integument rufous to piceous; scales yellow to ochreous and dark brown to black, pronotum with broad ventrolateral, dorsolateral and (or without) thin dorsomedian vittae of yellow to ochreous scales, elytral vestiture variable, yellow to ochreous scales condensed in post-macular fascia and humeral streak, ante-macular portion and suture with yellow to ochreous scales of various densities, elytral macula and portion below preapical callus dark brown to black (Fig. 218); venter with yellow scales except medially. Head: frontal fovea absent, rostrum slender, subcylindrical (Fig. 219), sides attenuated between apex and antennal insertion, costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂♂ 1.18–1.39 × (m=1.31, n=36), ♀♀ 1.26–1.41 × (m=1.35, n=40) pronotal length, length of ante-antennal portion ♂♂ 0.43–0.52 × (m=0.48, n=34), ♀♀ 0.44–0.53 × (m=0.49, n=38) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 subequal or longer (predominantly ♂♂) than 1, club oblong ovate. Pronotum: length 0.83–0.94 × (m=0.88, n=72) maximum width, sides rounded, widest in basal half, anterior portion tubulate; disk densely punctate, intervals granulose, occasionally confluent dorsomedially. Elytra: length 1.59–1.85 × (m=1.73, n=70) width at humeri, width 1.19–1.39 × (m=1.28, n=70) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 costate.

Legs: tibiae nearly straight, ventral margin with indistinct fringe of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle sclerotized, anterolateral portion membranous (as *E. leucopleura*, Fig. 212), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 1.8 × longer than body of aedeagus (as Fig. 224), flagellum very thin, one-third shorter than apodemes, transition to curved base gradual, basal appendage slender, fused with base of flagellum in inner arc and distally, not projecting beyond base (Fig. 220).

Plant association. *Piper glabrescens* (Marquis 2, Prena 21), *P. tonduzii* (Marquis 3), *P. biolleyi* (Greig 1, Marquis 1), *P. arieanum* (Marquis 1, Prena 1), *P. terrabanum* (Marquis 1), *P. curtispicum* (Prena 1).

Distribution. Southern Nicaragua to central Panama (Fig. 246).

Material examined. NICARAGUA. Chontales: Santo Domingo, 400 m (BMNH 2). COSTA RICA. Alajuela: Río San Lorencito, Res. San Ramon, 900 m (INBC); Guatuso, La Garroba, 100 m (MUCR 2). Cartago: Turrialba, 900 m (ZMHB 2). Guanacaste: Tierras Morenas, 700 m (INBC 6). Heredia: Puerto Viejo, La Selva, 100 m (CHAH 2, CWOB 2, JPPC 2, NMNH 8); 11 km ESE La Virgen, 300 m (INBC 2, JPPC 2, SNSD); 11 km SE La Virgen, 450 m (INBC 4, JPPC 8); 12 km SE La Virgen, 600 m (INBC 2, JPPC); 16 km SSE La Virgen, 1050 m (JPPC 3). Limón: 30 km N Cariari, Cerro Cocorí, 150 m (INBC 5, JPPC); Guápiles, 400 m (INBC); Amubri, 70 m (INBC). Puntarenas: 4 km S San Vito, 1100 m (CHAH 2, CWOB, JPPC 2, TAMU); Fila Cruces, Fca. Ilama, 1200 m (INBC); Alturas, 1700 m (CMNC, CWOB); Fundación Dúrika, 1700 m (JPPC 2); Monteverde, 1000–1500 m (HAHC, INBC 3); Península de Osa, 100–750 m (CHAH 2, INBC 3, JPPC 2, MUCR, NMNH). San José: 12 km NE San Isidro, Cerro Chucuyo, 1350 m (JPPC). PANAMA. Chiriquí: Volcán, 1200–1800 m (BMNH); Bugaba (BMNH 2); La Fortuna, 1100 m (CMNC 3, CWOB 3, FAUP). Coclé: 5 km N El Copé (HPSC). Colón: Portobelo, 50 m (NMNH). Darién: Cana, 450 m (HPSC 2). Panamá: Cerro Campana, 800 m (CNCI, CWOB, HPSC). Veraguas: Cerro Tute, 4 km W Santa Fe, 680 m (CWOB 5). Total 105 specimens.

Discussion. Meristic data, details of the male genitalia and transient color-patterns indicate a close relationship of *E. belti* to *E. politus* and several (mostly undescribed) South American species, among them *E. bicircinatus* (Chevrolat) and *E. circumcinctus* (Casey). Champion applied the name *triangularis* to a population occurring at 1100–1800 m elevation on the Pacific side of the Cordillera de Talamanca. I was not able to distinguish this taxon from typical *E. belti* without using the color-pattern. However, even this difference fades when the material from all local populations is considered. The variability of the color-pattern is related to its compound nature. The elytral color-pattern of specimens collected above 1000 m elevation deviates as follows: 1) the post-macular fascia is wider, 2) the dark elytral macula is narrowed by the wide post-macular fascia, 3) the post-macular fascia and the humeral streak are discontinued, 4) the yellow scales of the ante-macular portion compound to even vestiture. This can be demonstrated not only on

the Pacific side, but also for typical *E. belti* from the Atlantic side, e.g. on the ALAS-transect in Braulio Carrillo National Park. Even though specimens from the Atlantic side show a trend to less elongate elytra, the clinal nature of this character state does not support maintenance of more than one taxon. It seems of no practical value to distinguish the numerous local color-varieties, and I lump them together under the name *E. belti*. Specimens of all local subpopulations collected by myself, including typical *belti* and *triangularis*, were associated most often with *Piper glabrescens*.

65. Embates politus **Prena sp. n.**
(Fig. 221–224, 246)

Holotype male (dissected), Panama, labeled: "PANAMA: CHIRIQUÍ/ Pk. Int. La Amistad, Las/ Nubes, 5.3km W Cerro/ Punta, 2150m, 15.VI./ 1995-26D, R.S.Anderson/ cloud forest litter" (CMNC).

Description. Habitus: Fig. 221, total length 5.4 mm. Color: integument dark rufous; scales yellow and dark brown, pronotum with thin dorsomedian and broad dorsolateral vittae of yellow scales, elytron with yellow scales condensed in compound dorsolateral vitta and along striae in basal portion of disk, brown scales at humeri, preapical callus, apex and various portions of disk and pronotum (Fig. 221); venter with yellow scales except medially. Head: frontal fovea absent, transition between head and rostrum nearly continuous, rostrum slender, subcylindrical, basal portion nearly straight (Fig. 222), costate dorsomedially, basolateral margin moderately edged, length of rostrum ♂ 1.23 × pronotal length, length of ante-antennal portion ♂ 0.39 × total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.87 × maximum width, sides rounded, greatest width near base, anterior portion tubulate; disk granulose. Elytra: length 1.59 × width at humeri, width 1.40 × maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed, striae fine, punctures indistinct, interstriae flat, none costate. Legs: tibiae slender, slightly curved, ventral margin with distal cluster of yellow hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle and anterolateral portions sclerotized (Fig. 223), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.1 × longer than body of aedeagus, flagellum thin, one-third shorter than apodemes, transition to curved base gradual, basal appendage of moderate size, curved, fused subdistally with base of flagellum, projecting beyond base (Fig. 224).

Plant association. Not known.

Distribution. Panama, Pacific side of Cordillera de Talamanca (Fig. 246).

Discussion. *Embates politus* is one of the rarely collected species from higher elevations of the Cordilleras. Details of the male genitalia and the habitus suggest a close relationship to *E. belti*, *E. flavolimbatus* and the species near *E. circumcinctus* (Casey).

66. Embates maculifer **Prena sp. n.**
(Fig. 225–228, 260)

Holotype female, Costa Rica, labeled: "Quebrada Segunda, P.N. Tapantí,/ 1250 m, Prov. Cart., COSTA/ RICA. May 1993. G. Mora./ L-N-194000, 560000", CRI001 206066 (INBC).

Paratypes 4 (2 males, 2 females), Costa Rica, labeled: "Estac. Pitilla, 700 m, 9 km S/ Santa Cecilia, Guanacaste/ COSTA RICA, Feb 1990/ P. Rios, C. Moraga &/ R. Blanco. 330200-/ 380200", CRI000 125036, right elytron damaged (INBC); "COSTA RICA: Prov./ Heredia, F. La Selva/ 3 km S Pto. Viejo/ 10° 26' N 84° 01' W", "29.vi.1986/ H.A. Hespenheide", "117" (CHAH); "COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 14.–16.3.2003/ INBio-OET-ALAS transect", "malaise trap/ M. Sharkey & K. Pitz", INB0003229960 (JPPC); "COSTA RICA. Atlantic/ slope. 1400 m/ 6 km N. Santa Elena/ Punt. 11.V.1979/ H & A Howden" (HAHC).

Description. Habitus: Fig. 225, total length 3.8–5.3 mm (m=4.7, n=5). Color: integument dark brown, antenna dark rufous; basic vestiture brown with few yellow scales clustered along elytral striae; scales yellow in lateral pronotal vitta, in 2 pairs of maculae on pronotum and 4 pairs (humeral and apical maculae may be absent) on elytra (Fig. 225); venter with yellow scales in prosternal channel, on mesosternal process and in spots on flank of metasternum and ventrites 1–4. Head: frontal fovea absent, rostrum moderately thick, subcylindrical (Fig. 226), subcostate dorsomedially, basolateral margin edged, length of rostrum ♂♂ 1.16–1.17 × (n=2), ♀♀ 1.16–1.29 × (m=1.22, n=3) pronotal length, length of ante-antennal portion ♂♂ 0.43 × (n=2), ♀♀ 0.42–0.43 × (m=0.42, n=3) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 slightly longer than 1, club oblong ovate. Pronotum: length 0.75–0.84 × (m=0.79, n=5) maximum width, greatest width behind middle, sides rounded; disk densely punctate, intervals granulose, dorsomedian carina absent. Elytra: length 1.39–1.56 × (m=1.47, n=5) width at humeri, width 1.27–1.40 × (m=1.32, n=5) maximum pronotal width, sides subparallel in basal half, then increasingly narrowed toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures rather indistinct, interstriae flat, none subcostate. Legs: tibiae nearly straight, ventral margin very feebly produced near middle, distally with cluster (♀♀) or indistinct fringe (♂♂) of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 227), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 2.0 × longer than body of aedeagus, flagellum thin, half as long as apodemes, transition to curved base gradual, basal appendage elongate, fused distally with base of flagellum, projecting beyond base (Fig. 228).

Plant association. Not known.

Specific epithet. The name is a compound Latin adjective derived from macula (spot) and fero (to bear).

Distribution. Costa Rica, Atlantic side (Fig. 260).

Discussion. The color-pattern makes *E. maculifer* quite distinct among the Middle American species of *Embates*. The dorsolateral arrangement of the yellow spots suggests that the hypothetic ancestor might have exhibited a compound dorsolateral vitta, which has been reduced secondarily to its single components. The genital character states suggest a relationship to the species of the *E. leucopleura* complex.

67. Embates clandestinus **Prena sp. n.**
(Fig. 229–230)

Holotype female, Costa Rica, labeled: "COSTA RICA: Prov. Heredia:/ 10km SE La Virgen, 450–/ 550m, 10°20'N 84°05'W/ 14.–20.4.2003/ INBio-OET-ALAS transect", "hand-collecting/ leg. Jens Prena", INB0003230183 (INBC).

Paratypes 4 (1 male, 3 females), Costa Rica, labeled: as holotype, INBC0003230184 (JPPC); same label except 8.–13.4.2003, leg. Ed Riley, INBC0003230136 (CMNC); same label except 17-21.3.2003, leg. R. Anderson (CMNC); "COSTA RICA, Heredia:/ Est. Biol. La Selva, 50–/ 150m, 10°26'N 84°01'W/ May 1993, INBio-OET", "2 Mayo 1993/ bosque primario/ M/05/084", CRI001 227839 (INBC).

Description. Habitus: Fig. 229, total length 4.5–5.3 mm (m=4.9, n=5). Color: integument dark brown; basic vestiture of moderately sized dark scales, scales yellow in well-defined dorsolateral vittae between head and elytral apices, on venter and hind legs. Head: frontal fovea minute or absent, transition between head and rostrum nearly continuous, rostrum slender, subcylindrical (Fig. 230), slightly constricted in apical half, costate dorsomedially and dorsolaterally in basal half, basolateral margin roundly edged, length of rostrum ♂ 1.23 × (n=1), ♀♀ 1.24–1.28 × (m=1.25, n=4) pronotal length, length of anteantennal portion ♂ 0.51 × (n=1), ♀♀ 0.53–0.54 × (m=0.53, n=4) total rostral length, dorsal margin of antennal scrobe reaching rostral base well before eye; funicular segment 2 very slightly longer than 1, club oblong ovate. Pronotum: length 0.85–0.88 × (m=0.87, n=5) maximum width, widest in basal third, sides rounded, anterior portion subtubulate; disk densely punctate, intervals granulose, dorsomedian carina absent. Elytra: length 1.67–1.75 × (m=1.71, n=5) width at humeri, width 1.20–1.26 × (m=1.23, n=5) maximum pronotal width, sides slightly converging in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, 9 subcostate. Legs: tibiae nearly straight, ventral margin feebly produced near middle, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus broadly rounded, middle and anterolateral portions sclerotized, body of aedeagus of moderate length, angular at midlength in lateral view, apodemes 1.9 × longer than body of aedeagus, flagellum very thin, as long as apodemes, transition to curved base gradual, basal appendage slender, fused laterally with base of flagellum, barely projecting beyond base.

Plant association. *Piper* sp. [a climbing species near *P. subsessilifolium*, with much smaller leaves and pendulous inflorescence like in *P. urostachyum*] (Prena 2).

Distribution. Costa Rica, Atlantic side (lower part of ALAS-transect in Fig. 239).

Specific epithet. The name is a Latin adjective meaning "clandestine".

Discussion. *Embates clandestinus* resembles very much *E. flavolimbatus*, but lacks the vitta along the outer elytral interstria. After several weeks of unsuccessful search on *Peperomia*, I found single specimens on an unidentified climbing species of *Piper*. The habitus and transitions in the color-pattern suggest a relationship with several South American species near *E. circumcinctus* (Casey).

68. Embates flavolimbatus (Voss), comb. n.

(Fig. 231–234, 255)

Drepanambates flavolimbatus Voss 1953: 75. Lectotype male, Colombia, here designated, upper specimen of two on same pin, labeled: "Rio Aguacatal/ Colombia. W. Cord./ 2000 m/ Coll. Fassl", "Slg. C. Rudel/ Eing. Nr. 1/49", "Drepanambates/ flavolimbatus/ n. sp.", "cotype" (ZIUH). Paralectotypes 3 according to original text, Colombia, 1 on same pin below holotype, 2 not located. Weidner 1976 (cat.); Wibmer & O'Brien 1986 (cat.)

Redescription. Habitus: Fig. 231, total length 3.6–6.2 mm (m=4.9, n=30). Color: integument dark brown, legs and antenna sometimes dark rufous; basic vestiture inconspicuous, scales small and dark, few yellow scales variously clustered along elytral striae; scales yellow in dorsolateral vittae between head and elytral apices (may be reduced in large specimens from elevations above 2000 m) and in elytral interstriae 9 and 10 (Fig. 232), occasionally with ill-defined dorsomedian pronotal vitta; venter with imbricate yellow scales on prosternum and flank. Head: frontal fovea absent, transition between head and rostrum nearly continuous, rostrum slender, subcylindrical (Fig. 232), costate dorsomedially, subcostate dorsolaterally in large specimens, basolateral margin roundly edged, length of rostrum ♂♂ 1.09–1.34 × (m=1.21, n=19), ♀♀ 1.17–1.39 × (m=1.24, n=11) pronotal length, length of ante-antennal portion ♂♂ 0.36–0.40 × (m=0.39, n=19), ♀♀ 0.40–0.42 × (m=0.40, n=11) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; funicular segment 2 very slightly longer than 1, club oblong ovate. Pronotum: length 0.79–0.93 × (m=0.88, n=30) maximum width, widest in basal third, sides rounded or subparallel basally, occasionally slightly gibbous in ♂♂; disk densely punctate, intervals granulose, dorsomedian carina present or not. Elytra: length 1.46–1.65 × (m=1.58, n=30) width at humeri, width 1.27–1.48 × (m=1.36, n=30) maximum pronotal width, sides subparallel in basal third, increasingly rounded toward apex, apices rounded conjointly, preapical callus developed moderately, striae fine, punctures indistinct, interstriae flat, none costate. Legs: tibiae curved, ventral margin not or very feebly produced near middle, distally with cluster of cupreous hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus round, middle sclerotized, anterolateral portion membranous (Fig. 233), body of aedeagus of moderate length, basal third angular in lateral view, apodemes 1.9 × longer than body of aedeagus, flagellum thin, half as long as apodemes, tran-

sition to curved base gradual, basal appendage slender, fused laterally with base of flagellum, projecting beyond base (Fig. 234).

Plant association. *Peperomia guapilesiana* (Prena 14), *P. poasana* (Prena 5), *P. lancifolia* (Prena 5).

Distribution. South America, Andes; Costa Rica, Atlantic side (Fig. 255).

Material examined. COSTA RICA. Heredia: Cerro Zurquí, 5 km N San Isidro, 1500–1800 m (CWOB 4, JPPC 2, MUCR, TAMU); 5 km E Vara Blanca, 2000 m (HPSC, INBC, JPPC 9); 9 km NE Vara Blanca, 1500 m (INBC, JPPC); 16 km SSE La Virgen, 1100 m (CHAH, INBC, JPPC 12); 10 km SE La Virgen, 450 m (JPPC); B. Carrillo N.P., transect (INBC); Cartago: 4 km NE Cañon, Genesis II, 2300 m (JPPC 4). COLOMBIA. Valle del Cauca: Río Aguaca Valley, 2000 m (ZIUH 2). ECUADOR. Loja: Sabanilla (SNSD). Napo: Baños (AMNH); El Chaco (HAHC, JPPC, MZLU 2). Santiago-Morona: Macas (BMNH). Without location: (BMNH). PERU. Junín: Pampa Hermosa (CMNC). Without location: (BMNH, CMNC). Total 54 specimens.

Discussion. Paul Hanson collected the first Middle American specimens of *E. flavolimbatus* in a malaise trap at Cerro Zurquí, in central Costa Rica. I visited the area numerous times without being able to find the weevil on any of the species of *Piper* present. Once I had recognized its association with *Peperomia*, I found *E. flavolimbatus* at several locations on the Atlantic side of Costa Rica. The only other species of *Embates* known to be associated with species of *Peperomia* is *E. peperomiae*. *Embates flavolimbatus* has several close relatives occurring at low elevations, particularly in South America. They form a cline to species near *E. griseolus* (Erichson) and *E. circumcinctus* (Casey). Specimens of *E. flavolimbatus* can be recognized by the color-pattern, the shape of the rostrum and non-costate elytral interstriae. *Embates clandestinus* is more slender, and has been found in association with a species of *Piper*.

69. Embates gilvopictus **Prena sp. n.**
(Fig. 235–237, 249)

Holotype male (dissected), Panama, labeled: “PANAMA, Chiriqui,/ Fortuna, 82°15'W/ 8°44'N, May 16, 1978/ O’Brien & Marshall” (CWOB).

Paratypes 10 (7 males, 3 females), Panama, labeled: as holotype (CWOB 3, JPPC 2), same label except May 18 (JPPC), May 19 (CWOB, JPPC), May 20 (CWOB); “PANAMA: Chiriqui/ La Fortuna, Co.Dv.Tr./ 8°45'N 82°14'W/ 1100m; 9-V-1995/ H.P. Stockwell” (HPSC).

Description. Habitus: Fig. 235, total length 6.6–8.8 mm (m=7.7, n=11). Color: integument very dark brown to black; basic vestiture of small dark scales; scales light yellow in well-defined dorsolateral vitta between head and elytral apices (Fig. 235); venter with imbricate, light yellow scales on prosternum, mesosternal process and flank. Head: frontal fovea extremely minute or absent, rostrum slender, subcylindrical (as Fig. 230), con-

stricted in apical half, costate dorsomedially, subcostate dorsolaterally, basolateral margin roundly edged, length of rostrum ♂♂ 1.30–1.33 × (m=1.31, n=8), ♀♀ 1.31–1.41 × (m=1.35, n=3) pronotal length, length of ante-antennal portion ♂♂ 0.46–0.50 × (m=0.48, n=8), ♀♀ 0.50–0.52 × (m=0.50, n=3) total rostral length, dorsal margin of antennal scrobe reaching rostral base before eye; length of funicular segments 1 and 2 subequal, club oblong ovate. Pronotum: length 0.86–0.92 × (m=0.89, n=11) maximum width, sides subparallel in basal third, roundly narrowed anteriorly; disk densely punctate, intervals rugose, subcostate dorsomedially. Elytra: length 1.67–1.75 × (m=1.72, n=11) width at humeri, width 1.30–1.36 × (m=1.33, n=11) maximum pronotal width, sides subparallel in basal half, apices rounded conjointly, preapical callus developed moderately, striae fine, almost reduced on disk, punctures indistinct, interstriae flat, 9 convex. Legs: tibiae nearly straight, ventral margin not produced, distally with indistinct fringe of light yellow hairs, tarsal claws arcuate and separate at base. Male: apex of aedeagus rounded narrowly, middle sclerotized, anterolateral portion membranous (Fig. 236), body of aedeagus of moderate length, basal half angular in lateral view, apodemes 1.8 × longer than body of aedeagus, flagellum thin, half as long as apodemes, transition to curved base gradual, basal appendage rather thick, fused laterally with base of flagellum, barely projecting beyond base (Fig. 237).

Plant association. Not known.

Distribution. Panama, one location in Cordillera de Talamanca (Fig. 249).

Specific epithet. The name is a compound Latin participle derived from gilvus (light yellow) and pictus (painted).

Discussion. *Embates gilvopictus* seems to be related to *E. crinipes* and a number of undescribed South American species, which form a cline to *E. rufipes* (Kirsch). The species exhibits similarity to *E. quadrilineatus* (F.) (Fig. 31); the latter a species with differently formed aedeagus and well-defined lateral vitta (in addition to the dorsolateral vitta). The short basal appendage of the aedeagal flagellum separates *E. gilvopictus* from all Middle American species with similar vestiture.

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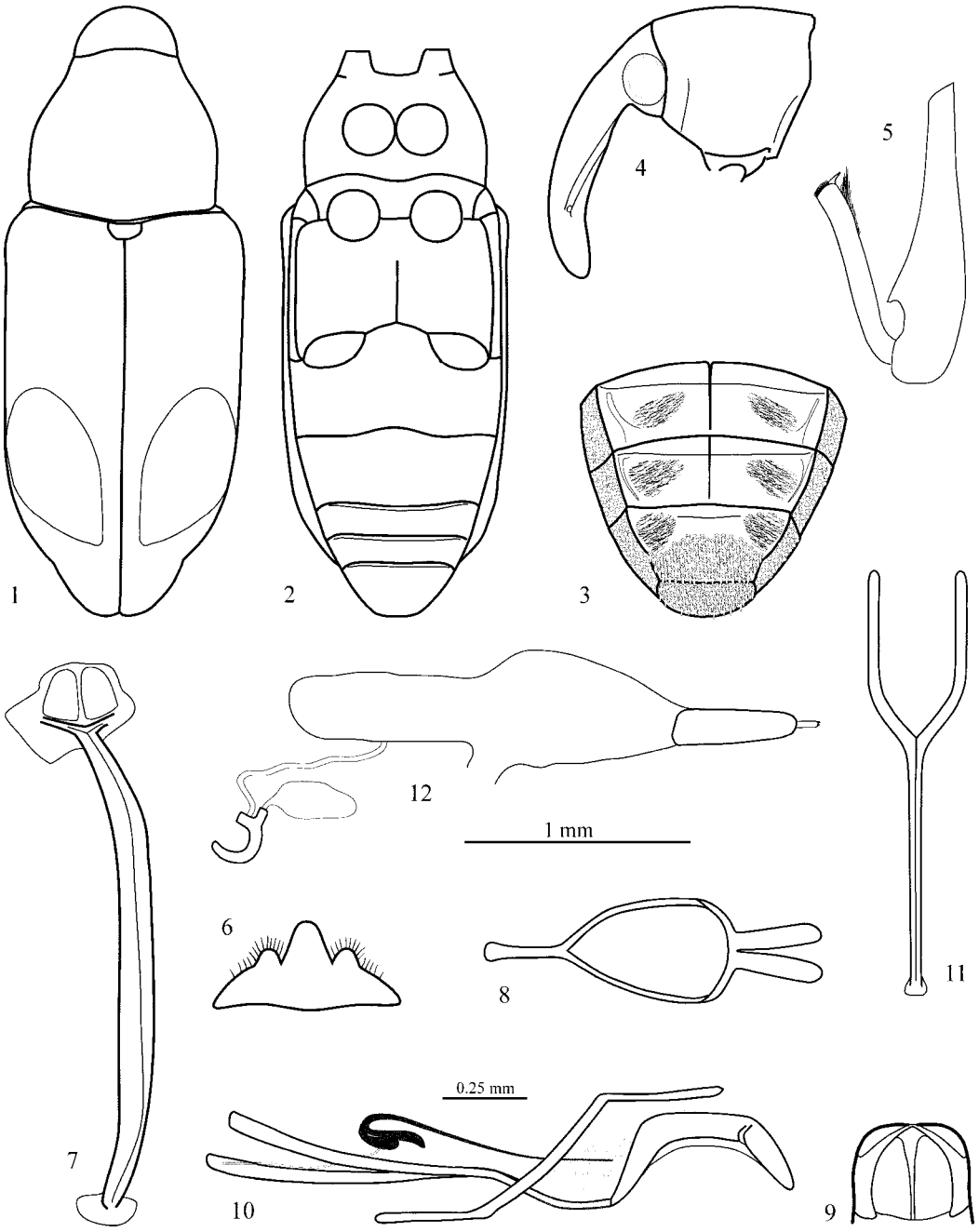
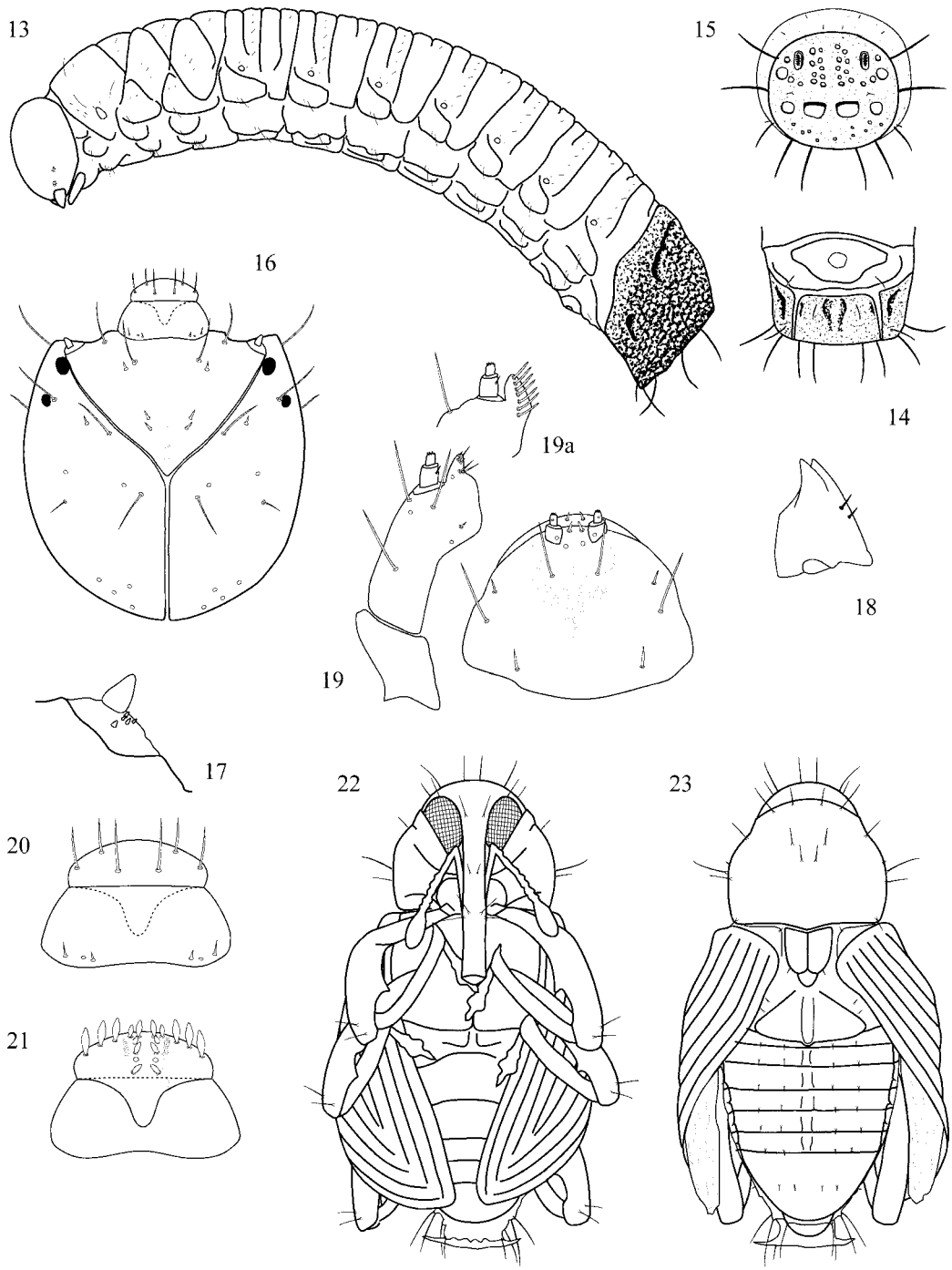


FIGURES 1–12. *E. caecus*: **1**, habitus and color-pattern, dorsal; **2**, thorax and abdomen, ventral; **3**, posterior tergites, dorsal; **4**, head and prothorax, lateral; **5**, metafemur and tibia; **6**, sternite 8, male; **7**, sternite 9, male; **8**, tegmen; **9**, apex of aedeagus, dorsal; **10**, aedeagus, lateral; **11**, sternite 8, female; **12**, female genital tract, lateral



FIGURES 13–23. **13–21**, Late-instar larva of putative *E. cretifer*: **13**, habitus, lateral; **14**, abdominal segments 8–10, ventral; **15**, abdominal segment 8, caudal; **16**, head capsule, frontal; **17**, antenna; **18**, right mandible, dorsal; **19**, maxilla and labium, ventral and (**19a**) dorsal; **20**, clypeus and labrum; **21**, epipharynx. **22–23**, pupa of *E. chelys*: **22**, habitus, ventral; **23**, habitus, dorsal.

FIGURE 24. Feeding damage of *E. pseudobumbraticus* on leaf of *Piper pseudobumbratum*

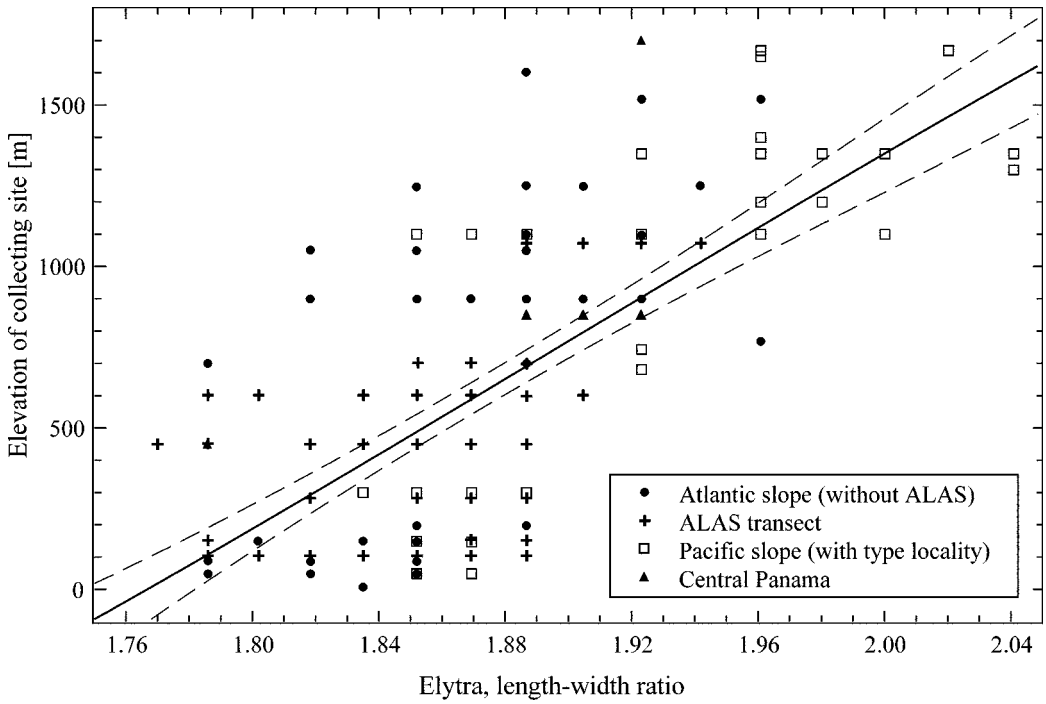
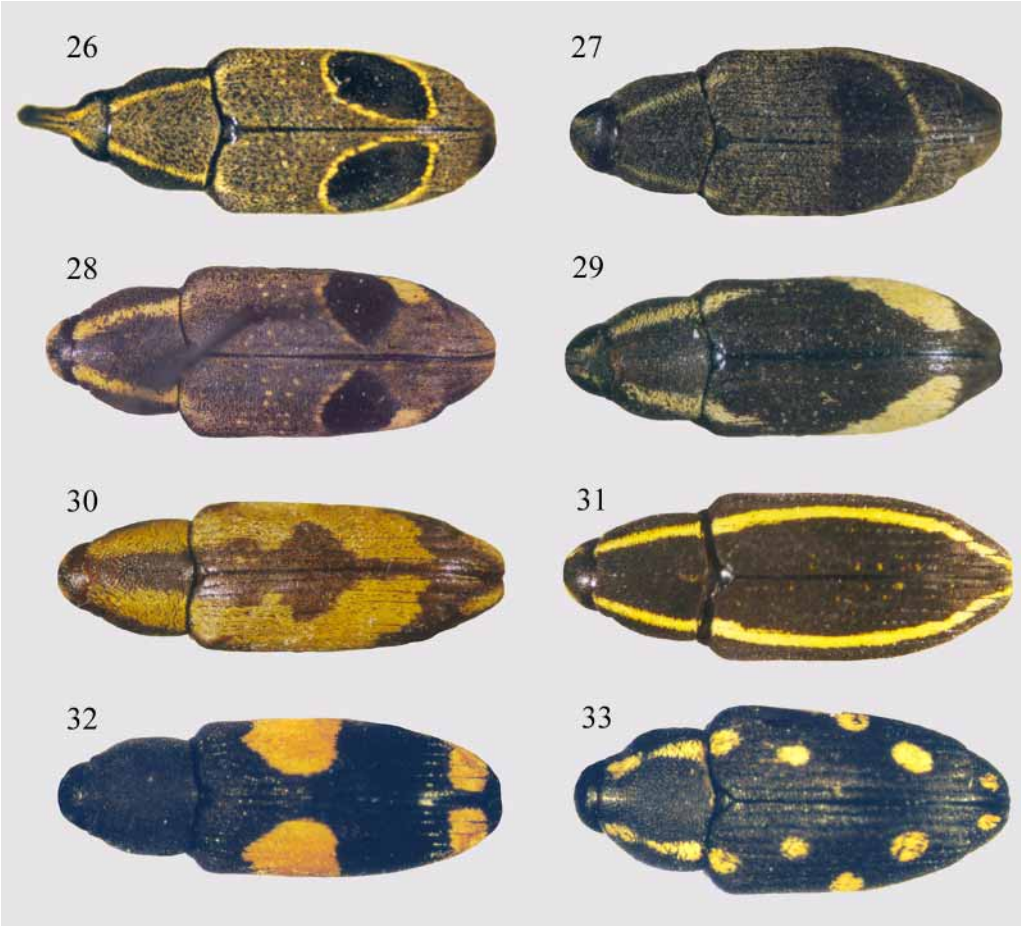


FIGURE 25. Relationship between elevation of collecting site and metric proportion of elytron in local populations of *E. sinuatus* (r^2= 0.48, p<0.001, n=215)



FIGURES 26–33. Examples for dorsal color-patterns in species of *Embates* (for further explanations see in the text). **26–28**, species with dark elytral macula preserved: **26**, *E. sagax*, Peru, with elytral macula with circumferential line entire; **27**, *E. delicatulus*, Bolivia, with elytral maculae and post-macular elements merged across suture, ante-macular element obliterated; **28**, *E.* species #91, Colombia, with narrow ante-macular and wide post-macular elements. **29–33**, species with dark elytral macula merged with basic vestiture: **29**, *E. obliquatus*, Peru, with ante-macular element obliterated, post-macular element well-developed and humeral streak present; **30**, *E. rhombifer*, Costa Rica, with ante- and post-macular elements wide, fused with humeral streak and demarking rhomboid pseudo-macula on disk; **31**, *E. quadrilineatus*, Guyana, with perfectly continuous vitta composed of ante- and post-macular, humeral and apical elements; **32**, *E.* species #75, Ecuador, with post-macular element obliterated, ante-macular and apical elements modified to fasciae; **33**, *E.* species #101, Peru, with ante-macular, humeral and apical elements reduced to small spots, post-macular element disintegrated in two small spots.