

## Research article

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# New Coccinellidae (Coleoptera, Coccinelloidea) from Napo Province in Ecuador

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**Abstract.** Examination of Coccinellidae material recently collected from Napo Province in Ecuador revealed 38 species of ladybird beetles, of which six are new: *Chnoodes yanayacu* sp. nov., *Cyrea mcclarini* sp. nov., *Eupalea borowieci* sp. nov., *Exoplectra misahualli* sp. nov., *Hyperaspis rutai* sp. nov., *Toxotoma gonzalezi* sp. nov. Seven species are recorded for the first time from Ecuador: *Cyrea noticollis* (Mulsant, 1850), *Eupalea formosa* Mulsant, 1850, *Epilachna transverselineata* (Mader, 1858), *Psyllobora marshalli* Crotch, 1874, *Toxotoma fuscopilosa* (Weise, 1902), *Toxotoma taeniola* (Gordon, 1975), *Zenoria linteolata* Mulsant, 1850. For three species: *Epilachna obtusifirma* Gordon, 1975, *Hinda ecuadorica* Gordon & Canepari, 2013 and *Siola atra* González, 2015, supplementary notes on the original descriptions are provided. New name combinations are proposed for six species, which are transferred to the genus *Toxotoma* Weise, 1900: *Toxotoma aequatorialis* (Gordon, 1975), *Toxotoma chigata* (Gordon, 1975), *Toxotoma flavocirculus* (González, 2015), *Toxotoma fuscopilosa*, *Toxotoma hybridula* (Gordon, 1975), *Toxotoma taeniola*. The occurrence of *Scymnus interruptus* (Goeze, 1777) in Ecuador is also confirmed.

**Keywords.** Taxonomy, new species, ladybird beetles, Neotropic, Andes.

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## Introduction

Coccinellidae Latreille, 1807, with more than 6000 species worldwide is the largest family within the superfamily Coccinelloidea Latreille, 1807 (Che *et al.* 2021). Although coccinellids are one of the most widely recognizable groups of beetles, their classification is still not stable (Sasaji 1971; Kovář 1996; Ślipiński 2007; Che *et al.* 2021). The largest diversity of ladybird beetles occurs in tropical and subtropical regions, and almost every collecting survey in such environments provides many new species to describe. However, new species (and tribes) of ladybird beetles were recently discovered in Europe

(new species of *Hyperaspis* Chevrolat in Dejean, 1837 – Bogaert *et al.* 2012; new tribe Madeirodulini – Szawaryn *et al.* 2020).

The eastern slopes of the Andes Mountains are a biodiversity hotspot (Myers *et al.* 2000) where the diversity of coccinellids is among the greatest in the world. Of the Andean countries, the Peruvian fauna of ladybird beetles is the most diverse, exceeding 400 species (González 2007); however, in many countries, the diversity of coccinellids is very poorly studied (e.g., Bolivia, Ecuador). Recent investigation of the material collected in Ecuador resulted in descriptions of numerous new species (González 2015a; Szawaryn & González 2017; González & Větrovec 2021). An examination of new material from Napo Province collected in 2009 revealed many new species and new country records which are herein described. One additional species, *Mada andeana* Szawaryn, 2015, was described from the same material in an earlier paper (Szawaryn 2015).

## Material and methods

Material was collected in and around the Yanayacu biological station in Ecuador in 2009.

Genitalia were dissected, cleared in a 10% solution of KOH, rinsed with distilled water, transferred to glycerol, and examined on slides. All color images were taken using a stereo microscope Leica MZ 16 with a digital camera IC 3D. Final images were produced using Helicon Focus 5.0X64 and Adobe Photoshop CS6 software. SEM illustrations were taken in the Laboratory of Scanning Microscopy, MIZ (Warsaw), using a HITACHI S-3400N under low vacuum conditions.

## Institutional abbreviations

MIZ = Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland  
MNHW = Museum of Natural History, University of Wrocław, Wrocław, Poland

## Abbreviations for measurements

EL = elytral length, along suture including scutellar shield  
EW = elytral width, across both elytra in the widest part  
PL = pronotal length, from the middle of anterior margin to margin of basal foramen  
PW = pronotal width, across widest part  
TL = total body length, from apical margin of clypeus to apex of elytra

Beetle morphology follows Lawrence *et al.* (2011), specific terminology follows Ślipiński (2007), classification after Seago *et al.* (2011) and Che *et al.* (2021). Classification of Epilachnini Costa, 1849 after Szawaryn *et al.* (2015) and Tomaszewska & Szawaryn (2016).

## Results

### Taxonomy

Class Insecta Linnaeus, 1758  
Order Coleoptera Linnaeus, 1758  
Suborder Polyphaga Emery, 1886  
Superfamily Coccineloidea Latreille, 1807  
Family Coccinellidae Latreille, 1807  
Subfamily Coccinellinae Latreille, 1807  
Tribe Brachiacanthini Mulsant, 1850  
Genus *Cyrea* Gordon & Canepari, 2013

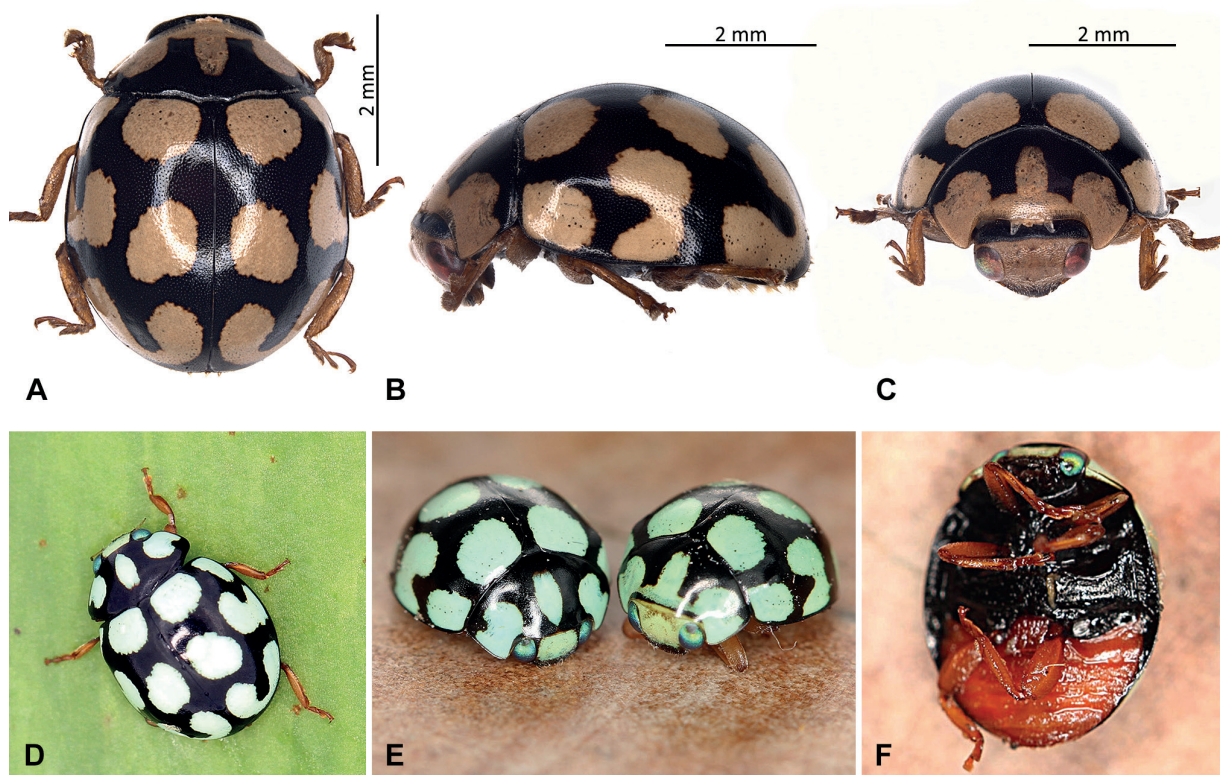
*Cyrea mcclarini* sp. nov.

[urn:lsid:zoobank.org:act:C81AA272-39BD-446F-802E-F3B318BF3BDB](https://zoobank.org/urn:lsid:zoobank.org:act:C81AA272-39BD-446F-802E-F3B318BF3BDB)

Figs 1–2

### Diagnosis

*Cyrea mcclarini* sp. nov. has a distinctive dorsal elytral pattern rarely found in ladybird beetles, with a turquoise colored maculae in living specimens (Fig. 1D–E) by which it may be easily recognized. In dried specimens the turquoise color disappears and the maculae become yellow (Fig. 1A–C). However, the unique double C pattern on each elytron (Fig. 1B, D) distinguish this species from all other known



**Fig. 1.** Habitus of *Cyrea mcclarini* sp. nov. **A.** Paratype (MIZ), ♂, dorsal view. **B.** Paratype (MIZ), ♂, lateral view. **C.** Paratype (MIZ), ♂, frontal view. **D.** Living specimen, dorsal view. **E.** Living specimens (left = female; right = male). **F.** Living specimen, ventral view. Photos: D–F = Jim McClarin.

species. Males have parameres unmodified, which places this species in the *tredecimguttata* group as defined by Canepari *et al.* (2016). Males can be separated by the following characters: presence of distinct, small, subtriangular projections on the posterior margin of ventrite 6 (Fig. 2B), large angulate projections on the posterior margin of tergite X (Fig. 2G), penis guide with truncate apex (Fig. 2L), tip of penis with spine like projections on both sides (Fig. 2J), and peculiar shape of inner sclerites in the apical part of penis (Fig. 2I–J). Females can be distinguished by distinctly shaped additional sclerites in the bursa copulatrix and a large rounded projection on the ventral surface of bursa (Fig. 2D–E).

### Etymology

This species is dedicated to Jim McClarin from Consanga, Napo, Ecuador, who kindly provided images of living specimens.

### Type material

#### Holotype

ECUADOR • ♂; “Napo prov., Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 17 XII 2009, leg. R. Ruta”; MNHW.

#### Paratypes

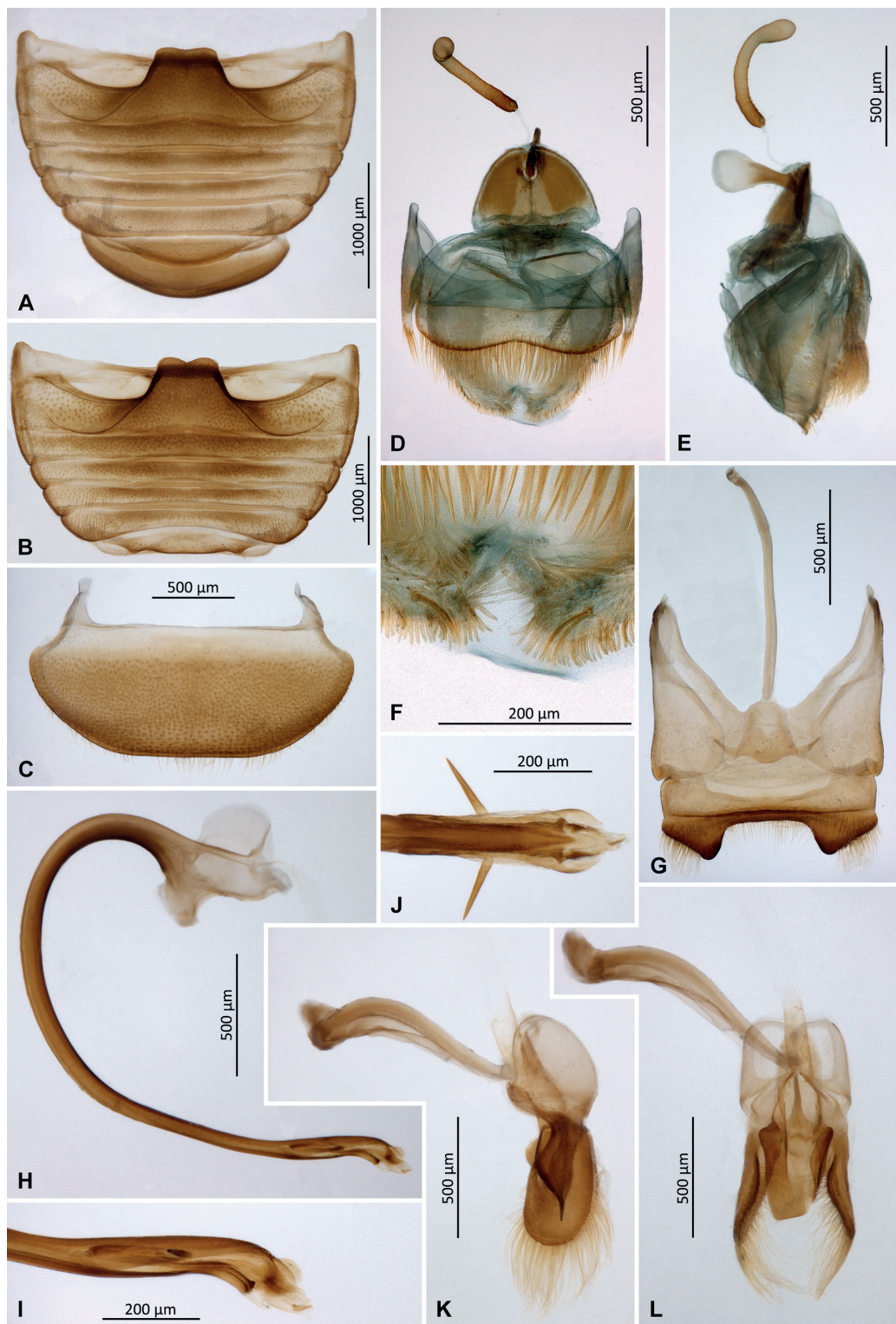
ECUADOR • 2 ♂♂; “Napo prov. Data same as for the holotype”; MNHW • 4 ♂♂, 2 ♀♀; “Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW • 2 ♂♂; same collection data as for preceding; MIZ • 2 ♂♂; “Cosanga vic., Antisana trail, Yanayacu, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga, Yanayacu road, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, steam trail, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta”; MNHW • 3 ♂♂, 1 ♀; “Cosanga vic., Yanayacu St.-Rio Aliso road, 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 2 ♂♂, 2 ♀♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI–17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga vic., near river 1900 m, 00°34’42.3”S / 77°51’59.3”W, 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga, Yanayacu 5 km rd. collecting along the road, 25 XI 2009, leg. L. Borowiec”; MNHW.

### Description

**BODY.** Length 5.00 mm; TL/EW = 1.25; PL/PW = 0.50; EL/EW = 1.00. Body oval (Fig. 1A, D), convex (Fig. 1B), winged; head black with turquoise frons and vertex in male and frons in female (Fig. 1E), pronotum black with three turquoise spots: one longitudinally elongate placed medially and two rounded on pronotal anterior corners, in males all spots fused with yellow anterior pronotal margin, in females separate (Fig. 1E); elytra black with five maculae on each elytron (2+2+1): humeral, anteromedian and discal spots oval, lateral and posterior spots C-shaped (Fig. 1B, D); ventrally (Fig. 1F) anterior part of hypomera turquoise; antennae, legs except coxae and abdomen reddish-brown; hypomera except anterior part, prosternum, meso- and metaventrite, coxae and epipleura black; mouthparts infuscate; mesepimeron in male turquoise. In death, turquoise color disappears and turns yellow. Dorsum glabrous, with single size punctures. Punctures on elytra less coarse than on head and pronotum. Head with microreticulation between punctures.

**HEAD.** Head partially covered by pronotum dorsally (Fig. 1E); ventral antennal grooves distinct, straight along eye margin. Eyes prominent, finely faceted, dorsally with inner orbits arcuate; ocular canthus present, as long as 4–5 ommatidium diameters; interocular distance about 0.50 × as wide as head across eyes; interfacetal setae absent. Antenna short, 0.35 × as long as head capsule width, composed of 11 antennomeres; scape simple, without projections; pedicel narrower than scape, barrel-shaped, about 1.20 × as long as wide; antennomere 3 about 1.20 × as long as pedicel. Antennal club consisting of three





**Fig. 2.** *Cyrea mcclarini* sp. nov. **A.** Paratype (MIZ), ♀, abdomen. **B.** Holotype (MNHW), ♂, abdomen. **C.** Holotype (MNHW), ♂, tergite VIII. **D.** Paratype (MIZ), ♀, genitalia, ventral view. **E.** Paratype (MIZ), ♀, genitalia, lateral view. **F.** Paratype (MIZ), coxites apices, ventral view. **G.** Holotype (MNHW), ♂, segments IX and X, dorsal. **H.** Holotype (MNHW), penis, lateral. **I.** Holotype (MNHW), penis tip, lateral. **J.** Holotype (MNHW), penis tip, inner. **K.** Holotype (MNHW), tegmen, lateral view. **L.** Holotype (MNHW), tegmen, inner view.

antennomeres, elongate, slender; antennomere 9 and 10, subequal in length; antennomere 11 elongate, obliquely truncate apically. Anterior clypeal margin straight. Labrum truncate at apex. Mandible bidentate at apex. Maxillary cardo transverse with outer angle reaching slightly outside of mouth cavity; terminal palpomere securiform, truncate obliquely. Submentum transverse; mentum sub-trapezoidal with anterolateral lobes projecting forwards, anterior edge strongly emarginate, ventral surface with lateral grooves along edges; prementum transverse; labial palps separated by distance about equal to width of palpomere; apical palpomere as long as penultimate one. Gula with distinct pore.

**PROTHORAX.** Pronotum with anterior corners rounded, obtuse (Fig. 1C); anterior, lateral and hind margins without bordering line. Prothoracic hypomeron smooth; notosternal suture distinct; prosternal process slightly widened apically, apex truncate; without carinae. Prosternum in front of coxa about  $0.70 \times$  as long as coxal longitudinal diameter at same position, its surface coarsely punctate, anterior margin with complete border; procoxal cavity elongate with bordering line, with lateral slit.

**PTEROTHORAX.** Mesoventrite with anterior edge margined with complete raised border; mesoventral process at median width of coxa about  $0.80$  as broad as corresponding coxal diameter; meso-metaventral articulation with suture visible; junction straight. Scutellar shield pentagonal; surface punctate and glabrous. Elytra with sides rounded; lateral margins narrow, partially visible from above from base to half its length; humeral angles slightly projected; elytral epipleuron wide, about  $3.0 \times$  as wide as corresponding metaepisternum, reaching base of ventrite 3, obtuse apically, inner margin with bordering line straight and fading before base of elytron; with foveae for reception of femora. Metaventricle with discrimen long but incomplete anteriorly; metaventral postcoxal lines joined at middle, roundly recurved and reaching lateral edge of metaventricle; metaventricle coarsely punctate on lateral sides; metepimeron indistinct.

**LEGS.** Legs with trochanters angulate; protibia narrow, outer margin smooth; tibial apices without spurs; tarsi with four tarsomeres, third very small; tarsal claws in both sexes bifid, inner tooth subquadrate; empodium absent.

**ABDOMEN.** Abdomen with six ventrites in both sexes (Fig. 2A–B), in male projections of tergite X also partially visible (Fig. 2G); ventrite 1,  $2.0 \times$  as long as ventrite 2, ventrite 2–4 subequal in length; abdominal postcoxal lines separate medially, incomplete, posteriorly reaching hind margin of ventrite 1 and recurved; hind margin of ventrite 5 in male widely emarginate (Fig. 2B), in female straight (Fig. 2A); male ventrite 6 truncate apically with distinct subtriangular lateral projections densely covered with hairs; male tergite VIII truncate apically (Fig. 2C); female ventrite 6 and tergite VIII rounded (Fig. 2A). In both sexes ventrite 6 with lateral pockets for accommodation of bent tergite VIII, lateral margins of tergite VIII partially covers ventrite 6. Entire surface of abdomen setose, central part of ventrite 1 with tuft of longer hairs.

**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 2G) with additional sclerite at base of apodeme subtrapezoidal, with small, lateral lobes; apodeme rod-like, arcuate; tergite X transverse, well sclerotized, with large subtriangular projections on posterior surface, projections visible externally. Tegmen in inner view (Fig. 2L) with penis guide asymmetrical, broad, obliquely truncate apically; parameres (Fig. 2K), well developed, wide oval, rounded apically, about  $1.25 \times$  as long as penis guide, with fringe of dense, long setae on apices and edges; tegminal strut widened apically. Penis capsule (Fig. 2H) with inner arm short, outer arm well developed, expanded; penis of equal diameter along entire length, slightly widened on a tip; penis tip slightly curved outwardly, apex partially membranous with additional sclerites (Fig. 2I), lateral spine like projections present (Fig. 2J).

**FEMALE GENITALIA.** Sperm duct uniform in diameter, short, shorter than spermatheca; infundibulum absent; spermatheca C-shaped, vermiform, with bulbous apex, without clear nodulus and ramus, spermathecal



accessory gland present (not shown). Apical part of bursa sclerotized forming almost semi rounded disc with oval hole present in apical part, lateral margins more heavily sclerotized, darker, median suture visible (Fig. 2D), additional sclerotized strut broad and distinctly rounded apically (Fig. 2E). Coxites broad, angled at apex; apical margins with row of short, stout setae; styli reduced, bearing two long setae (Fig. 2F). Proctiger transverse with hind edge emarginate, covered with long hairs (Fig. 2D).

*Cyrea noticollis* (Mulsant, 1850)

**Material examined**

ECUADOR • 1 ♀; “Orellana prov., Rio Suyuno, 7 km NE of Loreto, 426m, 00°37'S / 77°17'W, 10 XII 2009, leg. L. Borowiec”; MNHW.

**Remarks**

Species new to Ecuador.

Genus *Hinda* Mulsant, 1850

*Hinda ecuadorica* Gordon & Canepari, 2013

Figs 3E–F, 4

**Material examined**

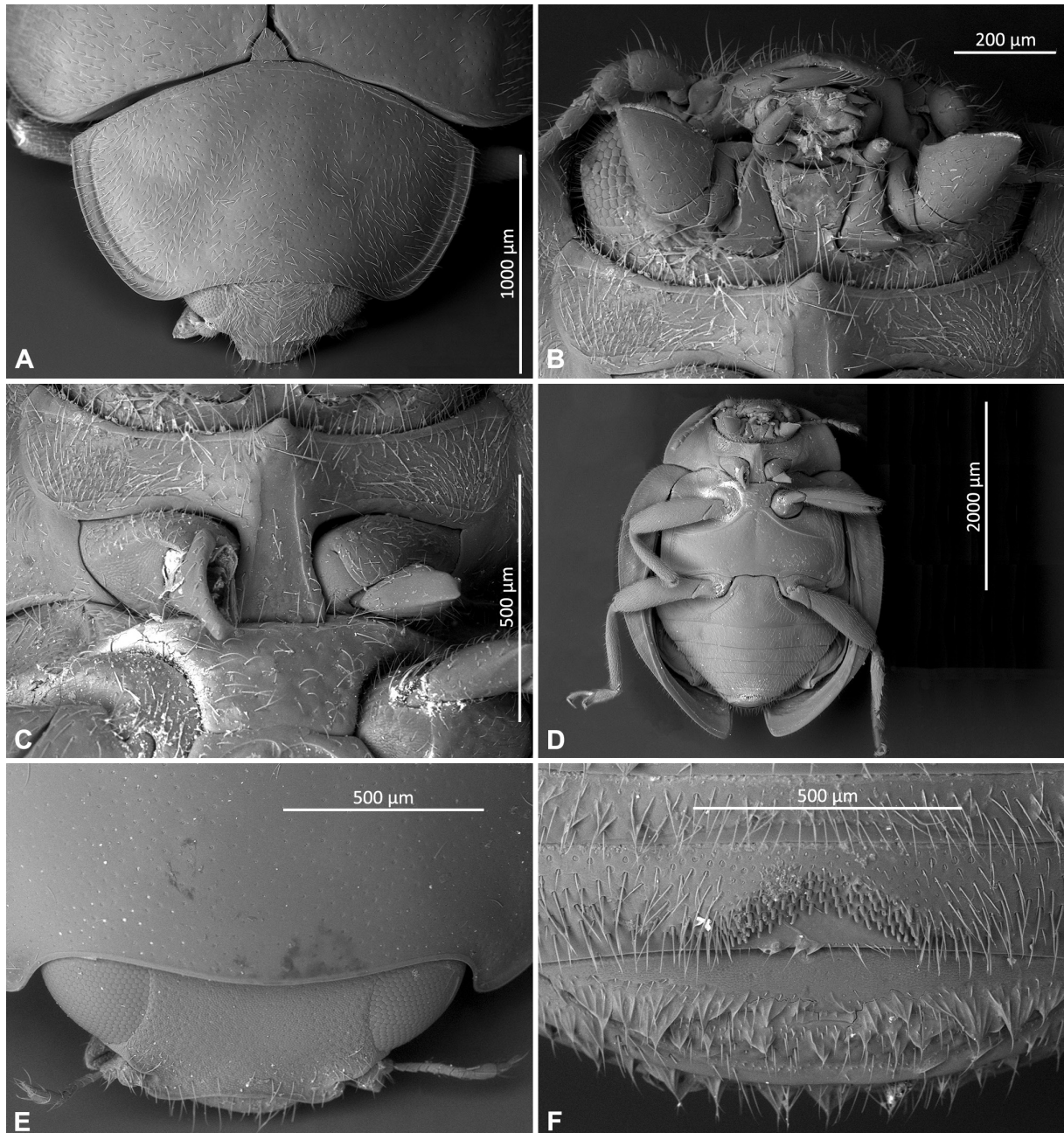
ECUADOR • 2 ♂♂; “Napo prov.: Cosanga, Yanayacu road, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; same collection data as for preceding; MIZ • 2 ♂♂; “Napo prov.: Cosanga, Yanayacu road, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; same collection data as for preceding; MIZ • 1 ♂, 3 ♀♀; “Cosanga, Yanayacu 5 km rd. collecting along the road 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♀; “Napo prov., Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MNHW.

**Additions to the original description**

**BODY.** Head black with yellow frons and vertex in male and frons in female. Protibia with wide, serrate flange (Fig. 3E). Abdomen with six ventrites in both sexes (Fig. 4A–B); ventrite 5 in male straight apically, with deep incision in middle, formed by very short setae; ventrite 5 in female straight apically, without incision; ventrite 6 in male slightly emarginated (Fig. 4A), in female arcuate (Fig. 4B); tergite VIII rounded apically in both sexes (Fig. 4C–D).

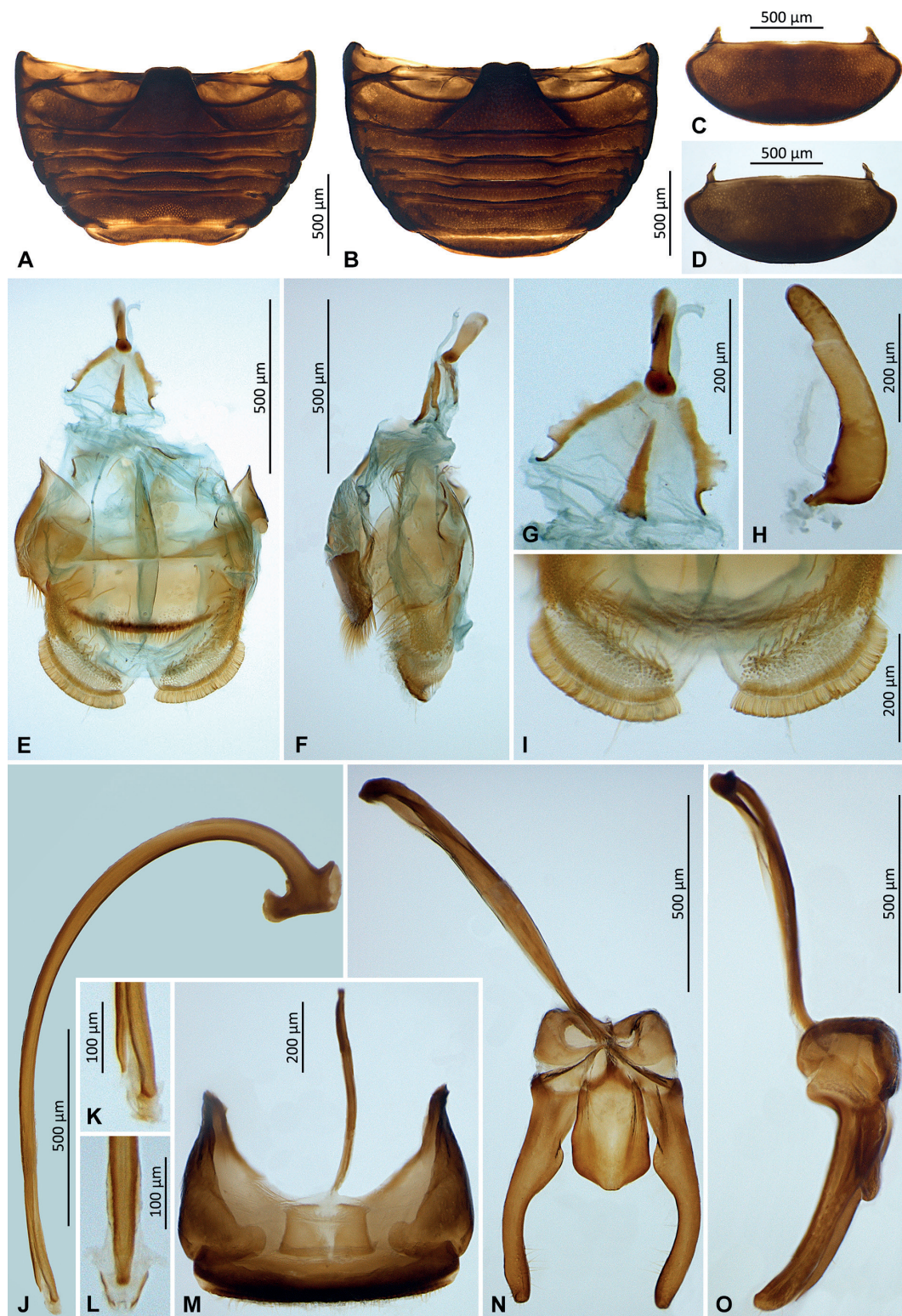
**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 4M) with additional sclerite subtrapezoidal; spiculum rod-like, shorter than width of sternite IX; tergite X short, transverse. Tegmen in inner view (Fig. 4N) with penis guide symmetrical, sides nearly parallel, slightly projected apically; parameres well developed, more than 2 × as long as penis guide, with small lobes in inner surface; in lateral view (Fig. 4O) slender, rounded apically, with sparse, long hairs on apices; tegminal strut stout, slightly arcuate. Penis capsule (Fig. 4J) with inner arm constricted medially, outer arm broadened but short; penis of nearly equal diameter along entire length, slightly widened at tip (Fig. 4K); penis tip with visible lateral alae (Fig. 4L).

**FEMALE GENITALIA.** Sperm duct uniform in diameter, moderately long; infundibulum absent (Fig. 4E–F); spermatheca (Fig. 4H) elongate, vermiform, tapering into apex, without clear visible nodulus and ramus, spermathecal accessory gland adjacent to sperm duct. Bursal cap with three sclerotized arms, outer 2 arms externally ragged (Fig. 4G); apical strut long, spatulate in lateral view (Fig. 4F). Coxites elongate, rounded on apices; inner surface densely covered with long setae; apical margins with row of short, stout setae fused in uniform comb along entire edge, styli present, stick out beyond comb as simple setae (Fig. 4I). Proctiger distinctly shorter than coxites; its hind edge arcuate, covered with long hairs (Fig. 4E–F).



**Fig. 3.** SEM images. **A–D.** *Eupalea borowieci* sp. nov., paratype (MIZ). **E.** *Hyperaspis rutai* sp. nov., paratype (MIZ). **F.** *Hinda ecuadorica* Gordon & Canepari, 2013, ♂, (MIZ). **A.** Head and pronotum. **B.** Head, ventral. **C.** Prosternum and mesoventrite. **D.** Habitus, ventral view. **E.** Head, dorsal view. **F.** Distal part of abdomen, ventral view.





**Fig. 4.** *Hinda ecuadorica* Gordon & Canepari, 2013 (MIZ). **A.** ♂, abdomen. **B.** ♀, abdomen. **C.** ♂, tergite VIII. **D.** ♀, tergite VIII. **E.** ♀, genitalia, ventral view. **F.** ♀, genitalia, lateral view. **G.** Internal sclerites in bursa copulatrix. **H.** Spermatheca. **I.** Coxites, ventral view. **J.** Penis, lateral view. **K.** Penis tip, lateral view. **L.** Penis tip, inner view. **M.** ♂, segments IX and X, dorsal. **N.** Tegmen, inner view. **O.** Tegmen, lateral view.

Genus *Serratitibia* Gordon & Canepari, 2013

*Serratitibia anna* Gordon & Canepari, 2013

**Material examined**

ECUADOR • 3 ♂♂; “Napo prov.: Cosanga vic., Antisana trail, Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW • 4 ♂♂, 3 ♀♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 23–24 XI 2009, leg. R. Ruta”; MNHW • 2 ♂♂; “Cosanga vic., Yanayacu Station, Bamboo hill trail & stream, 2125 m, S 00°36’18.4” / W 77°53’09”, 5 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 16 XII 2009, leg. R. Ruta”; MIZ • 1 ♀; “Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga, Yanayacu road, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., Yanayacu Station, steam trail, 2000–2200m, 00°35’S / 77°53’W, 28 XI 2009, leg. R. Ruta”; MIZ • 20 ♂♂, 7 ♀♀; “Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW • 9 ♂♂, 4 ♀♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 2 ♂♂, 2 ♀♀; same collection data as for preceding; MIZ • 1 ♂; “Cosanga to Yanayacu, 5 km rd, collecting along the road, 25 XI 2009, leg. L. Borowiec”; MNHW.

*Serratitibia fraudulenta* (Kirsch, 1876)

**Material examined**

ECUADOR • ♂; “Napo prov.: Puerto Misahuallí (2 km S), 439m, 01°02’S / 77°39’W, 8 XII 2009, leg. R. Ruta”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 1 ♀; same collection data as for preceding; L. Borowiec leg.; MNHW.

*Serratitibia lisa* Gordon & Canepari, 2013

**Material examined**

ECUADOR • 1 ♂; “Napo prov.: Cosanga vic., Antisana trail, Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW.

Tribe Coccidulini Mulsant, 1846

Genus *Eupalea* Mulsant, 1850

*Eupalea borowieci* sp. nov.

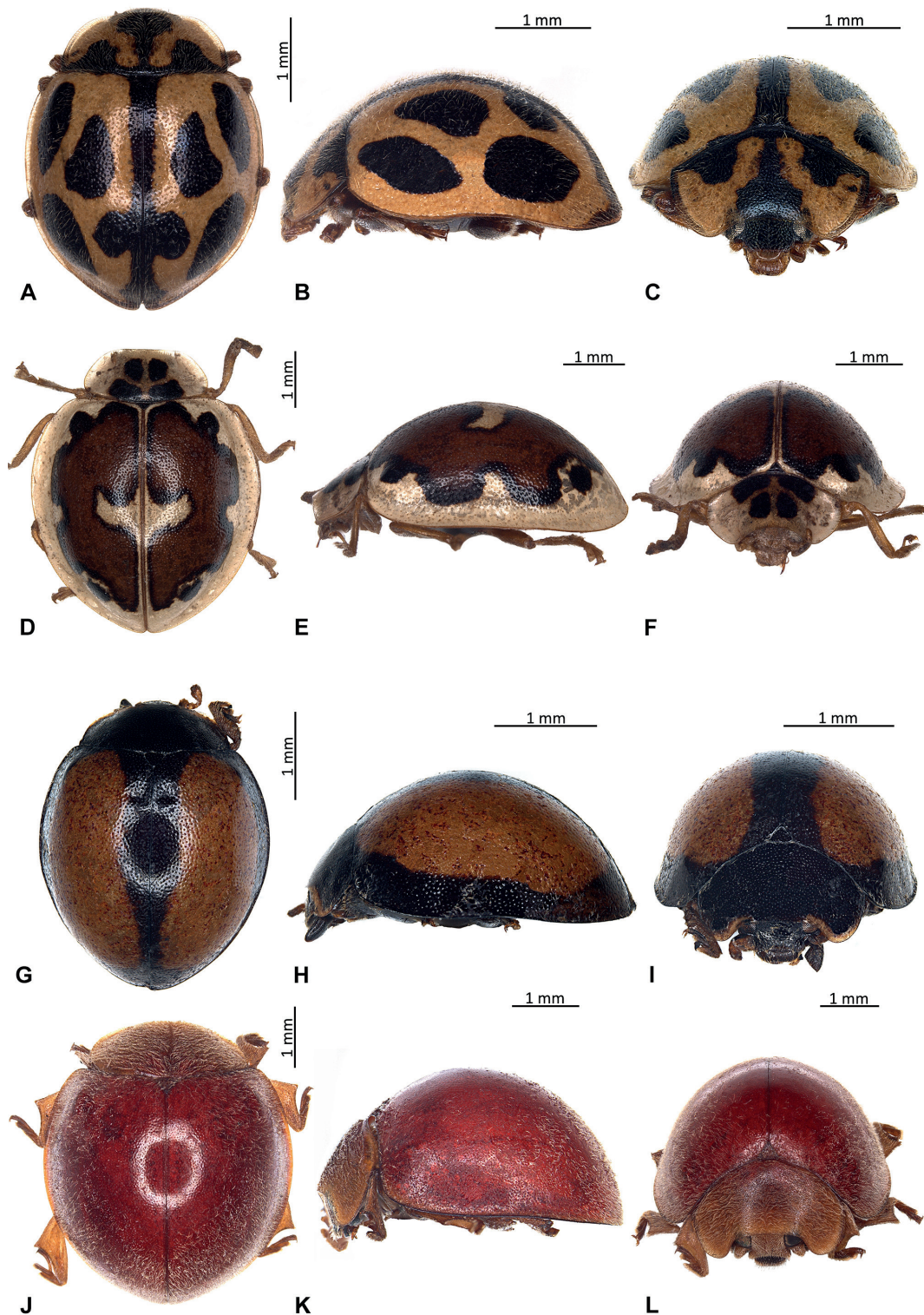
[urn:lsid:zoobank.org:act:841C8A61-9400-49EA-ACB9-DE2627351241](https://zoobank.org/urn:lsid:zoobank.org:act:841C8A61-9400-49EA-ACB9-DE2627351241)

Figs 3A–D, 5A–C, 6

**Diagnosis**

*Eupalea borowieci* sp. nov. belongs to the *conglomerata* species group which contains: *E. conglomerata* Crotch, *E. fryii* Crotch, *E. suffriani* Mulsant, 1850 and *E. melzeri* (Korschevsky, 1935) (Almeida & Gordon 1990). The group is characterized by an elongate oval body form and the dorsum yellow with several large, elongate, brown spots (Almeida & Gordon 1990). This species differs from other species within this species group by a unique arrangement of dorsal maculae (Fig. 5A) and a much darker, almost black color. The male genitalia are most similar to those of *E. reticularis* González, 2015 by having the penis with thickening in half of its length and a similar shape of the tip, but differs by having the penis guide in inner view with margins parallel, straight in lateral view, while in *E. reticularis* in inner view margins taper into tip, and in lateral view they are sinusoidal (González 2015a).





**Fig. 5.** Habitus. A–C. *Eupalea borowieci* sp. nov., ♂, holotype (MNHW). A. Dorsal view. B. Lateral view. C. Frontal view. D–F. *Psyllobora marshalli* Crotch, 1874, sex (MNHW). D. Dorsal view. E. Lateral view. F. Frontal view. G–I. *Chnoodes yanayacu* sp. nov., ♂, holotype (MNHW). G. Dorsal view. H. Lateral view. I. Frontal view. J–L. *Exoplectra misahualli* sp. nov., ♂, holotype (MNHW). J. Dorsal view. K. Lateral view. L. Frontal view.

**Etymology**

Dedicated to the Polish entomologist and world expert in Cassidinae (Chrysomelidae), collector of the type series, Lech Borowiec (University of Wrocław).

**Material examined****Holotype**

ECUADOR • ♂; “Napo prov., Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35'S / 77°53'W, 30 XI 2009, leg. L. Borowiec”; MNHW.

**Paratypes**

ECUADOR • 3 ♂♂, 3 ♀♀; same collection data as for holotype; MNHW • 1 ♀; same collection data as for holotype; MIZ • 1 ♀; same collection data as for preceding; MIZ • 2 ♂♂, 2 ♀♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35'S / 77°53'W, 23 XI – 17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 1 ♀; “Cosanga vic., near river 1900m, 00°34'42.3"S / 77°51'59.3"W, 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga vic., near river 1900m, S 00°34'42.3" / W 77°51'59.3", 25 XI 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, Bamboo hill trail & stream, 2125 m, S 00°36'18.4" / W 77°53'09", 5 XII 2009, leg. R. Ruta”; MIZ • 1 ♀; “Cosanga, Yanayacu road, 2 XII 2009, leg. R. Ruta”; MNHW.

**Description**

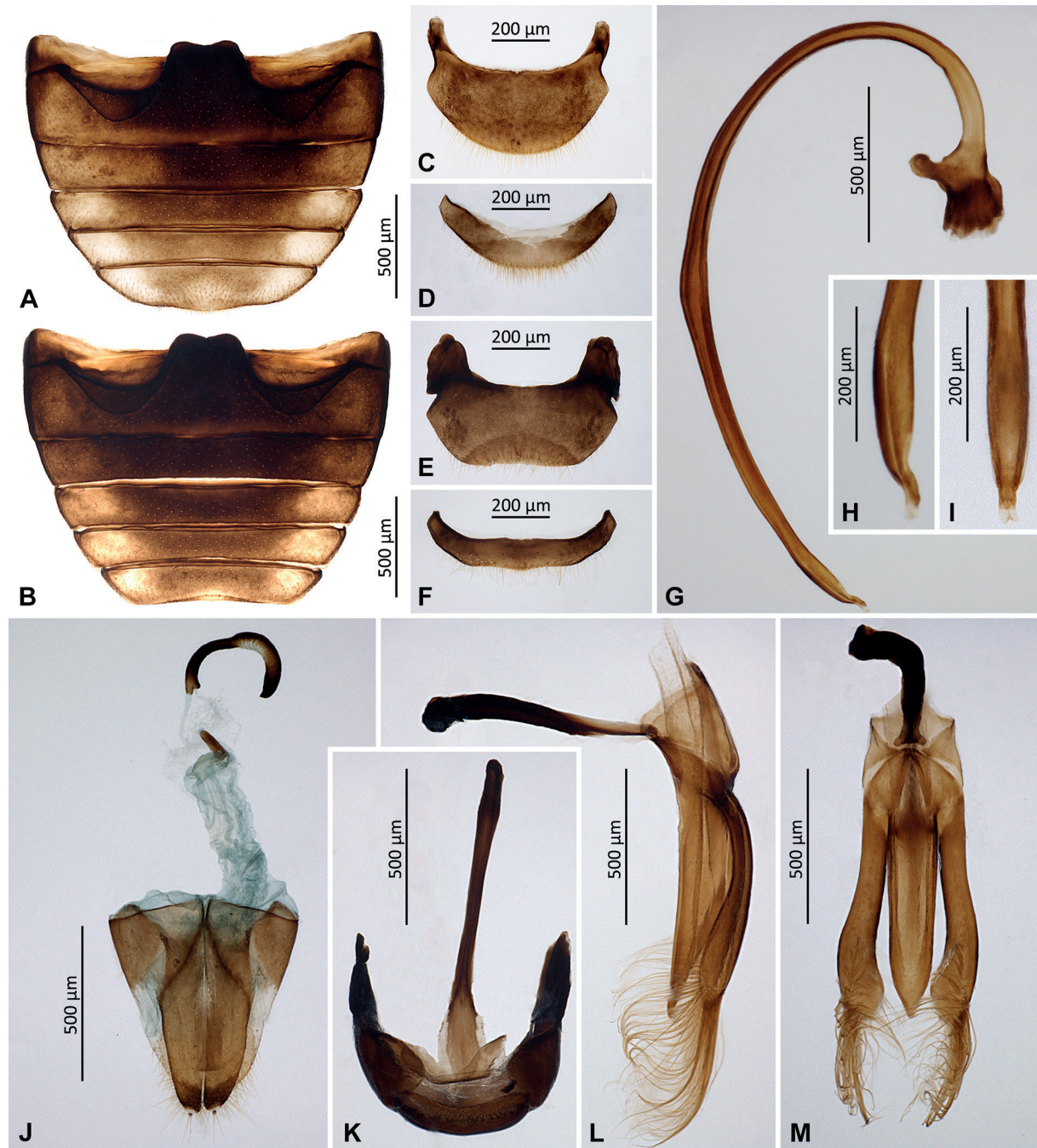
**BODY.** Length 3.50 mm; TL/EW = 1.20; PL/PW = 0.66; EL/EW = 1.20. Body (Fig. 5A) elongate oval, slightly acuminate apically, moderately convex (Fig. 5B), winged; head (Fig. 5C) black, pronotum yellow with basal margin and half length of lateral margins black, with three black maculae, one subtriangular placed medially, and two rounded lateral spots joined to the basal margin; elytra yellow with suture and apex black, with four black spots on each elytron: two lateral, elongate in shape (one placed anteriorly, second posteriorly), and two placed medially (anterior one subtriangular, separated from suture, posterior one smaller, sub-rounded and fused with suture); clypeus, mouthparts, antennae, tibiae and tarsi light brown; prosternum, meso- and metaventrite, abdomen, coxa and femora infuscate, dark brown to black. Lateral and anterior edges of pronotum and lateral edges of elytra translucent. Dorsum with single size punctures, punctures on pronotum coarser than on elytra. Dorsum with moderately long and uniform pubescence, not forming pattern on elytra.

**HEAD.** Head (Fig. 3A–B) partially covered by pronotum; ventral antennal grooves short, shallow. Eyes convex, dorsally with inner orbits arcuate; ocular canthus distinct, reaching half width of an eye; interocular distance about 0.5 × as wide as head across eyes; interfacetal setae distinct. Antenna about 0.9 × as long as head capsule width, composed of 11 antennomeres; scape swollen, 2 × as long as pedicel; pedicel narrower than scape, barrel-shaped, about 1.5 × as long as wide; antennomere 3 longer than pedicel, about 2.3 × as long as wide. Antennal club consisting of three antennomeres; antennomeres 9–11 asymmetrical, terminal antennomere distinctly elongate, truncate apically. Anterior clypeal margin straight. Labrum truncate at apex. Mandible bidentate at apex. Maxillary cardo transverse with outer angle reaching slightly outside of mouth cavity; terminal palpomere slightly widened, obliquely truncate. Submentum transverse; mentum sub-trapezoidal, anterior edge slightly emarginate with few long hairs, ventral surface with horseshoe-like impression; prementum transverse; ligula with few long hairs; labial palps separated by distance about equal to width of palpomere; apical palpomere as long and as broad as penultimate one.

**PROTHORAX.** Pronotum (Fig. 3A) with anterior corners rounded, produced anteriorly, not swollen with regular border; anterior margin without border; lateral margin with border complete, and with deep groove connected with basal margin and fading on anterior corner; hind margin with border complete.



Prothoracic hypomeron (Fig. 3D) without cavities; notosternal suture distinct; prosternal process protuberant, lateral carinae incomplete, long, reaching to anterior projection, but not joined apically. Prosternum (Fig. 3C) in front of coxa about  $0.7 \times$  as long as coxal longitudinal diameter at the same



**Fig. 6.** *Eupalea borowieci* sp. nov. **A.** Paratype (MIZ), ♀, abdomen. **B.** Holotype (MNHW), ♂, abdomen. **C.** Paratype (MIZ), ♀, tergite VIII. **D.** Paratype (MIZ), ♀, ventrite 6. **E.** Holotype (MNHW), ♂, tergite VIII. **F.** Holotype (MNHW), ♂, ventrite 6. **G.** Holotype (MNHW), penis, lateral view. **H.** Holotype (MNHW), penis tip, lateral. **I.** Holotype (MNHW), penis tip, inner. **J.** Paratype (MIZ), ♀, genitalia, ventral. **K.** Holotype (MNHW), ♂, segments IX and X, dorsal view. **L.** Holotype (MNHW), tegmen, lateral view. **M.** Holotype (MNHW), tegmen, inner view.

position, with visible border, interrupted only on projection; procoxal cavity oval with very small lateral slit, with visible bordering line.

**PTEROTHORAX.** Mesoventrite (Fig. 3C) with anterior edge straight with complete raised border; mesoventral process at median width of coxa about equal as corresponding coxal diameter; meso-metaventral articulation with suture visible; junction straight. Scutellar shield pentagonal (Fig. 3A); surface punctate and setose. Elytra with sides rounded; with lateral margins slightly flattened and fading only in their apices dorsally; humeral angles absent; elytral epipleuron wide, about  $3.0 \times$  as wide as corresponding metaepisternum, incomplete apically, inner margin with border line straight, fading before base of elytron. Metaventrite with discrimen entirely visible; metaventral postcoxal lines joined at middle, laterally complete, straight.

**LEGS.** Legs with trochanters subtriangular; tibial apices without spurs; tarsi with four tarsomeres, third very small; all tarsal claws in both sexes bifid. Empodium present as long, simple seta.

**ABDOMEN.** Abdomen (Figs 3D, 6A–B) with six ventrites in both sexes; ventrite 1 the same length as ventrites 2 and 3; ventrites 4 and 5 slightly shorter than ventrites 1–3; abdominal postcoxal lines separate medially, complete, reaching anterior margin of ventrite 1, posteriorly reaching half length of ventrite 1; hind margin of ventrite 5 in male slightly emarginate (Fig. 6B), in female with small median projection (Fig. 6A); tergite XIII (Fig. 6E) and ventrite 6 (Fig. 6F) in male truncate apically; tergite VIII (Fig. 6C) and ventrite 6 (Fig. 6D) in female rounded apically. Sternites VIII and ventrites VIII in both sexes with long hairs on hind margin.

**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 6K) with additional sclerite bilobed at base of apodeme; apodeme stout, straight, its base slightly widened and partially membranous laterally; tergite X short, transverse. Tegmen in inner view (Fig. 6M) with lateral margins of penis guide parallel and acute at apex; penis guide tip in lateral view (Fig. 6L) straight; parameres, well developed, gently widening to apex, slightly longer than penis guide, with fringe of dense, long setae on apices; tegminal strut stout. Penis capsule with inner arm narrow, outer arm broadened but short; penis with thickening in half of its length (Fig. 6G); penis tip (Fig. 6H–I) acute, slightly curved, partially membranous.

**FEMALE GENITALIA.** Sperm duct long, uniform in diameter; infundibulum absent; bursa with sclerotized, elongate additional sclerite near base of sperm duct; spermatheca vermiform, C-shaped, distinctly broadened from half its length to apex, nodulus and ramus present, spermathecal accessory gland membranous; coxites elongate, narrow; styli present.

*Eupalea formosa* Mulsant, 1850

**Material examined**

ECUADOR • 1 ♀; “Napo prov., Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MIZ • 1 ♀; “Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW.

**Remarks**

Species new to Ecuador.

Tribe Coccinellini Latreille, 1807  
Genus *Cycloneda* Crotch, 1871

*Cycloneda emarginata* (Mulsant, 1850)

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Yanayacu Station, hill above the station, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW.

*Cycloneda sanguinea* (Linnaeus, 1763)

**Material examined**

ECUADOR • 1 ex.; “Napo prov., Puerto Misahuallí (2 km S), 439m, 01°02’S / 77°39’W, 8 XII 2009, leg. R. Ruta”; MNHW.

Genus *Neda* Mulsant, 1850

*Neda aequatoriana* Mulsant, 1853

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW.

*Neda boliviana* Weise, 1893

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW.

*Neda norrisi* (Guérin-Méneville, 1842)

**Material examined**

ECUADOR • 3 ♂♂; “Napo prov., Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 1 ♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 1 ♂; “Cosanga vic., near river, 1900m, 00°34’42.3”S / 77°51’59.3”W, 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♂, 1 ♀; “Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW • 2 ♂♂; same collection data as for preceding; MIZ • 1 ♀; “Cosanga vic., Yanayacu Station, moist forest near the road, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta”; MNHW.

*Neda* sp.

**Material examined**

ECUADOR • 1 ♀; “Napo prov., Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 17 XII 2009, leg. R. Ruta”; MNHW • 2 ♀♀; “Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MIZ • 1 ♀; same collection data as for preceding; MNHW.



### Remarks

The examined specimens are identical to those illustrated by González (2015b) on his webpage and identified as “*Neda* sp. 8”; however, their genitalia are remarkably similar to those of *Neda aequatoriana* Mulsant, 1853 and *Neda norrisi* (Guérin-Méneville, 1842) and they may represent a color form of one of those species.

Genus *Psyllobora* Chevrolat, 1836

*Psyllobora dissimilis* Mulsant, 1850

### Material examined

ECUADOR • 1 ♂, 1 ♀; “Napo prov., Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; same collection data as for preceding; MIZ.

*Psyllobora marshalli* Crotch, 1874

Fig 5D–F

### Material examined

ECUADOR • 1 ♀; “Napo prov., Cosanga vic., Yanayacu Station, 2000–2200m, 00°35'S / 77°53'W, 23–24 XI 2009, leg. R. Ruta”; MNHW.

### Remarks

Species new to Ecuador.

Tribe Chnoodini Mulsant, 1850

= Exoplectrini Crotch, 1874

Genus *Chnoodes* Chevrolat in d'Orbigny, 1843

*Chnoodes yanayacu* sp. nov.

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Figs 5G–I, 7

### Diagnosis

This species is most similar to *Chnoodes rufovittata* Mader, 1957; however, its body outline is more elongate and maculae are larger, covering more surface of elytra, whereas in *C. rufovittata* the body is more rounded with smaller elytral maculae. *Chnoodes yanayacu* sp. nov. is also quite similar to *C. centralis* Sicard, 1912 and *C. unimaculata* Krüger, Castro-Guedes & Almeida, 2016 (Krüger *et al.* 2016; Krüger 2018), by general appearance, but it differs from both species by much larger elytral maculae covering almost the entire surface of the elytra, while in both mentioned species the maculae are distinctly smaller or forming a ring pattern. This species also differs from *C. centralis* by having the female genitalia with longer styli and constricted base of the spermatheca, from *C. unimaculata* by more elongate coxites and the presence of a mammiliform projection on spermathecal apex. Males of *C. centralis* and *C. unimaculata* are unknown. *C. rufovittata* was described from Bolivia while *C. centralis* from French Guiana, and *C. unimaculata* occur in Eastern Brazil (Pará).

### Etymology

This species is named after the Yanayacu biological station in Ecuador where the type series was collected.



## Material examined

### Holotype

ECUADOR • ♂; “Napo prov., Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW.

### Paratypes

ECUADOR • 1 ♀, 1 ex.; same collection data as for holotype; MNHW • 2 ex.; “Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta ”; MNHW • 1 ex.; “Cosanga, Yanayacu, road, 2 XII 2009, leg. R. Ruta ”; MIZ.

## Remarks

Guillermo González illustrated the holotype of *C. rufovittata* on his website ([www.coccinellidae.cl](http://www.coccinellidae.cl)), which is deposited in the Museo Nacional de Historia Natural de Santiago, Chile (MNHNS), but he was not able to investigate genitalia of that specimen. We provide here a detailed description of male and female genitalia that will allow to verify the status of *C. yanayacu* sp. nov. when new information is available.

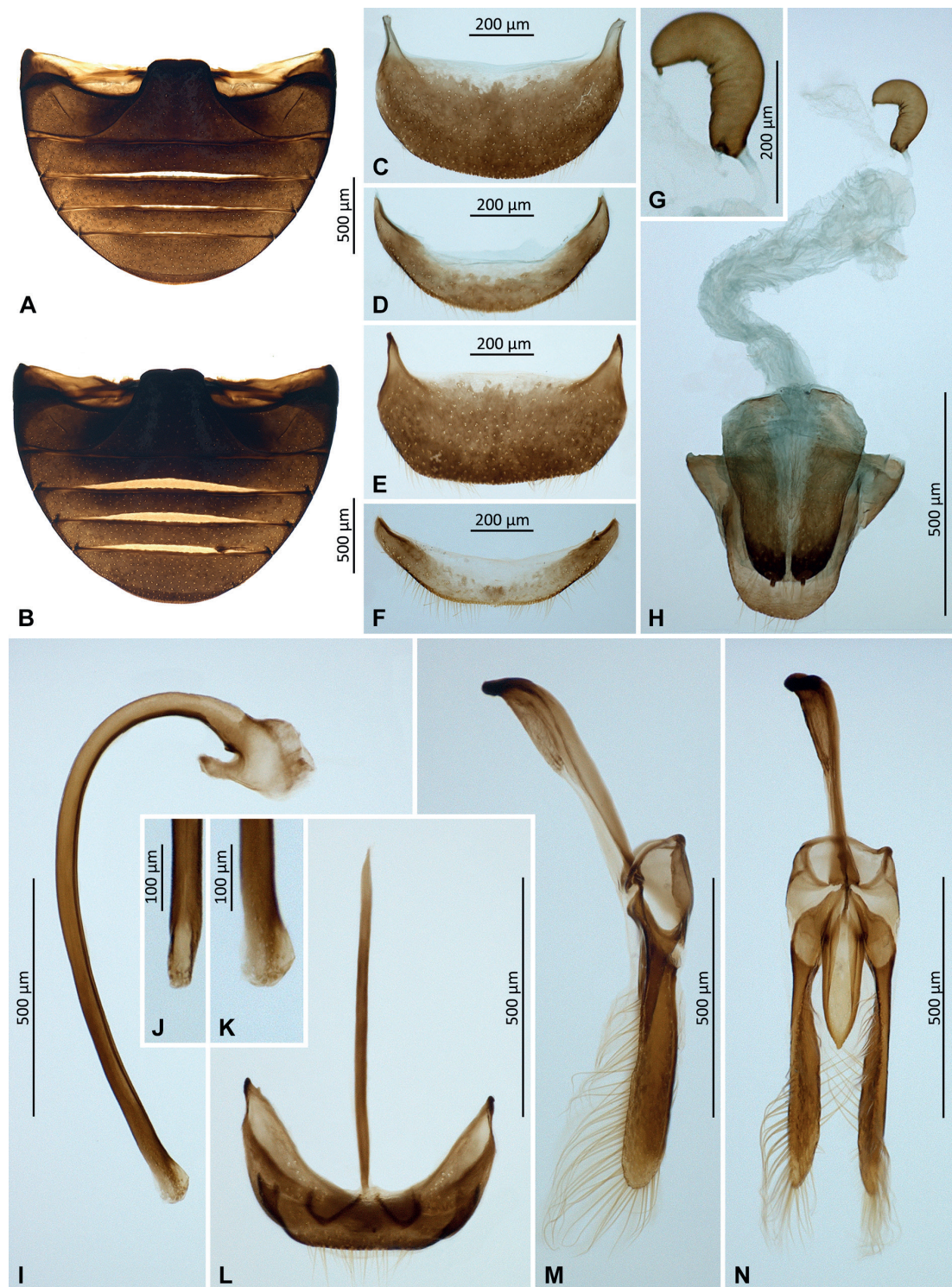
## Description

**BODY.** Length 3.20 mm; TL/EW = 1.15–1.30; PL/PW = 0.52; EL/EW = 0.95–1.00. Body oval (Fig. 5G), moderately convex (Fig. 5H), winged; dorsum black with one big, chestnut brown spot on each elytron and light brown anterolateral edges of pronotum (Fig 5I); ventral side infusate. Dorsum covered with short hairs, forming weak, wavy pattern on elytra. Dorsum with single size punctures. Punctures on elytra less coarse than on head and pronotum.

**HEAD.** Head partially covered by pronotum (Fig. 5I); ventral antennal grooves deep, straight. Eyes moderately convex, dorsally with inner orbits arcuate; ocular canthus present, protruding, reaching beyond half width of an eye; interocular distance about  $0.50 \times$  as wide as head across eyes; interfacetal setae absent. Antenna short, about  $0.50 \times$  as long as head capsule width, composed of 10 antennomeres; scape enlarged, distinctly roundly projected anteriorly; pedicel narrower than scape, barrel-shaped, about  $1.20 \times$  as long as wide; antennomere 3 distinctly shorter than pedicel. Antennal club consisting of four antennomeres; antennomeres 7–9 transverse, antennomere 10 elongate, truncate apically. Anterior clypeal margin margined with anterolateral lobes roundly projected. Labrum truncate at apex. Mandible bidentate at apex. Maxillary cardo slightly transverse; terminal palpomere securiform, truncate obliquely. Submentum transverse; mentum sub-trapezoidal, covered with sparse long hairs, with lateral longitudinal weak impressions on each side; prementum transverse; labial palps separated by distance about equal to width of palpiger; apical palpomere slightly shorter than penultimate one.

**PROTHORAX.** Pronotum (Fig. 5I) with anterior corners rounded, slightly produced anteriorly, not swollen with regular border; anterior and lateral margin with entire border; posterior margin without border. Prothoracic hypomeron smooth; prosternal process with sides parallel, with apex rounded, its surface with lateral carinae short, joined with procoxal bordering line. Prosternum in front of coxa about  $0.60 \times$  as long as coxal longitudinal diameter at the same position, anterior margin with complete bordering line; procoxal cavity transverse oval; procoxal bordering line incomplete medially.

**PTEROTHORAX.** Mesoventrite with anterior edge straight with complete raised border; mesoventral process at median width of coxa about equal as corresponding coxal diameter; meso-metaventral articulation with suture visible; junction straight. Scutellar shield triangular, bordered; surface punctate and haired. Elytra with sides rounded; lateral margins slender, entirely visible from above; humeral angles present; elytral epipleuron wide, about  $3.0 \times$  as wide as corresponding metaepisternum, incomplete apically, with shallow foveae for reception of femora; inner margin with border line fading before base of elytron.



**Fig. 7.** *Chnoodes yanayacu* sp. nov. **A.** Paratype (MNHW), ♀, abdomen. **B.** Holotype (MNHW), ♂, abdomen. **C.** Paratype (MNHW), ♀, tergite VIII. **D.** Paratype (MNHW), ♀, sternite VIII. **E.** Holotype (MNHW), ♂, tergite VIII. **F.** Holotype (MNHW), ♂, sternite VIII. **G.** Paratype (MNHW), spermatheca. **H.** Paratype (MNHW), ♀, genitalia, ventral. **I.** Holotype (MNHW), penis, lateral. **J.** Holotype (MNHW), penis tip, inner view. **K.** Holotype (MNHW), penis tip, lateral view. **L.** Holotype (MNHW), ♂, segments IX and X, dorsal view. **M.** Holotype (MNHW), tegmen, lateral view. **N.** Holotype (MNHW), tegmen, inner view.



Metaventricle with discrimen long but incomplete anteriorly; metaventral postcoxal lines joined at middle, laterally complete, rounded; metaventricle finely punctate.

LEGS. Legs with trochanters angulate; femora relatively large, excavated to receive tibiae, tibiae shallowly excavated to receive the tarsi, tibial apices without spurs; tarsi with four tarsomeres, third very small; tarsal claws of all legs in both sexes bifid.

ABDOMEN. Abdomen with 5 ventrites in both sexes (Fig. 7A–B); ventrite 1, 1.20 × as long as ventrite 2, ventrite 2, 1.20 × as long as ventrites 3 and 4; abdominal postcoxal lines separate medially, incomplete, posteriorly reaching hind margin of ventrite 1; additional oblique line on ventrite 1 present; hind margin of ventrite 5 in both sexes rounded; in male tergite VIII (Fig. 7E) and sternite VIII (Fig. 7F) truncate apically; sternite VIII with shallow, but clearly visible central depression; in female tergite VIII (Fig. 7C) and sternite VIII (Fig. 7D) rounded apically. Sternites VIII and ventrites VIII in both sexes with long hairs on hind margin.

MALE TERMINALIA AND GENITALIA. Sternite IX (Fig. 7L) with bilobed, partially membranous additional sclerite at base of apodeme; apodeme rod-like, straight; tergite X very short, transverse. Tegmen in inner view (Fig. 7N) with penis guide parallel, apex acute; parameres (Fig. 7M), well developed, simple, more than 2 × as long as penis guide, with fringe of dense, long setae on apices and edges; tegminal strut wide. Penis capsule (Fig. 3I) with inner arm narrow, outer arm broadened but short; penis of equal diameter along entire length, widened on tip (Fig. 7K), tip not partially membranous (Fig. 7J).

FEMALE GENITALIA. Sperm duct uniform in diameter, shorter than spermatheca; infundibulum absent; spermatheca vermiform, without clear nodulus and ramus, but with mammiliform projection on apex (Fig. 7G); spermathecal accessory gland adjacent to sperm duct. Coxites elongate, rounded on apices, inner surface covered with long hairs; styli distinct (Fig. 7H).

Genus *Exoplectra* Chevrolat, 1936

*Exoplectra misahualli* sp. nov.

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Figs 5J–L, 8

### Diagnosis

*Exoplectra misahualli* sp. nov. is very similar to other red species of *Exoplectra* and it can be reliably distinguished by male genitalia only. Up to now no *Exoplectra* species have been known from Ecuador; however, similarly colored species were reported from neighboring countries, e.g., *E. angustifrons* Weise, 1895, *E. coccinea* (Fabricius, 1801), *E. ruberrima* Erichson, 1847. Both, *E. angustifrons* and *E. ruberrima* have different shape of male genitalia. The type locality of *E. coccinea* is French Guiana (Costa *et al.* 2008), thus its occurrence in Andes is probably indicated erroneously. *Exoplectra misahualli* sp. nov. externally is also similar to numerous undescribed (five in Peru and one in Ecuador) species presented on the webpage of Guillermo González (González 2007, 2015b); however, all of them differ in the structure of male genitalia. The newly described species can be identified by equal length of penis guide and parameres, parameres very flat in lateral view (Fig. 8H) and distinctly expanded laterally (Fig. 8G), penis guide with apex upturned and rounded (Fig. 8I), and penis tip with small thorn-like projection (Fig. 8E).

### Etymology

The specific epithet is derived from the name of the type locality, Puerto Misahuallí.

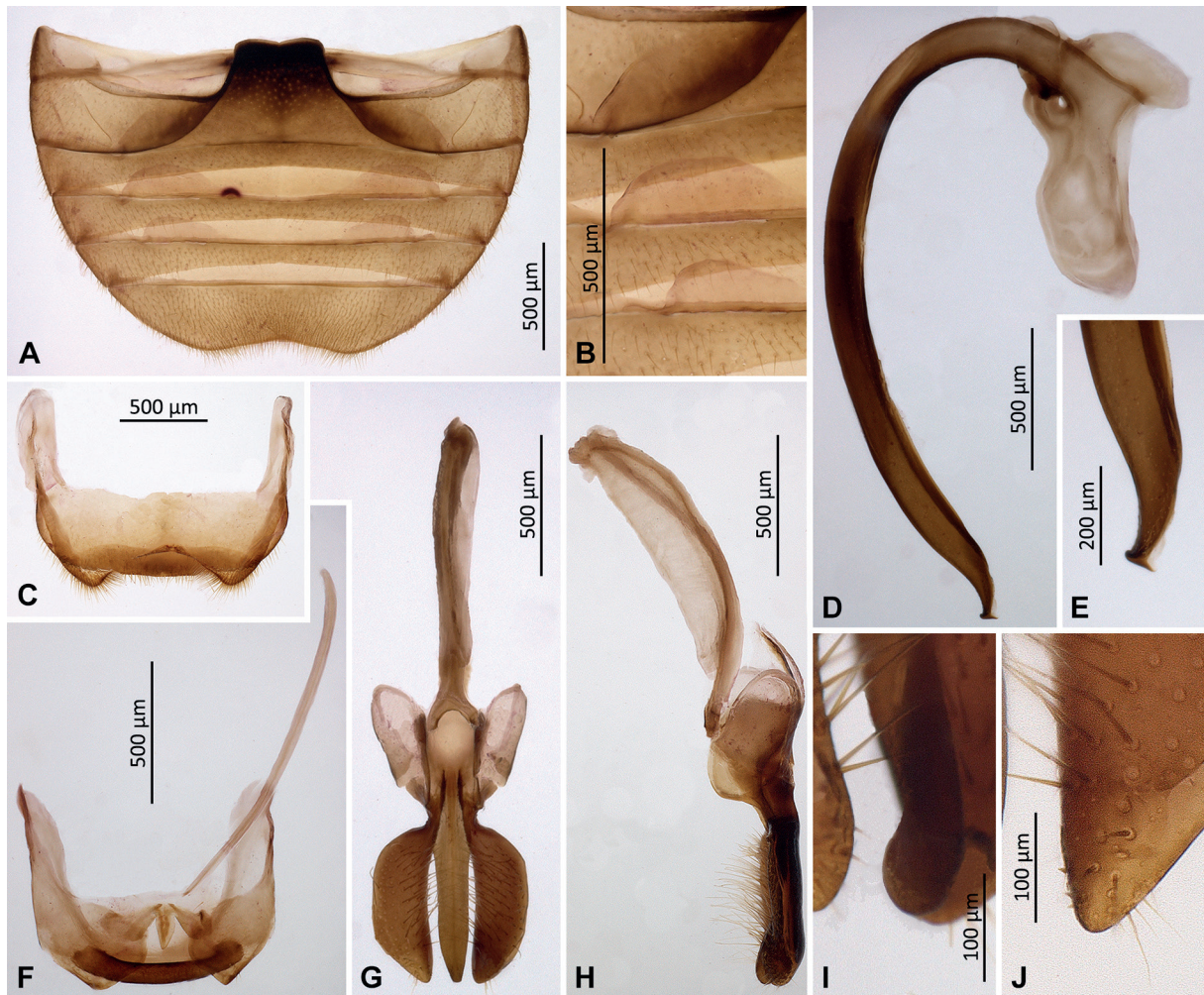
**Material examined****Holotype**

ECUADOR • ♂; “Napo prov., Puerto Misahuallí (2 km S), 439m, 01°02'S / 77°39'W, 8 XII 2009, leg. R. Ruta”; MNHW.

**Description**

**BODY.** Length 4.50 mm; TL/EW = 1.12; PL/PW = 0.50; EL/EW = 1.00. Body oval (Fig. 5J), strongly convex (Fig. 5K), winged; elytra and epipleuron dark red, antennae, head, prothorax, meso- and metaepisterna, meso- and metaepimera, legs except meso- and metacoxae and most of abdomen light brown; labrum, last segment of maxillary palps, meso- and metaventrite and abdominal process of first ventrite dark brown. Dorsum with moderately long and uniform pubescence, not forming pattern on elytra.

**HEAD.** Head partially covered by pronotum (Fig. 5L); ventral antennal grooves deep, distinctly circular bent towards outer margin of eye. Eyes dorsally with inner orbits parallel; ocular canthus distinct, long,



**Fig. 8.** *Exoplectra misahualli* sp. nov., ♂, holotype (MNHW). **A.** Abdomen. **B.** Inner surface of abdomen. **C.** Segment VIII, ventral view. **D.** Penis, lateral view. **E.** Penis tip, lateral view. **F.** Segments IX and X, dorsal view. **G.** Tegmen, inner view. **H.** Tegmen, lateral view. **I.** Penis guide apex, lateral view. **J.** Paramere apex, inner view.



reaching beyond half width of an eye; interocular distance about  $0.50 \times$  as wide as head across eyes; interfacetal setae absent. Antenna  $0.50 \times$  as long as head capsule width, composed of 11 antennomeres; scape enlarged, distinctly roundly projected anteriorly; pedicel narrower than scape, barrel-shaped, about the same length as length of antennomeres 3–5 combined, antennomere 3  $\times$  as long as wide; antennal club consisting of four antennomeres; antennomeres 8–10 wider than long, terminal segment distinctly elongate, rounded apically. Anterior clypeal margin distinctly emarginate with anterolateral lobes roundly projected. Labrum truncate at apex. Mandible bidentate at apex. Maxillary cardo transverse with outer angle reaching slightly outside of mouth cavity; terminal palpomere securiform. Submentum transverse; mentum sub-trapezoidal with anterolateral lobes projecting forwards, anterior edge emarginate with few long hairs laterally, ventral surface smooth; prementum transverse; labial palps separated by distance about equal to width of palpiger; apical palpomere as long and as broad as penultimate one.

**PROTHORAX.** Pronotum (Fig. 5L) with anterior corners rounded, distinctly produced anteriorly, not swollen with regular border; anterior and posterior margin without border; lateral margin with entire border. Prothoracic hypomeron smooth; prosternal process with sides parallel, with apex truncate, its surface with lateral carinae incomplete, reaching at most its base; prosternum in front of coxa about  $0.30 \times$  as long as coxal longitudinal diameter at the same position, anterior margin straight, with visible border; procoxal cavity distinctly transverse with lateral slit, without visible bordering line.

**PTEROTHORAX.** Mesoventrite with anterior edge straight with complete raised border; mesoventral process at median width of coxa about  $0.75 \times$  as broad as corresponding coxal diameter; meso-metaventral articulation with suture visible; junction straight. Scutellar shield triangular; surface punctate and setose. Elytra with sides rounded; with lateral margins slightly flattened and fading only in their apices; humeral angles absent; surface with single size punctures; elytral epipleuron wide, about  $4.0 \times$  as wide as corresponding metaepisternum, incomplete apically, with shallow foveae for reception of femora, inner margin with border line slightly sinusoidal, fading before base of elytron. Metaventrite with discrimen visible; metaventral postcoxal lines joined at middle, laterally complete, straight.

**LEGS.** Legs with trochanters angularly produced; femora relatively large, excavated to receive tibiae, tibiae with large, sharply angulate outer teeth, excavated to receive the tarsi, femoral apices of mid and hind leg with single spur; tarsi with four tarsomeres, tarsal claws of all legs appendiculate.

**ABDOMEN.** Abdomen with five ventrites (Fig. 8A); ventrite 1,  $1.5 \times$  as long as ventrite 2; abdominal postcoxal lines separate medially, incomplete, posteriorly reaching hind edge of ventrite 1; ventrites 1–3 in inner surface with hind edges with large, sclerotized lobes (Fig. 8B); hind margin of ventrite 5 emarginate and densely covered with long hairs; tergite VIII truncate apically; sternite VIII deeply emarginate, with long hairs on hind angles (Fig. 8C).

**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 8F) with additional sclerite at base of apodeme divided into three lobes; apodeme rod-like; tergite X short, transverse. Parameres, well developed, expanded laterally (Fig. 8G), as long as penis guide, with inner surface covered with long setae (Fig. 8H) and apices with little setae (Fig. 8J); penis guide symmetrical, elongate, lateral sides parallel, apex in lateral view outwardly curved and rounded (Fig. 8I), without additional processes; tegminal strut broad. Penis capsule (Fig. 8D) with outer arm broadened, short, inner arm well developed, elongate; penis tip slightly curved, with small sharp projection (Fig. 8E).

**FEMALE GENITALIA.** Not studied.

Genus *Siola* Mulsant, 1850*Siola atra* González, 2015

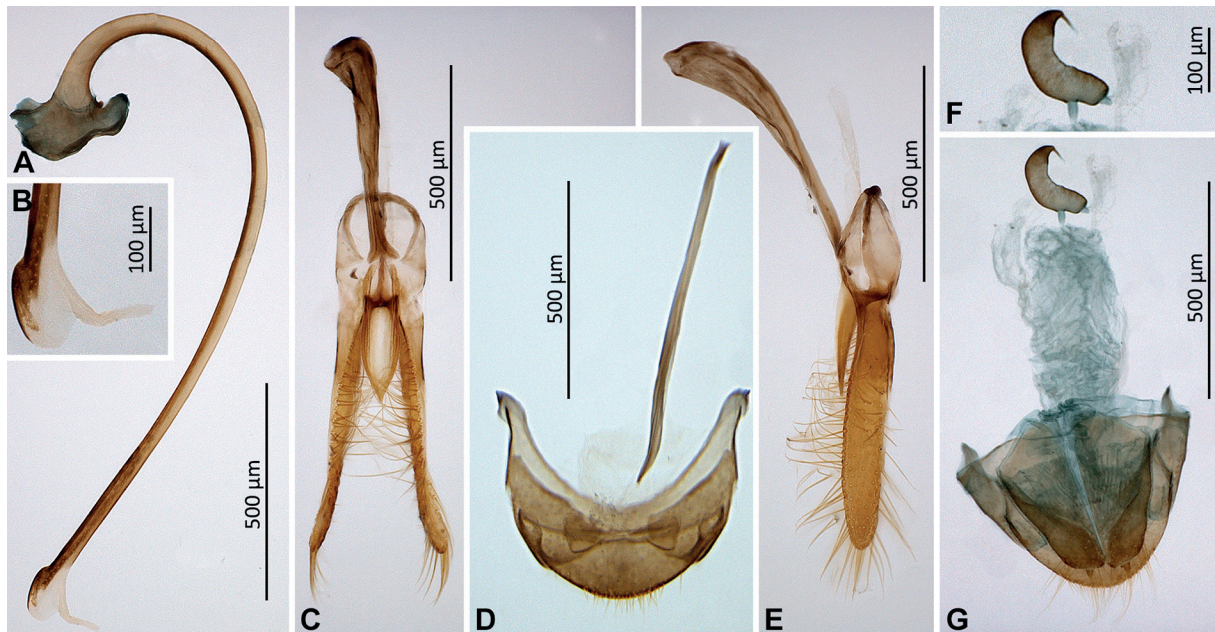
Fig. 9

**Material examined**

ECUADOR • 1 ♂, 1 ♀; “Napo prov.: Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 17 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW • 2 ♂♂; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 17 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 16 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; “Cosanga vic., Yanayacu Station, Bamboo hill trail & stream, 2125 m, S 00°36’18.4” / W 77°53’09”, 5 XII 2009, leg. R. Ruta”; MIZ • 1 ♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, XII 2009, leg. R. Ruta”; MNHW • 7 ♂♂, 1 ♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 3 ♀♀; “Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MIZ.

**Additions to the original description**

Male terminalia and genitalia. Sternite IX (Fig. 9D) with bilobed, partially membranous additional sclerite at base of apodeme; apodeme rod-like, straight; tergite X rounded, its hind edge covered with long hairs. Tegmen in inner view (Fig. 9C) with lateral edges of penis guide nearly parallel, apex pointed; parameres (Fig. 9E), well developed, simple, about 2.50 × as long as penis guide, entire inner surface and edges covered with long hairs; tegminal strut widened apically. Penis capsule (Fig. 9A) with inner arm narrow, outer well broadened but short; penis of equal diameter along the entire length, widened on tip, tip partially membranous with distinct flagellum (Fig. 9B).



**Fig. 9.** *Siola atra* González, 2015 (MIZ). A. Penis, lateral view. B. Penis tip, lateral view. C. Tegmen, inner. D. ♂, segments IX and X, dorsal view. E. Tegmen, lateral view. F. ♀, spermatheca. G. ♀, genitalia, ventral view.

FEMALE GENITALIA. Sperm duct very short, slightly widened near base of spermatheca; infundibulum absent; spermatheca vermiform with spiny projection on apex (Fig. 9F); spermathecal accessory gland present. Coxites (Fig. 9G) elongate, truncate on apices, apices covered with long hairs; styli distinct. Hind margin of proctiger rounded, covered with long hairs.

Tribe Epilachnini Mulsant, 1846

Recently, the classification of Epilachnini has changed significantly (Szawaryn *et al.* 2015; Tomaszewska & Szawaryn 2016). Most of the South American fauna is divided into two genera, *Epilachna* Chevrolat, 1836 and *Toxotoma* Weise, 1900. According to most recent molecular investigations, a large part of the species assigned to *Epilachna* should be moved to *Toxotoma*; however, only a part of the species groups proposed by Gordon (1975) were studied with molecular analyses. Thus, here we transfer species into *Toxotoma* from the previously studied species groups as listed in Szawaryn *et al.* (2015), the rest remains in *Epilachna*.

Genus *Epilachna* Chevrolat, 1836

*Epilachna cacica* (Guérin-Méneville, 1844)

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Rio Hollin, 1068 m 00°43’S / 77°38’W 6 XII 2009, leg. L. Borowiec”; MNHW • ♂; same collection data as for preceding; “14 XII 2009”; MNHW • 1 ♂; “Napo prov., Puerto Misahuallí (2 km S), 439m, 01°02’S / 77°39’W, 8 XII 2009, leg. R. Ruta”; MNHW.

*Epilachna extrema* Crotch, 1874

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Rio Hollin, 1068 m, 00°48’S / 77°38’W, 6 XII 2009, leg. L. Borowiec”; MIZ.

*Epilachna hektea* Gordon, 1975

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♀; same collection data as for preceding; MIZ.

*Epilachna languida* (Weise, 1900)

**Material examined**

ECUADOR • 4 ♀♀; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ.

*Epilachna mutabilis* Crotch, 1874

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MIZ.

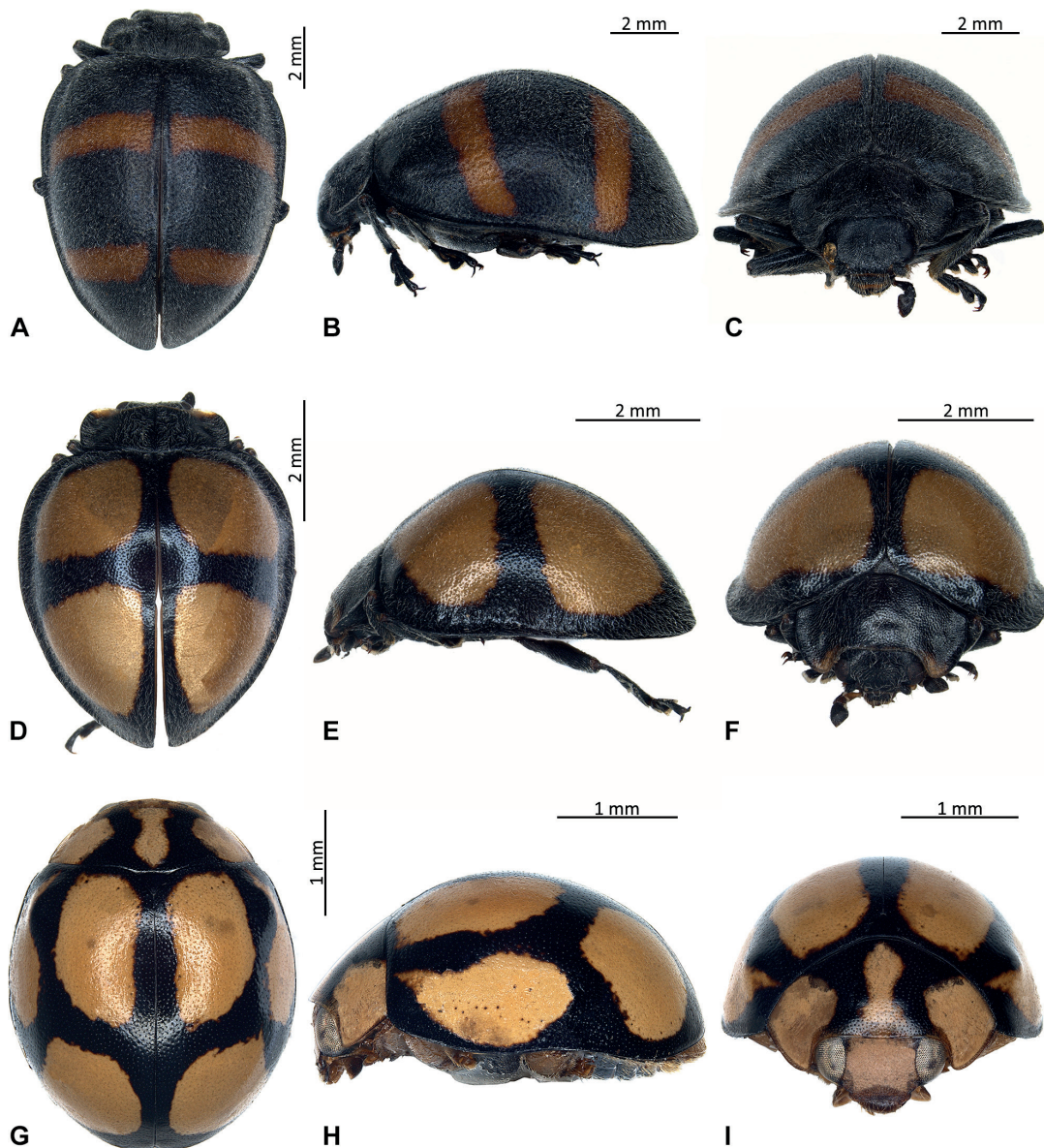


*Epilachna obtusifforma* Gordon, 1975

Figs 10A–C, 11

**Material examined**

ECUADOR • 3 ♂♂, 2 ♀♀; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI–17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♂, 2 ♀♀; same collection data as for preceding; MIZ • 2 ♀♀; “Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, valley near the hill above the station, 2000–2200m, 00°35’S / 77°53’W, 29 XI 2009, leg. R. Ruta”; MNHW.



**Fig. 10.** Habitus. **A–C.** *Epilachna obtusifforma* Gordon, 1975, ♀ (MIZ). **A.** Dorsal view. **B.** Lateral view. **C.** Frontal view. **D–F.** *Toxotoma gonzalezi* sp. nov., ♂, holotype (MNHW). **D.** Dorsal view. **E.** Lateral view. **F.** Frontal view. **G–I.** *Hyperaspis rutai* sp. nov., ♂, holotype (MNHW). **G.** Dorsal view. **H.** Lateral view. **I.** Frontal view.

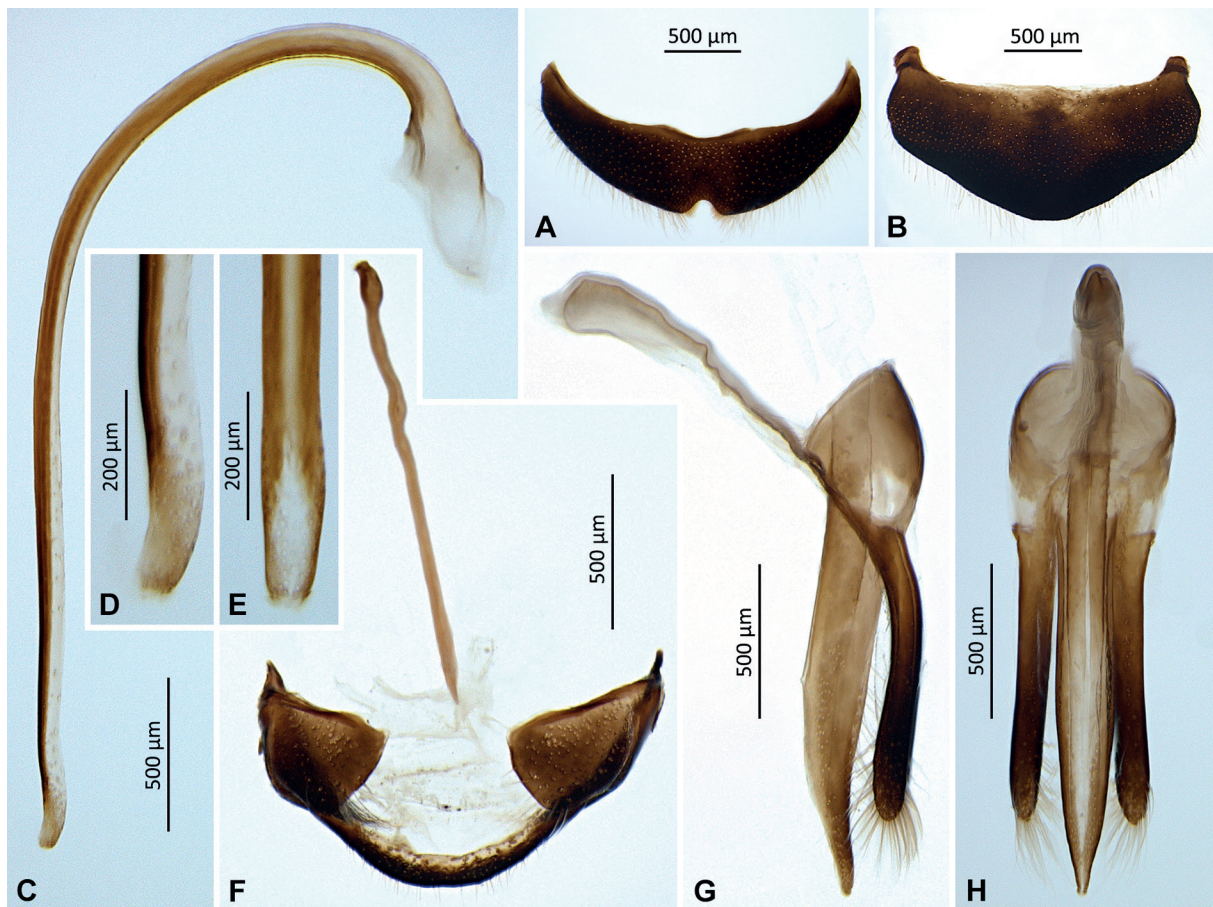


## Remarks

This species was described by Gordon (1975) based on two females from Napo and Tungurahua provinces in Ecuador. We had an occasion to examine a series of specimens with a color pattern identical to *E. obtusiforma* (Fig. 10A–C), and females possess genitalia identical as described and illustrated by Gordon (1975), among them we found a male specimen and here, we provide for the first time description of the male genitalia for that species.

## Additions to the original description

**MALE TERMINALIA AND GENITALIA.** Ventrite 6 in male emarginate medially at apex (Fig. 11A), tergite VIII rounded (Fig. 11B). Sternite IX (Fig. 11F) with apodeme rod-like, short; tergite X short, transverse, rounded at apex. Tegmen in inner view (Fig. 11H) with penis guide almost parallel in basal half, gradually narrowing apically, pointed at apex, in lateral view (Fig. 11G) almost parallel sided for  $\frac{2}{3}$  of its length, then narrowing towards apex and slightly upturned; parameres narrow, uniformly broad, distinctly shorter than penis guide; tegminal strut broad, shorter than penis guide. Penis capsule (Fig. 11C) with arms reduced; penis narrow, simple, with penis tip obtuse apically (Fig. 11D–E).



**Fig. 11.** *Epilachna obtusiforma* Gordon, 1975, ♂ (MIZ). **A.** Ventrite 6. **B.** Tergite VIII. **C.** Penis, lateral view. **D.** Penis tip, lateral view. **E.** Penis tip, inner view. **F.** Segments IX and X, dorsal view. **G.** Tegmen, lateral view. **H.** Tegmen, inner view.

*Epilachna transverselineata* (Mader, 1958)

**Material examined**

ECUADOR • 1 ♂; “Sucumbios prov. Cascada San Rafael 1321 m, S 00°06′12.1” / 77°35′20.3”, 11 XII 2009, leg. L. Borowiec”; MNHZ • 1 ♂; same collection data as for preceding; MIZ.

**Remarks**

Species new to Ecuador.

Genus *Toxotoma* Weise, 1900

*Toxotoma gonzalezi* sp. nov.

[urn:lsid:zoobank.org:act:9F1082E3-5FFC-4A4D-9CD6-F5D7F93BB975](https://doi.org/10.3896/urn:lsid:zoobank.org:act:9F1082E3-5FFC-4A4D-9CD6-F5D7F93BB975)

Figs 10D–F, 12

**Diagnosis**

The dorsal color pattern of *T. gonzalezi* sp. nov. is similar to that of numerous other species of Epilachnini inhabiting the Andes, like *Epilachna zischkai* Mader, 1950, *E. manni* Gordon, 1975 or *E. bolivicola* Mader, 1950, but the male genitalia place that species within the former *Epilachna vittigera* species group (as defined by Gordon 1975) and shows the greatest similarity to *E. strictanotata* Gordon, 1975 in having a pointed apex of the penis guide in inner view, and a small hook like projection at apex of the penis guide in lateral view; however, it can be distinguished from that species by having the preapical portion of the penis guide in lateral view almost parallel, while in *E. strictanotata* it is narrowed toward the apex. Apart from the shape of the male genitalia, *T. gonzalezi* sp. nov. has four large yellow maculae on elytra while *E. strictanotata* has one large orange-red macula across the elytra.

**Etymology**

This species is dedicated to our colleague, great expert of Neotropical Coccinellidae Guillermo González (Santiago, Chile).

**Material examined**

**Holotype**

ECUADOR • ♂; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35′S / 77°53′W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW.

**Paratypes**

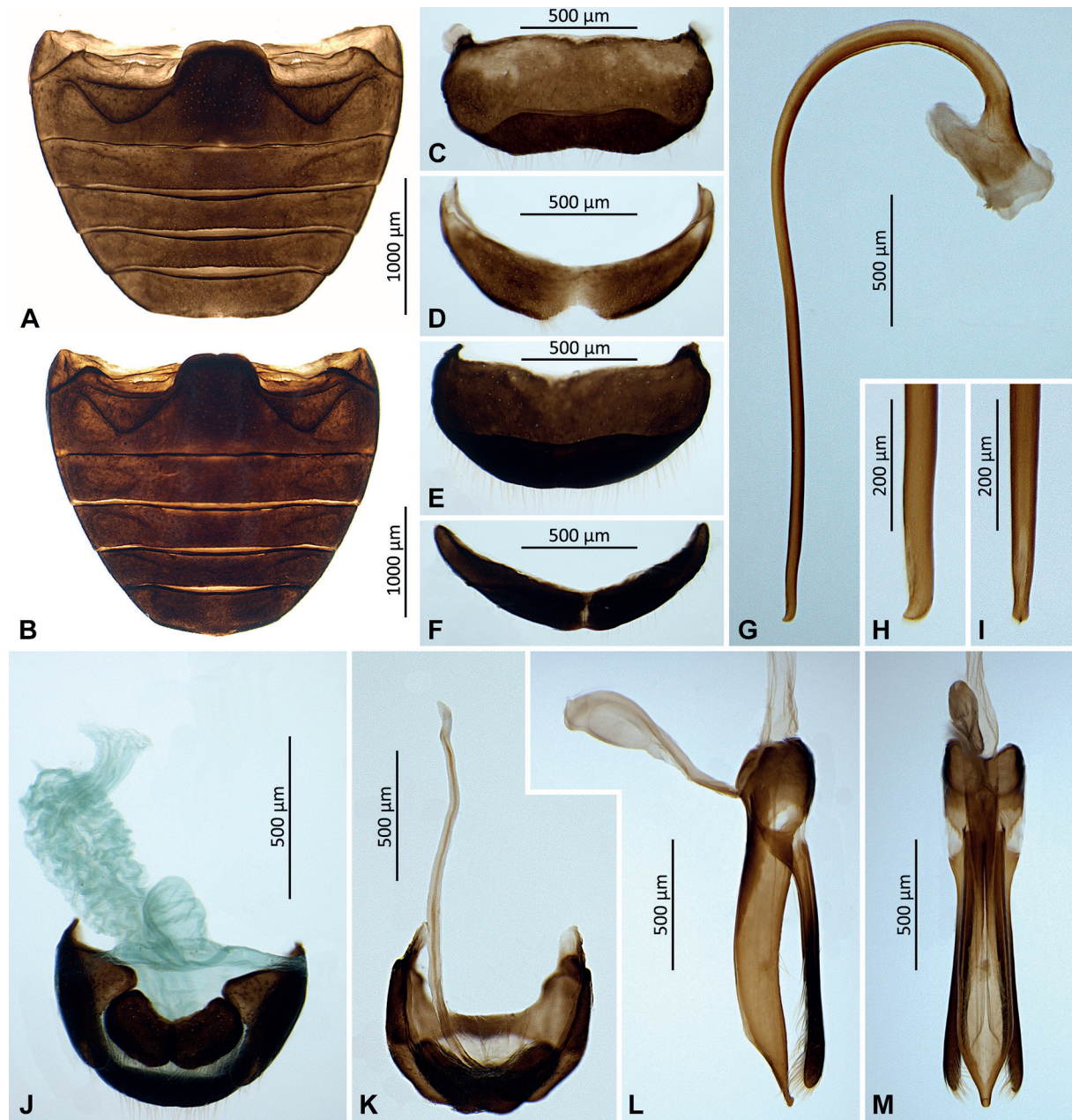
ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35′S / 77°53′W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, Road to Las Caucheras, 26 XI 2009, leg. Rafał Ruta”; MNHW • 1 ♂; “Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; same collection data as for preceding; MIZ • 1 ♂, 1 ♀; “Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW.

**Description**

BODY. Length 5.80 mm; TL/EW = 1.25; PL/PW = 0.40; EL/EW = 1.05. Body heart shaped (Fig. 10D), slightly acuminate apically, convex (Fig. 10E), winged; ventral side, head, legs, pronotum (except narrow border of anterior corners), and scutellar shield black; mouthparts brown; anterior corners of pronotum with narrow yellow margin (Fig. 10F); elytra black with two large yellow maculae on each elytron. Pronotum covered with punctures of single size, elytra with punctures in two sizes, irregularly arranged. Dorsum with short and uniform pubescence, not forming pattern on elytra.



HEAD. Head partially covered by pronotum (Fig. 10F); ventral antennal grooves short, indistinct. Eyes relatively small, convex, dorsally with inner orbits arcuate; without ocular canthus; interocular distance more than  $0.6 \times$  as wide as head across eyes; interfacetal setae absent. Antennae composed of 11 antennomeres; scape swollen; pedicel barrel-shaped; antennomere 3 longer than pedicel. Antennal club consisting of three terminal antennomeres; antennomeres 9–11 asymmetrical, terminal antennomere truncate apically. Anterior clypeal margin straight. Labrum truncate at apex. Maxillary palpomere 3



**Fig. 12.** *Toxotoma gonzalezi* sp. nov. **A.** Holotype (MNHW), ♂, abdomen. **B.** Paratype (MNHW), ♀, abdomen. **C.** Holotype (MNHW), ♂, tergite VIII. **D.** Holotype (MNHW), ♂, ventrite 6. **E.** Paratype (MNHW), ♀, tergite VIII. **F.** Paratype (MNHW), ♀, ventrite 6. **G.** Holotype (MNHW), penis, lateral view. **H.** Holotype (MNHW), penis tip, lateral view. **I.** Holotype (MNHW), penis tip, inner view. **J.** Paratype (MNHW), ♀ genitalia, ventral view. **K.** Holotype (MNHW), ♂, segments IX and X, dorsal view. **L.** Holotype (MNHW), tegmen, lateral view. **M.** Holotype (MNHW), tegmen, inner view.



elongate, more than  $2 \times$  as long as terminal palpomere, terminal palpomere with sides almost parallel or at most slightly widened apically, obliquely truncate. Mentum transverse, widest at base, narrowing anteriorly; labial palps separated by distance narrower than width of palpiger; apical palpomere as long and as broad as penultimate one.

**PROTHORAX.** Pronotum with anterior corners rounded; anterior and posterior margins not bordered; lateral margins with entire border and broadly explanate laterally. Prothoracic hypomeron without cavities; notosternal suture distinct; prosternal process protuberant, lateral carinae separate, incomplete, short, reaching to anterior procoxal margin. Prosternum in front of coxa shorter than coxal longitudinal diameter at same position, with complete anterior border; procoxal cavity oval with lateral slit, with visible bordering line.

**PTEROTHORAX.** Mesoventrite with anterior edge slightly emarginated medially with complete raised border; mesoventral process with small tubercle near base in middle, at median width narrower than corresponding coxal diameter; meso-metaventral articulation with suture visible; junction straight. Elytra with sides rounded; with lateral margins distinctly flattened; humeral angles distinct; elytral epipleuron very broad, more than  $3 \times$  as wide as corresponding metaepisternum, incomplete apically only, inner margin with border line present only in posterior half. Metaventrite with metaventral postcoxal lines joined at middle, laterally complete, straight, not descending.

**LEGS.** Legs slender, with trochanters subtriangular; tibial apices with spurs present (1-2-2); tarsi with four tarsomeres; all tarsal claws in both sexes bifid with base swollen. Empodium absent.

**ABDOMEN.** Abdomen with six ventrites in males and five in females; abdominal postcoxal lines separate medially, recurved, almost reaching anterior margin of ventrite 1, posteriorly reaching more than half length of ventrite 1; hind margin of ventrite 5 in male truncate (Fig. 12A), ventrite 6 emarginate medially (Fig. 12D), tergite VIII broadly emarginate (Fig. 12C); hind margin of ventrite 5 in female rounded with small median projection (Fig. 12B), sternite VIII emarginated medially with translucent narrow median line (Fig. 12F), tergite VIII rounded apically (Fig. 12E).

**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 12K) with apodeme rod-like, long; tergite X short, transverse with emarginate apex. Tegmen in inner view (Fig. 12M) with penis guide distinctly pointed at apex, in lateral view (Fig. 12L) uniformly broad, pointed apically, with hook-like projection at tip; parameres shorter than penis guide, uniformly broad; tegminal strut broad, shorter than penis guide. Penis capsule (Fig. 12G) with inner arm narrow, outer arm broadened but short; penis narrow, simple, with penis tip slightly curved downwards (Fig. 12H), not membranous partially (Fig. 12I).

**FEMALE GENITALIA.** Coxites transverse oval (Fig. 12J), with styli reduced but visible.

*Toxotoma aequatorialis* (Gordon, 1975) comb. nov.

**Material examined**

ECUADOR • 2 ♂♂, 1 ♀; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ • 1 ♀; “Cosanga vic., Yanayacu Station, hill above the station, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., Yanayacu Station, moist forest near the road, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, valley near the hill above the station, 2000–2200m, 00°35’S / 77°53’W, 29 XI 2009, leg. R. Ruta”; MIZ • 1 ♂; “Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. Rafał Ruta”; MNHW.

*Toxotoma chigata* (Gordon, 1975) comb. nov.

**Material examined**

ECUADOR • 2 ♂♂, 1 ♀; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MIZ • 3 ♀♀; same collection data as for preceding; MNHW • 4 ♂♂, 3 ♀♀; “Cosanga vic., Yanayacu St.-Rio Aliso road 2000–2200m, 00°35’S / 77°53’W, 30 XI 2009, leg. L. Borowiec”; MNHW • 3 ♀♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 23–24 XI 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., near river, 1900m, S 00°34’42.3’’W 77°51’59.3’’, 25 XI 2009, leg. Rafał Ruta”; MIZ • 1 ♀; “Cosanga vic., Yanayacu Station, moist forest near the road, 2000–2200m, 00°35’S / 77°53’W, 27 XI 2009, leg. R. Ruta” • 1 ♂; “Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, XII 2009, leg. Rafał Ruta”; MNHW.

*Toxotoma convergens* (Crotch, 1874)

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♂; same collection data as for preceding; MIZ.

*Toxotoma dubia* (Gordon, 1975)

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Antisana trail to Yanayacu, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♀; “Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MIZ.

*Toxotoma flavocirculus* (González, 2015) comb. nov.

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga to Yanayacu, 5 km rd. collecting along the road, 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♂; same collection data as for preceding; MIZ • 1 ♂; “Cosanga vic., near river, 1900m, 00°34’42.3’’S / 77°51’59.3’’W, 25 XI 2009, leg. L. Borowiec”; MNHW • 1 ♀; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; “Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MNHW.

*Toxotoma flavofasciata* (LaPorte, 1840)

**Material examined**

ECUADOR • 1 ♀; “Napo prov., Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♀; same collection data as for preceding; MIZ.

*Toxotoma fuscopilosa* (Weise, 1902) comb. nov.

**Material examined**

ECUADOR • 1 ♂; “Napo prov., Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW.

**Remarks**

Species new to Ecuador.

*Toxotoma hybridula* (Gordon, 1975) comb. nov.

**Material examined**

ECUADOR • 4 ♂♂; “Napo prov., Cosanga to Yanayacu, 5 km rd. collecting along the road, 25 XI 2009, leg. L. Borowiec”; MNHW • 2 ♂♂; “Cosanga vic., Yanayacu Biol. Station, 2000–2200m, 00°35’S / 77°53’W, 23 XI-17 XII 2009, leg. L. Borowiec”; MNHW • 1 ♂; “Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♂; “Cosanga vic., Yanayacu Station, 2000–2200m, 00°35’S / 77°53’W, 17 XII 2009, leg. R. Ruta”; MNHW.

*Toxotoma taeniola* (Gordon, 1975) comb. nov.

**Material examined**

ECUADOR • 3 ♂♂, 2 ♀♀; “Napo prov., Cosanga vic., Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW • 1 ♂, 1 ♀; same collection data as for preceding; MIZ.

**Remarks**

Species new to Ecuador.

Tribe Hyperaspidini Mulsant, 1846  
Genus *Hyperaspis* Chevrolat, 1836

*Hyperaspis rutai* sp. nov.

[urn:lsid:zoobank.org:act:A150DCAA-2BA8-408B-B04E-5FA996D9711E](https://doi.org/10.21203/rs.3.rs-1150969/v1)

Figs 10G–I, 13

**Diagnosis**

*Hyperaspis rutai* sp. nov. has antennae with 11 antennomeres, frontoclypeus with distinct lateral incision, tegmen with parameres long and broadly oval, and penis capsule with arms well developed which places this newly described species in the *onerata* species group as defined by Gordon & Canepari (2008). It can be easily distinguished from other species of this group by having a unique dorsal color pattern on each elytron consisting of three large yellow, unconnected maculae on a black background (Fig. 7G–H). Moreover, male genitalia are of typical form of *Hyperaspis* but the penis guide is short, barely extending beyond half-length of parameres. Female genitalia have the hind margin of proctiger coarsely serrate, and is very unique among all other species of *Hyperaspis*.

**Etymology**

This species is dedicated to the Polish entomologist and expert in Scirtidae systematics, collector of the type series, Rafał Ruta (University of Wrocław).

**Material examined**

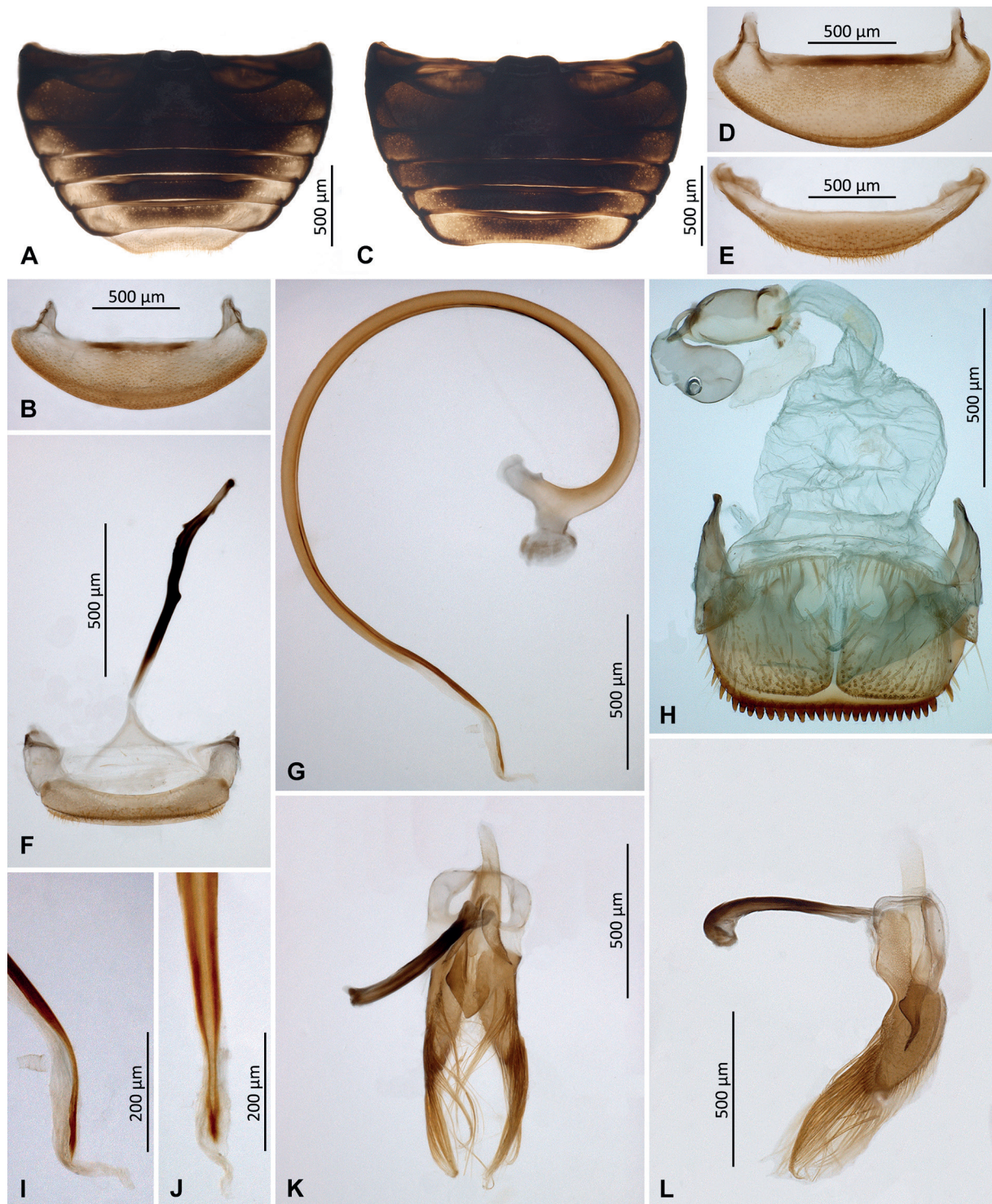
**Holotype**

ECUADOR • ♂; “Napo prov., Cosanga, Yanayacu, collecting along the road, 25 XI 2009, leg. R. Ruta”; MNHW.

**Paratypes**

ECUADOR • 2 ♂♂, 3 ♀♀; same collection data as for holotype; MNHW • 1 ♂, 1 ♀; same collection data as for holotype; MIZ • 1 ♀; “Cosanga vic., Las Palmas Island, 2 XII 2009, leg. R. Ruta”; MNHW.





**Fig. 13.** *Hyperaspis rutai* sp. nov. **A.** Holotype (MNHW), ♂, abdomen. **B.** Holotype (MNHW), ♂, tergite VIII. **C.** Paratype (MNHW), ♀, abdomen. **D.** Paratype (MNHW), ♀, tergite VIII. **E.** Paratype (MNHW), ♀, ventrite 6. **F.** Holotype (MNHW), ♂, segments IX and X, dorsal view. **G.** Holotype (MNHW), penis, lateral view. **H.** Paratype (MNHW), female genitalia, ventral view. **I.** Holotype (MNHW), penis tip, lateral view. **J.** Holotype (MNHW), penis tip, inner view. **K.** Holotype (MNHW), tegmen, inner view. **L.** Holotype (MNHW), tegmen, lateral view.

**Description**

**BODY.** Length 3.30 mm; TL/EW = 1.20; PL/PW = 0.45; EL/EW = 1.00. Body oval (Fig. 10G), strongly convex (Fig. 10H), winged; head yellow, pronotum black with three yellow spots: one longitudinal medially and two rounded on lateral sides as on Fig. 10I; elytra black with three large, yellow spots on each elytron (2+1): humeral spot elongate oval, extended posteriorly from humeral angle, discal spot elongate oval and apical spot oval; mouthparts, antennae, hypomera, legs except coxae, lateral sides of ventrites 1–5 and entire ventrite 6 yellow-brown, pro-, meso- and metasternum, coxae and central part of ventrites 1–5 infuscate, dark brown to black. Dorsum glabrous, with single size punctures. Punctures on pronotum and elytra less coarse than on head. Head with microreticulation between punctures.

**HEAD.** Head partially covered by pronotum; ventral antennal grooves shallow, straight. Eyes moderately convex, dorsally with inner orbits arcuate; ocular canthus absent; interocular distance about  $0.50 \times$  as wide as head across eyes; interfacetal setae absent. Antenna  $0.38 \times$  as long as head capsule width, composed of 11 antennomeres; scape enlarged, distinctly roundly projected anteriorly; pedicel narrower than scape, barrel-shaped, about  $1.20 \times$  as long as wide; antennomere 3 distinctly shorter than pedicel, about  $0.70 \times$  as long as pedicel. Antennal club consisting of three antennomeres, elongate, fusiform; antennomere 9 longer than two apical antennomeres combined, antennomere 10 obliquely truncate apically, terminal antennomere short, triangular. Anterior clypeal margin slightly emarginated. Labrum truncate at apex. Mandible bidentate at apex. Maxillary cardo transverse with outer angle reaching slightly outside of mouth cavity; terminal palpomere slightly widened, obliquely truncate at apex. Submentum transverse; mentum cordate in shape, anterior edge emarginated with distinct anterior lobes, ventral surface with lateral longitudinal impressions; prementum transverse; labial palps separated by distance about equal to width of palpiger; apical palpomere distinctly narrower and shorter than penultimate one.

**PROTHORAX.** Pronotum with anterior corners rounded, obtuse, not swollen with regular border; anterior margin without bordering line; lateral margin with additional oblique line in posterior part, hind margin bordered medially. Prothoracic hypomeron smooth; notosternal suture distinct; prosternal process with parallel margins, truncate apically; its surface with lateral carinae joined just before anterior margin of prosternum forming inverted Y-shape. Prosternum in front of coxa about  $0.70 \times$  as long as coxal longitudinal diameter at same position, anterior margin with complete bordering line; procoxal cavity transverse with apically rounded lateral slit, without anterior bordering line.

**PTEROTHORAX.** Mesoventrite with anterior edge emarginate with complete raised border; mesoventral process at median width of coxa about equal as corresponding coxal diameter; meso-metaventral articulation with suture visible; junction slightly sinuate. Scutellar shield pentagonal; surface punctate and glabrous. Elytra with sides rounded; lateral margins narrow, visible from above from base to half its length; humeral angles present; elytral epipleuron wide, about  $3.0 \times$  as wide as corresponding metaepisternum, incomplete reaching ventrite 3, obtuse apically, inner margin with bordering line curved outwardly before base of elytron; with foveae for reception of femora. Metaventrite with discrimen long but incomplete anteriorly; metaventral postcoxal joined at middle, laterally complete, rounded; metaventrite coarsely punctate, with microreticulation on lateral sides; metepimeron distinct.

**LEGS.** Legs with trochanters angulate; tibiae slender, cylindrical, tibial apices without spurs; tarsi with four tarsomeres, third very small; tarsal claws in female and in male with quadrate basal tooth; empodium absent.

**ABDOMEN.** Abdomen with six ventrites in both sexes; ventrite 1,  $2 \times$  as long as ventrite 2, ventrite 2–5 same length; abdominal postcoxal lines incomplete, posteriorly reaching hind margin of ventrite 1 and recurved; hind margin of ventrite 5 in male widely emarginate (Fig. 13A), in female straight to slightly emarginate (Fig. 13C); in male ventrite 6 truncate apically (Fig. 13A) and tergite VIII rounded



(Fig. 13B); in female ventrite 6 and tergite VIII rounded (Fig. 13D–E). In both sexes ventrite 6 with lateral pockets for accommodation of bent tergite VIII, lateral margins of tergite VIII partially covers ventrite 6 and is visible ventrally. Small glandular pores between ventrites 2–3 and 3–4 present.

**MALE TERMINALIA AND GENITALIA.** Sternite IX (Fig. 13F) with additional sclerite at base of apodeme in form of inverted V; apodeme rod-like, irregular; tergite X short, transverse. Tegmen in inner view (Fig. 13K) with penis guide asymmetrical, petal shaped; parameres (Fig. 13L), well developed, about  $2 \times$  as long as penis guide, with fringe of dense, long setae on apices and edges; tegminal strut rod-like. Penis capsule (Fig. 13G) with inner arm narrow, outer arm well developed; penis gently narrowing toward apex; penis tip acute, slightly curved, partially membranous apically (Fig. 13I–J).

**FEMALE GENITALIA.** Sperm duct short, shorter than spermatheca, broad, uniform in diameter; infundibulum absent; spermatheca compound, basal unit and apical portion connected by short, narrow duct, spermathecal accessory gland present. Coxites subquadrate, deeply roundly emarginate at base, truncate on apices; ventral surface covered with long setae. Styli reduced to small stigmata on hind margin near inner edge of coxites. Hind margin of proctiger distinctly serrate.

Tribe Ortaliini Mulsant, 1850  
Genus *Zenoria* Mulsant, 1850

*Zenoria linteolata* Mulsant, 1850

#### Material examined

ECUADOR • 1 ♂; “Napo prov., Puerto Misahuallí (2 km S), 439m, 01°02’S / 77°39’W, 8 XII 2009, leg. R. Ruta”; MNHW.

Tribe Scymnini Mulsant, 1846  
Genus *Scymnus* Kugelann, 1794

*Scymnus (Scymnus) interruptus* (Goeze, 1777)

#### Material examined

ECUADOR • 1 ex.; “Napo prov., road to Las Caucheras, Antisana trail, 3 XII 2009, leg. R. Ruta”; MNHW.

#### Remarks

This species is native to the West Palearctic region, but it was introduced into the United States as a biological control agent (Gordon 1985) and then spread to other regions of the New World. Recently also recorded in South America in Chile (González *et al.* 2019). Species new to Ecuador.

#### Discussion

The fauna of ladybird beetles of Ecuador was estimated to consist of 199 species (González 2015a, 2015b, 2016; Szawaryn 2015; Szawaryn & González 2017; González & Větrovec 2021). Examination of coccinellids recently collected in Yanayacu Biological Station in Napo Province in Ecuador revealed 37 native species of ladybirds representing the following tribes: Brachiacanthini (six species in three genera), Coccidulini (two species in one genus), Coccinellini (seven species in three genera), Chnoodini (three species in three genera), Epilachnini (17 species in two genera), and Hyperaspidiini, Ortaliini and Scymnini (each with one species). Among them, six are new: *Chnoodes yanayacu* sp. nov., *Cyrea mcclarini* sp. nov., *Eupalea borowieci* sp. nov., *Exoplectra misahualli* sp. nov., *Hyperaspis rutai*



sp. nov., *Toxotoma gonzalezi* sp. nov. Further, seven species are recorded for the first time in Ecuador: *Cyrea noticollis*, *Eupalea formosa*, *Epilachna transverselineata*, *Psyllobora marshalli*, *Toxotoma fuscopilosa*, *Toxotoma taeniola*, *Zenoria linteolata*, although, their presence in Ecuador is not surprising as they had been known either from Peru or Colombia. Among the examined material we also found one Palearctic species, *Scymnus interruptus*, which was introduced to the United States and further spread throughout North and South America. These finds result in 213 species of Coccinellidae currently recognized from the territory of Ecuador. Nonetheless, the true diversity of the Ecuadorian fauna is probably much higher, as numerous new species are pending descriptions.

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