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# Bolivian Cerambycinae: new anthophilous species (Coleoptera, Cerambycidae)

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(Coleoptera, Cerambycidae)

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Bolivian Cerambycinae: new anthophilous species (Coleoptera, Cerambycidae)

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**Abstract.** New species of anthophilous Cerambycinae (Coleoptera, Cerambycidae) are described from Bolivia: Molorchini, *Merionoedopsis zamalloae* sp. nov.; Heteropsini, *Chrysoprasis azurearegina* sp. nov., and *C. maryhowardae* sp. nov.; Rhopalophorini, *Dihammaphora densiserrata* sp. nov., *D. dilmanappae* sp. nov., *D. espinotibia* sp. nov., *D. fosterorum* sp. nov., *D. paraperforata* sp. nov., *D. pilcomayoensis* sp. nov., and *Rhopalophora santacruzensis* sp. nov. All species are illustrated and host flower records are provided.

**Key words.** Flower hosts, Heteropsini, Molorchini, Rhopalophorini, taxonomy

**Resumen.** Se describe **especies nuevas** de Cerambycinae anterofilas de Bolivia: Molorchini, *Merionoedopsis zamalloae* sp. nov.; Heteropsini, *Chrysoprasis azurearegina* sp. nov. y *C. maryhowardae* sp. nov.; Rhopalophorini, *Dihammaphora densiserrata* sp. nov., *D. dilmanappae* sp. nov., *D. espinotibia* sp. nov., *D. fosterorum* sp. nov., *D. paraperforata* sp. nov., *D. pilcomayoensis* sp. nov. y *Rhopalophora santacruzensis* sp. nov. Todas las especies son ilustradas y registros de sus flores huéspedes son suministradas.

**Palabras clave.** Flores huespederes, Heteropsini, Molorchini, Rhopalophorini, taxonomia

## Introduction

This paper describes new species of Cerambycinae, in the tribes Molorchini, Heteropsini, and Rhopalophorini, captured while feeding on pollen in the Bolivian departments of Santa Cruz and Tarija (Appendix 1).

## Material and Methods

Most of the material described here was collected adjacent to the Andean mountain's eastern cordillera. In the Department of Santa Cruz five new species are described from the Humid Tropical Forest in the area of Buena Vista (17°30'S/63°39'W), and two new species (and one paratype of another species) were collected in the submontane Tucuman Forest in the area of Samaipata and Camiri. The other new species are from the Chaco and Humid Chaco Forests in the department of Tarija, in the area of Villamontes (21°17'S/63°28'W) and Yacuiba.

Most of the specimens in the tribes Heteropsini and Rhopalophorini were kindly examined by Dr. Dilma Solange Napp (retired from the DZUP). He confirmed that both species of *Chrysoprasis* were new ones, and provided helpful guidance as to validity of the new species of *Dihammaphora*.

Holotypes (and some paratypes) are deposited in Museo Noel Kempff Mercado, Universidad Autónoma Gabriel René Moreno, Santa Cruz de la Sierra, Bolivia (MNKM); the remaining paratypes are deposited in the following collections:

**ACMT** – American Coleoptera Museum (James E. Wappes), San Antonio, Texas, USA

**DZUP** – Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil

**FSCA** – Florida State Collection of Arthropods, Gainesville, Florida, USA

**MZUSP** – Museu de Zoologia, Universidade de São Paulo, São Paulo, Brasil

**RCSZ** – Robin Clarke/Sonia Zamalloa private collection, Hotel Flora and Fauna, Buena Vista, Santa Cruz, Bolivia

**USNM** – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

**Measurements** were made using a cross-piece micrometer disc, 5mm x 0.1mm. Total length = tip of mandibles to apex of abdomen. Forebody length (estimated with head straight, not deflexed) = apex of gena to middle of posterior margin of metasternum. Length of abdomen = base of urosternite I (apex of abdominal process) to apex of urosternite V. Length of rostrum = genal length (from apex of side to where it meets inferior lobe of eye). Length of inferior lobe of eye (viewed from above with the scale along side of gena); from the lobes most forward position to its hind margin (adjacent to, and slightly to the side of, antennal insertion). Width of inferior lobe of eye (with head horizontal and level viewed from directly above) = width of head with eyes at its widest point, minus width of interocular space, and divided by two. Interocular space between inferior lobes = its width at the narrowest point (including smooth lateral margins). References to antennal length in relation to body parts are made, as far as is possible, with head planar to dorsad and antenna straightened. Length of leg (does not include coxae) = length of femur (from base of femoral peduncle to apex of claw) + length of tibia + length of tarsus (does not include claws).

## Taxonomy

### TRIBE MOLORCHINI

#### *Merionoedopsis zamalloae* sp. nov.

Fig. 1, 2

**Description of holotype.** Female, large (24.30 mm); forebody distinctly longer than abdomen (lengths forebody/abdomen 1.28). **Color.** Almost entirely black with metallic blue reflection, the reflection violet on metasternum, green on abdomen. The following rufescent or yellowish, palpomeres, labrum, clypeus, sides of elytra, coxae, peduncles of meso- and metafemora.

**Surface ornamentation.** Dorsad of antennal scape smooth, almost impunctate. Surface of pronotum almost uniformly carinate, including surface of calli.

**Structure.** Width of head with eyes distinctly narrower than maximum width of prothorax (widths head/prothorax 0.73); rostrum moderately long (width/length 2.81); inferior lobes of eyes small, interocular 3.7 width of one lobe (0.75 mm). **Antennae** short, passing apex of elytra at middle of antennomere X, nearly reaching apex of abdomen; antennomeres rather robust (including VIII–XI); VIII strongly bent at base. **Prothorax** subcylindrical; 1.4 longer than wide; somewhat attenuate towards apex; widest and constricted across basal fifth, strongly constricted before apex. **Prosternum** strongly constricted across apical third; towards base weakly convex, surface less prominent than prosternal process; the latter arced, with rather broad base (width of procoxal cavity 1.38 wider than base); apex of prosternal process a strongly transverse, isosceles triangle. Procoxal cavities angulate at sides, closed behind. **Elytra** subulate, narrowing from base to acuminate apex; 2.83 longer than width across humeri; dehiscent for apical two-thirds; apex reaching base of urosternite V. **Mesosternum** somewhat abruptly declivous anterior to its process, but not deeply so; mesosternal process flat and wide (1.21 wider than width of mesocoxal cavity), at apex bilobate, lobes separated by deep V-shaped excavation at apex, but hardly divergent. Mesosternum 0.75 length of metasternum. **Metasternum** rather broad throughout, with subparallel sides, apical margin almost truncate; weakly tumid, broadly flattened across disc. Metepisternum subrectangular, rather narrow at base, moderately tapering to apex. Mesocoxae moderately widely open to epimerum. **Abdomen** convex, moderately wide, weakly annulated; widest at base, tapering to apex; urosternite I (3.30 mm) twice as long as II–IV (1.70–1.50 mm respectively; V (1.8 mm) slightly longer than II–IV, trapezoidal, rather flat and weakly down turned towards apex, apical margin nearly truncate. Abdominal process broad, blunt, planar with abdominal surface. **Legs** pedunculate clavate; moderately long, ratio front/middle/hind legs 1.0:1.3:2.1; body length/length of front, middle, and hind leg 2.5, 2.0, 1.2 respectively; apex of metafemora reaching middle of urosternite V; metafemoral peduncle about twice length of claw; metatarsomere I 1.85 longer than II+III.

**Measurements (mm).** Female, total length 24.30; length of pronotum 4.70; width of pronotum 3.35; length of elytra 12.75; width at humeri 4.50.

**Diagnosis.** The female of this species may be separated from those of *M. brevipennis* Melzer, 1934 and *M. aeneiventris* Gounelle, 1911 (Fig. 3) by the following characters:

In *M. zamalloae* surface of pronotum almost uniformly and densely carinate, including surface of calli (in *M. aeneiventris* not entirely carinate, and calli smooth); in *M. zamalloae* forebody 1.3 longer than abdomen (in *M. aeneiventris* forebody about 1.1 longer; in *M. zamalloae* antennae pass apex of elytra at middle of antennomere X, and do not pass apex of abdomen (in *M. aeneiventris* antennae pass apex of elytra at base of antennomeres VII–VIII, and pass apex of abdomen at middle of X); in *M. zamalloae* procoxal cavity 1.4 wider than base of prosternal process (in *M. aeneiventris* coxal cavity about twice as wide as base of process); in *M. zamalloae* elytra dehiscent for apical two-thirds (in *M. aeneiventris* dehiscent for apical half); in *M. zamalloae* apex of elytra reach middle of urosternite V (in *M. aeneiventris* elytra do not pass urosternite III); in *M. zamalloae* metatarsomere I almost twice as long as II+III (in *M. aeneiventris* tarsomere I about 1.5 longer than II+III).

Furthermore, *M. zamalloae* and *M. brevipennis* are readily separated from *M. aeneiventris* by examining the upper surface of antennal scape, almost impunctate in the former two, rather densely punctured (and in parts with large contiguous ones) in *M. aeneiventris*.

**Type material. Holotype female:** BOLIVIA, *Santa Cruz*, Hotel Flora & Fauna, 5 km SSE of Buena Vista, 17°29'96"S/63°39'13"W, 440 m, on/flying to flowers of “Bejuco colorado enano”, 13.IX.2007 (MNKM).

**Etymology.** This species is dedicated to Sonia Zamalloa Herrera who collected the specimen.

#### TRIBE HETEROPSINI

#### *Chrysoprasis azurearegina* sp. nov.

Fig. 4, 5

**Description of holotype.** Male, total length 8.40 mm. **Color** almost entirely dark blue, including antennae and legs; urosternites III–V orange. **Head** with uniformly dense, alveolate, microreticulate punctures. Frons about one third wider than long. Clypeus almost flat, rather densely punctate and microreticulate, separated from frons by interrupted, arched suture. Genae rather short, one-third length of inferior lobe of eye. **Antennae** filiform (antennomeres III–VI hardly wider at apex, VII–X feebly serrate) and weakly carinate; apex passing tip of elytra at middle of antennomere X; segments densely punctured and pubescent. Scape (0.65 mm) about half length of III, slightly shorter than IV (0.75); III (1.25 mm) much longer than V and XI (both 0.85 mm); XI about five times longer than wide. **Prothorax** quadrate (length and width 1.55 mm); sides rounded towards apex and base, somewhat straight and parallel-sided for middle half; widest at about middle; pronotum and sides of prothorax almost uniformly punctate (punctures small, dense and alveolate); and pubescent (setae black, dense, short, thick and erect). **Prosternum** with small rugose punctures embedded in reticulate matrix of micropunctures, partly hidden by unruly, dense, whitish pubescence. **Metasternum** with similar matrix; on disc punctures relatively deep and large, towards sides smaller and shallower; uniformly covered by moderately sparse, subrecumbent, ochreous colored setae. **Elytra** narrow, 3.16 longer than length of prothorax; uniformly punctured, punctures small, beveled and setose, distance between them less than length of one seta. Humeri rounded, but moderately projecting, hardly prominent; distance between them (1.75 mm) slightly more than one-third length of elytra. Apex of elytron subtruncate, rounded from suture to middle, slightly sinuate to small tooth laterally. **Abdomen** subcylindrical, tapering from base to apex. Urosternite V transverse, about half as long as wide, rounded at apex, the latter partially covered by completely exposed pygidium; urosternite I and basal half of II moderately densely punctured, towards apex of IV incrementally sparser. **Legs** elongate; femora narrow, cylindrical, with small, dense punctures and moderately dense, recumbent, short

setae, surface microreticulate, but shining; metafemora passing apex of elytra by one-third its own length. Metatarsus narrow, elongate, one fifth shorter than metatibia; metatarsomere I 1.2 longer than II+III.

**Male variation.** In most paratypes apical segments of antennae brownish (without blue sheen); antennae may pass elytra at base of antennomere X, or at apex of X, depending upon the position of the head. Only in the holotype is the pygidium exposed.

**Female** (Fig. 5). Weakly sexually dimorphic; apex of antennae failing to reach apex of elytra; apical antennomere more robust and shorter than in male (about 2.5 longer than wide).

**Measurements (mm).** 16 males/5 females, total length 6.35–8.70/7.60–9.35; length of pronotum 1.30–1.75/1.40–1.85; width of pronotum 1.30–1.85/1.50–2.05; length of elytra 4.20–6.00/4.75–6.15; width at humeri 1.50–2.10/1.65–2.25.

**Diagnosis.** This species belongs to the *hypocrita*-group as defined by Napp & Martins (1998), and is closest to *Chrysoprasia nigrina* Bates, 1870; but may be separated from it by the following. In *C. azurearegina* color almost entirely royal blue, including most of antenna and legs (in *C. nigrina* elytra bluish-green, rest of body and appendages black); in *C. azurearegina* urosternites I and II dark blue, III–V orange (in *C. nigrina* urosternites orange with some dusky clouding on I); in *C. azurearegina* urosternite V transverse, about twice as wide as long (in *C. nigrina* elongate).

**Type material. Holotype male:** BOLIVIA, *Santa Cruz*, 19°48'S/63°39'W, 1070 m, 6 km W Estancia Caraparacito, Quebrada Angostura, on *Croton* sp. A flower, 3.I.2008 (MNKM). **Paratypes:** *Santa Cruz*, data as holotype, female (RCSZ); 18°51'S/63°22'W, Bo Hwy 9, 11 km S Cabezas, 5 males, 3 females, 11.XII.2012, Wappes, Bonaso & Skillman col. (ACMT); 19°00'S/63°14'W, 680m, 20 km S Abapo, on *Croton* sp. A flower, 17.XII.2007, male (FSCA), male (MZUSP), male (RCSZ); 19°19'S/63°25'W, 900 m, 83 km N Camiri, Rd to Itai, male, 17-18.XII.2011, Wappes, Bonaso & Skillman col. (ACMT). *Tarija*, 21°01'S/63°18'W, 600 m, 30 km N of Villamontes, 4 km E of Camatindi, Semi-dry Chaco Forest, on *Croton* sp. A flower, male, 11.XII.2007 (RCSZ); 21°15'S/63°34'W, Gran Chaco Rd to Tarija, 22 km W Villamontes, female, 13-15.XII.2011, Bonaso, Morris & Wappes col. (ACMT); 21°42'S/63°36'W, 762 m, 48 km N Yacuiba, 3-5 km Sanandita Road, flying to/on flowers of *Croton* sp. A, 8.I.2010, male (FSCA), male (MNKM), male (RCSZ), male (USNM).

**Etymology.** The species' name refers to its color, Latin *azurea* for blue, *regina* for queen (*i.e.*, royal blue).

### *Chrysoprasia maryhowardae* sp. nov.

Fig. 6, 7

**Description of holotype.** Male, length 7.50 mm. **Color** of forebody entirely bright, metallic green, abdomen rufous-brown; antennomeres black, scape with metallic green reflection; legs dark colored, femora and mesocoxae with metallic green reflection, tibia and tarsi with weak violet reflection. **Head** densely punctured, with large, subalveolate punctures on clypeus and between antennal tubercles, smaller and densest between inferior lobes of eyes. Clypeus almost flat; separated from frons by moderately distinct, arced suture. Frons twice as wide as long; median suture narrow and entire. Genae moderately long, about two-thirds length of inferior lobe. **Antennae** carinate, almost filiform, passing apex of elytra at apex of IX, and just reaching apex of abdomen; basal segments cylindrical, unarmed, and somewhat flattened; III–V with dense, moderately large punctures; III–VII with single row of sparse setae; apical segments micropunctate, distinctly flattened, hardly widened at apex, and scarcely serrate, passing apex of elytra at apex of IX, and just reaching apex of abdomen. Scape cylindrical, not robust; with

dense, corrugated punctures, and inconspicuously setose; about two-thirds (0.70 mm) length of antennomere III (1.15 mm), of equal length to IV; III longer than V (0.75), nearly twice as long as XI (0.60 mm), XI about four times longer than wide. **Prothorax** slightly wider than long, convex dorsally, sides only moderately rounded from apex to their widest point at basal third, strongly rounded to basal constriction. Pronotum with uniform, dense, moderately large (larger laterally), alveolate punctures; and almost glabrous. **Prosternum** with dense alveolate, weakly corrugate punctures, inconspicuously pubescent, weakly microreticulate. **Elytra** rather short (2.7 longer than prothorax), and wide (2.0 longer than width across humeri); weakly, but regularly narrowed from base to apex; surface entirely microreticulate with rather dense, beveled, setose, large punctures, becoming corrugated laterally. Humeri projecting. Apices obliquely truncate, and armed with conspicuous tooth laterally. **Metasternum** with large, subcontiguous, non-reticulate, subalveolate punctures, and; almost glabrous. Metepisternum rather sparsely, weakly and, shallowly punctured, without corrugation. **Abdomen** subglabrous, sparsely punctured; urosternite V transverse (about three times wider than long), broadly rounded to apex; pygidium completely exposed. **Legs** with dense, large, rather deep, corrugated punctures, shining and not microreticulate on femora; metafemora pass apex of elytra at apical third; metatarsomere I (1.00 mm) as long as II+III united.

**Female** (Fig. 7). Weakly sexually dimorphic. Brightness of color somewhat subdued (especially below), darker green on prosternum and metasternum (and mixed with copper colored reflection on latter), and mesosternum almost black. Mesocoxae black. Metasternal punctures larger and sparser than in male. Apex of antennae just failing to reach apex of elytra; antennomere XI more robust and shorter than in male, about 2.5 longer than wide. Prothorax slightly longer than in male, almost quadrate; sides regularly rounded from apex to base, widest more towards middle. Elytra slightly more elongate, 2.4 longer than width across humeri, the latter not as wide as in male; tooth at lateral apex inconspicuous. Urosternite V about twice as wide as long.

**Measurements (mm).** 1 male/1 female, total length 7.50/8.10; length of pronotum 1.60/1.65; width of pronotum 1.70/1.70; length of elytra 3.80/3.95; width at humeri 1.85/1.90.

**Diagnosis.** This species belongs to the *hypocrita*-group as defined by Napp & Martins (1998), and is closest to *Chrysoprasis tobiuna* Napp and Martins, 1998, but differs as follows. In *C. maryhowardae* abdomen almost impunctate (in *C. tobiuna* densely punctured); in male *C. maryhowardae*, antennae surpass apex of elytra (in male *C. tobiuna* just reach apex of elytra); in *C. maryhowardae* elytra regularly narrowed from base to apex (in *C. tobiuna* distinctly dilated for apical third); in *C. maryhowardae* only lateral half of elytral surface corrugated (in *C. tobiuna* entire surface corrugated); in *C. maryhowardae* metatarsomere I as long as II and III united (in *C. tobiuna* I distinctly shorter than II+III).

*Chrysoprasis maryhowardae* is smaller and much less robust than *C. tobiuna*; and the forebody and elytral color are entirely bright green (in *C. tobiuna* forebody and elytra green, but infused with copper colored tints, or almost entirely violet in color).

**Type material. Holotype male:** BOLIVIA, *Santa Cruz*, 17°27'S/63°43'W, 400m, 5 km W Buena Vista, 1km W Candelaria, flying to/on flowers of "Gomphrena", 14.VIII.2007 (MNKM). **Paratype:** *Santa Cruz*, data as holotype, female (RCSZ).

**Comment.** Following their description of the single male specimen of *C. tobiuna*, Napp and Martins (1998) stated that this species may be distinguished from all others by the following character combinations. Elytra short, with surface corrugated, and humeri distinctly projecting; prothorax as long as wide, weakly rounded at sides; antennae shorter than body, unarmed, apical segments flattened and serrate; metasternum with large, subcontiguous punctures; genae short. Since *C. maryhowardae* shares most of these characters (except antennae longer than body in male, and genae slightly longer in both sexes), it seems justified to consider them as distinguishing both species from all others in the *hypocrita*-group.

**Etymology.** This charming species is dedicated to Mary Howard, a good friend and generous donator to our project.

#### TRIBE RHOPHALOPHORINI

##### *Rhopalophora santacruzensis* sp. nov.

Fig. 8, 9

**Description of holotype.** Male, length 5.65 mm. **Color** black; head from mandibles to frons dark chestnut; prothorax almost entirely orange. The following yellow, front leg (except apical tarsomeres); extreme base of meso- and metafemoral peduncles; apical margin of urosternites I-IV. Border of elytral epipleuron inconspicuously yellowish near base. **Head** with rather rugose, dense, small, alveolate punctures, and conspicuous, untidy, golden pubescence. Antennal tubercles rounded at apex and widely separated. **Antennae** with eleven segments, unarmed, not carinate; passing elytra at apex of antennomere IX. Scape cylindrical, moderately long (0.50 mm); without basal depression; with almost uniform, dense, small, alveolate punctures, and inconspicuous short pubescence. Antennomere III (0.75 mm) slightly longer than IV (0.60 mm), hardly longer than V (0.70 mm); VI-X (0.70-0.40 mm) incrementally shorter; XI as long as X. **Prothorax** subcylindrical, 1.3 longer than wide; sides widest just in front of middle; weakly rounded for middle half, weakly sinuate and narrowed to apex, distinctly sinuate to base; front margin (0.70 mm) narrower than basal margin (0.80 mm). Pronotum convex, with rather irregular surface, including constriction just posterior to middle; surface details partly obscured by dense pubescence (silky, subrecumbent, and golden colored); with dense, small, alveolate punctures (somewhat rugose towards sides); with two pairs of inconspicuous calli present (large, oval calli occupying sides of disc situated to either side of middle; small, rounded, callus just anterior to, and towards sides of basal constriction). **Elytra** 3.05 longer than width across humeri, somewhat abruptly narrowed behind humeri, but rather weakly narrowing to middle, widening more strongly to pre-apex; humero-apical costa traceable from humeri to apical third; humeri rounded but projecting, abruptly, but not strongly, prominent laterally; apices subtruncate, oblique, with outer angle spiculate. Elytral surface rather strongly sculptured by lines of moderately large, deep, contiguous, alveolate punctures, and coarse microreticulation; clothed by a mat-like layer of short, ashy pubescence. **Mesosternum**, mesepisterna, and mesepimera almost entirely hidden below very dense, long, recumbent pubescence. **Abdomen** cylindrical, about as wide as metathorax; almost uniformly densely punctate; apart from midline clothed with rather dense grey pubescence. **Legs** with long peduncles and short claws on femora of middle and hind legs; metafemoral peduncle strongly flattened (giving them carinate appearance), and with rather abrupt, short claw (peduncle nearly three times longer than claw). Meso- and metatibia slightly flattened; metatibia slightly arched (when viewed from the side) and thickened from apical third to apex. Metatarsomere I (0.55 mm), slightly longer than length of II+III (0.45 mm).

**Male variation.** In one paratype prothorax dark chestnut; all of elytral epipleuron below humeri pale chestnut; and antennomere XI slightly shorter than X. In one paratype dorsad of profemur and protibia dusky; prothorax more cylindrical, and 1.5 longer than wide.

**Female** (Fig. 9). General coloration much as in male; prothorax of one female orange (except for basal and apical margins of pronotum and prosternum), in the other female similar, but pale chestnut; elytral epipleuron yellowish in one female, not in the other. Antennae passing elytra at base of antennomere XI. Antennomere XI (0.45 mm) longer than X (0.35 mm). Elytra 3.35 longer than width across humeri. Abdomen widest towards apex (where distinctly wider than metathorax). Metatarsomere I (0.65 mm), longer than length of II+III (0.45 mm).

**Measurements (mm).** 3 males/4 females, total length 5.65–5.90/5.90–7.20; length of pronotum 1.10–1.25/1.25–1.50; width of pronotum 0.75–0.95/1.00–1.10; length of elytra 3.40–3.90/3.70–4.30; width at humeri 1.05–1.20/1.20–1.35.

**Diagnosis.** This species is closest to *Rhopalophora dyseidia* Martins and Napp, 1989, but may be separated from it by the following male characters. In *R. santacruzensis* front leg and prosternum almost entirely yellow (in *R. dyseidia* these entirely black); in *R. santacruzensis* antennae rather short, passing apex of elytra at apex of antennomere IX (in *R. dyseidia* antennae longer, passing apex of elytra at base of VIII); in *R. santacruzensis* antennal scape two-thirds length of antennomere III (in *R. dyseidia* half length of III); in *R. santacruzensis* peduncle of meso- and metafemora apparently carinate (in *R. dyseidia* not carinate); in *R. santacruzensis* apex of metafemora passing apex of elytra at middle of clava (in *R. dyseidia* metafemora does not reach apex of elytra).

**Type material. Holotype male:** Bolivia, *Santa Cruz*, 19°20'S/63°28'W, 890 m, 83 km N Camiri, Rd to Itai, 17–18.XII.2011, Wappes, Lingafelter & Woodley col. (MNKM). **Paratype** with same data as holotype, female (MZUSP). **Paratype** with data nearly as holotype: 19°19'S/63°25'W, 83 km N Camiri, Rd to Itai, male, 4–5. XII.2012, Wappes, Bonaso & Skilman col. (ACMT). **Paratypes** from different localities. *Santa Cruz*, 18°51'S/63°22'W, 465 m, 11 km S Cabezas, female, 18.XII.2011, Wappes, Lingafelter & Woodley col. (ACMT); 18°09'S/63°49'W, 1,300 m, Achira, on flowers of [white blossoming] *Acacia* tree, male and 2 females 25.XI.2004 (RCSZ), female (FSCA).

**Comment.** Dr. Napp examined one of the Achira females, labelling it as *Rhopalophora dyseidia* (?); with four more specimens, including two males from near Itai (in better condition than those from Achira), the status of *D. santacruzensis* as a new species can be confirmed. Other characters which may be diagnostic for males are as follows. *R. santacruzensis* is a small species (*R. dyseidia* somewhat larger); in *R. santacruzensis* pronotum 1.32–1.50 longer than wide (in *R. dyseidia* 1.13–1.15 longer); in *R. santacruzensis* metafemoral clava rather abrupt (in *R. dyseidia* less abrupt). In their description of *R. dyseidia*, Martins and Napp (1989) make reference to the pilosity of the prothorax, “amarello e sedosa” (yellow and silky) on pronotum (in *D. santacruzensis* golden and silky on pronotum).

**Etymology.** *Rhopalophora santacruzensis* is aptly named, since all the specimens were collected in the Department of Santa Cruz (Latin “ensis”, meaning its provenance).

### *Dihammaphora dilmanappae* sp. nov.

Fig. 10, 11

**Description of holotype.** Male, length 5.50 mm. **Color** of head dusky, dark chestnut above, vertex and underside orange; mandible paler with black apex. Prothorax and procoxae orange. Mesosternum and mesocoxae chestnut. Elytra ochreous, costae and sutural border orange, apical third suffused with black. Antennal segments I–IV blackish, the rest chestnut. Legs (including metacoxae) sepia-black. **Head** with frons, clypeus and mandibles densely, and somewhat rugosely micropunctate; with inconspicuous, dense, recumbent, white pubescence. Vertex glabrous; with rugose, small, dense alveolate punctures. **Antennae** eleven-segmented, passing middle of elytra by half a segment. Basal segments moderately pubescent, towards apex denser. Antennomeres III–V subcylindrical, weakly widened at apex, III and V (0.4 mm) slightly longer than IV (0.35 mm); VI widening from base to moderately tumid apex, of equal length to V; VII and VIII moderately serrate; IX and X somewhat oval; VII (0.35 mm); VIII and IX (0.30 mm); X (0.25 mm); XI (0.35 mm) slightly shorter than III, fusiform and narrow. **Prothorax** subcylindrical; 1.4 longer than wide (0.95 mm); widest at middle; sides widened, distinctly rounded for middle third, moderately attenuate, bisinuate to front margin, strongly bisinuate to base (width of base 0.90 mm, about 1.3 narrower than humeri). Pronotum lacking setae; surface smooth with somewhat silky appearance; latero-basal gibbositities rather large, but rounded at apex. **Elytra** glabrous (except for inconspicuous pubescence at apex); moderately sinuous at sides, narrowest well before middle; distinctly depressed at base and on disc. Dorsal costa strong, almost reaching apex. Surface not microreticulate, across middle half ornamented with large, deep, alveolate, contiguous punctures in four seriate rows. Margins not asperate. Elytral apices well rounded. **Legs** with peduncle of femora distinctly sulcate. Metafemora passing apex of elytra at base of clava. Metatibiae sinuate. Apex of protibia with angular projection laterally. First segment of metatarsus longer (0.55 mm) than the following two combined (0.40 mm).

**Male variation.** In two specimens orange color as in holotype, in four more rufous, in one brownish; in one specimen head above rufous-orange, the rest similar to holotype; in three specimens legs black, sepia in two, chestnut in two. In two males surface of pronotum weakly rugose, with larger, semi-evanescent punctures on center of disc, the rest as holotype. In one male antennae pass apex of elytra by half a segment, in one by one segment, in two by 1.5 segments, in three by two segments. In two of the smallest males elytral punctures subseriate, smaller, and shallower.

**Female** (Fig. 11). Very similar to male; orange color more rufous than holotype, often clouded dusky; in two paratypes head above black, in two rufous-orange, in four only vertex rufous-orange; antennal color entirely black in six females, as holotype in two; in four females legs black, sepia in four. Surface of pronotum weakly rugose, with large, semi-evanescent punctures on center of disc. Antennal proportions much as male, but more crassate, base of antennomeres as wide as or wider than mesofemoral peduncle (when viewed from the side). In larger females prothorax 1.2 longer than wide and less sinuate at sides. Elytra more sinuate at sides; and usually narrowest well before middle. Metatibiae less sinuate. Side of protibial apex as in male. First segment of metatarsus 1.0–1.2 longer than the following two combined. Punctures on middle half of elytra as male; but, in the single, unusually large, female with five rows, and sides of humeri with distinct, small, tooth-like projection laterally (just traceable in most larger specimens of both sexes).

**Measurements (mm).** 8 males/8 females, total length 4.75–6.00/5.30–7.70; length of pronotum 1.10–1.45/1.30–1.75; width of pronotum 0.80–1.00/0.90–1.40; length of elytra 2.90–3.95/3.30–4.60; width at humeri 1.00–1.25/1.15–1.30.

**Diagnosis.** This species, with eleven-segmented antennae, may be immediately recognized by its unusual color combination; dusky head, pale orange prothorax, ochreous elytra (with dusky apex), and sepia colored appendages. Moreover, the margins of elytra of *D. dilmanappae* are not asperate, a character only shared by *Dihammaphora nitidicollis* Bates, 1870 among the eleven-segmented species. The latter is readily separated from *D. dilmanappae* by its black color, with prothorax reddish, and club of femora reddish black.

**Type material. Holotype, male:** BOLIVIA, *Santa Cruz*, 17°29'96"S/63°39'13"W, 430 m, 5 km SSE of Buena Vista, Hotel Flora & Fauna, flying to/on flowers of “Turere”, 9.X.2004 (MNKM). **Paratypes** with data as holotype, 2 males and 2 females, (RCSZ); 7.X.2005, male and female (DZUP), male (FSCA), female (MNKM), male and female (MZUSP), male (RCSZ), male and female (USNM). **Paratypes** with same data as holotype, different host flower, flying to/on flowers of “Bejuco hoja lanuda”, 30.IV.2005, female, 5.V.2005, male (RCSZ); flying to/on flowers of “Sama blanca chica”, 21.X.2006, male, 27.X.2006, female (RCSZ).

**Comment.** Another character not observed in any of the species described here, nor mentioned by Napp and Mermudes (2010), is found on the mesosternum, where the surface is divided into flat patches of dense pubescence by rings (in males), or partial rings (in females) of smooth glabrous chitin. This character was not confirmed for the description of the holotype because the mesosternum was hidden by the specimen’s mount.

**Etymology.** This species is named in honor of Dr. Dilma Solange Napp, now retired from the DZUP; she will be missed.

***Dihammaphora paraperforata* sp. nov.**

Fig. 12, 13

*Dihammaphora perforata*; Wappes et al., 2013: 7, fig. 31 (distr.).

**Description of holotype.** Male, length 6.40 mm. **Color** black; gula and prothorax orange. **Head** with frons, clypeus and mandibles densely, but not rugosely, micropunctate; with moderately dense, recumbent white pubescence. Vertex glabrous, with small, dense alveolate punctures. **Antennae** eleven-segmented, passing middle of elytra by one segment. Segments inconspicuously pubescent. Antennomeres III–V subcylindrical, moderately expanded at outer apex, gradually increasing in length (0.40–0.50 mm); VI widening from middle to distinctly tumid apex, slightly shorter (0.45 mm) than V; VII and VIII moderately serrate; IX–XI subcylindrical (but narrow at base); VII (0.40 mm); VIII and IX (0.35 mm); X (0.30 mm); XI as long as III. **Prothorax** almost cylindrical, one-third longer than wide; widened and weakly rounded for middle third, hardly attenuate, weakly sinuate to front margin, strongly sinuate to base (the latter wider than middle, 1.3 narrower than humeri). Pronotum with some erect, short setae at apical third; surface rendered slightly rugose by evanescent large punctures; latero-basal gibbosities well developed and somewhat acute. **Elytra** almost glabrous (with inconspicuous pubescence at apex); moderately sinuous at sides, narrowest just before middle, subdepressed at base. Dorsal costa present limited to basal third. Surface almost entirely microreticulate, for middle half ornamented with large, deep punctures (most separated by one diameter or less), in four subseriate rows. Margins moderately densely asperate on apical half (at apex asperities larger), absent towards base. Elytral apices rounded-truncate. **Legs** with peduncle of femora distinctly sulcate. Metafemora passing apex of elytra at middle of clava. Metatibiae straight. Apex of protibia with rounded projection laterally. First segment of metatarsus slightly longer than the following two combined.

**Male variation.** In one of the two paratypes vertex of head partially infused with orange, elytral punctures much smaller, and microreticulation reduced; in the other paratype dorsal costa almost reaching to middle of elytra.

**Female** (Fig. 13). Very similar to male, but puncturation of pronotum less evanescent, more distinctly alveolate; and orange color more rufous (vertex of head rufous-orange in one paratype). Prothorax more cylindrical and slightly narrower, less sinuous at sides. Elytra narrowest well before middle; in the two large paratypes punctures on elytra larger, and microreticulation much stronger. Metafemora just passing elytral apices. Apex of protibia without rounded projection laterally.

**Measurements (mm).** 2 males/3 females, total length 5.00–6.40/5.10–6.60; length of pronotum 1.25–2.00/1.20–2.10; width of pronotum 0.85–0.95/0.80–1.00; length of elytra 3.10–3.80/3.00–3.90; width at humeri 1.05–1.25/1.05–1.35.

**Diagnosis.** In the key provided by Napp and Mermudes (2010) to the species of *Dihammaphora* with eleven-segmented antennae this new species would run down to couplet 7, which includes *D. perforata* (Klug, 1825) and *D. ibirajarai* Mermudes, 1998. *Dihammaphora paraperforata* differs from *D. perforata* (Fig. 23) by the following characters; in *D. paraperforata* base of prothorax distinctly narrower than humeri, hardly attenuate to apex, and latero-basal gibbosities strong and somewhat pointed (in *D. perforata* base of prothorax almost as wide humeri, slightly attenuate to apex, and gibbosities rounded and almost obsolete); in *D. paraperforata* elytra glabrous, not conspicuously sinuous at sides, humero-apical costa nearly reaching apex, with four rows of punctures at middle third, where many punctures separated by less than their own diameter (in *D. perforata* elytra pubescent, conspicuously sinuous at sides, humero-apical costa present only at basal third, with three rows of punctures at middle third, where punctures separated by their own diameter or more); in *D. paraperforata* metatibia is straight (in *D. perforata* sinuate); in *D. paraperforata* mesosternum is black (in *D. perforata* red). Females of *D. paraperforata* differ from those of *D. perforata* by the apical antennomeres not serrate and rather narrow, XI as long as or longer than III (in *D. perforata* subserrate and somewhat swollen, XI shorter than III).

*Dihammaphora paraperforata* differs from *D. ibirajarai* by the following characters in males; in *D. paraperforata* clypeal suture rather weak (in *D. ibirajarai* suture missing); in *D. paraperforata* antennomeres III–V almost filiform, equally and only moderately wider at apex, VI slightly shorter than V (in *D. ibirajarai* III–V subserrate, sequentially more expanded at apex, VI as long as V); in *D. paraperforata* basal gibbosities of pronotum prominent and somewhat pointed (in *D. ibirajarai* rounded

and feebly prominent); in *D. paraperforata* peduncle of femora distinctly sulcate, and metafemora passing apex of elytra near middle of clava (in *D. ibirajarai* peduncles barely sulcate, and metafemora reaching elytral apex); in *D. paraperforata* metatarsomere I slightly longer than II+III (in *D. ibirajarai* as long as II+III).

**Type material. Holotype male:** BOLIVIA, *Santa Cruz*, 17°29'96"S/63°39'13"W, 430 m, 5 km SSE of Buena Vista, Hotel Flora & Fauna, flying to/on flowers of "Bejuco hoja lanuda", 3.V.2005 (MNKM). **Paratype** with data as holotype (except date), 27.IV.2005, female (RCSZ). **Paratypes** with different data to holotype; 17°27'S/63°42'W, Road to Potrerito village, 4 km W of Buena Vista, 440 m, flying to/on flowers of "Gomphrena", 11.VIII.2007 female (RCSZ); 17°40'S/63°20'W, Potrerillo del Guenda, 1 male, 6–8.XII.2011, Wappes, Lingafelter, Morris & Woodley col. (ACMT); 18°43'S/63°27'W, 750m, 20 km NNW Abapo, 17 km Road to Moroco "Las Petas", flying to/on flowers of "Sapaimosi chico", 6.XII.2008, male (RCSZ), female (FSCA), male (DZUP).

**Comment.** The Bolivian record for *D. perforata* (Wappes *et. al.* 2013) was due to a misidentification; their illustration shows it to be *D. paraperforata*.

**Etymology.** The species epithet, *paraperforata*, is a compound of the Latin "para" meaning a different form of *perforata*.

#### *Dihammaphora pilcomayoensis* sp. nov.

Fig. 14, 15

**Description of holotype.** Male, length 5.70 mm. Elegant, narrow and elongate. **Color** of upper body, and scutellum dusky rufescent; underside of head, prosternum and mesosternum rufescent; antennae, metasterna and abdomen black. Pronotum with ill-defined, transverse, rufous patch adjacent to broad, black fascia occupying middle third of disc. Elytra ochreous-brown, clouded dusky towards apex. Front leg rufous-orange (onychium black); middle and hind leg femora with rufescent peduncle and black clava, black tibiae and tarsi.

**Surface ornamentation** on upper side of head pronotum and elytra ornamented with scale-shaped, golden pubescence; on head, clypeus, frons and vertex with small punctures embedded in smooth matrix of micropunctures. Pronotum almost lacking setae, but clothed with minute, short, golden hairs concentrated to either side of midline; pubescence hiding details, but appears to be uniformly, densely and somewhat rugosely punctured (punctures small and alveolate). On underside only head glabrous, the rest rather densely clothed with fine, recumbent, grey pubescence (on meso- and metasterna very dense on prosternum, and less so on abdomen). Elytral surface reticulate, pubescence similar to that of pronotum (but lacking denser patches); densely covered by deep, contiguous, alveolate punctures, in 5–6 rows of non-seriate, moderately large punctures (one puncture between humero-apical and lateral costae). Margins weakly and sparsely asperate from apex to middle (densest towards apex with 6–7 asperities/mm). Antennae sparsely pubescent basally, denser towards apex.

**Structure.** **Head** with clypeus separated from frons by deep V-shaped suture; frons depressed, not bordered at sides. Antennal tubercles rounded, moderately prominent; separated by nearly three times width of scape. **Antennae** eleven-segmented, subfiliform, moderately robust, passing middle of elytra at apex of antennomere IX. Scape the longest segment (0.45 mm), cylindrical, hardly robust, with rugose, confluent, small punctures. Antennomeres III–V subcylindrical, weakly widened at apex, dorsally with narrow keel from base to apex; III, V and VI slightly longer (0.40 mm) than IV; VI widened from middle to weakly tumid apex, keeled for basal half; VII–X incrementally shorter (0.35–0.25 mm); VII subcylindrical, keeled for basal quarter; VIII widened from base to slightly tumid apex; XI fusiform, slightly longer (0.30 mm) and narrower than X. **Prothorax** 1.44 longer than wide, widest well behind middle; almost cylindrical, weakly rounded for middle half, hardly attenuate, somewhat sinuate to front margin, rounded and constricted to base; width of base about 1.3 narrower

than humeri. Pronotal surface uneven; center of disc rather convex, depressed at apical and basal constrictions, latero-basal gibbosities, rather small, moderately prominent and rounded at apex. **Elytra** long, nearly 3.4 longer than width across humeri; rather weakly sinuous at sides (almost parallel to middle, gradually widened to apex), narrowest before middle; moderately depressed at base and on disc. Dorsal costa moderately strong and almost reaching apex. Elytral apices hardly projecting, truncate, somewhat oblique; apical margin without asperities. **Legs** long (but hind leg less than twice length of front leg); femoral peduncles narrow, flattened, bicarinate, sulcate; claws fusiform, rather short, moderately abrupt. Metafemora just failing to reach apex of elytra. Tibiae narrow, without projection at inner apex; apex of protibia with weak rounded projection laterally; metatibiae moderately bisinuate (viewed laterally). First segment of metatarsus one-third longer (0.40 mm) than the following two combined.

**Female** (Fig. 15). Color and pubescence generally as in male; slightly duskier, especially on elytra, underside (prosternum black for basal half), and legs (middle leg entirely black). Pubescence generally less conspicuous and darker in color. Antennae rather short, not reaching middle of elytra; with similar formula to male, but lacking conspicuous distinctions (antennomere VI weakly widened from base to apex, VII–X similar in structure, VIII–X slightly longer (0.25 mm) than XI, XI not narrow (about twice as long as wide). Prothorax much as male, but shorter (1.3 longer than wide). Elytra 3.25 longer than wide; narrowest well before middle; margins with sparser and weaker asperities. Metafemoral clava passing elytra at apical constriction. Side of protibial apex as in male. First segment of metatarsus 1.4 longer (0.35 mm) than the following two combined.

**Measurements (mm).** 1 male/1 female, total length 5.70/5.50; length of pronotum 1.30/1.20; width of pronotum 0.90/0.80; length of elytra 3.70/3.25; width at humeri 1.10/1.00.

**Diagnosis.** This species, with eleven-segmented antennae, is readily separated from all other species in this species-group by its black and rufescent pronotum. In *Dihammaphora scutata* Gounelle, 1911 pronotum is reddish with well-delimited, scalloped black band across base. In *Dihammaphora falsa* Napp and Mermudes, 2010 (with habitus most similar to *D. pilcomayoensis*) pronotum is black; in *Dihammaphora uncinata* Napp and Mermudes, 2010 pronotum is reddish with broad, blackish band medially (and in both the latter species inner side of procoxa with uncinata projection, absent in *D. pilcomayoensis*). In all other species pronotum is entirely orange or reddish.

**Type material. Holotype male:** BOLIVIA, *Tarija*, 21°28'S/63°08'W, ca. 300 m, dry Chaco Forest, edge of Rio Pilcomayo, 300 meters S Palo Mercado, beaten from flowering *Acacia* tree, 12.XII.2007 (MNKM). **Paratype:** Data as for holotype, female (RCSZ).

**Etymology.** The specific epithet, *pilcomayoensis*, refers to the type locality of this species, the edge of the Pilcomayo River, and its name ends with the Latin “ensis” meaning its provenance.

### *Dihammaphora fosterorum* sp. nov.

Fig. 16

**Description of holotype.** Male, length 6.00 mm. **Color** of head and pronotum rufous-chestnut, sides of pronotum duskier; elytra paler, somewhat ochreous-chestnut; underside black (except apical margin of prosternum); antennae black and chestnut. Front legs orange (tarsi chestnut), middle legs dark chestnut (femoral peduncles and apex of tibiae slightly paler, tarsi black), hind leg peduncle black with chestnut base, clava sepia.

**Surface ornamentation** of clypeus, frons and vertex with rugose, large punctures embedded in matrix of dense micropunctures. Pronotum with scattered setae anteriorly, towards base denser and brassy in color; densely punctured (the details hidden by pubescence), somewhat uneven (with transverse depression just anterior to rather prominent latero-basal gibbosities). Elytra clothed with

dense, short, recumbent, brassy colored pubescence; surface details hidden by minute, thick hairs; but appears to be densely punctured, with 6–7 rows of non-seriate, small punctures. Underside almost entirely covered by short, recumbent, grey pubescence (very dense and silver colored on mesosternum). Antennae sparsely pubescent basally, denser apically.

**Structure.** **Head** with antennal tubercles separated by about twice width of scape, these rounded, but somewhat projecting laterally. **Antennae** ten-segmented, rather robust, passing middle of elytra at middle of antennomere IX. Scape (0.50 mm) pyriform and rather robust, with rugose, dense, small punctures. Antennomeres III–V subcylindrical, weakly widened at apex, III and IV (0.4 mm) slightly shorter than V (0.45 mm); VI (0.50 mm) widening from middle to moderately tumid apex; VII and VIII as long as V; VII widening from base to slightly tumid apex; IX (0.40 mm), X (0.65) fusiform with constriction at middle, as broad as IX, 1.62 longer than III and longer than all other segments. **Prothorax** 1.22 longer than wide, widest at middle (0.95 mm); vase-shaped (rather abruptly widened for middle third, attenuate and almost straight to front margin, sinuate to base); width of base about 1.4 narrower than humeri; latero-basal gibbositities rather prominent. **Elytra** 2.9 longer than width across humeri; weakly sinuous at sides, narrowest at middle; distinctly depressed at base and on disc. Dorsal costa strong and almost reaching apex. Margins entirely, but weakly asperate (denser at apex). Elytral apices broadly tumid, somewhat obliquely rounded. **Legs** with peduncle of all femora distinctly bicarinate and sulcate. Metafemora just failing to reach apex of elytra. Metatibiae moderately bisinuate (viewed laterally). Apex of protibia without tooth laterally. First segment of metatarsus (0.40 mm) as long as the following two combined.

**Male variation.** The single male paratype hardly differs from the holotype, but pronotum 1.3 longer than wide; and elytra 3.1 longer than width across humeri. Golden pubescence on front tibia much reduced.

**Female.** In one paratype general color paler, and more ochreous than in male, and asperations on sides of elytra slightly stronger. In both paratypes antennae and legs almost entirely pale chestnut. Antennae passing middle of elytra at middle of antennomere X; X 1.67–1.75 longer than III. Pronotum 1.2–1.3 longer than wide; and elytra 2.7–3.0 longer than width across humeri. Metatibiae more strongly bisinuate since apical third rather abruptly curved. First segment of metatarsus (0.4 mm) distinctly shorter than II+III (0.6 mm).

**Measurements (mm).** 2 males/2 females, total length 6.00–6.60/4.80–6.50; length of pronotum 1.25–1.50/1.05–1.35; width of pronotum 1.05–1.15/0.85–1.05; length of elytra 3.75–4.05/3.00–4.10; width of humeri 1.30/1.10–1.35 in both male specimens.

**Diagnosis.** This species, with ten-segmented antennae, is closest to *Dihammaphora auricollis* Martins, 1981, from which it can be separated by the following male characters. In *D. fosterorum* antennae black and chestnut, middle and hind legs not entirely black (in *D. auricollis* antennae and legs usually entirely black); in *D. fosterorum* dense black patch covering most of prosternum and extreme sides of pronotum (in *D. auricollis* prosternum usually concolorous, or partially clouded dusky, or at most with paired, small, black vittae adjacent to coxal cavities); in *D. fosterorum* antennomere XI about 1.6 longer than III (in *D. auricollis* about 1.9 longer); in *D. fosterorum* prothorax vase-shaped, rather abruptly widened at middle, distinctly attenuated to front margin, strongly sinuate to basal margin, and about 1.2 longer than wide (in *D. auricollis* prothorax almost cylindrical, and about 1.4 longer than wide); in *D. fosterorum* apical margin of elytra broadly tumid and rather rounded (in *D. auricollis* apical margin not tumid and sinuate-truncate); in *D. fosterorum* apical third of protibia densely covered with golden pubescence mesally (in *D. auricollis* sparsely pubescent towards apex); in *D. fosterorum* metatarsomere I about as long as the following two combined (in *D. auricollis* 1.26–1.29 longer than II+III).

**Type material.** **Holotype male:** BOLIVIA, *Santa Cruz*, 18°09'S/63°49', 1,300 m, Achira, on white-flowering *Acacia*, 25.XI.2004 (MNKM). **Paratypes:** BOLIVIA, *Santa Cruz*: 18°08'S/63°53', 6–8 km

NNE Samaipata, Rd to La Yunga de Mairana, female, 6.II.2013, Lingafelter & Garzon col. (USNM); 4–5 km N. Achira, Rd to Amboro, male, 12–13.XII. 2000, Wappes & Dozier col. (RCSZ); Florida, Mataral, 2000 m, female, XII.1984, L.E. Peña col. (ACMT).

**Etymology.** This species is named in appreciation of Sue and Cole Foster, who provided transport to the type locality, and for their generous contribution of equipment for our work on the Bolivian Cerambycidae.

***Dihammaphora densiserrata* sp. nov.**

Fig. 17, 18, 21

**Description of holotype.** Male length 5.20 mm. **Color** of dorsal side of body and elytra rufous-orange, head and base of elytra more ochreous, and scutellum black; underside of head and prothorax orange (with black process), the rest of underside black (except apical margins of urosternites I–IV yellowish). Antennae black. Front legs dark chestnut, middle and hind legs black.

**Surface ornamentation;** head clothed with dense, short, recumbent, ashy colored pubescence; clypeus, frons and vertex with small punctures embedded in matrix of dense micropunctures. Pronotum without thick, long setae, but clothed with minute, short setae; uniformly, densely, rather rugosely punctured in matrix of strong microsculpture; punctures alveolate, moderately large, rather deep and confluent. Elytral pubescence microscopic; surface glabrous, strongly reticulate, densely covered by deep, alveolate punctures, in 4–5 rows of non-seriate, moderately large punctures (one puncture row between humero-apical and lateral costae). Underside almost entirely covered by short, recumbent, grey pubescence. Antennae sparsely pubescent basally, denser apically.

**Structure. Head** with clypeus separated from frons by deep V-shaped suture; frons depressed, bordered at sides. Antennal tubercles separated by about twice width of scape, rounded and weakly projecting. **Antennae** ten-segmented, subfiliform, moderately robust, passing middle of elytra at middle of antennomere IX. Scape (0.45 mm) moderately robust, with rugose, dense, small punctures. Antennomeres III–V subcylindrical, weakly widened at apex, III–VI equal in length (0.40 mm), VI widening from middle to moderately tumid apex; VII–IX shorter (0.35–0.25 mm), widening from base to slightly tumid apex; X (0.40 mm) narrow, fusiform. **Prothorax** 1.53 longer than wide, widest behind middle (0.75 mm); cylindrical (rather abruptly widened for middle fifth, hardly attenuate and slightly excavate to front margin, sinuate to base); width of base about 1.4 narrower than humeri. Pronotal surface uneven; center of disc rather convex, depressed at apical and basal constrictions, latero-basal gibbositities, rather small, but prominent and acute. **Elytra** three times longer than width across humeri; rather weakly sinuous at sides, narrowest before middle; distinctly depressed at base and on disc. Dorsal costa strong, almost reaching apex. Margins entirely, densely and moderately strongly asperate (with 12–14 asperities/mm). Elytral apices strongly projecting, somewhat oblique, but their shape disrupted by double row of large asperities. **Legs** rather robust; femoral peduncles weakly bicarinate and sulcate, claws moderately large and abrupt. Apical constriction of metafemora just passing apex of elytra. All tibiae with short projection at inner apex (that of protibia rounded at apex, on mesotibia lanceolate, on metatibia scutate); apex of protibia with small, tooth-like projection laterally. Metatibiae moderately bisinuate (viewed laterally). First segment of metatarsus slightly longer (0.40 mm) than the following two combined.

**Male variation.** In some males head is not paler than pronotum; in most males mesal two-thirds of elytra ochreous (in another uniformly ochreous); in three males meso- and metasterna, and abdomen rufescent (in one of these the antennae chestnut and legs entirely rufous-orange; in the other two legs rufous-orange, but mesotibia, metatibia and tarsi remain black). Elytral surface may be less reticulate; punctures may be less dense, and less uniform in size; in most males puncture rows across middle of elytra alternate between four and five rows (in some four/row predominate, in others five/row); and lateral asperities always dense, but often reduced in size. Structural variation, especially of the

antennae in small specimens, is apparent, but the following are more significant; prothorax 1.3–1.4 longer than wide, may be more attenuate anteriorly, and surface irregularities reduced (in two paratypes not abruptly widened at middle, and hardly more convex on disc); elytra may be shorter (2.6 longer than wide), and humeri vary from square to strongly projecting; elytral apices variable, truncate, strongly oblique, acuminate, but nearly always projecting and strongly asperate.

**Female** (Fig. 18). Color generally like males, but with less variation. Head not paler than pronotum, antennae, mesosternum, metasternum, abdomen and legs black; only elytra more variable, in two females almost uniformly ochreous (as in Fig. 18), in the rest almost uniformly rufous-orange. Antennae more robust than in male (in the largest female substantially more robust); antennomere VI widening from base to apex; apical antennomeres more crassate, and X slightly shorter than in male. Prothorax generally more cylindrical, but also more attenuate than in male. Elytra narrowest well before middle; not as strongly asperate and projecting at apex. Metafemora just reaching apex of elytra. Inner apex of tibiae lacking projections; outer apex of protibia as in male. In some females length of first metatarsomere equal to the following two combined.

**Measurements (mm).** 12 males/8 females, total length 4.00–5.85/5.25–7.45; length of pronotum 1.05–1.30/1.25–1.75; width of pronotum 0.70–0.85/0.90–1.20; length of elytra 2.85–3.45/3.30–4.65; width at humeri 1.00–1.15/1.10–1.55.

**Diagnosis.** This species, with ten-segmented antennae, is closest to *D. peruviana* Martins, 1981; but males may be immediately separated from it (and almost all other species of the genus) by the tibiae which have a distinct, flat projection on their meso-apical surface (Fig. 21). In females tibial apices are somewhat projecting; but unlike males, still bear distinct tibial spurs. Both sexes are easily separated from *D. peruviana* by the densely asperate elytral margins.

The only other species known to have tibial projections is *Dihammaphora espinotibia* sp. nov. (described below), but the projections are much longer than in *D. densiserrata*.

**Type material. Holotype male:** BOLIVIA, *Santa Cruz*, 17°29'96"S/63°39'13"W, 430m, 5 km SSE of Buena Vista, Hotel Flora & Fauna. Flying to/on flowers of “Bejuco hoja lanuda”, 22.IV.2005 (MNKM). **Paratypes** with same data as holotype, 22–23.IV.2005, male and female (DZUP); 22.IV.2005, 2 males (FSCA); 23.IV.2005, male (ACMT); 22.IV.2005, female (MNKM); 28–30.IV.2005, male and female (RCSZ), 2.V.2005 male and female (RCSZ); 6.V.2005, male and female (RCSZ); 10.V.2005, female (RCSZ); 18.V.2005, male (RCSZ); 2.V.2005, male and female (MZUSP); 4–6.V.2005, male and female (USNM). **Paratypes** with same data as holotype, but different host flower. Flying to/on flowers of “Sama blanca”, 22.XI.2005, male (RCSZ). Flying to/on flowers of “Sama blanca chica”, 27.X.2006, male (RCSZ).

**Comment.** The diagnosis given for this species assumes that nearly all the other species of the genus lack projections on their tibiae, but in *D. densiserrata* the projections are short and could be overlooked.

**Etymology.** The specific epithet, *densiserrata*, refers to the densely asperate margins of the elytra.

***Dihammaphora espinotibia* sp. nov.**

Fig. 19, 20, 22

**Description of holotype.** Male, length 5.85 mm. **Color** of head and prothorax rufous-orange; mandible with extreme apex black. Prosternum yellow for basal two-thirds; pronotum with large, oval black patch on center of disc. Mesosternum rufous-orange. Metasterna, elytra, and abdomen black (apical margins of urosternites I–IV narrowly yellowish). Antennae black, scape dark ochreous-yellow above, rufescent below. Front leg ochreous-yellow, tarsi rufescent, onychium black; middle leg ochreous-yellow, femoral claws blackish dorsally, and tarsi black; hind leg with yellow peduncles, black claws,

tibiae and tarsi. **Head** with frons impressed. Frons, clypeus and mandibles densely punctured, with larger, somewhat rugose, alveolate punctures on frons and vertex; all with inconspicuous, short, recumbent pubescence. **Antennae** ten-segmented, subfiliform, passing middle of elytra by two segments; almost uniformly clothed with short, inconspicuous pubescence. Scape robust, equal in length (0.50 mm) to antennomeres III–VI; III–V subcylindrical, hardly widened at apex, VI widening from middle to moderately tumid apex; VII–IX widening from base to apex, incrementally shorter (0.40–0.35 mm); X (0.60 mm) slightly longer than III, narrow and fusiform. **Prothorax** 1.2 longer than wide, widest behind middle; vase shaped; widened and distinctly rounded for middle third, attenuate and nearly straight to front margin (but profile weakly interrupted by pair of small calli situated at each side of apical constriction), rather strongly sinuate to base (width of the latter 0.95 mm, 1.3 narrower than humeri). Pronotum densely and somewhat rugosely punctured, punctures almost uniformly distributed, small and alveolate; surface clothed with inconspicuous, ashy pubescence, and few short setae anteriorly; latero-basal gibbosities rather small, conical, acute at apex. **Elytra** 2.9 longer than width across humeri; apparently glabrous (but with inconspicuous pubescence at apex, and punctures with microscopic setae); moderately sinuous at sides, narrowest well before middle; distinctly depressed at base and disc. Dorsal costa moderately strong, almost reaching apex. Surface rather rugose, and strongly microreticulate, ornamented with moderately large and deep, alveolate punctures, in 5–6 non-seriate rows (two of them between the lateral and humero-apical costae). Margins strongly, closely and almost entirely asperate (at middle with 14 asperities/mm, towards apex 16/mm). Elytral apices rounded, but profile disrupted by large, well-separated asperities (8/mm). **Legs** robust; peduncle of all femora quadrangular, deeply sulcate and bicarinate, clava abruptly enlarged; hind leg (5.50 mm) about twice as long as front leg; metafemora passing apex of elytra at apical constriction of clava. All tibiae sulcate, quadrangular; mesal apex with long spine (about 0.15 mm), these narrow on pro- and mesotibiae, somewhat scutate on metatibiae; apex of protibia with small tooth-like projection laterally; metatibiae weakly bisinuate (viewed from the side), hardly widened to apex. First segment of metatarsus slightly longer (0.90 mm) than the following two combined (0.80 mm).

**Male variation.** The Achira male differs by the following; head yellower below, and elytra blackish (somewhat ochreous towards base and on epipleura); abdomen slightly rufescent towards apex; antennae passing middle of elytra by 1.5 segments; prothorax 1.3 longer than wide; elytral surface comparatively weakly reticulate.

**Female** (Fig. 20). Scape in two females black, in three rufescent clouded dusky; in one female black patch on pronotum narrower, and middle and hind femoral clavae paler. Antennae slightly more robust (towards apex segments wider and broader at base); passing middle of elytra by one segment. Prothorax of one female more cylindrical, and 1.3 longer than wide; and in all of them basal gibbosities larger and more prominent. Spine on mesal apex of tibiae shorter than in male; lateral apex of protibia as in male.

**Measurements (mm).** 5 males/5 females, total length 4.75–5.85/5.75–6.20; length of pronotum 1.00–1.30/1.25–1.35; width of pronotum 0.80–1.00/1.00–1.05; length of elytra 3.00–3.60/3.65–3.90; width at humeri 1.00–1.25/1.20–1.30.

**Diagnosis.** This species, with ten-segmented antennae, and spined tibiae in males (Fig. 22), shares these characters with *D. densiserrata*, the spine separating them from all known males of *Dihammaphora*. *Dihammaphora espinotibia*, with black elytra and long tibial spines, is easily separated from *D. densiserrata* with orange elytra and short tibial spines. The monotypic genus *Timabiara* Napp and Mermudes, 2001, also has long tibial spines; but in *Timabiara* males have a hook-like projection on protrochanters, absent in both Bolivian species of *Dihammaphora*.

**Type material.** **Holotype male:** BOLIVIA, *Tarija*, 21°01'S/63°18'W, 600m, 30 km N of Villamontes, Camatindi-Capirenda Rd., Semi-dry Chaco Forest, flying to/on flowers of “Urundel falso” [now “Urundel chaqueño”], 11.XII.2007 (MNKM). **Paratypes:** BOLIVIA, *Tarija*, data as holotype, female (DZUP);

male and female (FSCA); female (RCSZ); 20°52'S/63°22'W, 30 km N of Villamontes, on flowers of *Croton*, male, 8–10.XII.2012, Wappes, Bonaso & Skillman col. (ACMT); 21°01'S/63°18'W, 600 m, 4 km E Camatindi, flying to/on flowers of *Croton* sp. A, female, 11.XII.2007 (RCSZ); 21°42'S/63°36'W, 762 m, 48 km N Yacuiba, 3–5 km Sanandita Road, flying to/on flowers of *Croton* sp. A, female, 8.I.2010 (RCSZ). *Santa Cruz*, 18°09'S/63°49', 1,300 m, Achira, on white-flowering *Acacia*, male, 25.XI.2004 (RCSZ); 18°09'S/63°47', 1900 m, Above Achira, Rd to Floripondio, male, 19.XII.2011, Wappes, Lingafelter & Woodley col. (ACMT); 18°05'S/63°54', 6600 ft, 16 km NE Mairana, female, 11.XII.2011 (ACMT).

**Etymology.** The specific epithet, *espinotibia*, refers to the spine-like projection of the tibiae.

### Acknowledgements

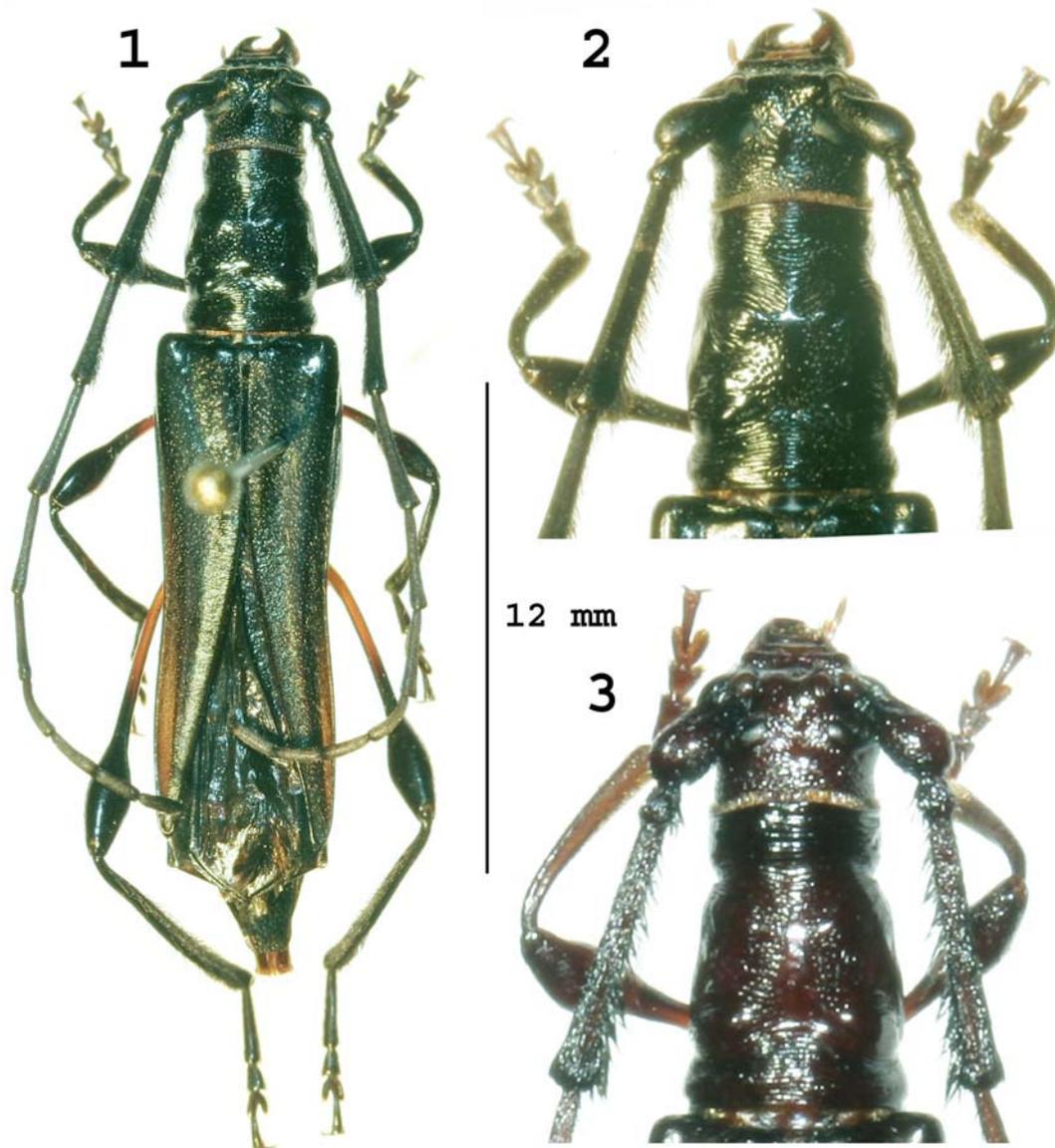
Many thanks to Dr. Joachim Willers (Museum für Naturkunde der Humboldt-Universität, Berlin, Germany) for the syntype photographs of *Dihammaphora perforata*. A special thanks to Dr. Dilma Solange Napp, (retired from the DZUP), for examining specimens and sending me a crucial PDF reprint; and for my friends, Dr. Michael Nee (New York Botanical Gardens, Institute of Systematic Botany) for his steady help with plant identifications, Ruperto Vargas (Buena Vista), Gilberto Aguilera (Samaipata) and Manuel Flores (Villamontes) for their local names. A sincere acknowledgement to my entomological colleagues, James Wappes (ACMT), Dr. Steven Lingafelter (USNM), Dr. Donald Windsor (Smithsonian Tropical Research Institute, Panama City, Panama), and Julieta Ledezma (MNKM) for the many and varied chores they have undertaken on my behalf. Additional heartfelt thanks to James Wappes and Antonio Santos-Silva who reviewed the manuscript, and editors of *Insecta Mundi* for greatly improving it. To our good friends Hugo Reinaldo Corte and Catalina Melgar, our gratitude for providing us with accommodation at Villamontes. Last but not least, praise for my wife, Sonia Zamalloa, for the many hours of help I have received from her in the field.

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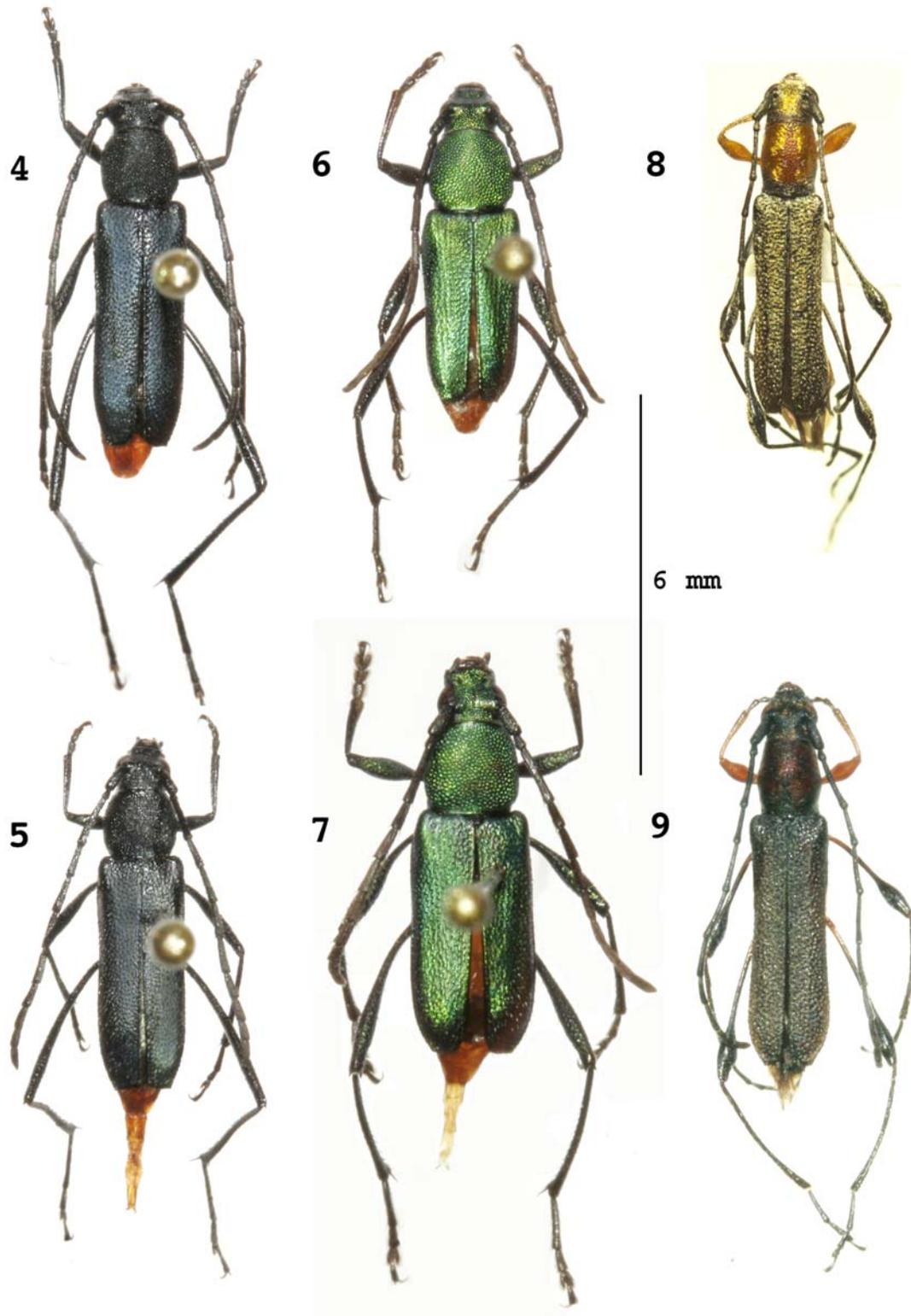
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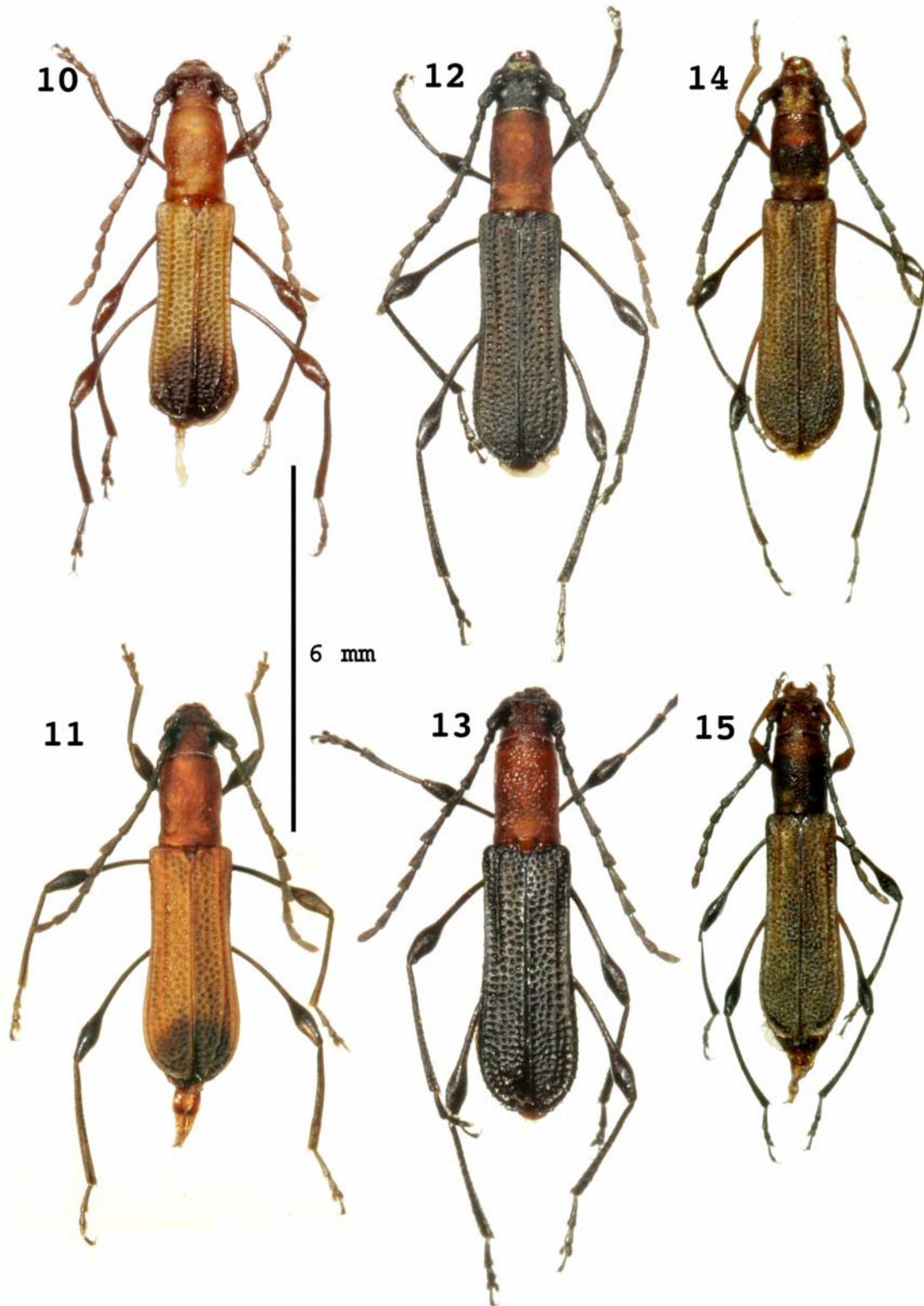
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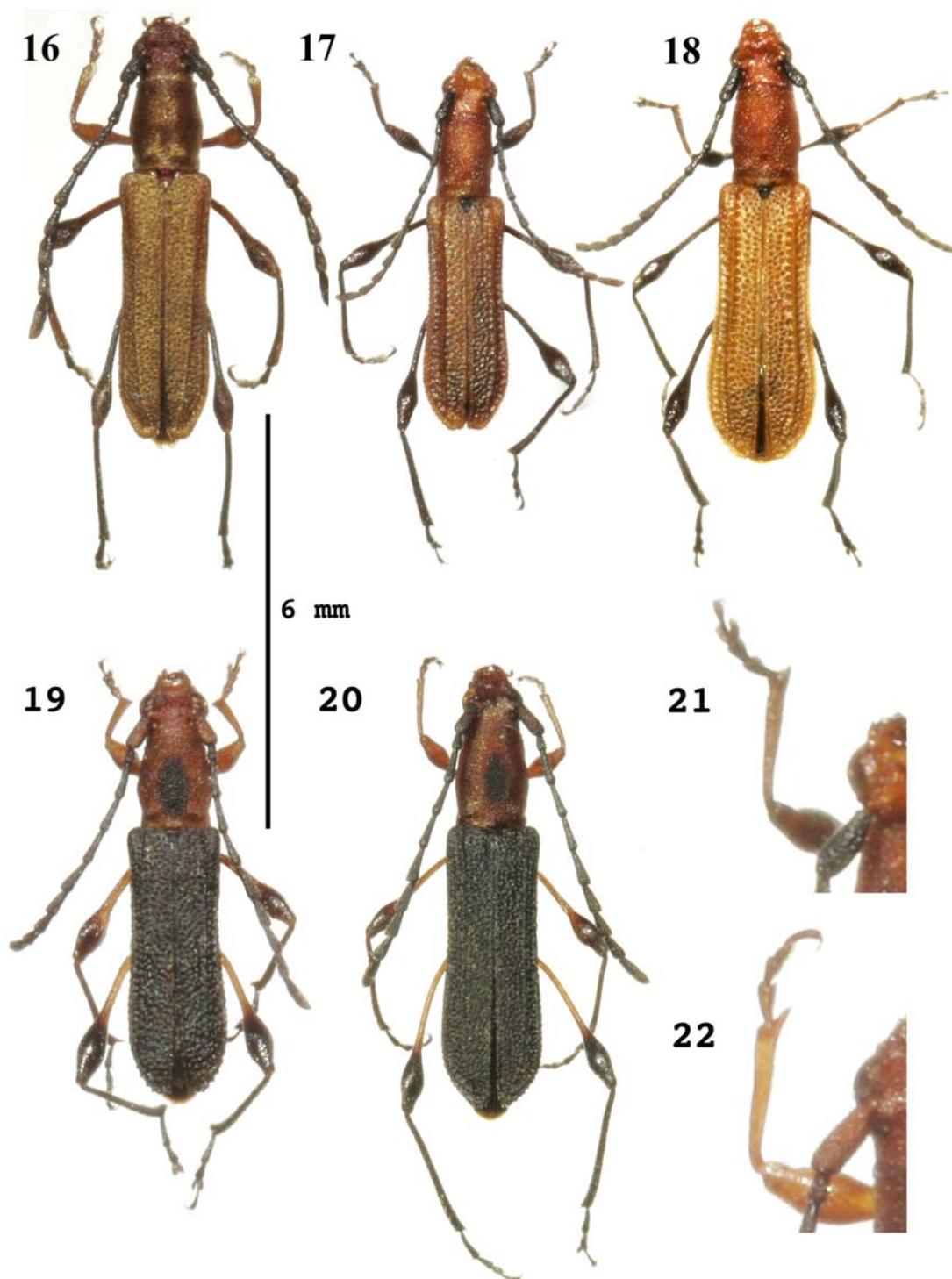
Figures 1–3. *Merionoedopsis* species. Figures 1–2. *Merionoedopsis zamalloae* sp. nov., female holotype. 1) dorsal habitus. 2) head and prothorax. 3) *Merionoedopsis aeneiventris* Gounelle, 1911, head and prothorax.



**Figures 4–9.** *Chrysoprasis* and *Rhopalophora* species. **Figures 4–5.** *Chrysoprasis azurearegina* sp. nov., dorsal habitus. **4)** male holotype. **5)** female paratype. **Figures 6–7.** *Chrysoprasis maryhowardi* sp. nov., dorsal habitus. **6)** male holotype. **7)** female paratype. **Figures 8–9.** *Rhopalophora santacruzensis* sp. nov., dorsal habitus. **8)** male holotype. **9)** female paratype.



**Figures 10–15.** *Dihammaphora* species. **Figures 10–11.** *Dihammaphora dilmanappae* sp. nov., dorsal habitus. **10)** male holotype. **11)** female paratype. **Figures 12–13.** *Dihammaphora paraperforata* sp. nov., dorsal habitus. **12)** male holotype. **13)** female paratype. **Figures 14–15.** *Dihammaphora pilcomayoensis* sp. nov., dorsal habitus. **14)** male holotype. **15)** female paratype.



**Figures 16–22.** *Dihammaphora* species. **16)** *Dihammaphora fosterorum* sp. nov., male holotype, dorsal habitus. **Figures 17–18.** *Dihammaphora densiserrata* sp. nov. **17)** male holotype, dorsal habitus. **18)** female paratype, dorsal habitus. **Figures 19–20.** *Dihammaphora espinotibiae* sp. nov. **19)** male holotype, dorsal habitus. **20)** female paratype, dorsal habitus. **21)** *Dihammaphora densiserrata* sp. nov. male holotype, protibia. **22)** *Dihammaphora espinotibiae* sp. nov. male holotype, protibia.

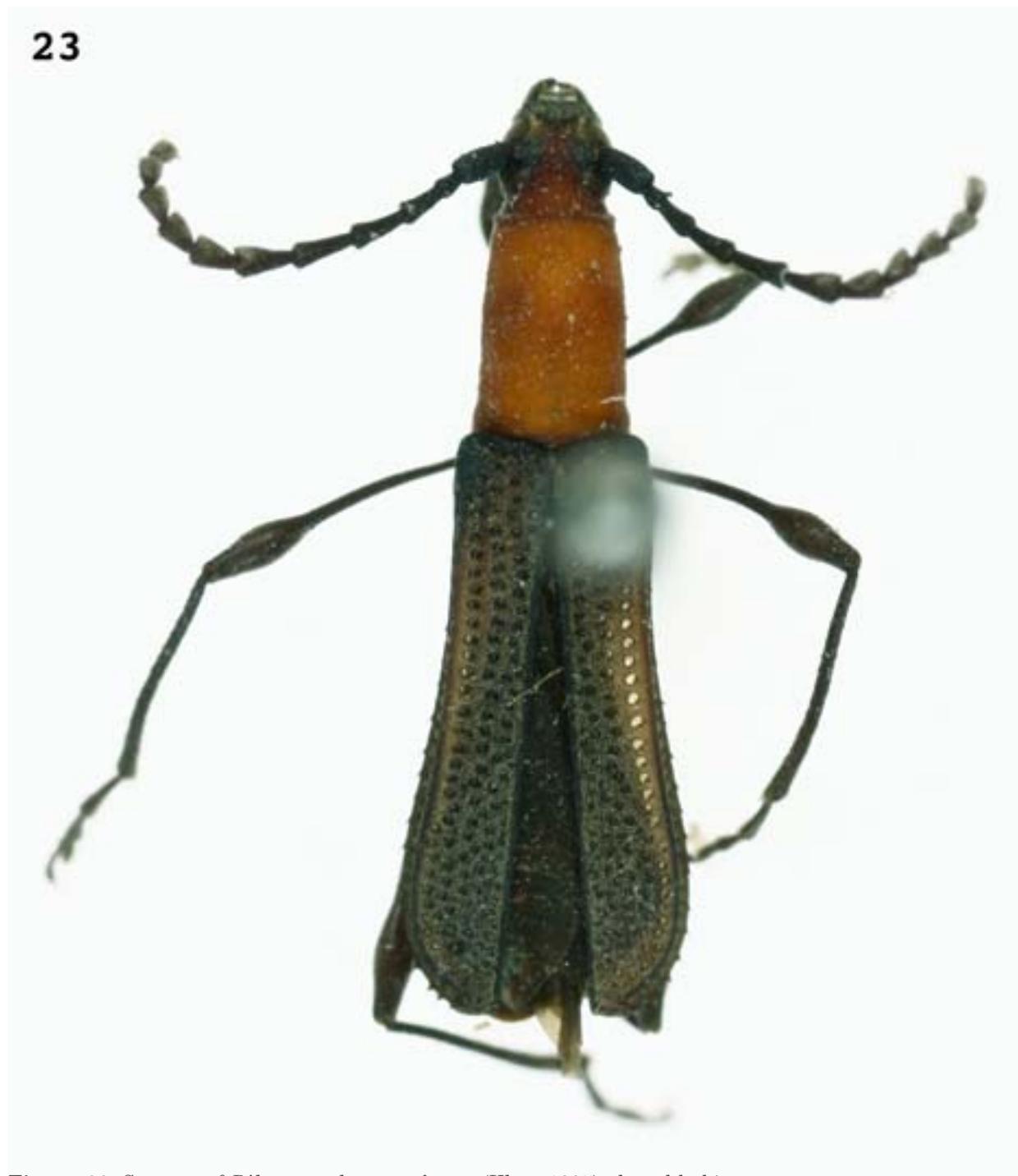


Figure 23. Syntype of *Dihammaphora perforata* (Klug, 1825), dorsal habitus.

**Appendix 1.** Summary of host flowers visited by anthophilous Cerambycinae

- Acacia** (*Acacia* sp. – MIMOSACEAE)  
*Dihammaphora espinotibia* sp. nov.  
*Dihammaphora fosterorum* sp. nov.  
*Dihammaphora pilcomayoensis* sp. nov.  
*Rhopalophora santacruzensis* sp. nov.
- Bejucó colorado enano** (*Rourea puberula* Baker – CONNARACEAE)  
*Merionoedopsis zamalloae* sp. nov.
- Bejucó hoja lanuda** (*Gouania mollis* Reiss – RHAMNACEAE)  
*Dihammaphora densiserrata* sp. nov.  
*Dihammaphora dilmanappae* sp. nov.  
*Dihammaphora paraperforata* sp. nov.
- Gomphrena** (*Gomphrena vaga* Mart. – AMARANTHACEAE)  
*Chrysoprasia maryhowardae* sp. nov.  
*Dihammaphora paraperforata* sp. nov.
- Sama blanca** (*Cupania cinerea* Poepp. and Endl. – SAPINDACEAE)  
*Dihammaphora densiserrata* sp. nov.
- Sama blanca chica** (*Matayba guianensis* Aublet – SAPINDACEAE)  
*Dihammaphora densiserrata* sp. nov.  
*Dihammaphora dilmanappae* sp. nov.
- Sapaimosi chico** (*Diplokeleba herzogii* Radlk. (?) – SAPINDACEAE)  
*Dihammaphora paraperforata* sp. nov.
- Tinajero (A)** (*Croton* sp.) – EUPHORBIACEAE  
*Chrysoprasia azurearegina* sp. nov.  
*Dihammaphora espinotibia* sp. nov.
- Turere** (*Rhamnidium elaeocarpum* Reissek – RHAMNACEAE)  
*Dihammaphora dilmanappae* sp. nov.
- Urundel chaqueño** (*Diplokeleba floribunda* Brown – SAPINDACEAE)  
*Dihammaphora espinotibia* sp. nov.