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## A revision of the *Deltochilum* subgenus *Aganhyboma* Kolbe, 1893 (Coleoptera: Scarabaeidae: Scarabaeinae)

FERNANDO A. B. SILVA<sup>1</sup>, JÚLIO LOUZADA<sup>2</sup> & FERNANDO VAZ-DE-MELLO<sup>3</sup>

<sup>1</sup>Universidade Federal do Pará, Instituto de Ciências Biológicas, setor de Zoologia. Rua Augusto Corrêa, 01. Guamá. Belém PA 66075-110, Brazil. E-mail: fernandoabsilva@yahoo.com.br

<sup>2</sup>Universidade Federal de Lavras, Departamento de Biologia, setor de Ecologia. Campus Universitário. Lavras MG 37200-000, Brazil. E-mail: jlouzada@gmail.com

<sup>3</sup>Muséum National d'Histoire Naturelle, Département Systématique et Évolution, Entomologie, 57 rue Cuvier, F-75231 Paris cedex 05, France. Permanent address: Universidade Federal de Mato Grosso, Instituto de Biociências, Departamento de Biologia e Zoologia. Av. Fernando Correa da Costa, 2367. Boa Esperança. Cuiabá MT 78060-900, Brazil. E-mail: vazdemello@gmail.com. CNPq fellow.

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## Abstract

The species of the *Deltochilum* subgenus *Aganhyboma*, endemic to Central and South America, are reviewed. The species have been divided into complexes, with a brief diagnosis presented for each. A key for identification of 26 currently recognized species is provided in English and Portuguese. Two major groups within the subgenus are recognized (*tresignatum* and *valgum*). The first is represented by species typically belonging to the subgenus *Aganhyboma* (*Deltochilum (A.) trisignatum*, *D. (A.) kolbei*, *D. (A.) violaceum*, *D. (A.) cupreicolle* and *D. (A.) viridescens* **new status**) and three **new species** described here (*D. (A.) amandaarcanjoae*, *D. (A.) viridicatum* and *D. (A.) titovidaurrei*). The second group (*valgum*) is represented by: *D. (A.) valgum*, *D. (A.) longiceps* **new status**, *D. (A.) acropyge* **new status**, *D. (A.) acanthus*, *D. (A.) icaroides* and *D. (A.) icariforme*), previously assigned to the subgenus *Deltohyboma*. Twelve **new species** are described for the *valgum* group (*D. (A.) schefflerorum*; *D. (A.) streblopodum*; *D. (A.) feeri*; *D. (A.) larseni*; *D. (A.) arturoi*; *D. (A.) finestriatum*; *D. (A.) cangalha*; *D. (A.) alpercata*; *D. (A.) ritamourae*; *D. (A.) kolleri*; *D. (A.) parsi*; *D. (A.) subrubrum*). A **lectotype** is designated for *D. (A.) trisignatum* and *D. (A.) icariforme*. A detailed literature review, synonymies, description, illustration of key morphological characters, data of the studied material and geographic distribution is provided for each species.

**Key words:** Systematics, dung beetles, millipede predators, *Deltochilum*, *Aganhyboma*

## Resumo

As espécies de *Deltochilum* do subgênero *Aganhyboma*, endêmico das Américas do Sul e Central, são revisadas. As espécies foram aqui organizadas em complexos, com uma breve diagnose apresentada. Uma chave para identificação de 26 espécies reconhecidas é apresentada em inglês e português. Dois grandes grupos dentro do gênero são reconhecidos (*tresignatum* e *valgum*). O primeiro representado pelas espécies pertencentes tipicamente ao subgênero *Aganhyboma* (*Deltochilum (A.) trisignatum*, *D. (A.) kolbei*, *D. (A.) violaceum*, *D. (A.) cupreicolle* e *D. (A.) viridescens* **novo status**) e três **novas espécies** descritas aqui (*D. (A.) amandaarcanjoae*, *D. (A.) viridicatum* e *D. (A.) titovidaurrei*). O segundo grupo (*valgum*) é representado pelas espécies: *D. (A.) valgum*, *D. (A.) longiceps* **novo status**, *D. (A.) acropyge* **novo status**, *D. (A.) acanthus*, *D. (A.) icaroides* e *D. (A.) icariforme*), pertencentes anteriormente ao subgênero *Deltohyboma*. Doze **novas espécies** são descritas para o grupo *valgum* (*D. (A.) schefflerorum*; *D. (A.) streblopodum*; *D. (A.) feeri*; *D. (A.) larseni*; *D. (A.) arturoi*; *D. (A.) finestriatum*; *D. (A.) cangalha*; *D. (A.) alpercata*; *D. (A.) ritamourae*; *D. (A.) kolleri*; *D. (A.) parsi*; *D. (A.) subrubrum*). Um **lectótipo** é designado para *D. (A.) trisignatum* e *D. (A.) icariforme*. Uma revisão de literatura detalhada, sinonímias, descrição, ilustração de importantes caracteres morfológicos, dados do material estudado e distribuição geográfica é apresentada para cada espécie.

**Palavras-chave:** Sistemática, rola-bosta, predadores de milípedes, *Deltochilum*, *Aganhyboma*

## Introduction

The subgenus *Aganhyboma* was proposed by Kolbe in 1893 for species of *Deltochilum* (*D. trisignatum* Harold, *D. cupreicolle* Blanchard, *D. atrocoeruleum* Kolbe [invalid name], *D. signiferum* Kolbe [invalid name]). However, he did not designate a type species. The characteristics on which Kolbe defined this subgenus were: medium body size; complete lateral elytral carina, extending the entire length of the elytra and separated from the epipleural carina; absence of anterior tarsi.

Shipp (1897) treated *Aganhyboma* as a genus and designated *D. trisignatum* as the type species. In the most recent revision of *Aganhyboma* by Paulian (1938), two new species (*D. kolbei* Paulian and *D. violaceum* Paulian)

were described and a key to the species was provided. Paulian (1938) treated *Aganhyboma* as a subgenus of *Deltochilum*. In the same paper Paulian erroneously designated *D. cupreicolle* Blanchard as the type species of the subgenus, an action nullified by the earlier designation by Shipp (1897). Since Paulian (1938), only Martínez (1948) has contributed to this subgenus with the description of a new subspecies, *D. cupreicolle viridescens* Martínez.

Paulian (1938) placed *D. valgum* Burmeister and *D. acropyge* Bates in the subgenus *Deltochilum*. In this same work, Paulian described a variety, *D. valgum* var. *longiceps*, and considered *valgum* to consist of three subspecies (var. *valgum*, var. *acropyge*, var. *longiceps*). *D. icariforme* Paulian 1938 was described and placed close to *valgum*. The *valgum* group was established for this set of species. Balthasar (1939) described a new species (*D. icaroides* Balthasar 1939) which he placed in the *valgum* group.

Lane (1946) pointed out Paulian's (1938) error in designating *D. submetallicum* (Castelnau 1840) as the type of the subgenus *Deltochilum*, a monobasic genus including only the de facto type, *D. dentipes* Eschscholtz 1822. In the same work, Lane established the subgenus *Deltohyboma* and designated *D. submetallicum* as type and in which he placed all species of the *valgum* group. Kohlmann and Solís (2012) described a new species in this group, *D. acanthus*.

Paulian (1938) recognized the morphological proximity of the *valgum* group and the subgenus *Aganhyboma* (shape of the head and pygidium, and the flattening of the elytral disc, as well as the simple parameres shape) but did not combine the two.

The purpose of this paper is to review the taxonomy of the subgenus *Aganhyboma*, including the species comprising the *valgum* group formerly placed in the subgenus *Deltohyboma*.

## Material

This study was based on the examination of 306 adult specimens of *Aganhyboma* and the *valgum* group. Material was kindly provided by the curators of several institutions and private collections as listed below.

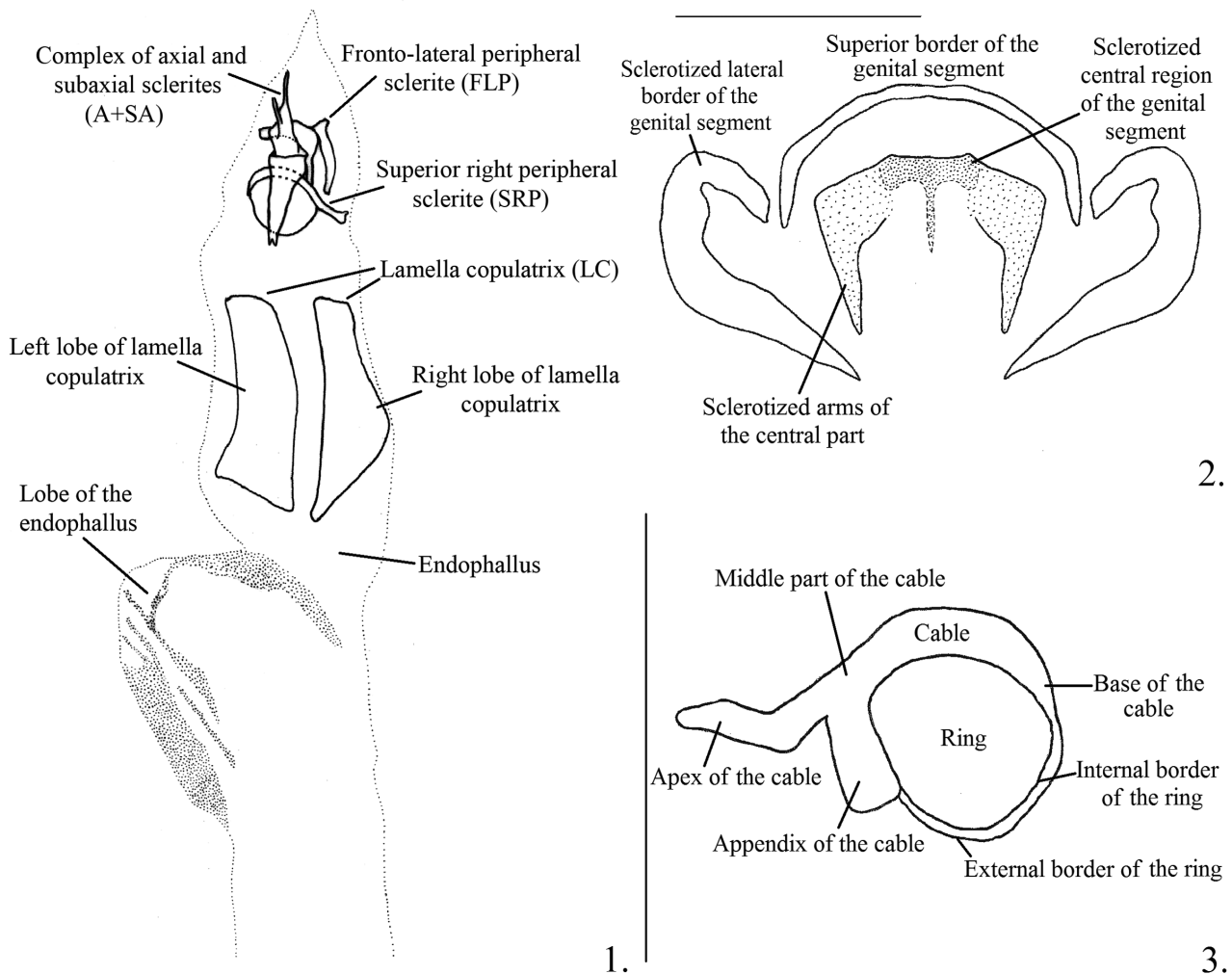
AFIC	Adrian Forsyth Insect Collection, housed at National Museum of Natural History, Smithsonian Institution, Washington, USA (Trond Larsen).
BMNH	Natural History Museum, London, England (Max Barclay and Malcolm Kerley)
CEMT	Seção de Entomologia da Coleção Zoológica, Departamento de Biologia e Zoologia, Universidade Federal de Mato Grosso, Cuiabá, Brasil (Fernando Vaz-de-Mello).
CEUFPB	Coleção do Laboratório de Entomologia, Universidade Federal da Paraíba, João Pessoa, Brasil (Adelmar Gomes Bandeira).
CMN	Canadian Museum of Nature, Ottawa, Canadá (François Génier).
CREN	Coleção de Referência de Escarabeíneos Neotropicais, Departamento de Biologia, Setor de Ecologia, Universidade Federal de Lavras, Lavras, Brasil (Júlio Louzada).
DZUP	Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brasil (Lúcia Massutti de Almeida).
INBio collection	National Biodiversity Institute, Santo Domingo de Heredia, Costa Rica.
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (Márcio Luiz de Oliveira and Thiago Mahlmann).
MACN	Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina (Axel Bachmann).
MNHN	Muséum National d'Histoire Naturelle, Paris, França (Olivier Montreuil e Antoine Mantilleri)
MNKM	Museo Noel Kempff Mercado, Universidad Autonoma Gabriel Rene Moreno, Santa Cruz de la Sierra, Bolívia (Julieta Ledezma).
MZUEFS	Museu de Zoologia da Universidade Estadual de Feira de Santana, Feira de Santana, Brasil (Freddy Bravo).
MZUSP	Museu de Zoologia da Universidade de São Paulo, São Paulo, Brasil (Carlos Campaner).
NMPC	National Museum of Natural History, Prague, Czech Republic (Jiří Hájek)
WDEC	W. David Edmonds, private collection, Marfa, Texas.
MNHU	Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Johannes Frisch and Joachim Willers).

## Methods

Examination of the aedeagus, endophallic sclerites and genital segment was undertaken to clarify the taxonomic differentiation of species. In describing these structures here, we generally follow Tarasov and Solodovnikov (2011), with some slight modifications. The terminology used for these sclerites is presented in Figures 1–3. The endophallus was removed from the aedeagus through the basal foramen of the phallobase, and its sclerites were illustrated according to the orientation inside the body (the symmetric aedeagus rests on its left side, with its right lateral to up); endophallic sclerites were drawn in dorsal view in the resting position (seen through the right lateral of the aedeagus) as shown in Figure 1, except for the superior right peripheral sclerite (SRP), which was illustrated in ventral view in resting position (seen from the left side of the aedeagus). The sclerites were found to be taxonomically useful: lamella copulatrix (Fig. 1), superior right peripheral sclerite (Figs 1, 3) and fronto-lateral peripheral sclerite (Fig. 1). Whereas, the complex of subaxial and axial sclerites (Fig. 59) did not provide significant taxonomic value.

Dissection of genitalia utilized soapy, hot water hydration, followed by immersion in warm 5% KOH solution, followed by washing in clean water and alcohol and stored in a vial with distilled glycerine.

The illustrations were made using a digitizing tablet and image editing software (Adobe Photoshop CS4). Some illustrations were drawn with the aid of a camera system coupled to a Leica stereomicroscope M205A. Images of specimens and key characters were taken with a Leica stereomicroscope M205A, using image stacking software (Leica Application Suite, version 3.7.0).



**FIGURES 1–3.** Male genital sclerites in *Deltochilum* (*Aganhyboma*). **1.** Position and nomenclature of endophallic sclerites (modified from Medina *et al.* 2013). **2.** Nomenclature of the main parts of the genital segment (*D. amandaarcanjoae* **new species**). **3.** Nomenclature of the main parts of the superior right peripheral sclerite (SRP) (*D. parsi* **new species**). Figures scale = 1 mm.



## Key to adults of species of *Deltochilum* subgenus *Aganhyboma*

1. Dorsal interocular distance nine to ten times eye width (Fig. 60); ninth interstria completely longitudinally carinate; elytral lateral edge bounded by the carina of ninth interstria (Fig. 62); length of sixth abdominal ventrite at midline equal to or less than that of fifth ventrite; metafemur clearly narrowed at base (Fig. 64). (*tresignatum* group) . . . . . 2
  - Dorsal interocular distance three to four times eye width (Fig. 61); carina of ninth elytral interstria at most extending 3/4 length of interstria; posterior part of elytral lateral edge formed by the pseudopleural carina (Fig. 63); length of sixth abdominal ventrite at midline greater than that of fifth ventrite; metafemur slightly narrowed at base (Fig. 65). (*valgum* group) . . . . . 9
2. Apex of pygidium rounded; basal third of the protibia abruptly expanded along inner edge (weakly indicated in *D. amandaarcanjoae*) (Fig. 66); medial lateral tooth of protibia closer to apical tooth than to basal tooth; apical one-third of metatibia strongly curved inward (weakly indicated in *D. amandaarcanjoae*) (Fig. 67) (*tresignatum* complex) . . . . . 3
  - Apex of pygidium acuminate (Fig. 73); protibia not abruptly widened; medial lateral tooth of protibia about equidistant from basal and apical teeth; apical one-third of metatibia only slightly curved inward (Fig. 68) (*cupreicolle* complex) . . . . . 6
3. Body completely bluish-black or violaceous (Fig. 98); margin of pronotum (close to lateral angles) straight, without depression; punctuation of abdominal sternites concentrated anterolaterally; anterior edge of profemur, in ventral view, with a complete margin. Male genitalia fig. 8. Brazil and Paraguay (Cerrado and Chaco) . . . . . *D. amandaarcanjoae* (Fig. 98).
  - Body not colored as above; margin of pronotum (close to lateral angles) curved inward; punctuation of abdominal sternites concentrated on anterior margin and posterior margin; anterior margin of profemur effaced at middle portion (Fig. 69) . . . . . 4
4. Head and pronotum green; pronotum lacking distinct spots; basal carina of seventh interstria longer than metatibial spur . . . . . 5
  - Head and pronotum differently coloured; anterior edge of pronotum with three black spots; elytra brown; basal carina of seventh interstria short (Fig. 95), approximately the same length as metatibial spur. Male genitalia figs 9, 27, 35, 44, 52. Brazil (southern Bahia, Espirito Santo and Minas Gerais) . . . . . *D. trisignatum* (Fig. 95).
5. Elytra with ocellate punctures (microtubercles) (Fig. 70); elytra surface slightly rugose, with an opaque sheen, except in ocellate punctures, which are shiny; apex of second interstria with tubercle. Brazil (Minas Gerais) . . . . . *D. violaceum* (Fig. 97).
  - Elytra surface smooth, without ocellate punctures and with strong bright metallic color (Fig. 96); apex of second interstria without tubercle or tubercle weakly indicated. Brazil (Atlantic Forest of northeast region) . . . . . *D. kolbei* (Fig. 96).
6. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria (Fig. 71); foveiform punctures on anterior portion of third interstria small, separated by three times or more their diameter; punctures at center of the third elytral stria separated by 1.5 times or less their diameter. . . . . 7
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  - Head with weak green or black-violaceous coloration, and an opaque sheen (Figs 104, 105); posteromedial portion of pronotum lacking greenish band or only faintly indicated; elytra with dark green or black-violaceous coloration; male with apex of pygidium weakly acuminate or rounded. Male genitalia figs 7, 34. Argentina, southern Brazil, Uruguay [doubtful] . . . . . *D. viridicatum* (Figs 104, 105).
8. Elytra dark brown or black (Fig. 100); disc of pronotum with transverse oval spot (Fig. 100); aedeagus with short parameres and phallobase (Fig. 4). Male genitalia figs 4, 42. Brazil (Goiás, Minas Gerais) . . . . . *D. titovidaurrei* (Fig. 100).
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  - Punctures of anteromedial portion of hypomera separated by less than one diameter (Fig. 79); pronotum black with an opaque sheen or weak luster (Fig. 115); elytral microtubercles well delimited, with brown sheen (Fig. 77). Brazil (Alagoas) . . . . . *D. alpercata* (Fig. 115).
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13. Pseudopleural carina complete, visible entire length of epipleuron; male genitalia figs 13, 46. Mexico to Panama . . . . . *D. acropyge* (Fig. 106).

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-	Foveiform punctures of head nearly touching; dorsal interocular distance approximately 2.5 times eye width; foveiform punctures of interstriae surrounded by approximately five well-defined shiny microtubercles; apex of second interstria without carina or tubercle; length < 13 mm. Male genitalia fig. 14. Peru . . . . .	<i>D. larseni</i> (Fig. 113).
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-	Apical carina of seventh interstria with length less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae; basal carina of seventh interstria equal to or longer than apical carina . . . . .	24
23.	Basal carina of ninth interstria surpassing anterior limit of apical carina of seventh interstria; elytral lateral edges distinctly curved outward (Fig. 121). Male genitalia fig. 20. Brazil (Mato Grosso) . . . . .	<i>D. parsi</i> (Fig. 121).
-	Basal carina of ninth interstria not surpassing anterior limit of apical carina of seventh interstria; elytral lateral edges slightly curved outward (Fig. 120). Male genitalia figs 21, 32, 40, 57. Brazil (Goiás, Mato Grosso and São Paulo) . . . . .	<i>D. icariforme</i> (Fig. 120).
24.	Lateral edges of elytra subparallel or slightly curved outward (Figs 122, 123). If curved outward, body never completely copper with reddish metallic sheen; dark brown or black coloration, with greenish or slightly reddish metallic sheen . . . . .	25
-	Elytral lateral edge distinctly curved outward; entirely copper and reddish metallic sheen. Male genitalia figs 22, 58. Brazil (Bahia, Ceará, Minas Gerais and Piauí) . . . . .	<i>D. ritamourae</i> (Fig. 119).
25.	Microtubercles of elytral interstriae absent or inconspicuous (Fig. 86); foveiform punctures near the center of posterior edge of pronotum separated by at least one diameter. Male genitalia figs 23, 41. Argentina (Misiones) . . . . .	<i>D. subrubrum</i> (Fig. 123).
-	Elytral microtubercles more conspicuous on lateral interstriae; foveiform punctures near the center of posterior edge of pronotum separated by less than one diameter. Male genitalia figs 19, 49, 56. Brazil (Mato Grosso do Sul and São Paulo) . . . . .	<i>D. kolleri</i> (Fig. 122).

### Chave para adultos das espécies de *Deltochilum* do subgênero *Aganhyboma*

1. Distância interocular dorsal nove a dez vezes a largura do olho (Fig. 60); nona interstria inteiramente carenada longitudinalmente; bordo lateral do élitro inteiramente formado pela carena da nona interstria (Fig. 62); sexto ventrito abdominal com comprimento na linha do meio igual ou menor que aquele do quinto ventrito; metafêmur nitidamente mais estreito na base (Fig. 64). (grupo *trisinatum*) . . . . . 2
- Distância interocular dorsal três a quatro vezes a largura do olho (Fig. 61); carena da nona interstria elytral atinge no máximo

- 3/4 do comprimento da interestria; parte posterior do bordo lateral do élitro formada pela carena pseudoepipleural (Fig. 63); meio do sexto ventrito abdominal com comprimento maior que aquele do quinto ventrito; metafêmur apenas um pouco mais estreito na base (Fig. 65). (grupo *valgum*) ..... 9
2. Ápice do pigídio arredondado; terço basal da protíbia bruscamente alargado no bordo interno (fracamente indicado em *D. amandaarcanjoae*) (Fig. 66); dente medial lateral da protíbia mais próximo do dente apical que do dente basal; metatíbia fortemente arqueada em direção ao corpo na sua terça parte apical (fracamente indicado em *D. amandaarcanjoae*) (Fig. 67) (complexo *tresignatum*) ..... 3
- Ápice do pigídio pontagudo (Fig. 73); protíbia com largura subigual em toda sua extensão; dente medial lateral da protíbia aproximadamente equidistante aos dentes apical e basal; metatíbia levemente arqueada em direção ao corpo (Fig. 68) (complexo *cupreicolle*) ..... 6
3. Corpo inteiramente preto-azulado ou violáceo (Fig. 98); margem do pronoto (próximo aos ângulos laterais) aproximadamente reta, sem reentrância; pontuação dos ventritos abdominais concentrada anterolateralmente; bordo anterior do profêmur, em vista ventral, com emarginação completa. Genitália masculina fig. 8. Brasil e Paraguai (Cerrado e Chaco) ..... *D. amandaarcanjoae* (Fig. 98).
- Corpo com coloração diferente; margem do pronoto (próximo aos ângulos laterais) com reentrância bem marcada; pontuação dos ventritos abdominais concentrada nos bordos anterior e posterior da lateral dos ventritos; bordo anterior dos profêmures com emarginação incompleta aproximadamente na metade do bordo (Fig. 69). ..... 4
4. Cabeça e pronoto verde; pronoto unicolor, sem machas diferenciadas; comprimento da carena basal da sétima interestria maior que aquele do calcar da metatíbia ..... 5
- Coloração da cabeça diferente do pronoto; bordo anterior do pronoto com três distintas manchas pretas; élitro castanho; carena basal da sétima interestria pequena (Fig. 95), com aproximadamente o mesmo comprimento do calcar da metatíbia. Genitália masculina figs 9, 27, 35, 44, 52. Brasil (sul da Bahia, Espírito Santo e Minas Gerais) ..... *D. trisignatum* (Fig. 95).
5. Élitros com microtúberculos oclares (Fig. 70); superfície elitral levemente rugosa, com reflexo opaco e brilho apenas nos microtúberculos da microescultura; tubérculo do ápice da segunda interestria presente. Brasil (Minas Gerais) ..... *D. violaceum* (Fig. 97).
- Superfície elitral lisa, sem microtúberculos oclares visíveis e com forte brilho metálico (Fig. 96); tubérculo do ápice da segunda interestria ausente ou quase inconspícuo. Brasil (Mata Atlântica da região nordeste) ..... *D. kolbei* (Fig. 96).
6. Carena da base da sétima interestria alongada, com aproximadamente quatro vezes a largura da sétima interestria (Fig. 71); pontos foveiformes da região anterior da terceira interestria pequenos, separados por três ou mais vezes o seu diâmetro; pontos no centro da terceira estria elitral distanciados por 1,5 vezes ou menos o seu diâmetro ..... 7
- Carena da base da sétima interestria pequena, com aproximadamente duas vezes a largura da sétima interestria (Fig. 72); pontos foveiformes da região anterior da terceira interestria separados por menos que três vezes o seu diâmetro; pontos no centro da terceira estria elitral distanciados por duas ou mais vezes o seu diâmetro. .... 8
7. Cabeça com coloração verde intensa e reflexos metálicos; região posterior do pronoto com forte mancha esverdeada semi-circular (Fig. 101), ou pronoto completamente verde (Figs 102, 103); élitros verde escuro; macho com o ápice do pigídio fortemente pontagudo (Fig. 73). Genitália masculina figs 6, 34, 43, 51, 59. Brasil e Paraguai (Cerrado e Chaco) ..... *D. viridescens* (Figs 101, 102, 103).
- Cabeça com coloração verde claro, ou preto-violáceo, sem brilho metálico (Figs 104, 105); região posterior do pronoto sem mancha esverdeada semi-circular, ou com apenas uma indicação da mesma; élitros verde escuro, ou preto-violáceo; macho com o ápice do pigídio suavemente acuminado ou arredondado. Genitália masculina figs 7, 34. Argentina, sul do Brasil, Uruguai [registro duvidoso] ..... *D. viridicatum* (Figs 104, 105).
8. Élitros marrom escuro ou preto (Fig. 100); disco do pronoto com mancha oval transversa, (Fig. 100); edeago com parâmeros e falobase curtos (Fig. 4). Genitália masculina figs 4, 42. Brasil (Goiás, Minas Gerais) ..... *D. titovidaurrei* (Fig. 100).
- Élitros avermelhados ou marrom claro (Fig. 99); disco do pronoto sem mancha oval transversa. Quando o disco do pronoto apresenta essa mancha, élitro nunca marrom escuro ou preto; edeago com parâmeros e falobase mais alongados (Fig. 5). Genitália masculina figs 5, 25, 33, 50. Bolívia e Brasil (Cerrado e Chaco). .... *D. cupreicolle* (Fig. 99).
9. Estrias elitrais delgadas, com margens carenadas que delimitam a estria próximas, quase tocando-se (Fig. 74) (complexo *finestriatum*) ..... 10
- Estrias elitrais alargadas, com margens carenadas claramente separadas (Fig. 75) ..... 12
10. Microtúberculos das interestrias discais pouco destacados e unidos por áreas brilhantes de baixo relevo (Fig. 74). Isso torna difícil a delimitação dos microtúberculos. Élitros com reflexo marrom escuro (Fig. 74); com formato oval alongado e bordos laterais suavemente curvados para fora (Fig. 116). Genitália masculina figs 11, 28, 36, 45, 53. Brasil (Mata Atlântica da região Sul e Sudeste) ..... *D. finestriatum* (Fig. 116).
- Microtúberculos das interestrias discais proeminentes, unidos ou não por manchas brilhantes; élitros arredondados e bordos laterais nitidamente curvados para fora. .... 11
11. Pontos da região antero-mediana do hipômero separados por no mínimo um diâmetro (Fig. 78); pronoto com reflexo vermelho metálico (Fig. 114); microtúberculos elitrais pouco delimitados, com reflexo vermelho cúpreo (Fig. 76). Brasil (Minas Gerais) ..... *D. cangalha* (Fig. 114).
- Pontos da região antero-mediana do hipômero separados por menos que um diâmetro (Fig. 79); pronoto preto, com reflexo opaco ou fraco brilho (Fig. 115); microtúberculos elitrais bem delimitados, com reflexo marrom (Fig. 77). Brasil (Alagoas) . . . *D. alpercata* (Fig. 115).
12. Carena da base da nona interestria geralmente não ultrapassa a metade do comprimento do élitro (Fig. 80). Se a carena da base da nona interestria ultrapassar a metade do comprimento do élitro, carena pseudoepipleural incompleta, porção do meio apagada (Fig. 80) (complexo *acropyge*). .... 13

- Carena da base da nona interestria se estende por 3/4 ou mais do comprimento do élitro; Carena pseudoepipleural completa, visível em toda a extensão da epipleura (complexo *valgum*) ..... 20
- 13. Carena pseudoepipleural completa, visível em toda a extensão da epipleura; genitália masculina figs 13, 46. México ao Panamá ..... *D. acropyge* (Fig. 106).
- Carena pseudoepipleural incompleta, porção do meio apagada (Fig. 80) ..... 14
- 14. Hipômero com pontuação foveiforme densa nas partes anterior e posterior (Fig. 81) ..... 15
- Hipômero com pontuação foveiforme densa apenas na parte anterior (pontos não se tocam), e ausente ou dispersa em uma faixa diagonal (Figs 82-83, indicada por seta) ..... 16
- 15. Pontos foveiformes da cabeça quase tocando-se, separados na superfície interocular dorsal por aproximadamente metade do diâmetro de um ponto. Guiana, Guiana Francesa e Trinidad e Tobago ..... *D. feeri* (Fig. 107).
- Pontos foveiformes da cabeça tocando-se. Brasil (sudeste do Rio Amazonas, no Mato Grosso e Pará) ..... *D. schefflerorum* (Fig. 108).
- 16. Faixa diagonal do hipômero sem pontuação ou com um ou dois pontos isolados (Fig. 83) ..... 17
- Faixa diagonal do hipômero com pontuação dispersa porém evidente (Fig. 82) ..... 19
- 17. Pontos das estrias elitrais frequentemente distintamente alongados (com formato elíptico), separados por espaçamento irregular. Alguns desses pontos são bem próximos enquanto outros são nitidamente dispersos (Fig. 84); comprimento > 13 mm. Genitália masculina figs 16, 37. Colômbia ..... *D. longiceps* (Fig. 110).
- Pontos das estrias elitrais arredondados, ou no máximo um pouco elípticos e sempre separados por espaçamento aproximadamente regular; comprimento < 13 mm ..... 18
- 18. Comprimento do bordo do pronoto, entre os ângulos lateral e posterior, menor que o comprimento do bordo entre os ângulos anterior e lateral; estrias elitrais com pontos arredondados; ápice da segunda interestria sem carena. Brasil (Amazonas) ..... *D. streblopodum* (Fig. 109).
- Comprimento das porções anterior e posterior do bordo lateral do pronoto aproximadamente iguais; estrias elitrais com pontos fracamente elípticos; ápice da segunda interestria com carena. Genitália masculina fig. 15. Panamá e Costa Rica ..... *D. acanthus* (Fig. 111).
- 19. Pontos foveiformes da cabeça separados na superfície interocular dorsal por aproximadamente metade dos seus diâmetros; distância interocular dorsal com aproximadamente três vezes a largura do olho; pontos foveiformes das interestrias circundados por aproximadamente quatro microtúbulos brilhantes bem definidos; ápice da segunda interestria com carena ou tubérculo inconspícuo; comprimento > 13 mm. Equador ..... *D. arturoi* (Fig. 112).
- Pontos foveiformes da cabeça praticamente tocam-se; distância interocular dorsal com aproximadamente 2,5 vezes a largura do olho; pontos foveiformes das interestrias circundados por aproximadamente cinco microtúbulos brilhantes bem definidos; ápice da segunda interestria sem carena ou tubérculo; comprimento < 13 mm. Genitália masculina fig. 14. Peru ..... *D. larseni* (Fig. 113).
- 20. Terceira interestria com pontos foveiformes cobrindo toda a superfície; superfície do élitro com reflexo opaco ou sedoso; espécimes com coloração negra ..... 21
- Pontos foveiformes da terceira interestria mais densos lateralmente (os pontos podem estar tão dispersos no centro da interestria que produzem um aspecto liso em uma faixa longitudinal) (Fig. 86); élitros com brilho metálico; coloração vermelho cúpreo (subcomplexo *icariforme*) ..... 22
- 21. Carena apical da terceira interestria apenas um pouco mais proeminente que as carenas do ápice da segunda e quarta interestria (Fig. 87); pontos foveiformes próximos ao centro da região posterior do pronoto geralmente separados por menos que um diâmetro; microtúbulos das interestrias geralmente inconspícuos, algumas vezes se misturam com a superfície ao redor. Genitália masculina figs 18, 31, 39, 48. Argentina, Bolívia, Brasil e Paraguai ..... *D. icaroides* (Fig. 117).
- Carena apical da terceira interestria distintamente mais proeminente e arredondada que as carenas do ápice da segunda e quarta interestria (Fig. 88); pontos foveiformes próximos ao centro da região posterior do pronoto geralmente separados por no mínimo um diâmetro; microtúbulos das interestrias densos e conspícuos. Genitália masculina figs 17, 30, 38, 47, 55. Argentina, Bolívia e Paraguai ..... *D. valgum* (Fig. 118).
- 22. Carena apical da sétima interestria alongada, comprimento maior que a soma dos comprimentos das carenas do ápice da quinta e sexta interestrias; carena da base da sétima interestria nitidamente menor que a carena apical ..... 23
- Carena apical da sétima interestria com comprimento menor ou igual a soma dos comprimentos das carenas do ápice da quinta e sexta interestrias; comprimento da carena da base da sétima interestria mais longo ou aproximadamente igual ao da carena apical ..... 24
- 23. Carena da base da nona interestria ultrapassa o limite anterior da carena apical da sétima interestria; bordo lateral do élitro nitidamente curvado para fora (Fig. 121). Genitália masculina fig. 20. Brasil (Mato Grosso) ..... *D. parsi* (Fig. 121).
- Carena da base da nona interestria não ultrapassa o limite anterior da carena do ápice da sétima interestria; bordo lateral do élitro suavemente curvado para fora (Fig. 29). Genitália masculina figs 21, 32, 40, 57. Brasil (Goiás, Mato Grosso e São Paulo) ..... *D. icariforme* (Fig. 120).
- 24. Bordos laterais dos élitros subparalelos ou levemente curvados para fora (Figs 122, 123). Se curvados, corpo nunca inteiramente cobre com reflexo metálico avermelhado; corpo marrom escuro, ou preto, com reflexo metálico esverdeado ou levemente avermelhado ..... 25
- Bordos laterais dos élitros distintamente curvados para fora; corpo inteiramente cobre e reflexo metálico avermelhado. Genitália masculina figs 22, 58. Brasil (Bahia, Ceará, Minas Gerais e Piauí) ..... *D. ritamourae* (Fig. 119).
- 25. Microtúbulos das interestrias elitrais ausentes ou inconspícuos (Fig. 86); pontos foveiformes próximos ao centro do bordo posterior do pronoto separados por no mínimo o diâmetro de um ponto. Genitália masculina figs 23, 41. Argentina (Misiones) ..... *D. subrubrum* (Fig. 123).

- Microtubérculos elitrais mais conspícuos nas interestrias laterais; pontos foveiformes próximos ao centro do bordo posterior do pronoto bastante densos, separados por menos que o diâmetro de um ponto. Genitália masculina figs 19, 49, 56. Brasil (Mato Grosso do Sul e São Paulo) ..... *D. kolleri* (Fig. 122).

### Subgenus *AGANHYBOMA* Kolbe 1893

*Deltochilum* (*Aganhyboma*) Kolbe 1893: 192 (original description)  
 Shipp 1897: 195 (designation of type species; author treated *Aganhyboma* as genus)  
 Paulian 1938: 240, 243, 252 (identification keys, species descriptions)  
 Lane 1946: 172, 173, 174 (comment about history of names in *Aganhyboma*)  
 Pereira & Martínez 1956: 120, 121 (identification key)  
 Martínez 1959: 51 (catalogue)  
 Vulcano & Pereira 1964: 641 (catalogue)  
 Vulcano & Pereira 1967: 555, 556 (identification keys)  
 Vaz-de-Mello 2000: 192 (checklist)  
 Vaz-de-Mello *et al.* 2011: 5, 11, 18, 26, 33, 41, 44 (checklist and identification keys).  
*Deltochilum* (*Deltochilum*) in part Eschscholtz 1822: 39 (original description)  
 Kolbe 1893: 191 (establishment of seven subgenera under *Deltochilum*)  
 Shipp 1897: 196 (taxonomic comments)  
 Paulian 1938: 240, 243, 268, 269 (description, identification key and comments)  
 Lane 1946: 172–175 (transfer of the *valgum* group to *Deltohyboma*).  
*Deltochilum* (*Deltohyboma*) in part Lane 1946: 175 (designation of subgenus)  
 Martínez 1959: 53–56 (catalogue)  
 Pereira & Martínez 1956: 120, 121 (identification key)  
 Vulcano & Pereira 1964: 641 (catalogue)  
 Vulcano & Pereira 1967: 555–560 (identification keys)  
 Vaz-de-Mello 2000: 192 (checklist)  
 Vaz-de-Mello *et al.* 2011: 5, 11, 18, 26, 33, 41, 44 (checklist and identification keys)

**Description. Body.** Lateral margins as well as dorsal surface vary from weakly to strongly convex (Figs 95–123), with some species quite round in shape. Dorsal surface glabrous, with at most minute setae in some species. Length 11 to 19 mm. **Head.** Surface with foveiform punctures, usually more conspicuous around eyes (Figs 60, 61). Anterior portion (between clypeogenal sutures) prolonged, similar to a small ‘muzzle’ (Figs 60, 61), bidentate. Margin of head, near clypeal teeth, straight and followed by a small tooth slightly pronounced (Fig. 61), or slightly curved and without teeth (Fig. 60). Lateral margin of gena curved outward until eyes, with a strong convex shape in the middle of this curvature, or with posterior half truncated, approximately straight. Clypeogenal suture well defined and shallow. Eye margin not emarginate. Eye rounded or comma-shaped in dorsal view. Dorsal interocular distance varies between three to ten times eye width (Figs 60, 61). **Thorax.** Pronotum with anterior angles acute, directed anteriorly. Lateral margin slightly angled. Pronotum punctures variable, dense or sparse, consisting of foveiform punctures. Sides of metasternum, anterior portion of hypomera, epimeron and episternum with a dense foveiform punctures. Hypomera not excavated to receive head margin (Figs 78, 79). Posterior portion of metasternum with a small, round, shallow fovea. Outer margin of mesocoxal cavity not reaching metaepimeron. **Elytra.** Lateral margins ranging from semiparallel to outwardly curved. Elytral striae with foveiform punctures. Interstriae with foveiform punctures of different sizes. Basal carina of sixth elytral interstria absent. Basal carina of seventh interstria short or elongate, prominent or not (Figs 71, 72). Length of basal carina of ninth interstria reaches from mid-interstria, to apex (Figs 62, 63, 80). Apices of interstriae 2, 3, 4, 5, 6 and 7 with tubercle or carina (that of second interstria sometimes weak or absent). Length of apical carina of seventh interstria less than one-half that of interstria. Pseudepipleural carina complete, visible entire length of epipleuron in most species (Figs 62, 63). In some species this carina can be interrupted in the basal third, re-appearing halfway along elytral length (Fig. 80). **Abdomen.** Abdominal ventrites shorter medially than laterally (Fig. 73). Punctures of ventrites most abundant and conspicuous at sides. Pygidium with rounded or elliptical foveiform punctures. Apex of pygidium acuminate or rounded. **Legs.** Protibia abruptly expanded (Fig. 66) or not in basal third. External apical margin of protibia bearing three large prominent teeth. Medial lateral tooth can be equidistant between apical and basal tooth, or closer to apical tooth. Metatibia short, truncated and only slightly curved inward (Fig. 68), or elongate and apical one-third strongly curved inward (Fig. 67). **Aedeagus.** Parameres symmetric, short or elongate, simple, without

ornamentation or setae (Fig. 24); endophallus: lobe in submedial portion; endophallic sclerites: lamella copulatrix sclerites (LC), superior right peripheral sclerite (SRP), fronto-lateral peripheral sclerite (FLP) and complex of axial and subaxial sclerites (A + SA) (Figs 1, 59).

**Diagnosis.** Anterior portion of head (between clypeogenal sutures) prolonged, similar to a small ‘muzzle’ (Figs 60, 61).

**Remarks.** The subgenus *Aganhyboma*, as defined here, includes 26 species distributed in South America, with one species (*D. acropyge* Bates) reaching as far North as Mexico. The highest species richness occurs in Brazil. This work recognizes two major species groups within the subgenus, the *tresignatum* and *valgum* groups. The first comprises species historically grouped in *Aganhyboma*, including the genus type. The *tresignatum* group can be further split into two species complexes, the *tresignatum* and the *cupreicolle* complexes. The *valgum* group is comprised of three species complexes, the *acropyge*, *finestriatum* and the *valgum* complexes.

## Genus *Deltochilum* Eschscholtz 1822

### Subgenus *Aganhyboma* Kolbe 1893

#### *tresignatum* group

##### *tresignatum* complex

- D. (A.) tresignatum* Harold 1881
- D. (A.) kolbei* Paulian 1938
- D. (A.) violaceum* Paulian 1938
- D. (A.) amandaarcanjoeae* **new species**

##### *cupreicolle* complex

- D. (A.) cupreicolle* (Blanchard 1841)
- D. (A.) titovidaurrei* **new species**
- D. (A.) viridescens* Martínez 1948 **new status**
- D. (A.) viridicatum* **new species**

#### *valgum* group

##### *acropyge* complex

- D. (A.) acropyge* Bates 1887 **new subgeneric placement and new status**
- D. (A.) feeri* **new species**
- D. (A.) schefflerorum* **new species**
- D. (A.) streblpodum* **new species**
- D. (A.) longiceps* Paulian 1938 **new subgeneric placement and new status**
- D. (A.) acanthus* Kohlmann & Solís 2012 **new subgeneric placement**
- D. (A.) arturoi* **new species**
- D. (A.) larseni* **new species**

##### *finestriatum* complex

- D. (A.) cangalha* **new species**
- D. (A.) alpercata* **new species**
- D. (A.) finestriatum* **new species**

##### *valgum* complex

- D. (A.) icaroides* Balthasar 1939 **new subgeneric placement**
- D. (A.) valgum* Burmeister 1873 **new subgeneric placement**

*icariforme* subcomplex

*D. (A.) ritamourae* **new species**

*D. (A.) icariforme* Paulian 1938 **new subgeneric placement**

*D. (A.) parsi* **new species**

*D. (A.) kollerii* **new species**

*D. (A.) subrubrum* **new species**

### ***tresignatum* group**

**Description. Body.** Small or medium (11–16.5 mm), weakly or strongly convex, with opaque or bright coloration in shades of black, brown, coppery, green or violet. **Head.** Elongate. Dorsal interocular distance approximately nine or ten times eye width (Fig. 60). **Thorax.** Pronotal margin, between anterior and lateral angles, oblique and slightly curved outward. Margin between lateral and posterior angles approximately straight or curved outward. Anterior and posterior portions of hypomera with dense foveiform punctures; anterior punctures rounded, posterior punctures mostly elliptical. **Elytra.** With punctate striae. Striae conspicuous or not. Foveiform punctures distributed evenly along the interstriae. Basal carina of seventh interstria prominent or not. Apices of interstriae 2, 3, 4, 5, 6 and 7 with tubercle or carina (that of second interstria sometimes weak or absent in *D. kolbei*). Apical tubercles of 2nd, 3rd and 4th interstriae of approximately equal size and shape. Length of apical carinae of 5th and 6th interstriae approximately equal and slightly longer than apical carinae of 2nd, 3rd and 4th interstriae. Apical carina of 7th interstria longer than carina of 6th interstria. Ninth interstria completely longitudinally carinate. Elytral lateral margin completely bounded by the carina of ninth interstria (Fig. 62). Pseudepipleurial carina complete (Fig. 62). First interstria usually brighter than rest of elytra. **Abdomen.** Punctuation of abdominal sternites concentrated anterolaterally (Fig. 73). Length of sixth ventrite, measured at midline, equal to or less than that of fifth ventrite (Fig. 73). Pygidium often acuminate at apex (Fig. 73), or rounded, with large transverse elliptical punctures. **Legs.** Most punctures on ventral surface of meso- and metafemora either transverse or oblique elliptical in shape (Fig. 64). Protibia abruptly expanded (Fig. 66) or not along inner margin. Metafemur clearly much wider in middle and apex than at base (Fig. 64). Apical one-third of metatibia slightly (Fig. 68) or strongly (Fig. 67) curved inward, with five or six clearly visible longitudinal carinae. Lateral carina of metatibia with a row of medium-size setae denser in apical half. Metatarsus much shorter or approximately two-thirds of metatibia length. **Secondary sexual characters.** Head of male sometimes slightly more triangular than that of female. Male abdomen usually slightly concave at lateral view, that of female usually convex. Male ventrites more flattened antero-posteriorly than that of female. Abdominal suture separating 6th from 5th ventrite usually curved in male (Fig. 73) and nearly straight in female. Apical margin of pygidium usually distended in male. Protibial spurs generally vary in shape and size between male and female of some species. **Aedeagus.** Parameres symmetrical, short, simple, without ornamentation or setae, and wider at base than at apex (Figs 4–9). Endophallus: with lobe in submedial portion. Lamella copulatrix: left lobe "J" shaped, right lobe "baton" shaped (Figs 33–35). Superior right peripheral sclerite (SRP): circular shaped, cable "n" shaped, and ring with margin "thread" shaped (Figs 42–44). Fronto-lateral peripheral sclerite (FLP): two irregular sclerites, with a sclerotized cover that surrounds it (Figs 50–52). Complex of axial and subaxial sclerites (A+SA): several superposed and elongate sclerites (Fig. 59). Genital segment: with lateral sclerotized arms in roughly a scalene triangle; central portion approximately "M" shaped, showing portions with different degrees of sclerotization; superior margin well delimited, with conspicuous sclerotization (Figs 25, 26, 27).

**Diagnosis.** Compared to the *valgum* group, the diagnostic characters of *tresignatum* group are: Dorsal interocular distance approximately nine or ten times eye width (Fig. 60); apical tubercle of the 2nd, 3rd and 4th interstriae with approximately equal size and shape (that of second interstria absent or weak in *D. kolbei*); length of apical carinae of 5th and 6th interstriae approximately equal to or slightly longer than apical carinae of 2nd, 3rd and 4th; ninth interstria completely longitudinally carinate (Fig. 62); elytral lateral margin bounded by the carina of ninth interstria (Fig. 62); ventral surface of meso and metafemora with transverse or oblique elliptical punctures (Fig. 64); lamella copulatrix (LC): left lobe "J"-shaped and right lobe baton-shaped (Figs 33–35); cable of superior right peripheral sclerite (SRP) "n"-shaped, and ring with margin "thread"-shaped (Figs 42–44); superior margin of genital sclerite well-defined, with conspicuous sclerotization (Figs 25–27).

## *tresignatum* complex

**Diagnosis.** Apex of pygidium rounded; basal third of protibia sharply widened along its inner margin (Fig. 66); middle protibial tooth closer to apical tooth than to basal tooth; apical one-third of metatibia strongly curved inward (Fig. 67).

### *Deltochilum (Aganhyboma) trisignatum* Harold 1881

(Figs 9, 27, 35, 44, 52, 66, 69, 89, 95)

*Deltochilum trisignatum* Harold 1881 [1880]: 150 (original description)

Heyne 1900: 61 (description)

Gillet 1911: 36 (catalogue)

Pessôa & Lane 1941: 428, 431 and 432 (description and identification key)

Blackwelder 1944: 203 (checklist)

*Deltochilum (Aganhyboma) trisignatum* Kolbe 1893: 192

Shipp 1897: 195

Paulian 1938: 240, 252, 253, 256, Figs 2, 18, map No 2 (description, taxonomic comments and identification key)

Lane 1946: 173, 174 (taxonomic comments)

Pereira & Martínez 1956: 121

Vulcano & Pereira 1964: 642 (catalogue)

Vaz-de-Mello 2000: 192 (checklist)

**Description. Body.** Head black with violet hue, pronotum yellowish brown with black spots, elytra reddish brown (Fig. 95). Ventral surface black with green reflections. Length 17 to 19 mm. **Head.** Dorsal surface completely covered by closely spaced to confluent foveiform punctures resulting in rugosity, anterior punctures smaller than those at center. Punctures margin well-defined (impressed). Margin between clypeal teeth and genae curved outward near clypeogenal suture. **Thorax.** Surface of pronotum with deep and dense foveiform punctures forming rugosity. Anteromedial punctures much smaller than posteromedial punctures. Margin of pronotum (close to lateral angles), curved inward, lacking emargination. Anterior margin with three black spots, one covering each angle and one at center. Pronotum with small black spot close to lateral angles and dark spot in posterior part of disc. Margin between lateral and posterior angles distinctly convex (curved outward). **Elytra.** Striae weakly marked, with almost inconspicuous punctures. Lateral margins evenly curved outward (Fig. 95). Interstrial surface with weak, medium-size foveiform punctures intermingled with dense microtubercles, some of which are confluent, shining and forming a glossy zone. First interstria brighter than rest of elytra. Basal carina of seventh interstria weak and short (Fig. 95), approximately the same length as metatibial spur. Length of apical carina of seventh interstria 1.5 times that of apex of sixth interstria. **Abdomen.** Punctures large and conspicuous, concentrated on anterior and posterior margins of sternites and reduced to a narrow belt along midline of abdomen. Pygidium almost completely covered by nearly confluent, large, foveiform punctures, leaving only a short, smooth medial line from base to about midlength of pygidial surface. Apex of pygidium rounded. **Legs.** Protibia sharply widened along inner margin from basal third to apex (Fig. 66). Middle protibial tooth closer to apical tooth than to basal tooth (Fig. 66). Apical third of metatibia strongly curved inward (Fig. 67). Inner margin of metatibia with a longitudinal row of small tubercles. Apex of metatibia with six clearly visible longitudinal carinae. Anterior margin of profemur effaced at middle portion (Fig. 69). Most foveiform punctures of the profemur elliptical. Metatarsus approximately one-third as long as metatibia. **Secondary sexual characters.** Male abdomen slightly more longitudinally flattened than that of female. Apical margin of pygidium more dilated in male. Male protibial spur rounded at apex. Female spur acuminate apically.

**Material studied. Lectotype** (MNHU) [here designated] ♂: 1. [old white label, handwritten]. 8915; 2. [green label, handwritten]. *trisignatum* Harold Brasilia; 3. [red label, bordered and printed in black, handwritten]. Lectotype *Deltochilum trisignatum* Harold des. F.Z. Vaz-de-Mello, 2014. **Paralectotypes** (MNHU) 2♀♀: ♀ 1. [old white label, handwritten]. 8915; 2. [green label, handwritten]. Brasilia; 3. [yellow label, bordered and printed in black, handwritten]. Paralectotype *Deltochilum trisignatum* Harold des. F.Z. Vaz-de-Mello, 2014./ ♀ 1. [old white label, handwritten]. 8915; 2. [yellow label, bordered and printed in black, handwritten]. Paralectotype *Deltochilum trisignatum* Harold des. F.Z. Vaz-de-Mello, 2014.



**Taxonomic notes.** A lectotype is here designated in order to maintain nomenclatural stability by choosing the only male (presenting characters that are easier to use for distinguishing from other species) among the available syntypes as the single name-bearing type.

**Non-type material [30]: ARGENTINA:** TUCUMAN [probably mislabelled] (1 ♀ MNHN); **BRAZIL:** BAHIA: Santa Teresinha, Pedra Branca, (12°51.33'S, 39°28.575'W), 2.II.2009, L.R.M. Oliveira (3 MZUEFS); ESPÍRITO SANTO: P. Cachoeira, (2 ♀ MZUSP); Conceição da Barra, 22–28.X.1968, C. & C.T. Elias (1 ♀ DZUP); Linhares, II.1964 (1 ♂ DZUP); same, XII.1967 (1 ♀ DZUP); Linhares, Lagoa do Macuco, (19°03'50"S, 39°58'43"W), 26–27.I.2000, F. Génier & S. Ide (1 ♂ 3 ♀ CEMT, 2 ♀ CMN); Linhares, Povoação, (19°36'S, 39°48'W), 3.XII.2000, G. Schiffler (1 ♂ CEMT); MINAS GERAIS: Mar de Espanha, 9.XII.1910, J.F. Zikán (1 ♀ CEMT, 1 ♂ MZUSP); Marliéria, Parque Estadual do Rio Doce, (19°42'09.22"S, 40°30'54.21"W), 11.I.2005, S.S.P. Almeida & M.R. Pereira (10 ♂ 1 ♀ CEMT); RIO DE JANEIRO: Sto. Antonio dos Brotos, Distrito de San Fidelis, 1876–1882, Auguste Vincent de Lyon (1 ♂ MNHN).

**Sampling methods.** Millipede carrion baited pitfall trap [3 specimens]; Flight interception trap [1]; un-baited pitfall trap [11]. The un-baited pitfall traps contained formalin solution (as a preservative) may act as an attractant for beetles predacious on millipedes, since millipedes often release defence secretions containing formaldehyde-based compounds.

**Habitat.** Brazil (southern Bahia, Espirito Santo and Minas Gerais) (Fig. 89), from available data this species inhabits lowland Atlantic forest, with sandy soil. A single specimen was collected from “cabruca” vegetation (agricultural area where the cacao is planted in the midst of the natural vegetation of Atlantic forest). The known elevation range is 10 to 130 m *AMSL*.

**Diagnosis and remarks** (within the *tresignatum* complex): head black with violet hue, pronotum yellowish-brown with three distinct black spots, elytra reddishbrown; dorsal surface of head completely covered by closely spaced to confluent foveiform punctures resulting in rugosity; margin of pronotum (close to lateral angles) curved inward. The following aedeagus characters are also diagnostic: parameres shorter than phallobase, rounded at apex, in lateral view forming an angle of approximately 30° with phallobase (Fig. 9). Lamella copulatrix: right lobe “scaphopode” shaped (Fig. 35). Superior right peripheral sclerite (SRP) as in Fig. 44. Fronto-lateral peripheral sclerite (FLP) as in Fig. 52. Center of genital segment with a well-sclerotized portion and “M”-shaped (Fig. 27). There is some variation in the pronotum of four specimens examined, which display yellow coloration. The dark spot on posterior portion of pronotal disc can be difficult to see in some individuals.

### ***Deltochilum (Aganhyboma) kolbei* Paulian 1938**

(Figs 89, 96)

*Deltochilum (Aganhyboma) kolbei* Paulian 1938: 252, 254, Figs 4, 7, map n. 2 (original description, taxonomic comments and identification key)

Vulcano & Pereira 1964: 642 (catalogue)

Vaz-de-Mello 2000: 192 (checklist)

*Deltochilum kolbei*: Blackwelder 1944: 203 (checklist)

**Description. Body.** Completely metallic green, with strong luster. Elytra a little darker than head and pronotum (Fig. 96). Ventral surface dark green. Length 15 to 17 mm. **Head.** Dorsal surface with dense punctures close, confluent on anterior and lateral portions. Punctures around clypeus larger and closer than those at center of dorsal interocular surface. Anterior margin of each puncture not defined (impressed). Margin between clypeal teeth and genae curved outward near clypeogenal suture. **Thorax.** Pronotum smooth, covered with small punctures, apparently simple and uniformly distributed. Punctures on anterior angles larger, with a typical foveiform shape. Margin of pronotum (close to lateral angles) curved inward. Margin between lateral and posterior angles distinctly convex (curved outward). Posterior half of pronotum with rounded shape. **Elytra.** Smooth surface and strong metallic bright (Fig. 96). Lateral margins evenly curved outward (Fig. 96). Elytral striae narrow, with carinate margins close and almost touching. Punctures of elytral striae small and inconspicuous. Interstrial surface with plenty small and scattered punctures. Surface of second interstria more irregular than the others. Basal carina of seventh interstria prominent and short (Fig. 96). Length of apical carina of seventh interstria approximately two times that of apical carina of sixth interstria. Apical tubercle of second interstria absent or weak. **Abdomen.**

Punctures large and conspicuous on lateral portions of ventrites, concentrated on anterior and posterior margins and reduced to a narrow belt along midline of abdomen. Pygidium with dense foveiform punctures over entire surface; punctures small, transverse, elliptical and almost confluent. Apex of pygidium rounded. **Legs.** Protibia sharply widened along inner margin from basal third to apex (as in Fig. 66). Middle protibial tooth closer to apical tooth than to basal tooth (as in Fig. 66). Apical third of metatibia strongly curved inward (as in Fig. 67). Inner margin of metatibia with a longitudinal row of small tubercles. Apex of metatibia with six clearly visible longitudinal carinae. Anterior margin of profemur effaced at middle portion. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus with approximately one-half of length of metatibia. **Secondary sexual characters.** Since we have been unable to examine a male specimen, it is not possible to verify which characters exhibit sexual dimorphism. However, as this species is closely related to *D. trisignatum*, we believe the characters cited for *D. trisignatum* will be similar.

**Material studied. Holotype** (MNHN) [examined]: **BRAZIL:** Bahia, Villa Victoria [Vitória da Conquista] (CH. PUJOL, 1890; Col. R. OBERTHÜR).

**Non-type material [5]: BRAZIL:** PARAÍBA: Mataraca, (6°29'S, 34°56'W), IV.2004, V.H. Costa & B. Bellini (1 ♀ CEMT); same, V.2004, V.H. Costa & B. Bellini (1 ♀ CEUFPB); Rio Tinto, Rebio Guaribas, (6°46'S, 35°04'W), III.2002, M.I.M. Hernández (2 ♀ CEUFPB); [RIO GRANDE DO NORTE] (1 ♀ CEMT).

**Sampling methods.** Flight Interception Trap [4 specimens].

**Habitat.** Brazil (Bahia, Paraíba and Rio Grande do Norte) (Fig. 89), from available data this species inhabits lowland Atlantic forest with sandy soil.

**Diagnosis and remarks** (within the *trisignatum* complex): body completely metallic green, with strong luster (Fig. 96); anterior margin of each head puncture not defined (impressed); margin of pronotum (close to lateral angles) curved inward; elytra with smooth surface and strong metallic bright, without ocellate punctures (microtubercles); surface of second interstria more irregular than the others, apical tubercle of second interstria absent or weak.

The green coloration of this species is characteristic and unique among *Aganhyboma*. The strong bright metallic color of elytra, among other characters, differentiates this species from *D. violaceum*.

### ***Deltochilum (Aganhyboma) violaceum* Paulian 1938**

(Figs 70, 89, 97)

*Deltochilum (Aganhyboma) violaceum* Paulian 1938: 252, 253, Figs 7, 18 (original description, taxonomic comments and identification key)

Vulcano & Pereira 1964: 642 (catalogue)

Vaz-de-Mello 2000: 192 (checklist)

*Deltochilum violaceum*: Blackwelder 1944: 203 (checklist)

**Description. Body.** Completely green or blue, with weak or opaque sheen. Elytra a little darker than head and pronotum (Fig. 97). Ventral surface dark green. Length 15 mm. **Head.** Dorsal surface with dense punctures close, confluent on anterior and lateral portions. Punctures around clypeus larger and closer than those at center of dorsal interocular surface. Anterior margin of each puncture not defined (impressed). Margin between clypeal teeth and genae curved outward near clypeogenal suture. **Thorax.** Pronotum smooth, covered with small punctures, apparently simple and uniformly distributed. Punctures located on anterior angles larger, with a typical foveiform shape. Margin of pronotum (close to lateral angles) curved inward. Margin between lateral and posterior angles distinctly convex (curved outward). Posterior half of pronotum with rounded shape. **Elytra.** Slightly rugose due to small and shiny microtubercles along interstriae (Fig. 70). Lateral margins evenly curved outward (Fig. 97). Elytral striae narrow, with carinate margins close and almost touching. Punctures of elytral striae small and inconspicuous. Interstitial surface with small and dispersed punctures intermingled with dense microtubercles, some of which are confluent, shining and form an glossy zone (Fig. 70). Surface of second interstria more irregular than the others. Basal carina of seventh interstria prominent and short (Fig. 97). Length of apical carina of seventh interstria approximately two times that of apical carina of sixth interstria. Apical tubercle of second interstria present. **Abdomen.** Punctures large and conspicuous on lateral portions of ventrites, concentrated on anterior and posterior margins and reduced to a narrow belt along midline of abdomen. Pygidium with dense foveiform punctures over

entire surface; punctures small, transverse, elliptical and almost confluent. Apex of pygidium rounded. **Legs.** Protibia sharply widened along inner margin from basal third to apex (as in Fig. 66). Middle protibial tooth closer to apical tooth than to basal tooth (as in Fig. 66). Apical third of metatibia strongly curved inward (as in Fig. 67). Inner margin of metatibia with a longitudinal row of small tubercles. Apex of metatibia with six clearly visible longitudinal carinae. Anterior margin of profemur effaced at middle portion. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus with approximately one-half of metatibia length.

**Material studied. Holotype** (MNHN) [examined]: **BRAZIL** (no locality given in original description). 1. [old white label, handwritten]. Brésil; 2. [old white label, printed and bordered in black]. Ex Musaeo/ E. Allard/ 1899; 3. [old white label, printed and bordered in black]. R. Paulian/ Vidit; 4. [old white label, handwritten]. *D. violaceum* n. sp./ Type.; 5. [red label, printed in black]. Holotype.

**Non-type material [1]: BRAZIL:** MINAS GERAIS: Águas Vermelhas, XII.1997, A. Bello & F. Z. Vaz-de-Mello (1 ♀ CEMT).

**Sampling methods.** millipede baited pitfall trap [1].

**Habitat.** Brazil (Minas Gerais) (Fig. 89), the single specimen with data was collected in “Carrasco”. This habitat consists of dense shrubby xerophilous vegetation that occurs in semi-arid domain of Brazil.

**Diagnosis and remarks** (within the *tresignatum* complex): This species can be confused with *D. kolbei*. However, *D. violaceum* can be easily distinguished by the following characters: elytra with dense and shiny microtubercles (Fig. 70); elytra opaque or with weak luster; apical tubercle of second interstria present.

### ***Deltochilum (Aganhyboma) amandaarcanjoae* new species**

(Figs 2, 8, 89, 98)

**Etymology.** Named in honour of Amanda Arcanjo, wife of the first author and scarabaeine cytogeneticist.

**Description. Body.** Completely bluish-black or violaceous, with weak sheen or opaque. Elytra a little darker than head and pronotum (Fig. 98). Ventral surface black, with blue or green sheen. Length 13 mm. **Head.** Dorsal surface with dense, but not confluent, foveiform punctures separated at center of dorsal interocular surface by approximately twice their diameter. Punctures located near the clypeus larger and closer compared to those from center of interocular surface. Anterior margin of each puncture not defined (impressed). Margin between clypeal teeth and genae curved outward approximately at halfway its length. **Thorax.** Pronotum with smooth aspect, covered by small punctures, apparently simple and uniformly distributed. Punctures on anterior angles larger, with a typical foveiform shape. Margin of pronotum (close to lateral angles) straight, without depression. Margin between lateral and posterior angles distinctly convex (curved outward). Posterior half of pronotum with rounded shape (Fig. 98). **Elytra.** Lateral margins evenly curved outward (Fig. 98). Elytral striae narrow and shiny, with carinate margins close and almost touching. Punctures of elytral striae small. Interstitial surface with small, dispersed foveiform punctures amid small bright ocellate punctures, randomly distributed. First interstria brighter than rest of elytra. Surface of second interstria with regular aspect. Basal carina of seventh interstria prominent and short (Fig. 98). Length of apical carina of seventh interstria approximately two times that of apical carina of sixth interstria. Apical tubercle of second interstria present. **Abdomen.** Punctures large and conspicuous, concentrated anterolaterally on each sternite and reduced to a narrow belt along midline of abdomen. Pygidium with foveiform punctures over entire surface; punctures transverse, elliptical and almost confluent. Apex of pygidium rounded. **Legs.** Protibia widened along inner margin from basal third to apex; widened portion weakly indicated. Middle protibial tooth closer to apical tooth than to basal tooth. Apical third of metatibia curved inward; curvature softer than in other species of this complex (Fig. 98). Inner margin of metatibia with a longitudinal row of small tubercles. Apex of metatibia with five clearly visible longitudinal carinae. Anterior edge of profemur completely emarginate, with abundant setae for about two-thirds of its length. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus with approximately one-half of metatibia length.

**Material studied. Holotype:** **BRAZIL:** MATO GROSSO: Rosário Oeste, XII.1959 (1 ♂ DZUP).

**Paratype [1]: PARAGUAY:** CONCEPCIÓN: Horquetá, 1964, Martínez (1 ♂ CMN).

**Diagnosis and remarks** (within the *tresignatum* complex): bluish-black or violaceous coloration (Fig. 98); margin of pronotum (close to lateral angles) straight, lacking depression; anterior edge of profemur completely emarginate. The following aedeagus characters are also diagnostic: parameres short, rounded at apex, in lateral

view forming an angle of approximately 20° with phallobase (Fig. 8). Lamella copulatrix: left lobe "J"-shaped (as in Fig. 33); right lobe baton-shaped, slightly curved (as in Fig. 33). Fronto-lateral peripheral sclerite (FLP) as in Fig. 50. Center of genital segment with a well-sclerotized portion and "T"-shaped (Fig. 2).

### *cupreicolle* complex

**Diagnosis.** Apex of pygidium acuminate (Fig. 73); protibia not abruptly expanded along inner margin; middle protibial tooth equidistant between apical and basal teeth; apical third of metatibia only slightly curved inward (Fig. 68).

### *Deltochilum (Aganhyboma) cupreicolle* (Blanchard 1841)

(Figs 5, 25, 33, 50, 72, 90, 99)

*Hyboma cupreicolle* Blanchard 1841: plate 10, Fig. 4; Blanchard 1845: 157 (original description)

*Canthon cupricolle* Lucas 1859: 99 (original description, synonymy)

*Deltochilum cupreicolle*: Harold 1869a: 995 (catalogue)

Harold 1869b: 57 (synonymized *Canthon cupricolle* with *Deltochilum cupreicolle*)

Bruch 1911: 185 (catalogue)

Gillet 1911: 35 (catalogue)

Blackwelder 1944: 202 (checklist)

*Deltochilum (Aganhyboma) cupricolle*: Kolbe 1893: 192

Shipp 1897: 195

Vulcano & Pereira 1967: 556 (identification key)

*Deltochilum (Aganhyboma) cupreicolle*: Paulian 1938: 240, 252, 253, 255, Figs 7, 10, 18, map No 2 (description, taxonomic comments and identification key)

Lane 1946: 173, 174 (taxonomic comments)

Martínez 1959: 51 (catalogue)

Vulcano & Pereira 1964: 641 (catalogue)

Vaz-de-Mello 2000: 192 (checklist)

**Description. Body.** Head dark green with weak sheen or opaque, pronotum in copper tone, with black or greenish spots, elytra reddish-brown, with an opaque sheen (Figs 72, 99). Ventral surface black with a greenish sheen. Length 11 to 13 mm. **Head.** Dorsal surface with dense foveiform punctures, not confluent, separated at center of dorsal interocular surface by approximately twice their diameter. Punctures of variable size; largest around the eyes, smallest closer to antero-lateral portion, near the clypeus. Anterior margin of each puncture not defined (as in Fig. 60). Margin between clypeal teeth and genae curved outward approximately at halfway of its length. **Thorax.** Surface of pronotum with small punctures, apparently simple and uniformly distributed. Punctures located on anterior angles with a typical foveiform shape. Pronotum with a narrow greenish band extending the entire edge. Posterior edge with band "I"-shaped (Fig. 99); this band can extend up to the disc of pronotum. Margin of pronotum (close to lateral angles) straight and emarginated, without depression. **Elytra.** Lateral margins evenly curved outward, with narrow dark spot, more visible on anterior portion. Striae faintly visible at a small magnification (Fig. 72). Interstrial surface with small, dispersed foveiform punctures amid small bright ocellate punctures, randomly distributed. First interstria brighter than rest of elytra. Basal carina of seventh interstria short, length about twice the width of the seventh interstria (Fig. 72). Length of apical carina of seventh interstria approximately 2.5 times that of apical carina of sixth interstria. **Abdomen.** Punctures large and conspicuous, concentrated anterolaterally on each sternite, reduced to a narrow belt along midline of abdomen (as in Fig. 73). Pygidium with dense foveiform punctures, transverse, elliptical and almost confluent at base. Apex of pygidium acuminate (as in Fig. 73). **Legs.** Protibia not abruptly widened (Fig. 99). Middle protibial tooth equidistant between apical and basal teeth. Protibial spur acuminate at apex. Apical third of metatibia only slightly curved inward (as in Fig. 68), with five clearly visible longitudinal carinae. Inner margin of metatibia with a longitudinal row of small tubercles. Anterior edge of profemur completely emarginate, with abundant setae in two-thirds of its length. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus approximately two-thirds as long as metatibia. **Secondary sexual characters.** Male abdomen more longitudinally flattened than that of female. Males

may possess a small tubercle medially between first and second ventrites. Apical margin of pygidium longer in male. Protibial spur more acuminate in female.

**Material studied. Holotype of *Hyboma cupreicolle* Blanchard (MNHN) [examined]:** Andes (no locality given in original description). 1. [red label, printed in black]. Type; 2. [green label, handwritten]. *Deltochilum cupreicolle* Blanch; 3. [old white label, handwritten]. *Deltochilum cupreicolle* Blanch; 4. [old green label, round].

**Holotype of *Canthon cupricolle* Lucas (MNHN) [examined]:** (no locality given in original description). 1. [old white label, handwritten]. *Canthon cupricolle* Luc.; 2. [old green label, round].

**Non-type material [18]: BOLÍVIA:** SANTA CRUZ: Andrés Ibañez, (17°43'S, 63°14'W), 15.II.1997, Paolo Bettella (1 ♂ CEMT); Chiquitos (1 MNHN); Chiquitos, Santiago de Chiquitos, (18°19'S, 59°34'W), 11.XI.2008, T. Vidaurre (1 ♀ CEMT, 1 ♀ CREN, 2 ♀ MNKM); same data, W.D. Edmonds & T. Vidaurre (2 ♂ CEMT); San Ignacio, (16°24'S, 61°10'W), 19.I.2010, T. Vidaurre (1 ♂ MNKM, 1 ♂ CREN). **BRAZIL:** [no other data] (1 MNHN); GOIÁS: Colinas do Sul, Serra da Mesa, (14°01'S, 48°12'W), 15.XII.1995, C. Campaner (1 ♂ MZUSP); MATO GROSSO: Cáceres, 18.XI.1984, C. Elias (3 ♂ DZUP); Cuiabá, Faz. Santhidi, 14.III.2009, (15°23'06"S, 56°06'53"W), L. R. Silva (1 ♀ CEMT); Barra dos Bugres, R. E. Serra das Araras, 16.II.1987, Y.O. Willis (1 ♀ CEMT); SÃO PAULO: Campinas, III.1943, M. Autuori (1 ♀ DZUP).

**Sampling methods.** baited pitfall trap with injured diplopods [6 specimens].

**Habitat.** Bolivia and Brazil (Goiás and Mato Grosso) (Fig. 90), from available data this species inhabits Cerrado and Chaco. Six individuals were collected in "Chiquitano Cerrado".

**Diagnosis and remarks** (within the *cupreicolle* complex): basal carina of seventh interstria short, length about twice the width of the seventh interstria (Fig. 72); elytra reddish-brown or dark brown, with an opaque sheen (Fig. 99). The following aedeagus characters are also diagnostic: parameres shorter than phallobase, slightly rounded at apex, in lateral view forming an angle of approximately 45° with phallobase (Fig. 5). Lamella copulatrix (LC): left lobe "J"-shaped (Fig. 33); right lobe baton-shaped (Fig. 33). Fronto-lateral peripheral sclerite (FLP) as in Fig. 50. Center of genital segment with a well-sclerotized portion and "T"-shaped (Fig. 25).

The coloration of pronotum can vary between dark brown and copper. The color of elytra can also vary from reddish-brown to dark brown. Most specimens do not present a round spot on disc of pronotum. When this spot is present, elytra are never dark brown.

Based on examination of the types, we can find no significant difference between *Hyboma cupreicolle* Blanchard 1841 and *Canthon cupricolle* Lucas 1859, we therefore confirm that *C. cupricolle* Lucas is a junior synonym of *Deltochilum cupreicolle* (Blanchard 1841).

### ***Deltochilum (Aganhyboma) titovidaurrei* new species**

(Figs 4, 42, 90, 100)

**Etymology.** Named in honour of Tito Vidaurre Sánchez, a friend and collaborator in scarabaeine studies.

**Description. Body.** Head dark green with a weak sheen or opaque, pronotum in copper tone, with black or greenish spots, elytra dark brown, with an opaque sheen (Fig. 100). Ventral surface black. Length 11 to 12 mm.

**Head.** Dorsal surface with dense foveiform punctures, not confluent, separated at center of dorsal interocular surface by approximately twice their diameter. Punctures of variable size; largest around the eyes, and smallest on the anterolateral portion of the head, near the clypeus. Anterior margin of each puncture not defined (as in Fig. 60). Margin between clypeal teeth and genae curved outward approximately at halfway of its length. **Thorax.** Surface of pronotum with small punctures, apparently simple and uniformly distributed. Punctures on anterior angles larger, with a typical foveiform shape. Pronotum with a narrow greenish band extending the entire edge; Disc with transverse oval spot (Fig. 100). Margin of pronotum (close to lateral angles) straight and emarginated, without depression. Margin between lateral and posterior angles approximately straight. **Elytra.** Lateral margins evenly curved outward (Fig. 100). Striae punctate, however faintly visible at a small magnification. Interstitial surface with small, dispersed foveiform punctures, amid small bright ocellate punctures, randomly distributed. First interstria slightly brighter than rest of elytra. Basal carina of seventh interstria short, length about twice the width of the seventh interstria (as in Fig. 72). Length of apical carina of seventh interstria with approximately 2.5 times that of apical carina of sixth interstria. **Abdomen.** Punctures large and conspicuous, concentrated anterolaterally on each sternite, reduced to a narrow belt along midline of abdomen (as in Fig. 73). Pygidium with dense foveiform punctures, transverse, elliptical and almost confluent at base. Apex of pygidium acuminate (as in Fig. 73). **Legs.**

Protibia not abruptly widened. Middle protibial tooth equidistant between apical and basal teeth. Protibial spur acuminate at apex. Apical third of metatibia only slightly curved inward (as in Fig. 68), with five clearly visible longitudinal carinae. Inner margin of metatibia without longitudinal row of small tubercles. Anterior edge of profemur completely emarginate, with abundant setae in two-thirds of its length. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus approximately two-thirds as long as metatibia. **Secondary sexual characters.** Male abdomen more longitudinally flattened than that of female. Males may possess medially between first and second ventrites, a small tubercle. Apical margin of pygidium longer in male. Protibial spur more acuminate in female.

**Material studied. Holotype: BRAZIL:** MINAS GERAIS: Lavras, near Parque Ecológico Quedas do Rio Bonito, (21°20'21.3"S, 44°58'38.8"W), 10.II.2009, Fernando Silva & Tito Vidaurrei (1 ♂ CEMT).

**Paratypes [5]: BRAZIL:** GOIÁS: Brazlândia, I.1994, E. Grossi (1 ♂ CEMT); Jatahy, 1895–96, Ch. Pujol (2 MNHN); MINAS GERAIS: Lavras, 15.II.1999, Leila A.S. (1 ♂ CEMT); Lavras, near Parque Ecológico Quedas do Rio Bonito, (21°20'21.3"S, 44°58'38.8"W), 10.II.2009, Fernando Silva & Tito Vidaurrei (1 ♀ CREN).

**Sampling methods.** baited pitfall trap with injured diplopods [2 specimens].

**Habitat.** Brazil (Goiás and Minas Gerais) (Fig. 90), from available data this species inhabits Cerrado. Two individuals were collected in "Campo Limpo", Cerrado, 1,170 m *AMSL*.

**Diagnosis and remarks** (within the *cupreicolle* complex): basal carina of seventh interstria short, length about twice the width of the seventh interstria (as in Fig. 72); elytral coloration can vary from dark brown to black; disc of pronotum with transverse oval spot (Fig. 100). The following aedeagus characters are also diagnostic: parameres shorter than phallobase, slightly rounded at apex, in lateral view forming an angle of approximately 30° with phallobase (Fig. 4). Lamella copulatrix: left lobe "J"-shaped (as in Fig. 33); right lobe baton-shaped (as in Fig. 33). Superior right peripheral sclerite (SRP) as in Fig. 42. Center of genital segment with a sclerotized portion and "T"-shaped.

The specimens present the parameres and phallobase shorter or truncated than *D. cupreicolle*.

### ***Deltochilum (Aganhyboma) viridescens* Martínez 1948 new status**

(Figs 6, 26, 34, 43, 51, 60, 64, 68, 71, 73, 90, 101, 102, 103)

*Deltochilum cupreicolle* ssp. *viridescens* Martínez 1948, 171 (original description)

*Deltochilum (Aganhyboma) cupreicolle viridescens* Martínez 1959: 52 (catalogue)

Martínez 1987: 55 (checklist)

*Deltochilum cupreicolle viridescens* Silva *et al.* 2012: 1359–1367 (predatory behaviour study)

**Description. Body.** Head and elytra dark green, with a metallic sheen. Pronotum light brown, with green spots (Fig. 101). Ventral surface with metallic dark green. Length 12 to 14 mm. **Head.** Dorsal surface with dense foveiform punctures not confluent, separated at center of dorsal interocular surface by approximately twice their diameter (Fig. 60). Punctures of variable size; largest around the eyes and smallest on the anterolateral portion, next to the clypeus. Anterior margin of each puncture not defined (Fig. 60). Margin between clypeal teeth and genae curved outward approximately at halfway of its length. **Thorax.** Surface of pronotum with small punctures, apparently simple and uniformly distributed. Punctures located on anterior angles larger, with a typical foveiform shape. Pronotum with a narrow greenish band extending the entire edge; posteromedial portion with a semi-circular band which extends up to half of pronotal disc (Fig. 101). Margin of pronotum (close to lateral angles) straight and emarginated, without depression. Margin between lateral and posterior angles approximately straight. **Elytra.** Slightly elongate (Figs 101–103). Striae well impressed and punctate (Fig. 71). Interstitial surface with small, dispersed foveiform punctures, amid small bright ocellate punctures, randomly distributed. First interstria brighter than rest of elytra. Basal carina of seventh interstria prominent and elongate, extending a little further than humeral callus portion (Fig. 71). Length of apical carina of seventh interstria three times that of apical carina of sixth interstria. **Abdomen.** Punctures large and conspicuous, concentrated anterolaterally on each sternite, reduced to a narrow belt along midline of abdomen (Fig. 73). Foveiform punctures of pygidium denser on medial portion, some confluent. Apex of pygidium strongly acuminate (Fig. 73). **Legs.** Protibia not abruptly widened (Fig. 101). Middle protibial tooth equidistant between apical and basal teeth. Protibial spur acuminate at apex. Apical third of metatibia only slightly curved inward (Figs 68, 101), with five clearly visible longitudinal carinae. Inner margin of

metatibia without longitudinal row of small tubercles. Anterior edge of profemur completely emarginate, with abundant setae in two-thirds of its length. Foveiform punctures of metafemur with transverse or oblique elliptical shape (Fig. 64). Metatarsus with two-thirds of metatibia length. **Secondary sexual characters.** Male abdomen more longitudinally flattened than that of female. Males may possess medially between first and second ventrites, a small tubercle. Apical margin of pygidium longer in male. Protibial spur more acuminate in female.

**Material studied. Holotype (MACN) [not examined]: ARGENTINA:** Prov. Salta, Depto. Rosario de la Frontera, El Naranjo. The original description, as well as the examination of a specimen of CMN which was compared to the holotype, are sufficient to confirm the identification of this species.

**Non-type material [55]: BRAZIL:** BAHIA [doubtful]: Barro Preto, Ch. Pujol (8 MNHN); DISTRITO FEDERAL: Universidade de Brasília (1 ♂ CEMT); GOIÁS: Jataí, 1955 (1 ♀ MZUSP); Jatahy, 1895–96, Ch. Pujol (1 MNHN); Mineiros, Parque Nacional das Emas, (18°04'S, 52°55'W), 15–19.XII.1987, expedição MZUSP (1 ♂ 1 ♀ MZUSP); MATO GROSSO: Cuyaba (1 MNHN); Cuiabá, XII.1945 (1 ♀ MZUSP); Chapada dos Guimarães, X.1937, Pinto (1 ♀ MZUSP); Chapada dos Guimarães, 27.X.1961, F.M. Oliveira (4 ♂ 7 ♀ DZUP); Chapada dos Guimarães, XI.1963, Alvarenga & Werner (1 ♀ MZUSP); Rosário Oeste, XII.1959, (1 ♂ DZUP); Uirapuru, Chapada dos Parecis, XII.2002, A. Foucart (1 ♀ CEMT); 30 Km norte de Uirapuru, (14°17'S, 59°15'W), 15.XII.2001, A. Foucart (3 ♂ CEMT); SÃO PAULO, Itirapina, 15.III.2000, (1 ♂ CEMT); Itirapina, II.2000, G. Machado (2 ♀ CEMT); Itirapina, Estação Ecológica, (22°13'S, 47°54'W), 30.I.2009, Fernando Silva (6 ♂ 9 ♀ CEMT). **PARAGUAY:** AMAMBAY: Cerro Corá, XII. 1993, Drechsel (1 ♂ CEMT); CAAGUAZÚ: Caaguazú, XII.1977, Martínez/Fritz (1 ♀ CMN); CONCEPCIÓN: Horqueta, 1934, Schulze (1 ♀ CMN); GUAIRA: Villarrica, II.1922 (1 ♂ CEMT).

**Sampling methods.** baited pitfall trap with injured diplopods [15 specimens]; flight interception trap [3].

**Habitat.** Brazil (Bahia, Distrito Federal, Goiás, Mato Grosso and São Paulo) and Paraguay (Fig. 90), from available data this species inhabits Cerrado and Chaco. 15 individuals were collected in "Campo Sujo", Cerrado, 731 m AMSL.

**Diagnosis and remarks** (within the *cupreicolle* complex): head dark green, with a metallic sheen; basal carina of seventh interstria elongate, extending a little further than humeral callus portion (Fig. 71); apex of pygidium strongly acuminate in male (Fig. 73). The following aedeagus characters are also diagnostic: parameres shorter than phallobase, rounded at apex, in lateral view forming an angle of approximately 30° with phallobase (Fig. 6). Lamella copulatrix (LC): left lobe "J"-shaped (Fig. 34); right lobe with shape similar to a human leg (Fig. 34). Superior right peripheral sclerite (SRP) as in Fig. 43. Fronto-lateral peripheral sclerite (FLP) as in Fig. 51. Center of genital segment with two well-sclerotized portions with oval shape (Fig. 26).

Pronotum can be yellow, red or brown. Posteromedial portion of pronotum can show only a small and inconspicuous greenish band.

Body coloration can be completely green (Fig. 102). Through the study of original description, as well as the examination of a specimen of CMN, which had been compared with the holotype, we concluded that the type specimen (entirely green) is a variant of the most common coloration pattern for species.

### ***Deltochilum (Aganhyboma) viridicatum* new species**

(Figs 7, 34, 90, 104, 105)

Pereira & Martínez 1956: 93 (comment on predation of Diplopoda; referred as *D. kolbei* "misidentification")

Martínez 1959: 52 (catalogue; cites Pereira & Martínez 1956)

Halffter 1959: 166 (comment on predation of Diplopoda; cites Pereira & Martínez 1956)

Halffter & Matthews 1966: 42 (comment on predation of Diplopoda; cites Pereira & Martínez 1956)

Cano 1998: 176 (cites Pereira & Martínez 1956)

**Etymology.** The green body color inspired the species name.

**Description. Body.** Head dark green or black-violaceous, with weak sheen or opaque, pronotum dark brown, with dark green spots, elytra dark green (Fig. 104). Ventral surface dark green, with a smooth metallic sheen. Length 13 to 14 mm. **Head.** Surface with dense foveiform punctures, not confluent, separated at center of dorsal interocular surface by approximately one or two times their diameters. Punctures of variable size; largest around eyes and smallest closer to clypeus. Anterior margin of each puncture not defined (as in Fig. 60). Margin between

clypeal teeth and genae curved outward approximately at halfway of its length. **Thorax.** Surface of pronotum with small punctures, apparently simple and uniformly distributed. Punctures located on anterior angles larger, with a typical foveiform shape. Pronotum with a narrow greenish band extending the entire edge (Fig. 104). Margin of pronotum (close to lateral angles) straight and emarginated, without depression. Margin between lateral and posterior angles approximately straight. **Elytra.** Slightly elongate (Figs 104, 105). Striae well impressed and punctate. Interstrial surface with small, dispersed foveiform punctures, amid small bright ocellate punctures, randomly distributed. First interstria brighter than rest of elytra. Basal carina of seventh interstria prominent and elongate, extending a little further than humeral callus portion (as in Fig. 71). Length of apical carina of seventh interstria not surpassing three times that of apical carina of sixth interstria. **Abdomen.** Punctures large and conspicuous, concentrated anterolaterally on each sternite, reduced to a narrow belt along midline of abdomen (as in Fig. 73). Pygidium with foveiform punctures denser on medial portion, near the base. Apex of pygidium weakly acuminate or rounded. **Legs.** Protibia not abruptly widened. Middle protibial tooth equidistant between apical and basal teeth. Protibial spur acuminate at apex. Apical third of metatibia only slightly curved inward (as in Fig. 68), with five clearly visible longitudinal carinae. Inner margin of metatibia without longitudinal row of small tubercles. Anterior edge of profemur completely emarginate, with abundant setae in two-thirds of its length. Foveiform punctures of profemur with transverse elliptical shape. Metatarsus longer than two-thirds of metatibia length. **Secondary sexual characters.** Male abdomen more longitudinally flattened than that of female. Males may possess medially between first and second ventrites, a small tubercle. Apical margin of pygidium longer in male. Protibial spur more acuminate in female.

**Material studied. Holotype: ARGENTINA:** MISIONES: San Pedro, I. 1956 (1 ♂ CEMT).

**Paratypes [7]: ARGENTINA:** MISIONES: Loreto, 1955, F. H. Walz (1 ♀ MZUSP); Loreto, XI.1958, Martínez (1 ♀ CEMT); Loreto, A. Ogloblin (1 ♂ MZUSP); [no indication of city], II.1954, F. H. Walz (1 ♂ CMN). **BRAZIL:** RIO GRANDE DO SUL: Neu Wurttemberg [currently Panambi], 1915, E. Garbe (1 ♂ MZUSP); Guaíba, 1976, M.H. Galileo (1 ♀ CEMT). **URUGUAY** [doubtful]: Puntas, Arenal (1 ♂ MZUSP).

**Habitat.** Argentina, southern Brazil and Uruguay [doubtful] (Fig. 90). Only one specimen with label data "Mata de galeria" [riparian forest].

**Diagnosis and remarks** (within the *cupreicolle* complex): head dark green or black-violaceous, with a weak sheen or opaque; apex of pygidium weakly acuminate or rounded; basal carina of seventh interstria prominent and elongate, extending a little further than humeral callus portion (as in Fig. 71), though somewhat shorter and inconspicuous on the basis than in *D. viridescens*. The following aedeagus characters are also diagnostic: parameres shorter than phallobase, rounded at apex, in lateral view forming an angle of approximately 30° with phallobase (Fig. 7); parameres more enlarged at the base in lateral view (Fig. 7) than in *D. viridescens*. Lamella copulatrix (LC): left lobe "J"-shaped (Fig. 34); right lobe with shape similar to a human leg (Fig. 34). Frontolateral peripheral sclerite (FLP) darkly sclerotized (as in Fig. 51). Center of genital segment with two well-sclerotized portions with oval shape.

We examined a specimen with label data "Puntas, Arenal" and we believe this location is Puntas del Arenal, Uruguay. This specimen is black (Fig. 105), and the foveiform punctures on central portion of head are extremely close.

The species can show other variations in pattern of colors. Pronotum of some individuals can vary between dark and light brown or reddish. Elytra can vary between dark green and black. Ventral surface may also vary from dark green and black.

### ***valgum* group**

**Description. Body.** Dorsal surface with foveiform punctures of variable size and density. Head, pronotum, elytra and ventral surface with a black, copper or red coloration, with or without reddish, brownish, greenish sheen or copper tones. Length 12 to 16.5 mm. **Head.** Surface with strong, deep and dense punctures (Fig. 61), almost confluent in some species. Foveiform punctures of head with well-defined margin (Fig. 61). Margin of head, near clypeal teeth, straight and followed by a small tooth slightly pronounced (Fig. 61). After this tooth, margin slightly curved inward until the junction of clypeus with gena. Dorsal interocular distance approximately three or four times eye width (Fig. 61). **Thorax.** Margin between anterior and lateral angles elongate and oblique (Fig. 85),



approximately straight, with visible row of setae in dorsal view. Margin between lateral and posterior angles straight or slightly rounded (curved outward). Posterior margin, after the posterior angle, slightly curved outward. Pronotum surface with deep and dense foveiform punctures. Punctures smaller and more dispersed near the anteromedial portion of pronotum (Fig. 85). Hypomera with foveiform punctures denser on anterior portion and somewhat more dispersed on posterior portion (Figs 81–83). **Elytra.** Oval shape, irregular surface (slightly rugose) and lateral margins ranging from semi-parallel to convex. Striae thick and well delimited (Fig. 75) or narrow and almost inconspicuous (Fig. 74). Interstriae ranging from distinctly convex to flattened, with uniform punctures along the width (Fig. 75), or more punctate on the sides, close to striae (Fig. 86). Interstriae of most species with ocellate punctures (microtubercles), or shiny and glossy zones poorly defined amid foveiform punctures (Figs 74–77). Basal carina of seventh interstria short or elongate. Basal carina of ninth interstria, when present in three-quarters of elytra, can reach the anterior limit of apical carina of seventh interstria. Basal carina of ninth interstria never traverses the entire length of elytra (Fig. 63). In some species, basal carina of ninth interstria reaches no farther than mid length of elytra (Fig. 80). Posterior part of elytral lateral margin formed by the pseudepipleural carina (Fig. 80). Apices of interstriae 2, 3, 4, 5, 6 and 7 with tubercle or carina. Apical carina of second interstria absent in some species. Apical carina of third interstria can be more evident than apical carinae of second and fourth interstriae (Fig. 88); species which this carina is more evident, it presents a rounded form, resembling a tubercle. Length of apical carina of sixth interstria longer than or equal to that of apical carina of fifth interstria. Pseudepipleural carina complete, visible entire length of epipleuron in most species (Fig. 63); in some species this carina may be interrupted at basal third, reappearing next to one-half of elytral length (Fig. 80). **Abdomen.** Punctures large and conspicuous on lateral portion of ventrites; sparser or absent along midline. Punctures reduced on medial portion to one row on anterior margin. Length of sixth ventrite, measured at midline, longer than that of fifth ventrite. Pygidium with dense rounded punctures over entire surface. Apex of pygidium acuminate. **Legs.** Most foveiform punctures of the metafemur rounded and dense (Fig. 65). Anterior edge of profemur completely emarginate. Protibia not abruptly widened, with dense foveiform punctures from base to first tooth. Medial lateral tooth of protibia closer to apical tooth than to basal tooth. Metafemora just slightly narrowed at base (Fig. 65). Apical third of metatibia strongly curved inward (as in Fig. 67). Inner margin of metatibia without longitudinal row of small tubercles, or tubercles inconspicuous. Metatarsus with approximately one-half of metatibia length. **Secondary sexual characters.** Male abdomen more longitudinally flattened than that of female. Males with a small tubercle at medial portion of abdomen between first and second ventrites. Protibial spur broader and more curved in male. Inner margin of metatibia usually with a longitudinal row of small tubercles more conspicuous in male. **Aedeagus.** Parameres symmetrical, simple, without ornamentation or setae, elongate or short (Figs 10–23). Endophallus: lobe in submedial portion. Lamella copulatrix (LC): subrectangular or subtrapezoidal sclerites (Figs 36–41). Superior right peripheral sclerite (SRP): circular shaped, sub-straight cable and a small sclerotized appendix. Ring with margin usually narrow, but never "thread"-shaped (Figs 45–49). Fronto-lateral peripheral sclerite (FLP): two irregular sclerites with a sclerotized cover that surrounds it (Figs 53–58). Complex of axial and subaxial sclerites (A+SA): several superposed and elongate sclerites. Genital segment: lateral arms sclerotized in a scalene triangle shape; central portion "M"-shaped; superior margin weakly bounded, with weak sclerotization (Figs 28–32).

**Diagnosis.** Compared to the *tresignatum* group, the diagnostic characters of *valgum* group are: Presence of small clypeal teeth external to central teeth (Fig. 61); foveiform punctures of pronotal disc smaller than that of lateral portion; posterior part of elytral lateral margin formed by the pseudepipleural carina (Figs 63, 80); lamella copulatrix: subrectangular or subtrapezoidal sclerites (Figs 36–41); ring of superior right peripheral sclerite (SRP) with thick and regular margin, never similar to a "thread" (Figs 45–49); SRP with a small appendix (Figs 45–49).

### ***acropyge* complex**

**Diagnosis.** Posteromedial punctures of pronotum not touch the posterior margin of pronotum. Basal carina of ninth interstriae extending at most to midway along elytra (Fig. 80)

### ***Deltochilum (Aganhyboma) acropyge* Bates 1887 new subgeneric placement and new status**

(Figs 13, 46, 91, 106)

*Deltochilum acropyge* Bates 1887: 36, plate 2, Fig. 15 (original description)

Gillet 1911: 35 (catalogue)

Blackwelder 1944: 202 (checklist)

Blackwelder 1973: 5 (checklist)

*Deltochilum (Deltochilum) valgum* var. *acropyge*: Paulian 1938: 269, 273 (taxonomic comments and identification key)

*Deltochilum (Deltohyboma) valgum acropyge*: Howden 1966: 733, 735 (identification key, taxonomic comments)

*Deltochilum valgum acropyge*: Howden & Young 1981: 36, 39 (identification key, description)

Cano 1998: 174, 175, 176, 177, Figs 2 and 3 (comment on habitat, distribution and behavior of predation)

Halffter 2003: 27, 28, Fig. 2.5 (description)

**Description. Body.** Head, pronotum, elytra and ventral surface black, with a silky sheen (Fig. 106). Length > 14 mm. **Head.** Punctures dense, almost touching; foveiform punctures separated at dorsal interocular surface by approximately half diameter. Punctures around clypeus shallower, smaller and more dispersed than those on interocular surface. Lateral margin of gena, nearby eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures, not touching each other. Punctures on the sides and anterior angles larger and somewhat closer than that of pronotum disc. Discal punctures separated approximately by 1.5 or two times their diameters. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by at least one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles straight, with approximately the same length of margin between anterior and lateral angles. Hypomera with foveiform punctures much more dense on anterior portion; anteromedial punctures separated by distance smaller or equal to one diameter; median portion with sparser punctures. Diagonal band of hypomera from posteromedial portion to middle of lateral margin, with dispersed but obvious punctures. **Elytra.** Lateral margins curved outward and elytral surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated. Interstriae flattened or faintly convex with foveiform punctures surrounded by approximately four shiny microtubercles. Microtubercles with sheen more evident than surrounding surface; some microtubercles indistinct. Foveiform punctures separate on the elytral disc by more than one diameter. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length. Apical carina or tubercle of second elytral interstria absent. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria shorter than the sum of apical carinae of fifth and sixth interstriae. Pseudopleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype (BMNH) [examined]:** 1. [old white label, printed in black, bordered in red]. Type; 2. [old white label, printed in black]. B. Honduras./ Blancaneau.; 3. [old white label, printed in black]. Sp. figured.; 4. [old white label, handwritten]. *Deltochilum acropyge* Bates.

**Non-type material [2]: GUATEMALA:** PETÉN: La Libertad, Comunidad Bethel, 14.VIII.1996, E. Cano (1 ♂ 1 ♀ CEMT).

**Sampling methods.** baited pitfall trap with live diplopods [2 specimens].

**Habitat.** Belize, Costa Rica, Guatemala, Mexico and Panama (inhabits the Caribbean slope) [see too Halffter 2003; Kohlmann & Solis, 2012] (Fig. 91), from available data this species inhabits tropical rainforest.

**Diagnosis and remarks** (within the *acropyge* complex): Length > 14 mm; posteromedial punctures of pronotum usually separated by at least one diameter; anteromedial punctures of hypomera usually separated by less than one diameter; apex of second interstria without carina or tubercle; pseudopleural carina complete, visible entire length of epipleuron (as in Fig. 63). Elytra are slightly more convex than in other species of this complex, with clearly impressed striae. The following aedeagus characters are also diagnostic: parameres symmetric and quite elongate, in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 13). Lamella copulatrix (LC): subrectangular sclerites. Superior right peripheral sclerite (SRP) as in Fig. 46.

### *Deltochilum (Aganhyboma) feeri* new species

(Figs 91, 107)

**Etymology.** Named in honour of François Feer, an excellent scarab ecologist who was responsible for collecting a large number of the type specimens.

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with a silky sheen (Fig. 107). Length < 14 mm. **Head.** Punctures dense and almost touching; around clypeus shallower, smaller and more dispersed than those on the dorsal interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae; margin with central portion clearly convex. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior angles and posterior portion. Punctures of pronotal disc more dispersed than those of lateral portion. Density, size and proximity of anteromedial punctures similar to those on disk. Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles with approximately the same length of margin between anterior and lateral angles. Hypomera with foveiform punctures dense at anterior, median and posterior portions; punctures of anteromedial portion nearly touching. Diagonal band of hypomera from posteromedial portion to middle of lateral margin with obvious punctures. **Elytra.** Lateral margins slightly curved outward, and elytral surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated. Interstriae flattened, with foveiform punctures surrounded by approximately four well-defined shiny microtubercles. Microtubercles with sheen more apparent than surrounding surface. Foveiform punctures separated on elytral disc by one diameter or less. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (as in Fig. 80). Apical carina or tubercle of second elytral interstria absent. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudopleural carina incomplete, effaced medially (as in Fig. 80).

**Material studied. Holotype: FRENCH GUIANA:** Nouragues, II.2001, F. Feer (1 ♂ CEMT).

**Paratypes [10]: GUIANA:** Isherton, 14.XI.1931 (2 ♀ MZUSP). TRINIDAD AND TOBAGO: Tunapuna, Mt. St. Benedict, 21.VI.1993, S. & J. Peck (1 ♀ CMN). **FRENCH GUIANA:** Cayenne, (4°48'18"N, 28°52'41"W), 9.VI.1997, J. Ashe & R. Brooks (1 ♀ CMN); Nouragues, II.2001, F. Feer (1 ♂ CEMT); same, III.2002, F. Feer (1 ♂ CEMT); same, III.2006, F. Feer (1 ♂ CEMT). **SURINAM:** SIPALIWINI DIST.: Kwamalasamutu region, Sipaliwini River (Werehpai), 02°21'N, 56°41'W, CI RAP, 3–7.IX.2010, T. Larsen, 250m (1 ♂ CEMT); same but Kutari River, 02°10'N, 56°47'W, ~250masl. CI RAP Survey, 18–24.VIII.2010 (1 ♂ AFIC); same but CI RAP 3 sites between 02°21'N, 56°41'W and 02°10'N, 56°47'W. ~250masl, VIII–IX.2010 (1 ♀ AFIC).

**Sampling methods.** flight interception trap [2 specimens].

**Habitat.** Guyana, French Guiana and Trinidad and Tobago (Fig. 91). One specimen with label data "Summit Rain Forest".

**Diagnosis and remarks** (within the *acropyge* complex): length < 14 mm; foveiform punctures of head almost touching, separated in dorsal interocular surface by about half diameter; posteromedial punctures of pronotum usually separated by less than one diameter; anteromedial punctures of hypomera nearly touching; apical carina or tubercle of second elytral interstria absent; pseudopleural carina incomplete, effaced medially (as in Fig. 80).. Hypomera punctures in individuals of this species, as well as in *D. acropyge* and *D. schefflerorum* **new species**, are the most dense of *acropyge* complex.

### ***Deltochilum (Aganhyboma) schefflerorum* new species**

(Figs 12, 29, 54, 81, 91, 108)

**Etymology.** Named in honour of Pamela Scheffler and Timothy Scheffler who collected a part of the type specimens.

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with a silky sheen. Length 12 to 13.5 mm. **Head.** Punctures extremely dense and touching; around clypeus shallower, smaller and more dispersed than those on the dorsal interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae; margin with central portion clearly convex. Dorsal interocular distance approximately 2.5 times eye width. **Thorax.** Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior angles and posterior portion. Discal punctures only somewhat smaller and more dispersed than those of lateral portion. Density, size and proximity of anteromedial punctures similar to those on disk.

Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles with length somewhat smaller than that of margin between anterior and lateral angles. Hypomera with foveiform punctures dense at anterior, median and posterior portions (Fig. 81); anteromedial punctures nearly touching. Diagonal band of hypomera from posteromedial portion to middle of lateral margin with obvious punctures (Fig. 81). **Elytra.** Lateral margins slightly curved outward (Fig. 108), and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated. Interstriae flattened, with foveiform punctures surrounded by approximately four well-defined shiny microtubercles. Microtubercles with sheen more evident than surrounding surface. Foveiform punctures separated on elytral disc by one diameter or less. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (as in Fig. 80). Apical carina or tubercle of second elytral interstria absent. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina incomplete, effaced medially (as in Fig. 80).

**Material studied. Holotype: BRAZIL:** MATO GROSSO: Cotriguaçu, Faz. S. Nicolau, (09°50'53"S, 58°14'36"W), 12.X.2009, F. Vaz-de-Mello (1 ♂ CEMT).

**Paratypes [9]: BRAZIL:** MATO GROSSO: Alta Floresta, (09°35'55"S, 55°56'10"W), VI.2008, E. Berenguer (1 ♂ CEMT); Cotriguaçu, Faz. São Nicolau, (09°50'24"S, 58°15'10"W), 9.X.2009, F. Vaz-de-Mello (1 ♂ CEMT); same, (09°49'22"S, 58°15'48"W), 08.XII.2010, F. Vaz-de-Mello (1 ♂ 1 ♀ CEMT); Cotriguaçu, V.2011, R. E. Vicente (1 ♂ CEMT); PARÁ, Redenção, (07°46'S, 51°58'W), XI.1998, P & T. Scheffler (2 ♂ 2 ♀ CEMT).

**Sampling methods.** flight interception trap [4 specimens]; at light-trap [1]; collected manually on millipedes [2].

**Habitat.** Brazil (Mato Grosso and Pará) (Fig. 91), from available data this species inhabits Amazon rainforest.

**Diagnosis and remarks** (within the *acropyge* complex): foveiform punctures of dorsal interocular surface touching; anteromedial punctures of pronotum separated by less than one diameter; diagonal band of hypomera with obvious punctures (Fig. 81); apical carina or tubercle of second elytral interstria absent; pseudepipleural carina incomplete, effaced medially (as in Fig. 80). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, in lateral view forming an angle of approximately 45° with phallobase; apex acuminate (Fig. 12). Genital segment with superior margin weakly sclerotized (Fig. 29). Lamella copulatrix (LC): subrectangular sclerites. Fronto-lateral peripheral sclerite (FLP) as in Fig. 54.

### ***Deltochilum (Aganhyboma) streblopodum* new species**

(Figs 91, 109)

**Etymology.** *Streblopodum* (crooked + legs), Latin adjective, refers to the posterior tibiae of individuals, which are curved.

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an evident sheen. Length < 13 mm. **Head.** Punctures extremely dense, almost touching; foveiform punctures separated at dorsal interocular surface by half diameter or less. Punctures around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae; margin with central portion clearly convex. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior angles and posterior portion. Discal punctures somewhat smaller and more dispersed than those of lateral portion. Density, size and proximity of anteromedial punctures similar to those on disk. Posteromedial punctures separated by one diameter or less. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles with length somewhat smaller than that of margin between anterior and lateral angles. Hypomera with dense foveiform punctures at anterior portion and absent at posteromedial portion. Diagonal band of hypomera from posteromedial portion to middle of lateral margin lacking punctures or with one or two isolated punctures on otherwise smooth surface (as in Fig. 83). **Elytra.** Lateral margins slightly curved outward (Fig. 109) and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated. Interstriae flattened, with foveiform punctures surrounded by approximately four well-defined shiny microtubercles. Microtubercles with sheen more evident than surrounding surface. Foveiform punctures separated

on elytral disc by one diameter or less. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length. Apical carina or tubercle of second elytral interstria absent. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleurale carina incomplete, effaced medially (as in Fig. 80). **Aedeagus.** The specimen examined presented the aedeagus weakly sclerotized, without defined morphology.

**Material studied. Holotype: BRAZIL:** AMAZONAS: Barcelos, Igarapé Erere/Coruja, (00°06'16"N, 63°51'01"W), 18–25.VI.2008, F.F. Xavier (1 ♂ INPA).

**Sampling methods.** at light-trap [1 specimen].

**Habitat.** Brazil (Amazonas) (Fig. 91), from available data this species inhabits Amazon rainforest.

**Diagnosis and remarks** (within the *acropyge* complex): margin of pronotum between lateral and posterior angles narrower than that between anterior and lateral angles; diagonal band of hypomera lacking punctures or with one or two isolated punctures on otherwise smooth surface (as in Fig. 83); apical carina or tubercle of second elytral interstria absent; elytral striae with round punctures; pseudepipleurale carina incomplete, effaced medially (as in Fig. 80).

### ***Deltochilum (Aganhyboma) longiceps* Paulian 1938 new subgeneric placement and new status** (Figs 16, 37, 61, 80, 83, 84, 91, 110)

*Deltochilum (Deltochilum) valgum* var. *longiceps* Paulian 1938: 269, 273 (original description, identification key)

*Deltochilum longiceps*: Blackwelder 1944: 203 (checklist)

Contreras 1951: 222 (catalogue)

*Deltochilum (Deltohyboma) valgum longiceps*: Vulcano & Pereira 1967: 557 (identification key)

*Deltochilum valgum longiceps*: Cano 1998: 177 (comment on feeding behavior)

Escobar 2003: 131 (observations of feeding behavior, referred as *Deltochilum acropyge*, "misidentification")

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an evident sheen. Length > 13 mm. **Head.** Punctures dense, but not touching each other; foveiform punctures separated at the dorsal interocular surface by approximately one diameter (Fig. 61). Punctures around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures, not touching each other. Punctures on the sides and posterior angles as close as those on anterior angles. Discal punctures smaller and more dispersed than those of lateral portion, separated by approximately two or three times their diameter. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by at least one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles straight, with approximately the same length of margin between anterior and lateral angles. Hypomera with dense foveiform punctures at anterior portion and absent at posteromedial portion (Fig. 83); anteromedial punctures usually separated by less than one diameter. Diagonal band of hypomera from posteromedial portion to middle of lateral margin lacking punctures or with one or two isolated punctures on otherwise smooth surface (Fig. 83). **Elytra.** Lateral margins slightly curved outward (Fig. 110) and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated; striae punctures often elliptical, separated by irregular spacing (Fig. 84). Interstriae flattened, with foveiform punctures surrounded by approximately five well-defined shiny microtubercles. Foveiform punctures separated on elytral disc by approximately half diameter. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (Fig. 80). Apical carina or tubercle of second interstria inconspicuous. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria noticeably smaller than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleurale carina incomplete, effaced medially (Fig. 80). Parameres symmetric and elongate, length equal to or longer than phallobase; in lateral view forming an angle greater than 60° with phallobase; apex rounded (Fig. 16). Lamella copulatrix (LC): subrectangular sclerites (Fig. 37). Fronto-lateral peripheral sclerite (FLP) as in Fig. 54.

**Material studied. Holotype** (BMNH) [examined] ♀: **COLOMBIA** (no locality given in original description). 1. [white label, handwritten]. 416; 2. [white label, printed in black]. 6745; 3. [white label, bordered in red, round]. Type; 4. [white label, handwritten]. longiceps/ Reiche/ Colombie; 5. [white label, handwritten]. Deltochilum/ valgum var. longiceps/ Paulian/ Type.

**Non-type material [1]: COLOMBIA:** TOLIMA: Mariquita, XI.1995, F. Escobar (1 ♂ CEMT).

**Sampling methods.** un-baited pitfall trap [1].

**Habitat.** Colombia (Fig. 91), one specimen with label data "Bosque Seco".

**Diagnosis and remarks** (within the *acropyge* complex): foveiform punctures separated at the dorsal interocular surface by approximately one diameter (Fig. 61); foveiform punctures of pronotal disc separated by approximately two or three times their diameter; punctures of elytral striae often elliptical, separated by irregular spacing (Fig. 84); apical carina or tubercle of second elytral interstria inconspicuous; pseudopleural carina incomplete, effaced medially (Fig. 80). The pattern of hypomera punctures on individuals of this species is also characteristic (Fig. 83). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, length equal to or longer than phallobase; in lateral view forming an angle greater than 60° with phallobase; apex rounded (Fig. 16). Lamella copulatrix (LC): subrectangular sclerites (Fig. 37). Fronto-lateral peripheral sclerite (FLP) as in Fig. 54.

Escobar (2003) reported the feeding behavior of seven specimens from Colombia (Tolima), supposedly identified as *D. valgum acropyge* Bates. As far as we know, *D. acropyge* Bates inhabits only the Caribbean slope of Central America to Mexico. From Colombia we know only specimens of *D. longiceps*. Therefore, we believe that those specimens reported from Colombia are *D. longiceps*.

### ***Deltochilum (Aganhyboma) acanthus* Kohlmann & Solís 2012**

(Figs 15, 91, 111)

*Deltochilum (Deltohyboma) acanthus* Kohlmann & Solís 2012: 35, 36, 37, 38, Figures 6, 7 and 15 (original description)

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an evident sheen. Length < 13 mm. **Head.** Punctures dense, nearly touching at central portion; around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately 2.5 times eye width. **Thorax.** Surface of pronotum with dense foveiform punctures, not touching each other. Punctures on the sides, anterior and posterior angles separated by half diameter or less. Discal punctures smaller and more dispersed than those of lateral portion, separated by approximately two times their diameter. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles straight, with the same length of margin between anterior and lateral angles. Hypomera with dense foveiform punctures at anterior portion and absent at posteromedial portion; anteromedial punctures usually separated by less than one diameter. Diagonal band of hypomera from posteromedial portion to middle of lateral margin lacking punctures or with one or two isolated punctures on otherwise smooth surface (as in Fig. 83). **Elytra.** Lateral margins semiparallel (Fig. 111) and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated; several punctures clearly elliptical, separated by regular spacing. Interstriae flattened, with foveiform punctures surrounded by approximately four well-defined shiny microtubercles. Foveiform punctures separated on elytral disc by approximately one diameter. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (as in Fig. 80). Apical carina or tubercle of second interstria present. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria noticeably less than that of sum of apical carinae of fifth and sixth interstriae. Pseudopleural carina incomplete, effaced medially (as in Fig 80).

**Material studied. Holotype** (INBio) [not examined]: **COSTA RICA:** Prov. Puntarenas, Res. Biol. Carara, Est. Quebrada Bonita, VI. 1993, 50 m, J.C. Saborío, L-N-194500, 469850, CRI001185073 (1 ♂ INBio collection). The original description is sufficient to confirm the identification of species.

**Non-type material [2]: PANAMA:** PANAMA: Gatún Lake, Barro Colorado Island, 5.V.1981, B. Gill (1 ♂ CMN). **COSTA RICA:** PUNTARENAS: Osa Peninsula. Río Piro, la Joya 350m, 8°23'56"N, 83°19'51"W, V–IX.1997, N. Gibson (A. Forsyth) (1 ♀ AFIC).

**Sampling methods.** flight interception trap [1 specimen].

**Habitat.** Panama and Costa Rica (Fig. 91). According to Kohlmann & Solis (2012), this species inhabits Pacific tropical rain forest of Costa Rica and the Canal Zone of Panama, ranging from 0 to 100 m AMSL.

**Diagnosis and remarks** (within the *acropyge* complex): foveiform punctures of dorsal interocular surface nearly touching; foveiform punctures of pronotal disc separated by approximately twice their diameter; posteromedial punctures of pronotum usually separated by less than one diameter; pronotal margin, between lateral and posterior angles, with approximately the same length of margin between anterior and lateral angles; elytra with lateral margins semiparallel (Fig. 111); punctures of elytral striae often elliptical, separated by regular spacing; apical carina or tubercle of second elytral interstria present; pseudopleural carina incomplete, effaced medially (as in Fig 80). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, length approximately equal to phallobase; in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 15). Lamella copulatrix (LC): subrectangular sclerites. Fronto-lateral peripheral sclerite (FLP) as in Fig. 54.

### ***Deltochilum (Aganhyboma) arturoi* new species**

(Figs 82, 91, 112)

**Etymology.** Named in honour of Fabio Arturo González Alvarado, friend of both authors and good dung beetle taxonomist.

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an evident sheen. Length > 14 mm. **Head.** Punctures dense but not touching each other; foveiform punctures separated at the dorsal interocular surface by approximately half diameter. Punctures around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae, or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures. Punctures on the sides, anterior and posterior angles nearly touching. Discal punctures smaller and more dispersed than those of lateral portion, separated approximately by one diameter. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by at least one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles straight, with approximately the same length of margin between anterior and lateral angles. Hypomera with dense foveiform punctures on anterior portion and dispersed on posteromedial portion (Fig. 82); anteromedial punctures separated by approximately half diameter. Diagonal band of hypomera from posteromedial portion to middle of lateral margin with few isolated punctures on otherwise smooth surface (Fig. 82). **Elytra.** Lateral margins slightly curved outward (Fig. 112) and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated; some punctures slightly elliptical, separated by regular spacing. Interstriae flattened, with foveiform punctures surrounded by approximately four well-defined shiny microtubercles. Foveiform punctures separated on elytral disc by at least one diameter. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (as in Fig. 80). Apex of second interstria with carina or tubercle inconspicuous. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria approximately equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudopleural carina incomplete, effaced medially (as in Fig. 80).

**Material studied. Holotype: ECUADOR:** PICHINCHA: B.P. Milpe, 1200m, IV.2003, Fumigación Dosel, P.Araujo & William Chamorro (1 ♀ CEMT).

**Paratype [1]: ECUADOR:** SANTO DOMINGO: Santo Domingo (16 Km E), Tinalandia, 25.VII.1985, S. & J. Peck (1 ♀ CMN).

**Sampling methods.** flight interception trap [1 specimen].

**Habitat.** Ecuador (Fig. 91), one specimen with label data “tropical rain forest”.

**Diagnosis and remarks** (within the *acropyge* complex): length > 14 mm; foveiform punctures of dorsal interocular surface separated by approximately half diameter; foveiform punctures of pronotal disc separated approximately by one diameter; posteromedial punctures of pronotum usually separated by at least one diameter; pronotal margin, between lateral and posterior angles, with approximately the same length of margin between anterior and lateral angles; some punctures of elytral striae slightly elliptical, separated by regular spacing; apical carina or tubercle of second elytral interstria inconspicuous; pseudepipleural carina incomplete, effaced medially (as in Fig. 80). The pattern of hypomera punctures on individuals of this species is also characteristic (Fig. 82).

***Deltochilum (Aganhyboma) larseni* new species**

(Figs 14, 91, 113)

**Etymology.** A patronym honoring Trond Larsen, great and enthusiastic scarab ecologist who collected most of the type specimens.

**Description. Body.** Black or dark brown coloration, with obvious sheen (Fig. 113). Length < 13 mm. **Head.** Punctures dense, nearly touching; around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately 2.5 times eye width. **Thorax.** Surface of pronotum with dense foveiform punctures. Punctures on the sides, anterior and posterior angles nearly touching. Discal punctures smaller and more dispersed than those of lateral portion, separated approximately by one diameter. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by at least one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles with length somewhat shorter than that of margin between anterior and lateral angles. Hypomera with dense foveiform punctures on anterior portion and dispersed on posteromedial portion; anteromedial punctures almost touching. Diagonal band of hypomera from posteromedial portion to middle of lateral margin with dispersed punctures on otherwise smooth surface. **Elytra.** Lateral margins slightly curved outward (Fig. 113) and surface slightly irregular (rugose). Elytral striae with carinate margins clearly separated; striae punctures separated by regular spacing; most of punctures round intermingled with some slightly elliptical. Interstriae flattened, with foveiform punctures surrounded by approximately five obvious shiny microtubercles. Foveiform punctures separated on elytral disc by approximately one diameter. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria with approximately one-half of elytral length (as in Fig. 80). Apical carina or tubercle of second elytral interstria absent. Apical carina of third interstria weaker than apical carina of fourth interstria. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria longer than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina incomplete, effaced medially (as in Fig. 80).

**Material studied. Holotype: ECUADOR: SUCUMBIOS: R.P.F. Cuyabeno, Trocha Zábalo-Güepí, km 10, 9.VIII.2010, Colección Manual nocturna, Bosque de tierra firme colinado, Pablo Araujo, LOTE 557 (1 ♂ CEMT).**

**Paratypes [15]: ECUADOR: SUCUMBIOS: R.P.F. Cuyabeno, Trocha Zábalo-Güepí, km 10, 9.VIII.2010, Colección Manual nocturna, Bosque de tierra firme colinado, Pablo Araujo, LOTE 557 (1 ♂ CEMT); PASTAZA: B.P. Oglán, T4, Bsvpm. 554 msnm, 201146E 9853376N, 23.VIII.2008, Col. W. Chamorro & V. Guasumba (1 ♀ CEMT). PERU: valle cerca Abancay, 2.VII.1948, C.S. Carbonell (1 ♂ MZUSP); Upper Rio Marañón, 8.X.1928 (1 ♂ MZUSP); MADRE DE DIOS: Río Tambopata, 300 m, Ccolpa de Guacamayos, 13°08.5'S, 69°36.4'W, A Forsyth, X.1995 (1 ♂ AFIC); Río Madre de Dios, Río Los Amigos, base camp, 1° terra firme, 290 m, pitfall crushed but live spirobolid millipede, 12°34'10.0"S, 70°06'01.4"W, T. Larsen, IV.2000 (1 ♂ CEMT, 1♂ 1♀ AFIC); same but 12–13.IV.2000 (1♂ CEMT); same but Río Amiguillos, small rever flood plain, 260 m, pitfall millipede, 12°22'25.4"S, 70°22'13.2"W, T. Larsen, V.2000 (1♂ AFIC, 1♀ CEMT); same but Río Palma Real Grande, Limon Camp, 12°32'20"S, 68°51'40"W, Flight intercept trap, 220 m, T. Larsen, 11–12.X.1999 (1♀ CEMT); same but pitf. crished millipede, 12–13.X.1999 (1♀ AFIC); same but perching night, 11.X.1999 (1♀ AFIC); same but 12°32'20"S, 68°51'41"W, Flight interception trap, 400 m, 2–3.IV.1999 (1♀ AFIC).**

**Habitat.** Ecuador and Peru (Fig. 91), from available data this species inhabits Amazon rainforest.

**Diagnosis and remarks** (within the *acropyge* complex): length < 13 mm; punctures of pronotal disc separated by approximately one diameter; posteromedial punctures of pronotum usually separated by at least one diameter;



pronotal margin, between lateral and posterior angles, with length somewhat shorter than margin between anterior and lateral angles; elytral striae with carinate margins clearly separated; strial punctures separated by regular spacing; most of strial punctures round intermingled with some slightly elliptical; apical carina or tubercle of second interstria absent; pseudopleural carina incomplete, effaced medially (as in Fig. 80). The following aedeagus characters are also diagnostic: parameres symmetric and short, length shorter than phallobase; in lateral view forming an angle of approximately 45° with phallobase (Fig. 14). Lamella copulatrix (LC): subrectangular sclerites. Fronto-lateral peripheral sclerite (FLP) as in Fig. 54.

### *finestriatum* complex

**Diagnosis.** Elytral striae narrow, carinate margins close and almost touching (Fig. 74).

### *Deltochilum (Aganhyboma) cangalha* new species

(Figs 10, 76, 78, 92, 114)

**Etymology.** The new species name, "cangalha", is a typical term of the northeastern region of Brazil, which means "bowlegged", a characteristic usually found in individuals of *Aganhyboma*. The epithet is a name in apposition.

**Description. Body.** Head, pronotum, elytra, and ventral surface black, with a copper-red sheen. Length > 14 mm. **Head.** Punctures extremely dense and touching; around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae, or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (as in Fig 61). **Thorax.** Pronotum with a red metallic sheen (Fig. 114). Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior angles and posterior portion. Discal punctures smaller and more dispersed than those of lateral portion. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles approximately straight. Hypomera with moderate foveiform punctures on anterior and posterior portions (Fig. 78); anteromedial punctures separated by at least one diameter (Fig. 78). **Elytra.** Elytra rounded, sides bulging outward (Fig. 114) and surface slightly irregular (rugose). Elytral striae narrow, carinate margins close and almost touching (as in Figs 74, 76). Interstriae flattened, with foveiform punctures surrounded by shiny areas poorly defined. Foveiform punctures of interstriae separated on elytral disc by less than one diameter. Microtubercles of interstriae dense and weakly defined on most of surface, united by glossy spots with a red-cupreous sheen (Fig. 76). Basal carina of seventh interstria short, length about twice the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra, but it never reaches the anterior limit of apical carina of seventh interstria. Apical carina of third interstria somewhat more prominent than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudopleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype: BRAZIL:** MINAS GERAIS: Águas Vermelhas, XII.1998, A. Bello & F. Z. Vaz-de-Mello (1 ♂ CEMT).

**Habitat.** Brazil (Minas Gerais) (Fig. 92), from available data this species inhabits "Carrasco". This habitat consists of dense shrubby xerophilous vegetation that occurs in semi-arid domain of Brazil.

**Diagnosis and remarks** (within the *finestriatum* complex): pronotal margin, between lateral and posterior angles, straight; Elytra rounded, sides bulging outward (Fig. 114); anteromedial punctures of hypomera separated by at least one diameter (Fig. 78); pronotum with a red metallic sheen; elytral microtubercles weakly defined, with a red-cupreous sheen (Fig. 76). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 10). Lamella copulatrix (LC): left lobe subtrapezoidal; right lobe subrectangular. Fronto-lateral peripheral sclerite (FLP) as in Fig. 53.

Although the aedeagus of *D. cangalha* **new species** and *D. alpercata* **new species** do not present significant difference, the elytral punctures in these species are distinct.

***Deltochilum (Aganhyboma) alpercata* new species**

(Figs 10, 77, 79, 92, 115)

**Etymology.** "alpercata" is a typical footwear of the northeastern region of Brazil. The epithet is a name in apposition.

**Description. Body.** Head, pronotum, elytra, and ventral surface black, with a silky sheen. Length > 14 mm. **Head.** Punctures extremely dense and touching; around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae, or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Pronotum black with an opaque sheen or a weak luster (Fig. 115). Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior angles and posterior portion. Discal punctures somewhat smaller and more dispersed than those of lateral portion. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles approximately straight. Hypomera with dense foveiform punctures on anterior and posterior portions (Fig. 79); anteromedial punctures separated by less than one diameter (Fig. 79). **Elytra.** Rounded, sides bulging outward (Fig. 115) and surface slightly irregular (rugose). Elytral striae narrow, carinate margins close and almost touching (as in Figs 74, 77). Interstriae flattened, with foveiform punctures surrounded by four or five shiny microtubercles. Foveiform punctures separated on elytral disc by less than one diameter. Microtubercles of interstriae well delimited and conspicuous, with strong luster; interstitial surface around microtubercles opaque (Fig. 77). Basal carina of seventh interstria short, length about twice the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra, but it never reaches the anterior limit of apical carina of seventh interstria. Apical carina of third interstria more prominent than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype: BRAZIL:** ALAGOAS: Murici, S. Branca, V.1984, F.M. Oliveira (1 ♂ CEMT).

**Habitat.** Brazil (Alagoas) (Fig. 92), from available data this species inhabits lowland Atlantic forest.

**Diagnosis and remarks** (within the *finestriatum* complex): elytra rounded, sides bulging outward (Fig. 115); punctures of anteromedial portion of hypomera separated by less than one diameter (Fig. 79); pronotum black with an opaque sheen or a weak luster (Fig. 115); elytral microtubercles well delimited, with a brown sheen (Fig. 77); interstitial surface around microtubercles opaque (Fig. 77). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 10). Lamella copulatrix (LC): left lobe subtrapezoidal; right lobe subrectangular. Fronto-lateral peripheral sclerite (FLP) as in Fig. 53.

Although the aedeagus of *D. alpercata* **new species** and *D. cangalha* **new species** do not present significant difference, the elytral punctures in these species are distinct.

***Deltochilum (Aganhyboma) finestriatum* new species**

(Figs 11, 28, 36, 45, 53, 63, 74, 92, 116)

**Etymology.** Named referring to the narrow elytral striae.

**Description. Body.** Head, pronotum, elytra, and ventral surface black, with a silky sheen. Length 13.3 to 15.8 mm. **Head.** Punctures extremely dense and touching. Foveiform punctures distributed along the entire dorsal surface; around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately three times eye width (as in Fig. 61). **Thorax.** Surface of pronotum with dense foveiform punctures,

nearly touching on the sides, anterior angles and posterior portion. Discal punctures somewhat smaller and more dispersed than those of lateral portion. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles approximately straight. Hypomera with dense foveiform punctures on anterior portion; anteromedial punctures separated by less than one diameter. **Elytra.** Oval-elongate with lateral margins slightly curved outward (Fig. 116) and surface slightly irregular (rugose). Elytral striae narrow, carinate margins close and almost touching (Fig. 74). Interstriae flattened, with foveiform punctures surrounded by glossy areas weakly defined (Fig. 74). Foveiform punctures separated on elytral disc for less than one diameter. Microtubercles dense and weakly defined on most of surface, united by depressed glossy areas making their delimitation difficult (Fig. 74). Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra, but it never reaches the anterior limit of apical carina of seventh interstria (Fig. 63). Apical carina of third interstria elongate, more prominent than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (Fig. 63).

**Material studied. Holotype:** BRAZIL: MINAS GERAIS: Viçosa, Mata do Paraíso, (20°48.135'S, 42°51.525'W), 14.II.2009, Fernando Silva (1 ♂ CEMT).

**Paratypes [27]:** BRAZIL: [no data] (1 ♀ MNHN); ESPÍRITO SANTO: Rio Bonito, II.1964 (1 ♀ DZUP); MINAS GERAIS: Guanhões, 25.III.1994, J.C. Zamuncio (1 ♀ CEMT); Marliéria, Parque Estadual do Rio Doce, (19°42'09.22"S, 42°30'54.21"W), 11.I.2005, S.S.P. Almeida & M.R. Pereira (1 ♂ CEMT); Ravana, (19°49'46.52"S, 43°49'01.24"W), (1 ♂ CEMT); Viçosa, Mata do Paraíso, X.1998, F.Z. Vaz-de-Mello (1 ♀ CEMT); same, XI.1998, F.Z. Vaz-de-Mello (1 ♀ CEMT); same, (20°48.135'S, 42°51.525'W), 14.II.2009, Fernando Silva (6 ♂ 4 ♀ CREN); PARANÁ: Campina Grande do Sul, Estrada da Mandaçaia, I.2009, F.W.T. Freitas (1 ♀ CEMT); Cornélio Procópio, Parque Estadual Mata São Francisco, (23°09'20"S, 50°34'20"W), 14.XII.2009, N. Cipola (1 ♂ CEMT); Londrina, Parque Estadual Mata dos Godoy, (23°27'S, 51°14'W), 24.I.2000, J. Lopes (1 ♀ CEMT); RIO DE JANEIRO: Rio de Janeiro, Jardim Botânico, XII.1992, F.Z. Vaz-de Mello (1 ♀ CEMT); SANTA CATARINA: Corupá, XII.1953, Anton Maller (1 ♀ MZUSP); Corupá, 1961, Anton Maller (1 ♀ MZUSP); same, XII.1963, (1 ♀ DZUP); Florianópolis, Lagoa do Peri, (27°49'S, 48°32'W), X.2007, P. Condé & M. Hernández (1 ♀ CEMT); Hansa, I.1941, (1 ♂ MZUSP); SÃO PAULO: Santo André, Rebio Alto da Serra do Paranapiacaba, (23°46'48"S, 46°18'36"W), 18.II.2007, M. Uehara-Prado (1 ♀ CEMT).

**Sampling methods.** baited pitfall trap with injured diplopods [11 specimens]; flight interception trap [2].

**Habitat.** Brazil (Espírito Santo, Minas Gerais, Paraná, Rio de Janeiro and Santa Catarina) (Fig. 92). From the available data this species inhabits Atlantic forest, ranging from 0 to 800 m *AMSL*.

**Diagnosis and remarks** (within the *finestriatum* complex): elytra with oval-elongate shape and lateral margins slightly curved outward (Fig. 116); elytral microtubercles dense and poorly defined on most of surface, united by glossy spots with dark brown or black sheen, never copper-red (Fig. 74). The following aedeagus characters are also diagnostic: parameres symmetric and elongate; in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 11). Genital segment as in Fig. 28. Lamella copulatrix (LC): left and right lobes as in Fig. 36. Superior right peripheral sclerite (SRP) as in Fig. 45. Fronto-lateral peripheral sclerite (FLP) as in Fig. 53.

### ***valgum* complex**

**Diagnosis.** Interstriae convex.

### ***Deltochilum (Aganhyboma) icaroides* Balthasar 1939 new subgeneric placement**

(Figs 18, 31, 39, 48, 85, 87, 93, 117)

*Deltochilum* (s. str.) *icaroides* Balthasar 1939: 10 (original description)

*Deltochilum icaroides*: Blackwelder 1944: 203 (checklist)

Roze 1955: 43 (checklist)  
Génier 2001: 4 (comments about type locality)  
*Deltochilum* (s. str.) *icarioides*: Lane 1947: 109 (taxonomic comments)  
*Deltochilum* (*Deltohyboma*) *icarioides*: Martínez 1959: 54 (catalogue)  
Vulcano & Pereira 1964: 655 (catalogue)  
Vulcano & Pereira 1967: 557 (identification key)  
Vaz-de-Mello 2000: 192 (checklist)

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an opaque or silky sheen. Length 12.8 to 13.5 mm. **Head.** Foveiform punctures extremely dense, usually touching on the dorsal interocular surface. Punctures around clypeus shallower, smaller and more dispersed than those on the interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Dorsal interocular distance approximately four times eye width. **Thorax.** Surface of pronotum with dense foveiform punctures, nearly touching on the sides, anterior and posterior angles (Fig. 85). Discal punctures somewhat smaller and more dispersed than those of lateral portion. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by less than one diameter. Margin between anterior and lateral angles with row of small setae. Hypomera with dense foveiform punctures on anterior and posterior portions; foveiform punctures almost touching. **Elytra.** Lateral margins slightly curved outward (Fig. 117) and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae slightly convex; however, always less convex than that of the *icariforme* subcomplex. Interstriae with foveiform punctures over entire surface. Elytral microtubercles almost inconspicuous, sometimes blending in with remainder of interstria surface. Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra, but it never reaches the anterior limit of apical carina of seventh interstria. Apical carina of third interstria somewhat more prominent than apical carinae of second and fourth interstriae (Fig. 87). Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype** (NMPC) [examined] ♀: 1. [white label, printed in black]. San Bernardino / A. Fischer S. G. / 8. 1912; 2. [white label, handwritten and printed in black]. *Deltochilum* / *icariformis* / Ohs. in litt. / dr. V. Balthasar det.; 3. [red label, handwritten]. Typus; 4. [red label, printed in black]. HOLOTYPE; 5. [white label, printed in black]. Type; 6. [green label, bordered in black, handwritten]. *icarioides* / m. See also Bezděk & Hájek (2011).

The holotype has the following locality data on the label: «San Bernardino, A. Fischer, S. G., 8.1912». In the original description, the author supposes that this location is in Venezuela (Balthasar 1939). However, Génier (2001) believes that the specimen is from San Bernardino, Paraguay, because he examined an individual, according to him, identical to the type, from Villarica, Paraguay.

**Non-type material [44]: ARGENTINA:** MISIONES: Loreto (1 ♀ MZUSP); Loreto, A. Uglobin (1 ♀ CEMT); P. N. Iguazú, 6.I.1991, S. & J. Peck (1 ♀ CMN); Puerto Iguazú, X.1997 (1 ♀ CEMT). **BOLIVIA:** SANTA CRUZ: Chiquito, Santiago de Chiquito, (18°19'S, 59°34'W), 11.XI.2008, T. Vidaurre (1 ♂ 2 ♀ MNKM, 3 ♂ 1 ♀ CEMT); same, (18°20.103'S, 59°35.007'W), XI.2008, W.D.E. Edmonds & T. Vidaurre (7 ♂ 2 ♀ WDEC); 5km SSE Buena Vista, Hotel Flora e Fauna, (17°29.925'S, 63°39.128'W), 15.XII.2003, S. & J. Peck (1 ♂ CMN). **BRAZIL:** GOIÁS: [anonym] (2 ♀ MZUSP); MINAS GERAIS: Rio Doce, 5.III.1940 (1 ♀ MZUSP); MATO GROSSO: Chapada dos Guimarães, 14.XI.2008, S.P. Rosa, F. Fernandes, J. Almeida & R. Kawada (2 ♀ CEMT); Diamantino, Alto Rio Arinos, X.1999, E. Furtado (1 ♂ CEMT); same, II.2001, E. Furtado (1 ♂ CEMT); Nossa Senhora do Livramento, Distrito de Pirizal, 15.X.2009, D. D. Pinheiro (1 ♀ CEMT); Rosário Oeste, XI.1959 (2 ♀ DZUP); same, XI.1963, Alvarenga & Werner (1 ♀ MZUSP); same, II.1969 (1 ♀ DZUP); MATO GROSSO DO SUL: Bodoquena, Ass. Canaã, (20°46.267'S, 56°46.038'W), XI.2009, F. O. Roque (1 ♂ 1 ♀ CEMT); Corumbá, Serra do Urucum, (19°13'S, 57°33'W), 23.XI.1960, K. Lenko (1 ♀ DZUP); SÃO PAULO: Batatais, XII.1940 (1 ♀ MZUSP); Pres. Epitácio, J. Lane (1 ♂ MZUSP). **PARAGUAY:** CANINDEYÚ: Lagunita, Res. Nat. Bosque Mbaracayú, 10.XI.1996, C. F. Costa (1 ♀ CMN); Salto del Guaira, Melgarejo, 10.X.1994, Drechsel (1 ♂ CEMT); GUAIRA: Villarrica, XI.1928, F. Schade (2 ♀ CEMT); same, 23.XII.1946, (1 ♀ MZUSP); Cerro Acati, XI.1993, Drechsel (1 ♀ CEMT).

**Sampling methods.** baited pitfall trap with injured diplopods [16 specimens].

**Habitat.** Argentina, Bolivia, Brazil (Goiás, Minas Gerais, Mato Grosso, Mato Grosso do Sul and São Paulo) and Paraguay (Fig. 93). From available data this species inhabits mainly the Cerrado domain. The elevation data ranges from 622 to 750 m *AMSL*.

**Diagnosis and remarks** (within the *valgum* complex): length 12.8 to 13.5 mm; foveiform punctures near the posteromedial portion of pronotum usually separated by less than one diameter; elytral interstriae with homogeneous and dense foveiform punctures over entire surface; elytral surface with an opaque or silky sheen; apical carina of third interstria somewhat more prominent than apical carinae of second and fourth interstriae (Fig. 87). The following aedeagus characters are also diagnostic: parameres symmetric and elongate; in lateral view forming an angle of approximately 45° with phallobase; apex rounded (Fig. 18). Genital segment as in Fig. 31. Lamella copulatrix (LC): left and right lobes as in Fig. 39. Superior right peripheral sclerite (SRP) as in Fig. 48. Fronto-lateral peripheral sclerite (FLP) as in Fig. 55.

Some specimens exhibit apical carina of sixth interstria shorter than carina of fifth interstria.

### ***Deltochilum (Aganhyboma) valgum* Burmeister 1873 new subgeneric placement**

(Figs 17, 30, 38, 47, 55, 75, 88, 93, 118)

*Deltochilum valgum* Burmeister 1873: 409 (original description)

Gillet 1911: 36 (catalogue)

Bruch 1911: 186 (catalogue)

Blackwelder 1944: 185 (checklist)

Larsen *et al.* 2009: 1–4 (feeding behavior, "misidentification" probably refers to the species described here as *D. larseni*)

*Deltochilum (Deltochilum) var. valgum*: Paulian 1938: 252, 269, 271, 276, map n. 5 (description, taxonomic comments and identification key)

*Deltochilum (Deltohyboma) valgum*: Martínez 1959: 55 (catalogue)

Vulcano & Pereira 1964: 659 (catalogue)

Martínez 1987: 55 (checklist)

*Deltochilum valgum valgum*: Cano 1998: 177 (ecological comments)

*Deltochilum (Deltohyboma) valgum valgum*: Vaz-de-Mello 2000: 192 (checklist)

**Description. Body.** Head, pronotum, elytra and ventral surface black or dark brown, with an opaque or silky sheen. Length 14 to 15 mm. **Head.** Foveiform punctures dense, but not touching each other as in *D. icaroides*; around clypeus quite shallower and smaller than those on the dorsal interocular surface. Lateral margin of gena, around eyes, without row of setae or with almost inconspicuous setae. Interocular distance approximately four times eye width. **Thorax.** Surface of pronotum with deep and dense foveiform punctures, nearly touching on the sides and posterior angles. Discal punctures somewhat smaller and more dispersed than those of lateral portion. Anteromedial punctures smaller and more dispersed than discal punctures. Posteromedial punctures usually separated by at least one diameter. Margin between anterior and lateral angles with row of small setae. Margin between lateral and posterior angles straight. Hypomera with dense foveiform punctures on anterior and posterior portions; foveiform punctures almost touching. **Elytra.** Lateral margins slightly curved outward (Fig. 118), or almost parallel, and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (Fig. 75). Interstriae slightly convex; however, always less convex than that of the *icariforme* subcomplex. Interstriae with foveiform punctures over entire surface (Fig. 75). Microtubercles of interstriae dense and conspicuous (Fig. 75). Basal carina of seventh interstria elongate, length about four times the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra, but it never reaches the anterior limit of apical carina of seventh interstria. Apical carina of third interstria round, better defined as tubercle, distinctly more prominent than the apical carina of second and fourth interstriae (Fig. 88). Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleurial carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype** (MACN) [**image examined**]: 1. [white label, bordered and printed in black]. MACN-En/ 1525; 2. [red label, bordered in black, handwritten]. *Deltochilum/ valgum/ Burmeister/ 1873/ Typus*; 3. [white label, bordered in black, handwritten and printed]. *Deltochilum/ valgum valgum/ Lectotipo Burm/ A.*

Martínez Det. 1950; 4. [old white label, handwritten]. *valgum*/ Burm./ Rep. Arg.; 5. [white label, bordered in red, handwritten]. 52977; 6. [old white label, printed in black]. Col./ Antigua; 7. [green label, printed in black]. Tucuman.

The locality data in original description was given as “near Tucumán”. Fabio Arturo González supplied high resolution images of a specimen from Tucumán, deposited at the MACN, with a lectotype label placed by Antonio Martínez. However, Martínez did not publish this designation. After studying the original description of Burmeister, we believe that the author described this species from a single specimen. Therefore, the specimen with the lectotype designation by Martínez is the holotype.

**Non-type material [10]: ARGENTINA:** CORDOBA: El Sauce, Diquecito, Martínez (1 ♀ CEMT); same, XII.1964, Martínez (1 ♂ CMN); FORMOSA: San José, 20.XI.1948, E. Budim (1 ♂ CEMT); JUJUY: Km 38/Ruta 52, 17.I.2008, K.S. Ramos (1 ♂ CEMT); P. N. Calilegua (3 km NW de campground), (23°44.149'S, 064°51.044'W), 15.I.2008, D.M. Takiya (1 ♀ CEMT); P. N. Calilegua (Estaca el Cero), 28.XII.1987, S. & J. Peck (1 ♀ CMN). **BOLIVIA:** SANTA CRUZ: Caballero, ~9Km Sudoeste Comarapa, (17°57.847'S, 64°27.745'W), XII.2008, W.D.E. Edmonds & T. Vidaurre (1 ♂ WDEC); Chiquito, Santiago de Chiquito, (18°19'S, 59°34'W), 11.XI.2008, T. Vidaurre (1 ♂ 1 ♀ CEMT). **PARAGUAY:** PRESIDENTE HAYES: Pozo Colorado, Trans-Chaco [highway], IV.1995, J.C. D'Alessandro (1 ♂ CEMT).

**Sampling methods.** at light-trap [3 specimens]; baited pitfall trap with injured diplopods [2].

**Habitat.** Argentina, Bolivia and Paraguay (Fig. 93). From available data this species inhabits mainly the Chaco domain. Two specimens with label data “Chiquitano” [a transition zone between the moist Amazonian forests of the north and dryer forest of the southern Chaco regions].

**Diagnosis and remarks** (within the *valgum* complex): length 14 to 15 mm; elytral interstriae with homogeneous and dense foveiform punctures over entire surface; elytral surface with an opaque or silky sheen; apical carina of third interstria distinctly more prominent and rounded than apical carinae of second and fourth interstriae (Fig. 88). The following aedeagus characters are also diagnostic: parameres symmetric and short; in lateral view forming an angle of approximately 30° with phallobase; apex rounded (Fig. 17). Genital segment as in Fig. 30. Lamella copulatrix (LC): left lobe subrectangular (Fig. 38); right lobe “b”-shaped (Fig. 38). Superior right peripheral sclerite (SRP) as in Fig. 47. Fronto-lateral peripheral sclerite (FLP) as in Fig. 55.

The specimens present the foveiform punctures of head and pronotum more sparse than that in *D. icaroides*.

### *icariforme* subcomplex

**Diagnosis.** Body coloration copper with a metallic sheen (Figs 119–123); punctures of pronotal disc clearly more dispersed than lateral punctures; elytral interstriae clearly convex; foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (Fig. 86).

### *Deltochilum (Aganhyboma) ritamourae* new species

(Figs 22, 58, 94, 119)

**Etymology.** Named in honour of Rita de Cássia de Moura, an enthusiast in the study of dung beetles and specialist in Scarabaeinae cytogenetics.

**Description. Body.** Head, pronotum, elytra and ventral surface with copper coloration and a reddish metallic sheen. Length 13.5 to 14.5 mm. **Head.** Foveiform punctures dense, touching on dorsal interocular surface. Punctures around clypeus shallower, smaller and more dispersed than those on interocular surface. Dorsal interocular distance approximately four times eye width. Lateral margin of gena strongly curved outward, with row of medium sized setae around the eyes. **Thorax.** Surface of pronotum with dense foveiform punctures, touching on the sides and anterior angles (however not as deep as in *D. icariforme*). Density, size and proximity of anteromedial punctures similar to those on disk. Posteromedial punctures separated by at least one diameter. Margin between lateral and posterior angles straight. **Elytra.** Entirely copper and with a reddish metallic sheen (Fig. 119). Lateral margin distinctly curved outward (Fig. 119) and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae clearly convex, with its central portion nearly flat. Interstitial

surface with foveiform punctures surrounded by approximately six microtubercles. Interstrial surface usually more punctate on sides, close to striae. Foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (as in Fig. 86). Basal carina of seventh interstria elongate, length about three or four times seventh interstria width. Basal carina of ninth interstria extending 3/4 or more along elytral length. Apical carina of third interstria rounded, better defined as tubercle, more prominent than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype: BRAZIL: MINAS GERAIS: Águas Vermelhas, XII.1998, A. Bello & F. Z. Vaz-de-Mello (1 ♂ CEMT).**

**Paratypes [26]: BRAZIL: BAHIA:** [no data] (1 MNHN); Encruzilhada, XI.1972, M. Alvarenga (1 ♀ CEMT); same, XII.1980, A. Martínez & M. Alvarenga (1 ♀ CMN); same, XII.1995, P. Arnaud (12 ♂ 3 ♀ CEMT); CEARÁ: Carquejo, Dirings (1 ♂ MZUSP); MINAS GERAIS: Águas Vermelhas, XII.1997, F.Z. Vaz-de-Mello (1 ♂ CEMT); same, Faz. Faceiro, 15°23'56"S, 41°23'57"W, 12.XII.2012, JARafael & EJGrossi, Ar. luz. 850 m (2 INPA); Montes Claros, I.2002, G.L.D. Leite (1 ♂ CEMT); Fronteira Minas/Bahia, 14.II.1977, Celso Jr. (1 ♂ CEMT); PIAUÍ: São Raimundo Nonato, Parque Nacional Serra da Capivara, 4.XII.1998, C.A.R. Matrangolo (1 ♀ CEMT); SERGIPE: Poço Redondo, MONA Grota do Angico, (9°41'S, 38°31'W), 28–30.IV.2013, Maual, Santos-Júnior (1 CEMT).

**Sampling methods.** at light [8 specimens].

**Habitat.** Brazil (Bahia, Ceará, Minas Gerais and Piauí) (Fig. 94). From the available data this species occurs mainly in semi-arid domain of Brazil.

**Diagnosis and remarks** (within the *icariforme* subcomplex): length 13.5 to 14.5 mm; body completely copper and with a reddish metallic sheen (Fig. 119); length of apical carina of seventh interstria less than or equal the sum of lengths of apical carinae of fifth and sixth interstriae; elytral lateral margin distinctly curved outward. The following aedeagus characters are also diagnostic: parameres symmetric and elongate, in lateral view forming an angle of approximately 45° with phallobase; apex acuminate (Fig. 22). Fronto-lateral peripheral sclerite (FLP) as in Fig. 58.

In some specimens, apical carina of third interstria weaker than apical carina of second and fourth interstriae.

### ***Deltochilum (Aganhyboma) icariforme* Paulian 1938 new subgeneric placement**

(Figs 21, 32, 40, 57, 94, 120)

*Deltochilum (Deltochilum) icariforme* Paulian 1938: 269, 273, 276, Fig. 18, map n.5 (original description, taxonomic comments and identification key)

*Deltochilum icariforme*: Blackwelder 1944: 203 (checklist)

*Deltochilum (Deltochilum) icariniforme*: Martínez 1947: 274 (comments about geographical distribution)

*Deltochilum (Deltohyboma) icariforme*: Martínez 1959: 53 (catalogue)

Vulcano & Pereira 1964: 655 (catalogue); Vaz-de-Mello 2000: 192 (checklist)

**Description. Body.** Head, pronotum, elytra and ventral surface with copper coloration and a reddish metallic sheen. Length 14.5 to 15.8 mm. **Head.** Foveiform punctures dense and deep, touching on dorsal interocular surface. Dorsal interocular distance approximately three times eye width. Lateral margin of gena strongly curved outward, with row of setae around eyes. **Thorax.** Surface of pronotum with deep and dense foveiform punctures, nearly touching on the sides and anterior angles. Anteromedial punctures more dispersed than those of surrounding surface. Margin between lateral and posterior angles straight. Posteromedial punctures separated by less than one diameter. **Elytra.** Lateral margins slightly curved outward, almost parallel (Fig. 120). Surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae clearly convex, with its central portion nearly flat. Interstrial surface with foveiform punctures surrounded by microtubercles weakly defined. Interstriae surface usually more punctate on sides, close to striae. Foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (as in Fig. 86). Basal carina of seventh interstria elongate, length about four or more times seventh interstria width.

Basal carina of ninth interstria present in three-quarters of elytra (not surpassing anterior limit of apical carina of seventh interstria). Apical carina of third interstria weaker than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria longer than the sum of lengths of apical carina of fifth and sixth interstriae. Pseudepipleurale carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Lectotype (MNHN) [here designated]:** 1. [old white label, bordered and printed in black]. Jatahy/ Etat de Goyaz/ Ch. Pujol 1895–96; 2. [old white label, handwritten]. *icariforme* n. sp. Type; 3. [old white label, bordered and printed in black]. R. PAULIAN/ Vidit; 4. [red label, bordered and printed in black]. LECTOTYPE; 5. [white label, handwritten, bordered and printed in black]. *Deltochilum icariforme* Paul. LECTOTYPUS FVaz-de-Mello des. 2013.

In the original description, Paulian (1938) stated that the “type” was deposited in the Oberthür collection. After examining the list of the specimens used by the author to describe the species, we found that only one individual from Jataí (Goiás) and one from Lacerda (Bahia) were deposited in this collection.

We examined three of the five specimens listed in the original description. These were labeled by Paulian with the designation of “type” and deposited in the Muséum National d’Histoire Naturelle (MNHN), Paris, France. Two of them correspond to the specimens from Jataí and Lacerda mentioned above, and the third is from Paraguay. After careful analysis, we concluded that these individuals represent three different species.

Thus, with the purpose of stabilizing nomenclature by choosing the name-bearing specimen, we designate the specimen from Jataí (Goiás) as the lectotype of *D. icariforme*. The specimen from Bahia represents a new species described here as *D. ritamourae* **new species**, and the specimen from Paraguay is *D. icaroides*.

**Non-type material [5]: BRAZIL:** MATO GROSSO: Rio Verde, XI.1963 (1 ♂ DZUP); SÃO PAULO: Itirapina, 27.II.2000, G. Machado (1 ♀ CEMT); Itirapina, Estação Ecológica, (22°13’S, 47°54’W), 30.I.2009, Fernando Silva (2 ♂ CEMT); Pirassununga, E.E.C.P., 29.X.1945, Schubart (1 ♂ MZUSP).

**Sampling methods.** baited pitfall trap with injured diplopods [2 specimens].

**Habitat.** Brazil (Goiás, Mato Grosso and São Paulo) (Fig. 94). From available data this species inhabits Cerrado. Two specimens with label data “Campo Sujo”, Cerrado.

**Diagnosis and remarks** (within the *icariforme* subcomplex): length 14.5 to 15.8 mm; length of apical carina of seventh interstria longer than the sum of lengths of apical carina of fifth and sixth interstriae; basal carina of ninth interstria present in three-quarters of elytra (not surpassing anterior limit of apical carina of seventh interstria). The following aedeagus characters are also diagnostic: parameres symmetric and elongate, in lateral view forming an angle of approximately 45° with phallobase; apex acuminate (Fig. 21). Genital segment as in Fig. 32. Lamella copulatrix (LC): left lobe trapezoid (Fig. 40); right lobe subrectangular (Fig. 40). Fronto-lateral peripheral sclerite (FLP) as in Fig. 57.

The body coloration of some specimens can vary between dark brown, copper or red, with reddish or greenish sheen. In some specimens, apical carina of third interstria can be somewhat more prominent than apical carina of second and fourth interstriae, with a rounded form, resembling a tubercle.

### ***Deltochilum (Aganhyboma) paresi* new species**

(Figs 3, 20, 94, 121)

**Etymology.** Named in honour of the indigenous people of the “Chapada dos Parecis”, known as the “Paresi”, from region where the specimens were collected.

**Description. Body.** Head, pronotum, elytra and ventral surface dark brown with green or copper metallic sheen. Length 16 to 16.5 mm. **Head.** Foveiform punctures dense and deep, touching on dorsal interocular surface. Dorsal interocular distance approximately three times eye width (as in Fig. 61). Lateral margin of gena strongly curved outward, with row of setae around eyes. **Thorax.** Surface of pronotum with deep and dense foveiform punctures, touching on the sides and anterior angles. Anteromedial punctures more dispersed than those of surrounding surface. Posteromedial punctures usually separated by less than one diameter. Margin between lateral and posterior angles straight. **Elytra.** Lateral margin distinctly curved outward (Fig. 121) and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae clearly convex, with its central portion nearly flat. Interstitial surface with foveiform punctures surrounded by microtubercles



weakly defined. Interstriae usually more punctate on sides, close to striae. Foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (as in Fig. 86). Basal carina of seventh interstria elongate, length about four or more times seventh interstria width. Basal carina of ninth interstria surpassing anterior limit of apical carina of seventh interstria. Apical carina of third interstria more prominent than apical carinae of second and fourth interstriae. Apical carina of sixth interstria longer than apical carina of fifth interstria. Length of apical carina of seventh interstria longer than the sum of lengths of apical carina of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied.** **Holotype:** BRAZIL: MATO GROSSO: Nova Marilândia, (14°20'56.27"S, 57°42'40.02"W), II.2008, R.J. Silva (1 ♂ CEMT).

**Paratypes [4]:** BRAZIL: MATO GROSSO: Nova Marilândia, (14°20'56.27"S 57°42'40.02"W), II.2008, R.J. Silva (1 ♀ CEMT); same, (14°19'41.37"S, 57°45'1.52"W), II.2008, R.J. Silva (1 ♂ CEMT); same, (14°20'11.36"S, 57°44'44.17"W), R.J. Silva (1 ♂ 1 ♀ CEMT).

**Sampling methods.** un-baited pitfall traps [5 specimens].

**Habitat.** Brazil (Mato Grosso) (Fig. 94). Two specimens with label data "Campo Sujo" (Cerrado) and three specimens with "Cerrado s. str." The elevation data ranges from 522 to 613 m *AMSL*.

**Diagnosis and remarks** (within the *icariforme* subcomplex): length 16 to 16.5 mm; length of apical carina of seventh interstria longer than the sum of lengths of apical carina of fifth and sixth interstriae; basal carina of ninth interstria surpassing anterior limit of apical carina of seventh interstria. The following aedeagus characters are also diagnostic: parameres symmetric and elongate, directed downward, almost at an angle of 90° with phallobase; apex acuminate (Fig. 20). Lamella copulatrix (LC): left lobe subtrapezoidal (as in Fig. 40); right lobe subrectangular (as in Fig. 40). Superior right peripheral sclerite (SRP) as in Fig. 3.

The lateral elytral margin is the most curved between species of the *icariforme* subcomplex. In some specimens, apical carina of third interstria can be somewhat more prominent than apical carina of second and fourth interstriae, with a rounded form, resembling a tubercle. Apical carina of seventh interstria presents the largest length among the species of the *valgum* group.

### ***Deltochilum (Aganhyboma) kollerii* new species**

(Figs 19, 49, 56, 94, 122)

**Etymology.** Named in honour of Wilson Werner Koller, the collector of one of the specimens examined.

**Description. Body.** Head, pronotum, elytra and ventral surface dark brown or black, with a greenish metallic sheen. Length > 13 mm. **Head.** Foveiform punctures dense, touching on dorsal interocular surface. Punctures around clypeus shallower, smaller and more dispersed than those on the interocular surface. Dorsal interocular distance approximately four times eye width. Lateral margin of gena strongly curved outward, with row of setae around the eyes. **Thorax.** Surface of pronotum with dense and deep foveiform punctures, touching on the sides and anterior angles. Discal punctures smaller and more dispersed than those of surrounding surface. Posteromedial punctures usually separated by less than one diameter. Margin between lateral and posterior angles straight. **Elytra.** Lateral margins almost parallel (Fig. 122) and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae clearly convex, with its central portion nearly flat. Interstitial surface with foveiform punctures surrounded by microtubercles weakly defined, conspicuous on lateral of elytra. Interstriae usually more punctate on the sides, close to striae. Foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (as in Fig. 86). Foveiform puncture surrounded by approximately six microtubercles. Basal carina of seventh interstria elongate, length about four or more times seventh interstria width. Basal carina of ninth interstria present in three-quarters of elytra (not reaching anterior limit of apical carina of seventh interstria). Apical carina of third interstria rounded, better defined as tubercle, more prominent than apical carina of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carina of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype: BRAZIL:** MATO GROSSO DO SUL: Coxim, 26.II.1986, Koller (1 ♂ CEMT).

**Paratypes [5]: BRAZIL:** MINAS GERAIS: São Roque de Minas, Parque Nacional Serra da Canastra, (20°15'17"S, 46°25'11"W), 9.XI.2007, M. F. Souza (1 ♂ 2 ♀ CEMT); SÃO PAULO: Piracicaba, E.E.C.J.V., 30.IV.1966 (1 ♂ CEMT); [no data] (1 ♂ CEMT).

**Sampling methods.** at light-trap [1 specimen].

**Habitat.** Brazil (Minas Gerais and Mato Grosso) (Fig. 94). From available data this species inhabits Cerrado.

**Diagnosis and remarks** (within the *icariforme* subcomplex): length > 13 mm; posteromedial punctures of pronotum usually separated by less than one diameter; length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae; lateral margins of elytra almost parallel. The following aedeagus characters are also diagnostic: parameres symmetric and elongate, directed downward, almost at an angle of 60° with phallobase; apex weakly acuminate (Fig. 19). Lamella copulatrix (LC): left lobe subrectangular (as in Fig. 41); right lobe "b"-shaped (as in Fig. 41). Superior right peripheral sclerite as in Fig. 49. Fronto-lateral peripheral sclerite (FLP) as in Fig. 56.

The punctures at center of elytral interstriae, on anterior portion of elytra, are the most dense of *icariforme* subcomplex. Apical carina of sixth interstria can present the same length of apical carina of fifth interstria.

### ***Deltochilum (Aganhyboma) subrubrum* new species**

(Figs 23, 41, 86, 94, 123)

**Etymology.** *Subrubrum* (reddish), Latin adjective, refers to the color of individuals.

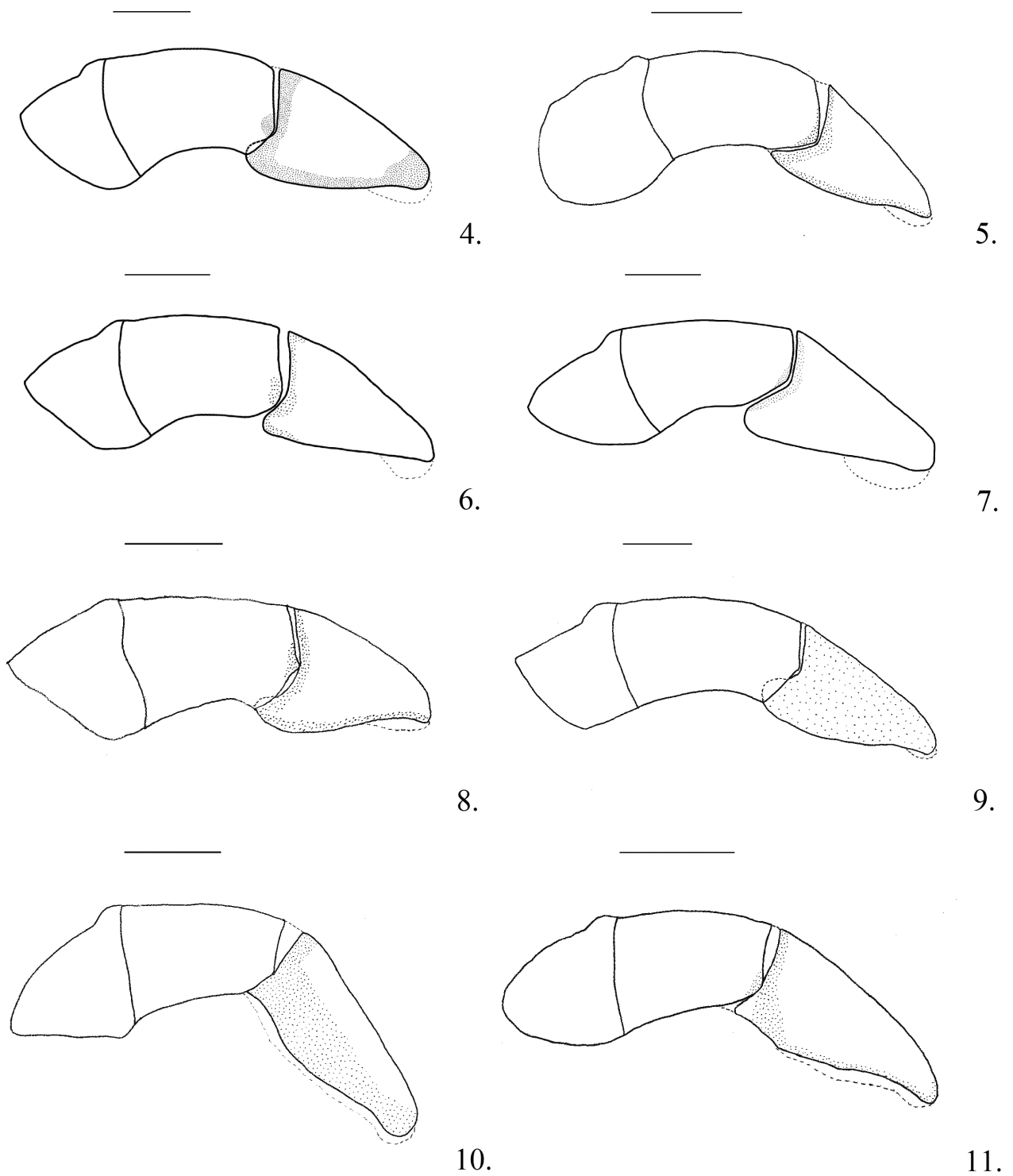
**Description. Body.** Head, pronotum, elytra and ventral surface dark brown or black, with greenish or reddish metallic sheen. Length 14.8 to 15.8 mm. **Head.** Foveiform punctures dense, touching on dorsal interocular surface. Punctures around clypeus shallower, smaller, and more dispersed than those on the interocular surface. Dorsal interocular distance approximately four times eye width. Lateral margin of gena strongly curved outward, with row of setae around eyes. **Thorax.** Surface of pronotum with dense foveiform punctures, touching on the sides and anterior angles (however not as deep as in *D. icariforme*). Posteromedial punctures separated by at least one diameter. Margin between lateral and posterior angles straight. **Elytra.** Lateral margins almost parallel (Fig. 123) and surface slightly irregular (rugose). Elytral striae wider, carinate margins clearly separated (as in Fig. 75). Interstriae clearly convex, with its central portion nearly flat. Interstriae usually more punctate on the sides, close to striae. Foveiform punctures of third interstria denser laterally (punctures can be so scattered at center of interstria to produce smooth midlongitudinal strip) (Fig. 86). Microtubercles of interstriae almost inconspicuous. Basal carina of seventh interstria elongate, length about four or more times the width of the seventh interstria. Basal carina of ninth interstria present in three-quarters of elytra (not reaching anterior limit of apical carina of seventh interstria). Apical carina of third interstria rounded, better defined as tubercle, more prominent than apical carinae of second and fourth interstriae. Length of apical carina of sixth interstria longer than that of apical carina of fifth interstria. Length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae. Pseudepipleural carina complete, visible entire length of epipleuron (as in Fig. 63).

**Material studied. Holotype: ARGENTINA:** MISIONES: Loreto, 1955, F. H. Walz (1 ♂ DZUP).

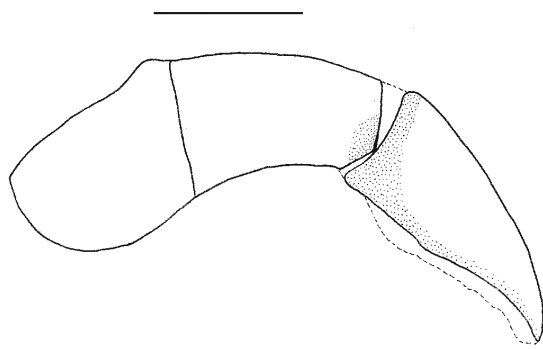
**Paratypes [3]: ARGENTINA:** MISIONES: Loreto (1 ♀ CEMT); same, San Ignacio (1 ♂ 1 ♀ MNHN).

**Diagnosis and remarks** (within the *icariforme* subcomplex): length 14.8 to 15.8 mm; posteromedial punctures of pronotum separated by at least one diameter; length of apical carina of seventh interstria less than or equal to the sum of lengths of apical carinae of fifth and sixth interstriae; microtubercles of elytral interstriae absent or almost inconspicuous. The following aedeagus characters are also diagnostic: parameres symmetric and elongate, directed downward, almost at an angle of 60° with phallobase; apex weakly acuminate (Fig. 23). Lamella copulatrix (LC): left lobe subrectangular (Fig. 41); right lobe "b"-shaped (Fig. 41). Fronto-lateral peripheral sclerite (FLP) as in Fig. 56.

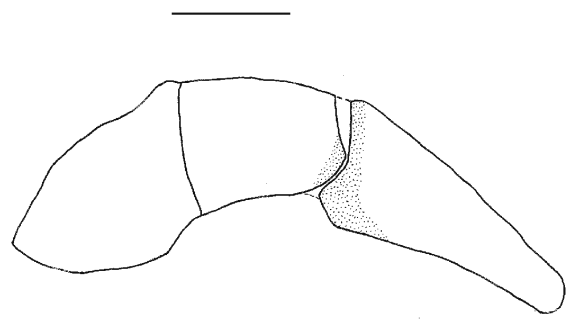
We noted a single female with lateral margins of elytra distinctly curved outward.



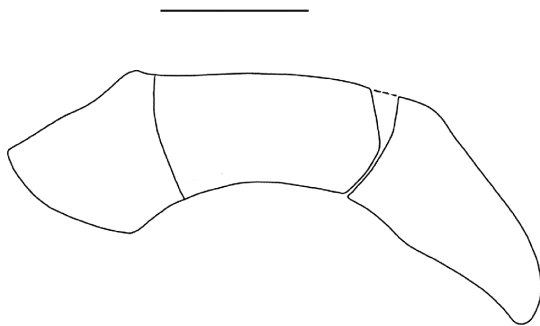
**FIGURES 4–11.** Aedeagus in *Deltochilum* (*Aganhyboma*). 4. *D. titovidaurrei* **new species**. 5. *D. cupreicolle*. 6. *D. viridescens* **new status**. 7. *D. viridicatum* **new species**. 8. *D. amandaarcanjoae* **new species**. 9. *D. trisignatum*. 10. *D. cangalha* **new species**. and *D. alpercata* **new species**. 11. *D. finestriatum* **new species**. Figures scale = 1 mm.



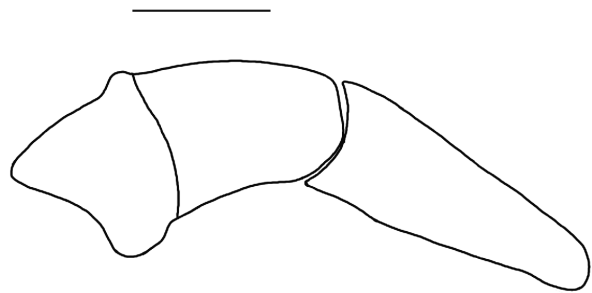
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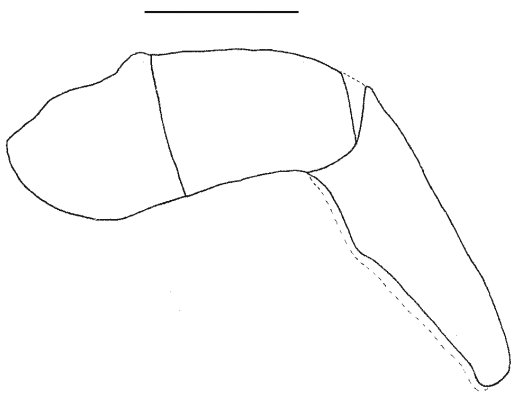
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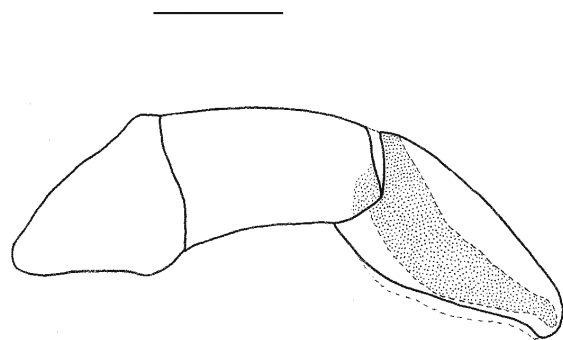
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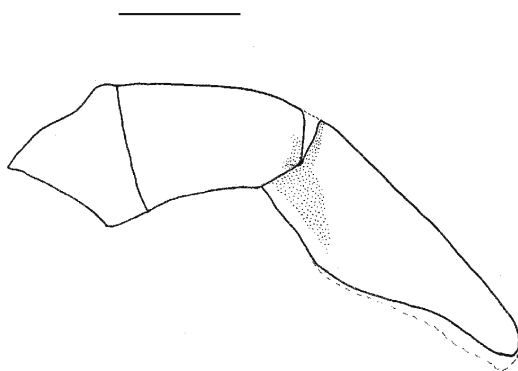
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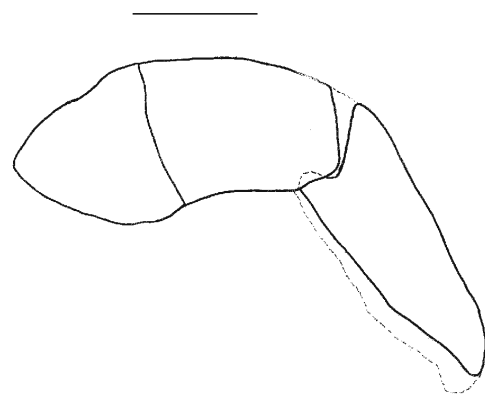
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17.

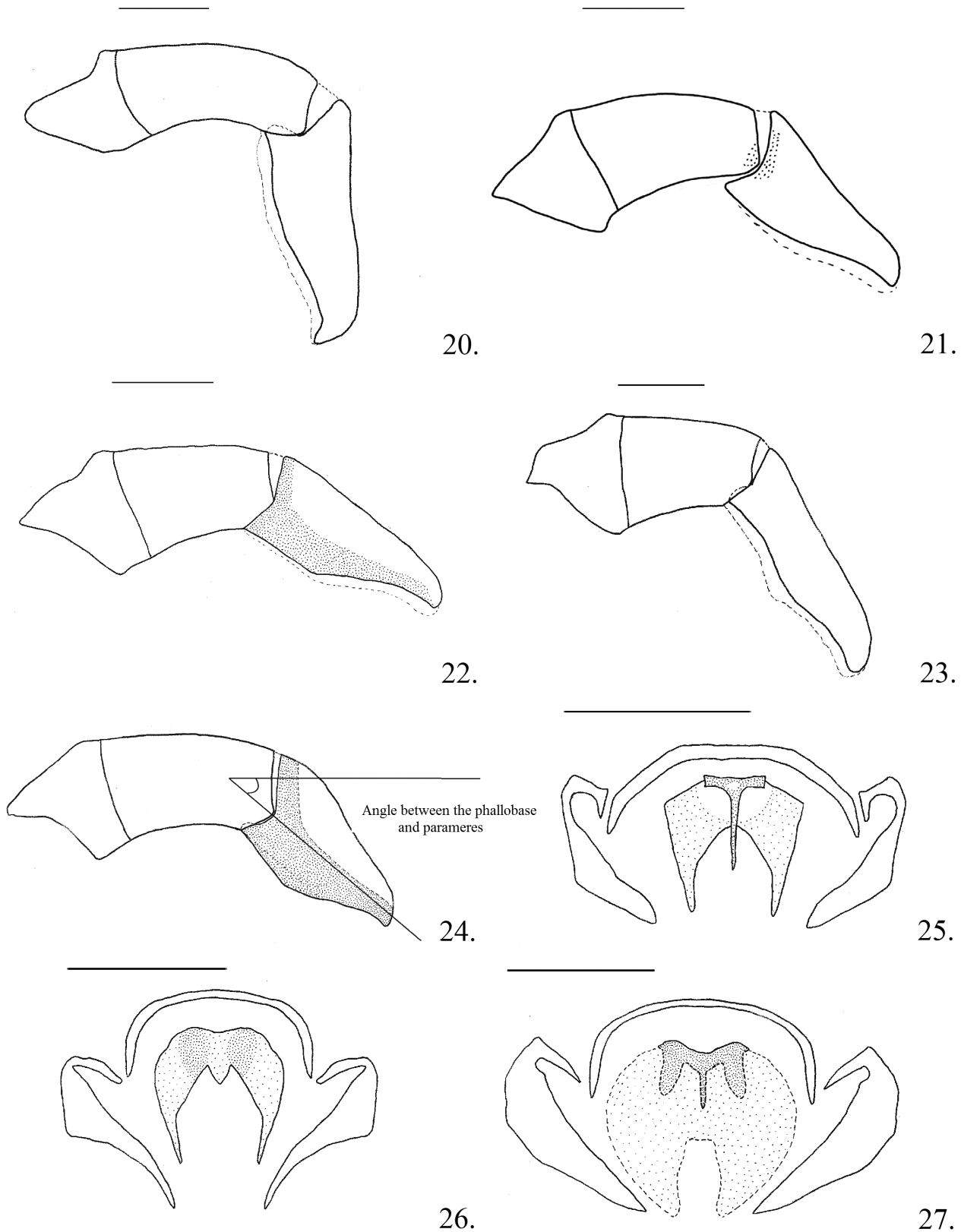


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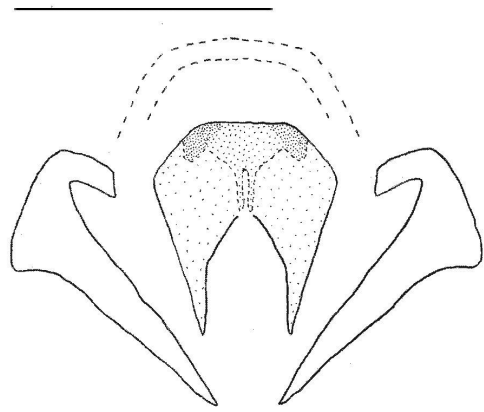


19.

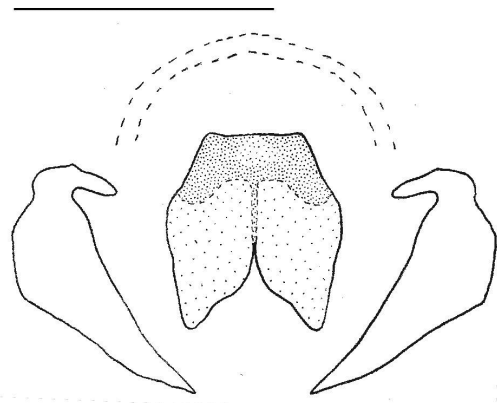
**FIGURES 12–19.** Aedeagus in *Deltochilum* (*Aganhyboma*). 12. *D. schefflerorum* **new species**. 13. *D. acropyge* **new status**. 14. *D. larseni* **new species**. 15. *D. acanthus*. 16. *D. longiceps* **new status**. 17. *D. valgum*. 18. *D. icaroides*. 19. *D. kolleri* **new species**. Figures scale = 1 mm.



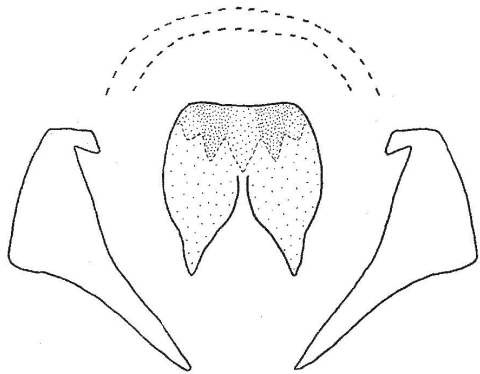
**FIGURES 20–23.** Aedeagus in *Deltochilum* (*Aganhyboma*). **20.** *D. parsi* **new species**. **21.** *D. icariforme*. **22.** *D. ritamourae* **new species**. **23.** *D. subrubrum* **new species**. **Figure 24.** Aedeagus illustration showing the angle between the phallobase and the parameres. **Figures 25–27.** Genital segment in *Deltochilum* (*Aganhyboma*). **25.** *D. cupreicolle*. **26.** *D. viridescens* **new status**. **27.** *D. trisignatum*. Figures scale = 1 mm.



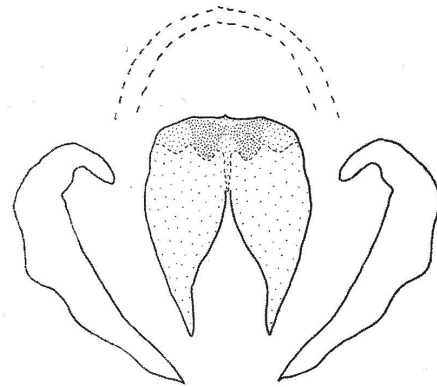
28.



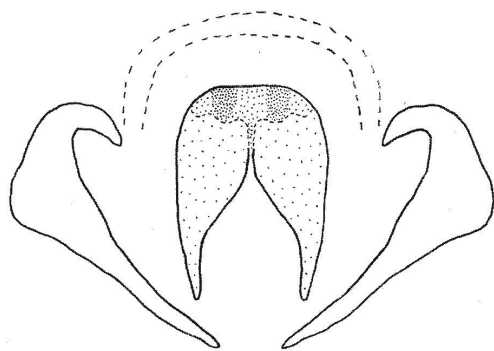
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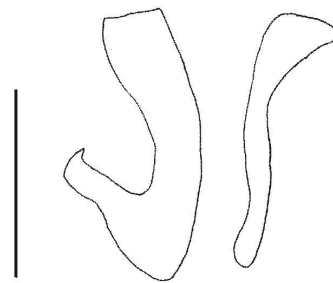
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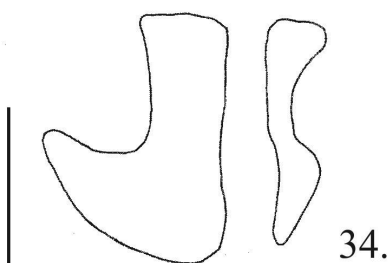
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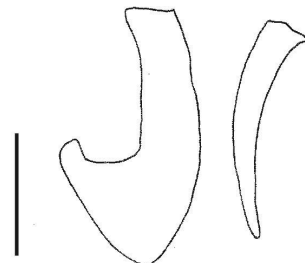
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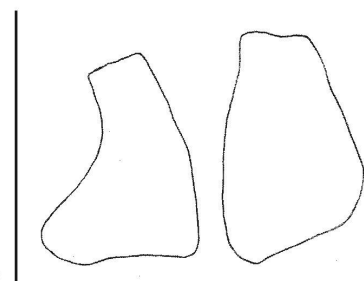
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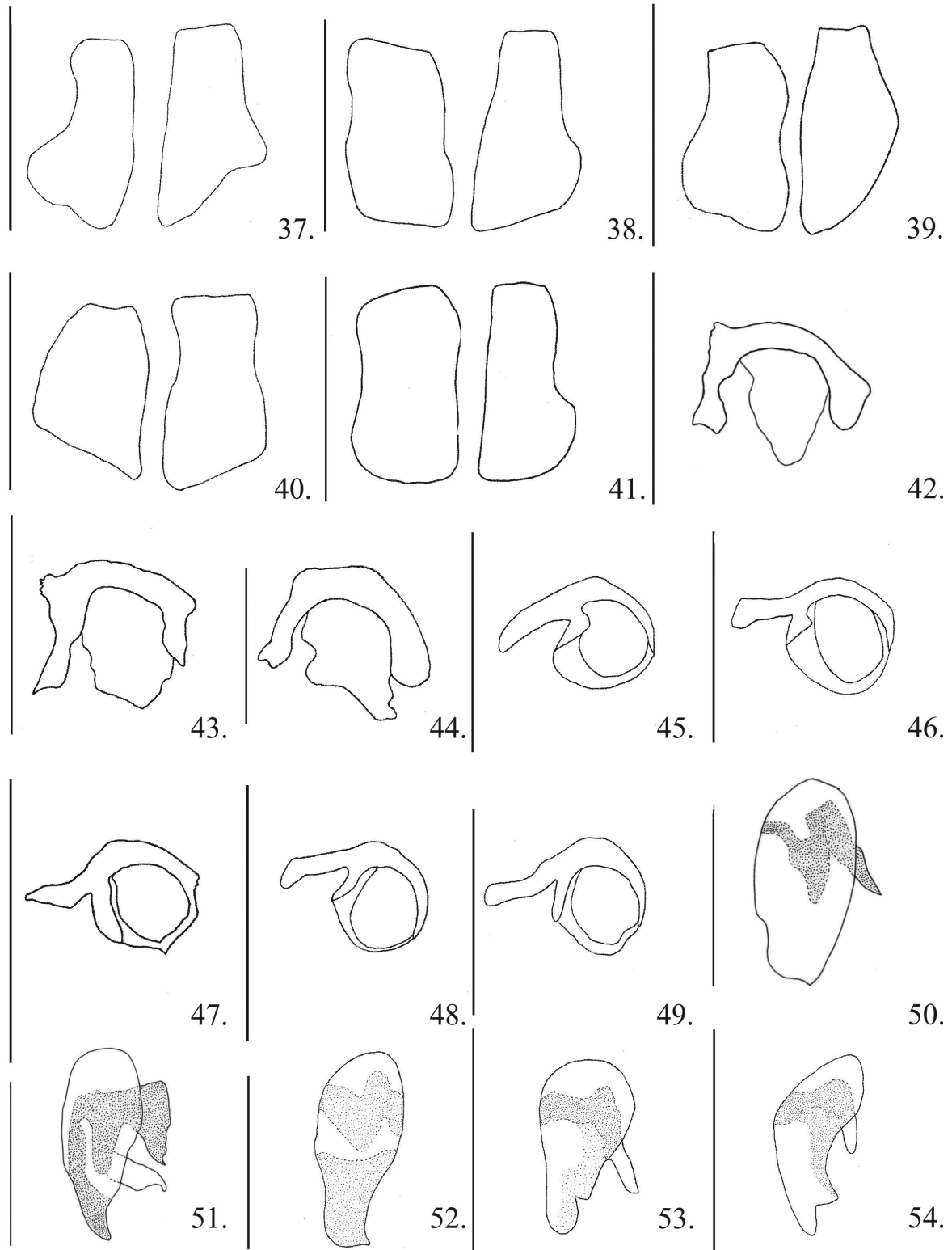


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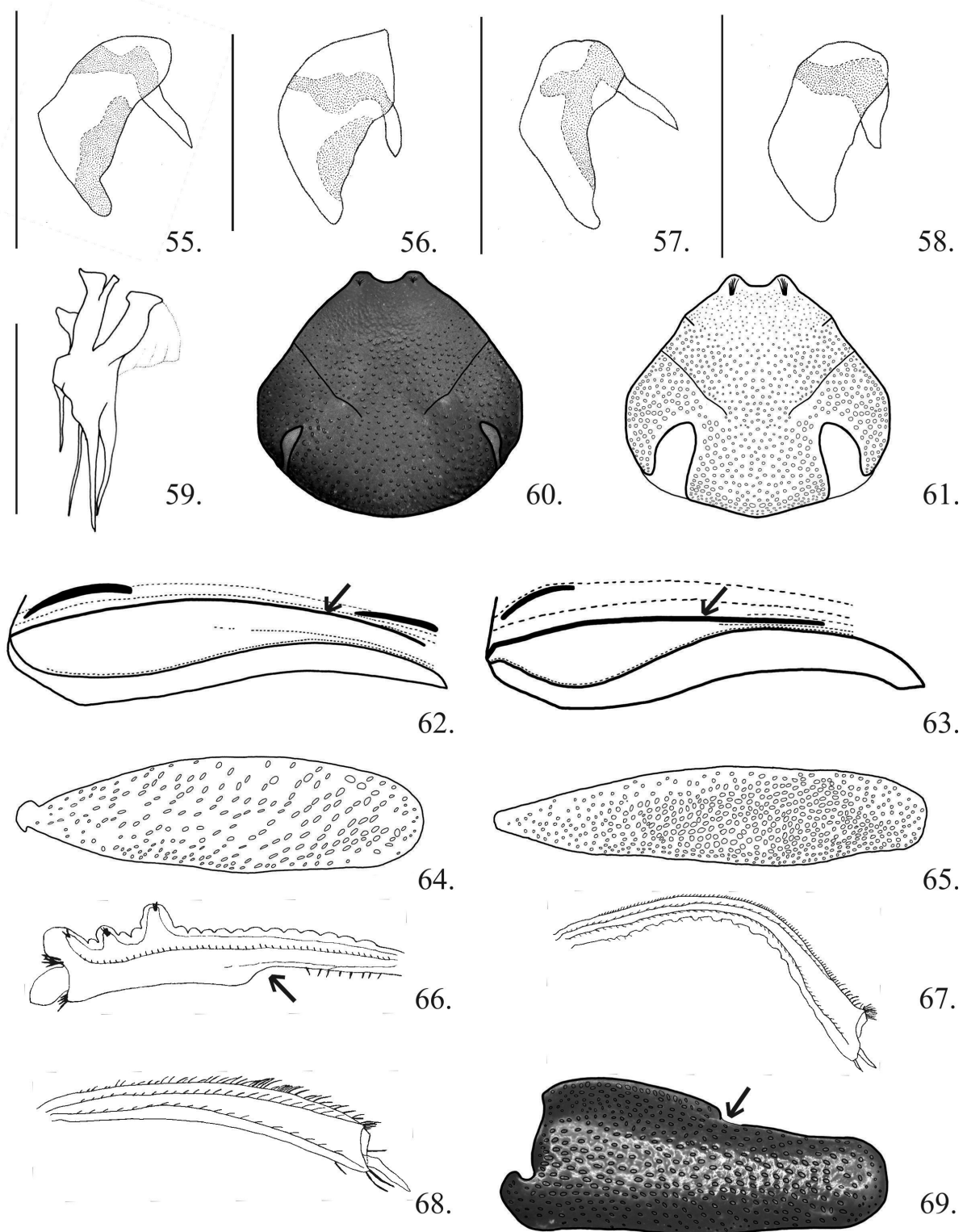


36.

**FIGURES 28–32.** Genital segment in *Deltochilum* (*Aganhyboma*). **28.** *D. finestriatum* **new species**. **29.** *D. schefflerorum* **new species** **30.** *D. valgum*. **31.** *D. icaroides*. **32.** *D. icariforme*. **Figures 33–36.** Lamella copulatrix sclerites in *D.* (*Aganhyboma*). **33.** *D. cupreicolle*. **34.** *D. viridescens* **new status** and *D. viridicatum* **new species** **35.** *D. trisignatum*. **36.** *D. finestriatum* **new species**. Figures scale = 1 mm.

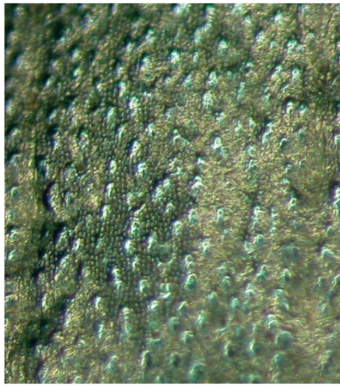


**FIGURES 37–41.** Lamella copulatrix sclerites in *D.* (*Aganhyboma*). 37. *D. longiceps* new status. 38. *D. valgum*. 39. *D. icaroides*. 40. *D. icariforme*. 41. *D. subrubrum* new species. **Figures 42–49.** Superior right peripheral sclerite (SRP) in *D.* (*Aganhyboma*). 42. *D. titovidaurrei* new species. 43. *D. viridescens* new status. 44. *D. trisignatum*. 45. *D. finestriatum* new species. 46. *D. acropyge* new status. 47. *D. valgum*. 48. *D. icaroides*. 49. *D. kolleri* new species. **Figures 50–54.** Fronto-lateral peripheral sclerite (FLP) in *D.* (*Aganhyboma*). 50. *D. cupreicolle*. 51. *D. viridescens* new status. 52. *D. trisignatum*. 53. *D. finestriatum* new species. 54. *D. schefflerorum* new species. Figures scale = 1 mm.

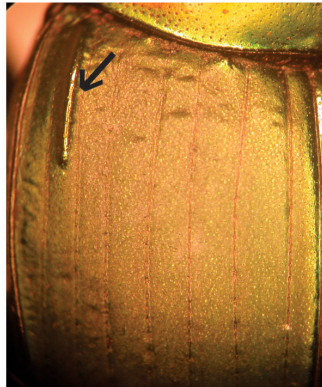


**FIGURES 55–58.** Fronto-lateral peripheral sclerite (FLP) in *D.* (*Aganhyboma*). 55. *D. valgum*. 56. *D. kolleri* new species. 57. *D. icariforme*. 58. *D. ritamourae* new species. **Figure 59.** Complex of axial and subaxial sclerites (A+AS) in *D. viridescens* new status. **Figures 60–61.** Head in *D.* (*Aganhyboma*). 60. *D. viridescens* new status. 61. *D. longiceps* new status. **Figures 62–63.** Lateral view of the elytra in *D.* (*Aganhyboma*). 62. *D. viridescens* new status (arrow points the basal carina of ninth interstria). 63. *D. finestriatum* new species. (arrow points the basal carina of ninth interstria). **Figures 64–69.** Legs. 64. Metafemur in *D. viridescens* new status. 65. Metafemur in *D. longiceps* new status. 66. Protibia in *D. trisignatum*. 67. Metatibia in *D. trisignatum*. 68. Metatibia in *D. viridescens* new status. 69. Profemur in *D. trisignatum* (arrow indicates the anterior margin discontinuous). Figures scale = 1 mm.





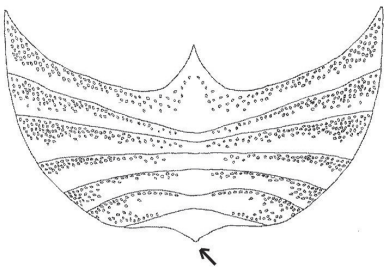
70.



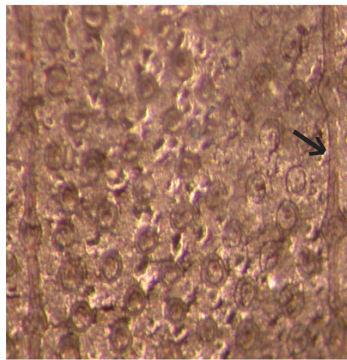
71.



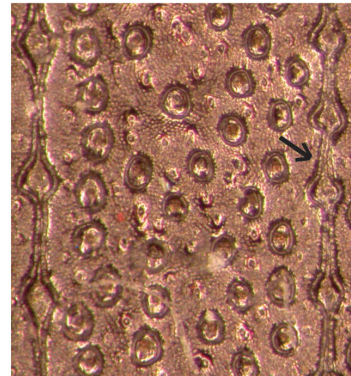
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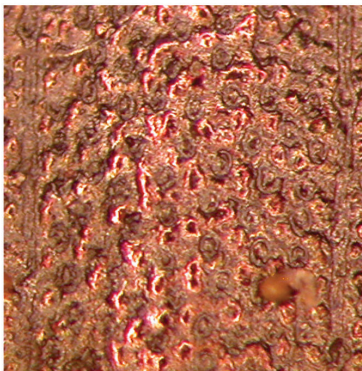
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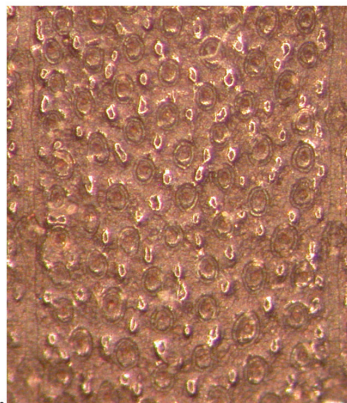
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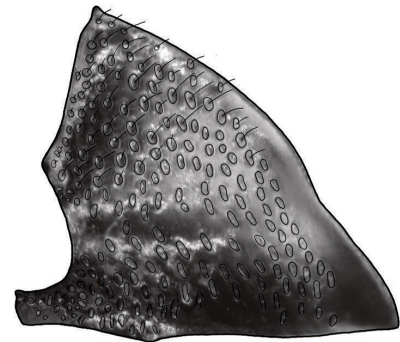
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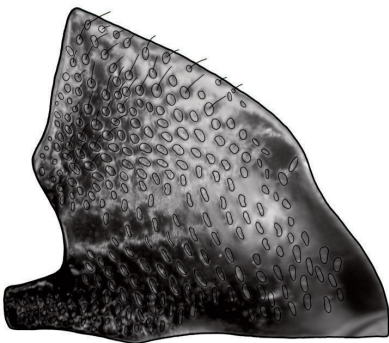
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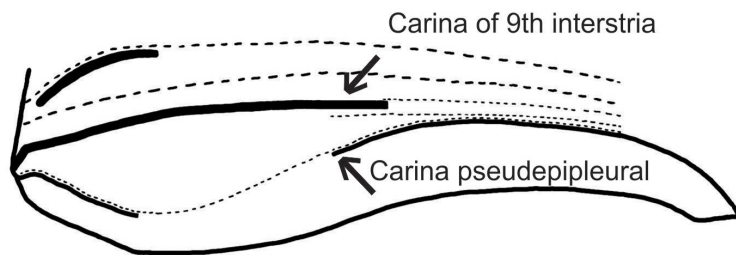
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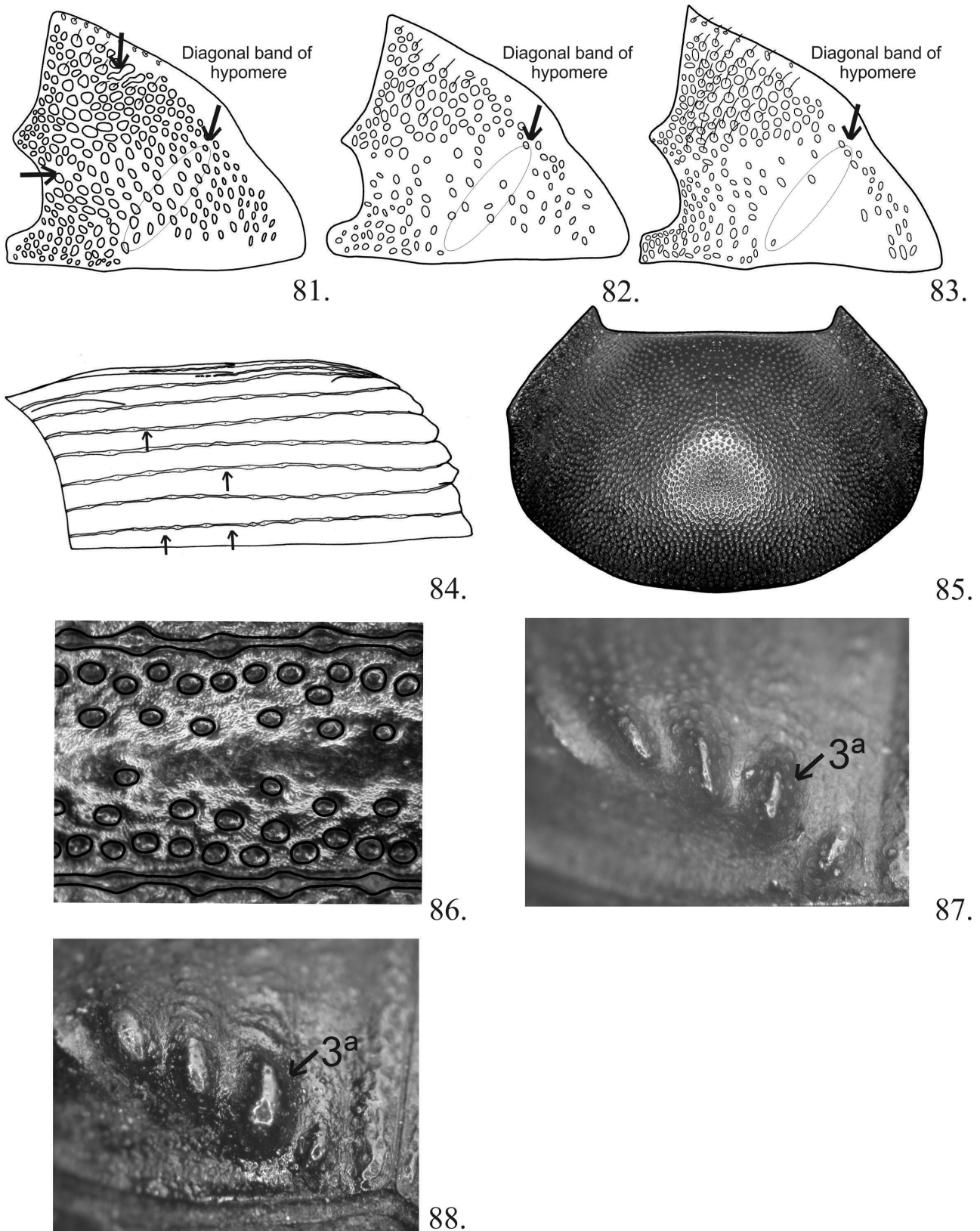


79.



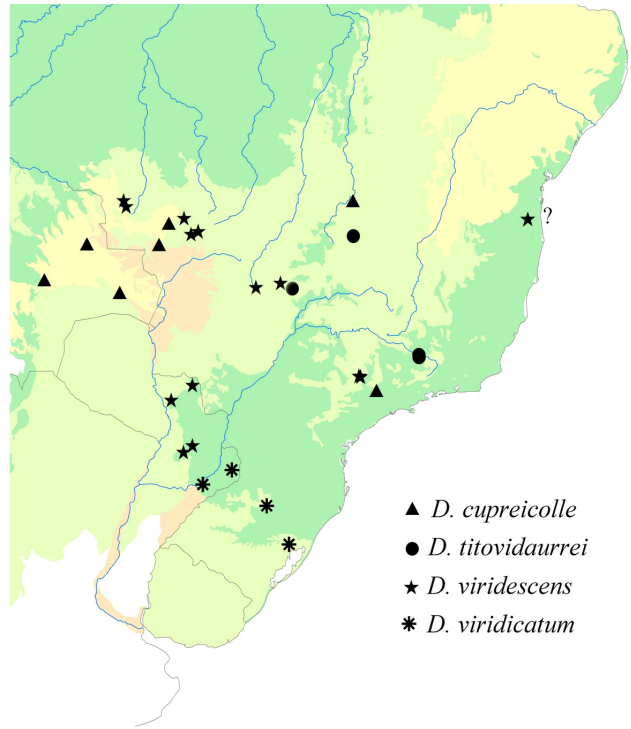
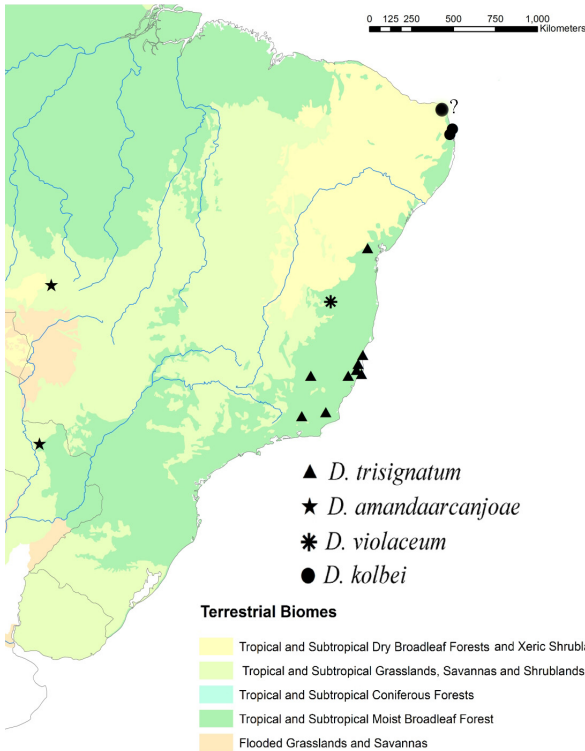
80.

**FIGURE 70.** Detail of the interstitial surface in *D. violaceum*. **Figures 71–72.** Detail of the basal carina of seventh interstria in *D. (Aganhyboma)*. 71. *D. viridescens* **new status**. 72. *D. cupreicolle*. **Figure 73.** Abdominal ventrites in *D. viridescens* **new status** (male; arrow points to apex of pygidium). **Figures 74–77.** Detail of the third elytral interstria in *D. (Aganhyboma)*. 74. *D. finestriatum* **new species**. (arrow points to third elytral interstria). 75. *D. valgum* (arrow points to third elytral interstria). 76. *D. cangalha* **new species**. 77. *D. alpercata* **new species**. **Figures 78–79.** hypomera in *D. (Aganhyboma)*. 78. *D. cangalha* **new species**. 79. *D. alpercata* **new species**. **Figure 80.** Lateral view of the elytra in *D. longiceps* **new status**.



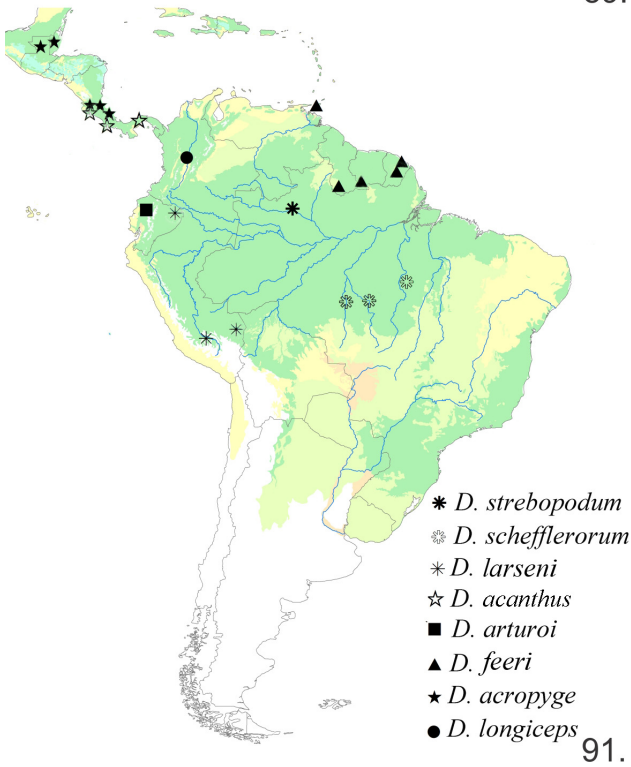
**FIGURES 81–83.** Illustrations of hypomera in *D. (Aganhyboma)*. **81.** *D. schefflerorum* **new species**. **82.** *D. arturoi* **new species**. **83.** *D. longiceps* **new status**. **Figure 84.** Right elytron of *D. longiceps* **new status** (arrows indicate the irregular spacing among the points of the elytral striae). **Figure 85.** Pronotum in *D. icaroides*. **Figure 86.** Apex of third interstria in *D. subrubrum* **new species**. **Figures 87–88.** Detail of the apical tubercle of third interstria in *D. (Aganhyboma)*. **87.** *D. icaroides*. **88.** *D. valgum*.



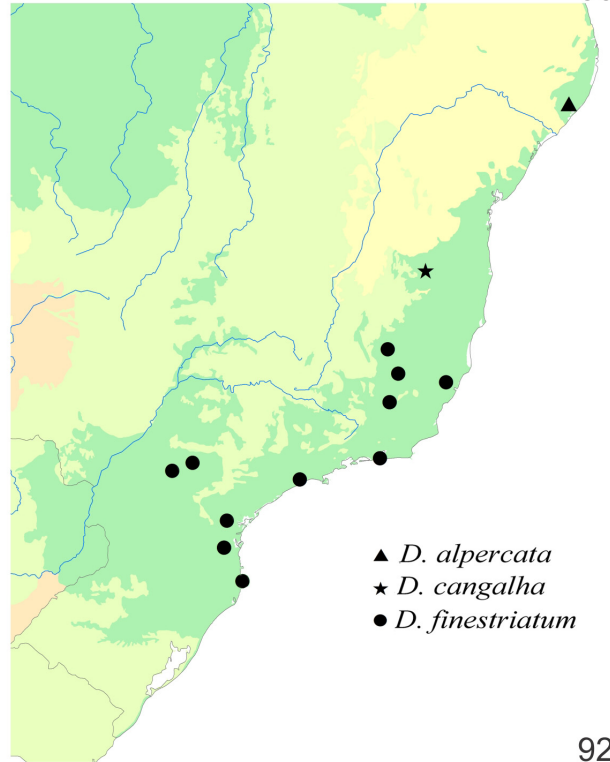


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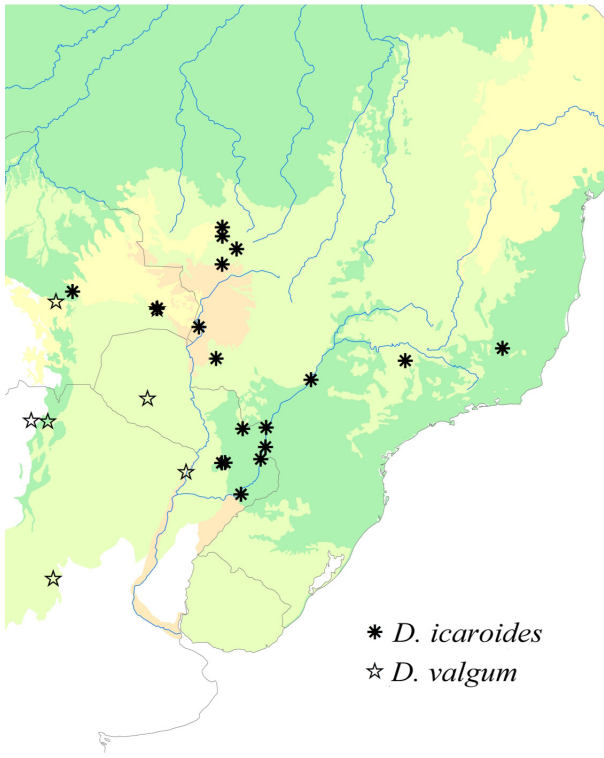


91.

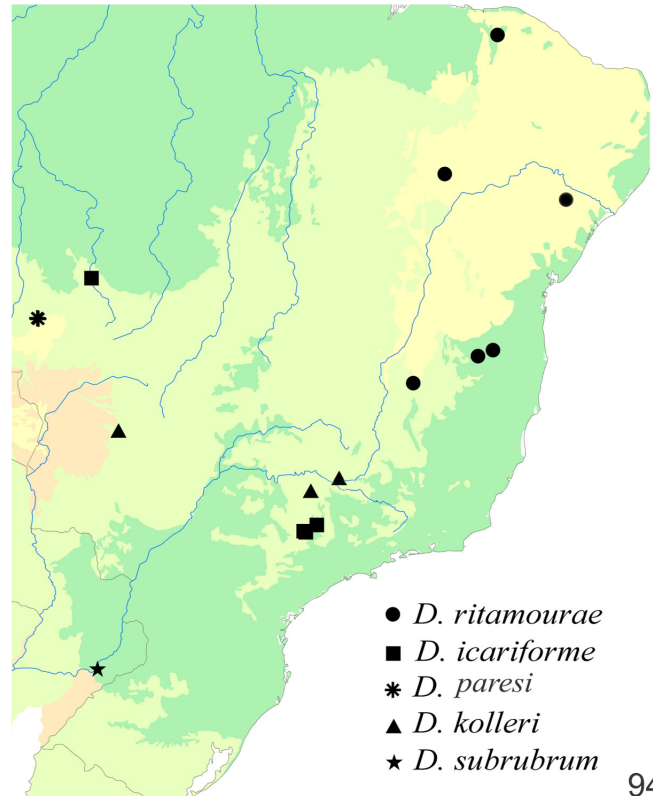


92.

**FIGURES 89–92.** Known distribution of *D.* (*Aganhyboma*). 89. *trisignatum* complex. 90. *cupreicolle* complex. 91. *acropyge* complex. 92. *finestriatum* complex.



93.

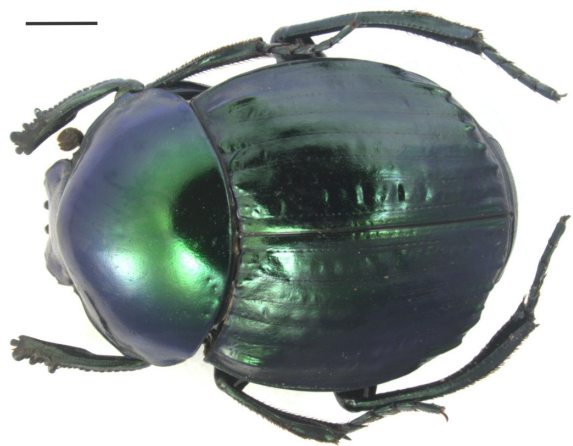


94.

FIGURES 93–94. Known distribution of *D. (Aganhyboma)*. 93. *D. icaroides* and *D. valgum*. 94. *icariforme* subcomplex.



95.



96.



97.



98.



99.



100.



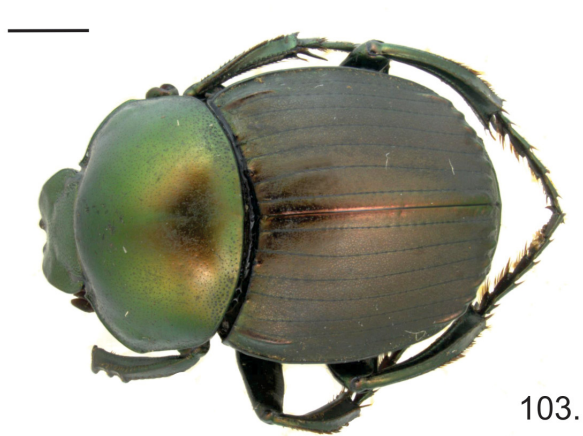
101.



102.

**FIGURES 95–102.** Species of *D. (Aganhyboma)*. 95. *D. trisignatum*. 96. *D. kolbei*. 97. *D. violaceum*. 98. *D. amandaarcanjoeae* new species. 99. *D. cupreicolle*. 100. *D. titovidaurrei* new species. 101. *D. viridescens* new status. 102. *D. viridescens* new status. Figures scale = 1mm.





103.



104.



105.



106.



107.



108.



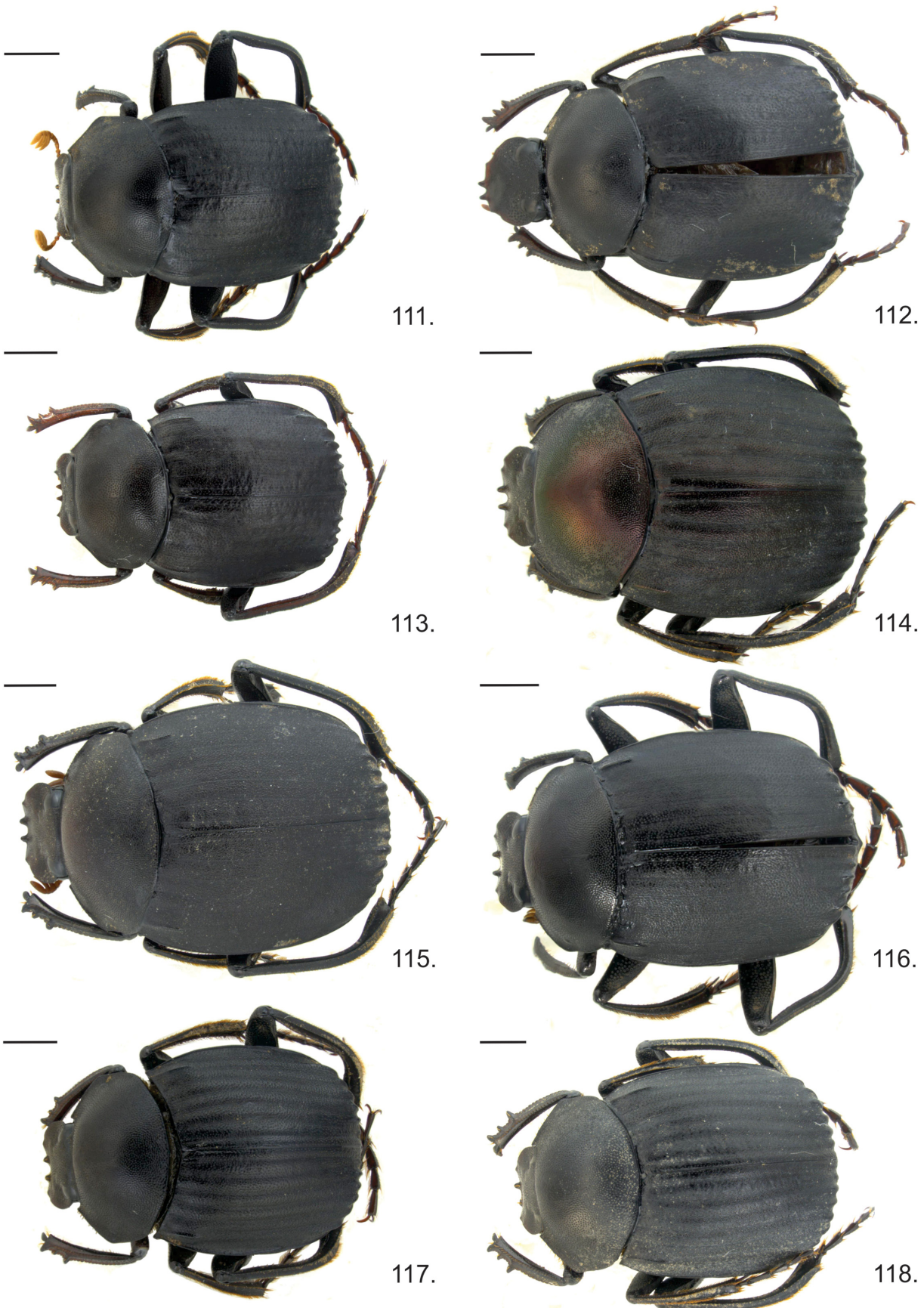
109.



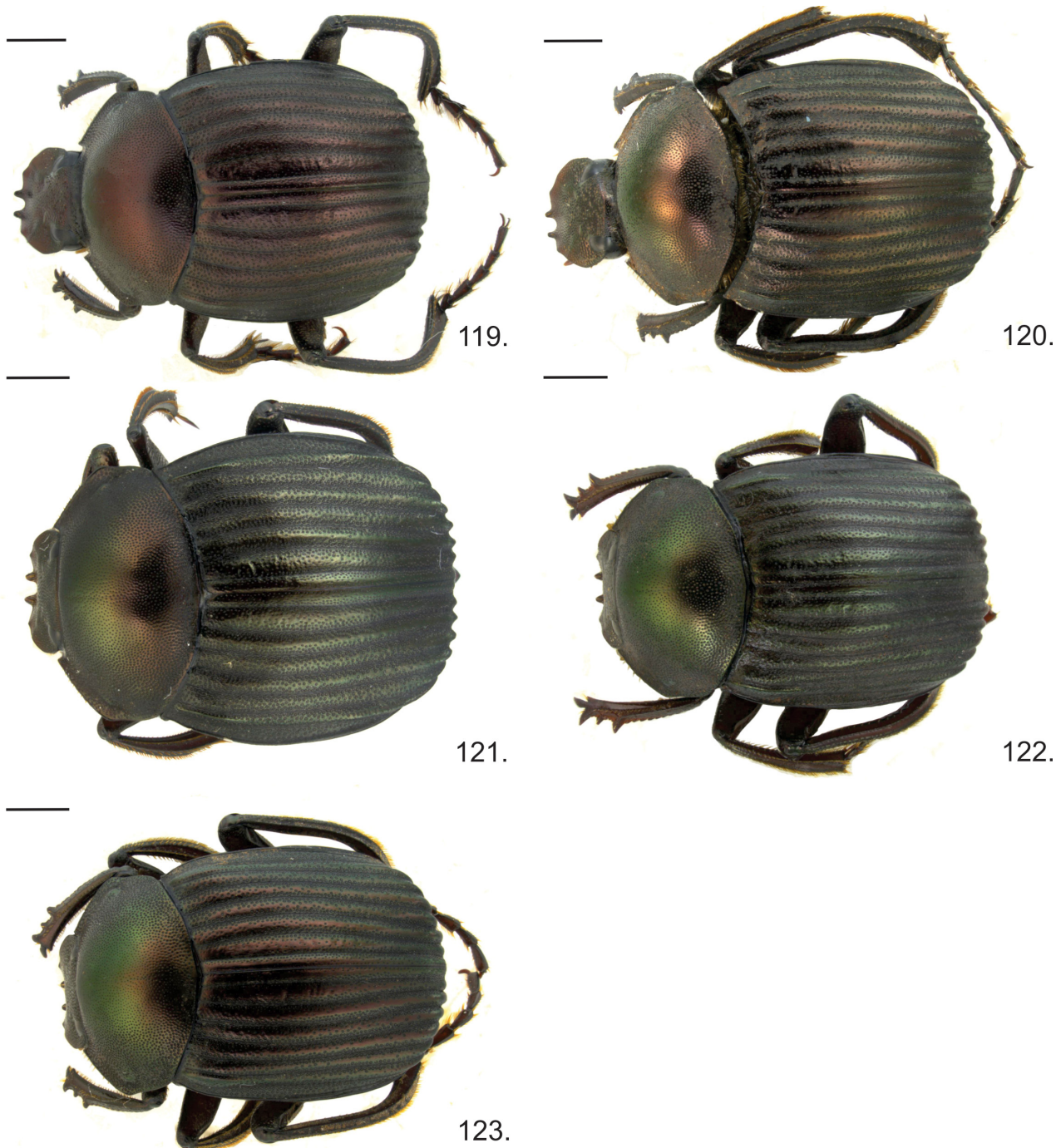
110.

**FIGURES 103–110.** Species of *D. (Aganhyboma)*. 103. *D. viridescens* new status. 104. *D. viridicatum* new species. 105. *D. viridicatum* new species. 106. *D. acropyge* new status. 107. *D. feeri* new species. 108. *D. schefflerorum* new species. 109. *D. streblpodum* new species. 110. *D. longiceps* new status. Figures scale = 1 mm.





**FIGURES 111–118.** Species of *D. (Aganhyboma)*. **111.** *D. acanthus*. **112.** *D. arturoi* new species. **113.** *D. larseni* new species. **114.** *D. cangalha* new species. **115.** *D. alpercata* new species. **116.** *D. finestriatum* new species. **117.** *D. icaroides*. **118.** *D. valgum*. Figures scale = 1 mm.



**FIGURES 119–123.** Species of *D. (Aganhyboma)*. **119.** *D. ritamourae* **new species**. **120.** *D. icariforme*. **121.** *D. parsi* **new species**. **122.** *D. kolleri* **new species**. **123.** *D. subrubrum* **new species**. Figures scale = 1 mm.

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