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Description of eight new *Anomala* species from Costa Rica (Coleoptera: Scarabaeidae: Rutelinae).

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Abstract

Eight new species of *Anomala* from Costa Rica are described: *A. arthuri* new species, *A. cupreovariolosa* new species, *A. ferrea* new species, *A. nigroflava* new species, *A. semilla* new species, *A. solisi* new species, *A. volsellata* new species, *A. zumbadoi* new species and a distribution map of each is given. The male genitalia (aedeagus and endophallus) of the species covered are illustrated.

Keywords: aedeagus, species distribution, endophallus, new species.

1. Introduction

The genus *Anomala* Samouelle is one of the largest of the animal kingdom, with more than 1000 species described and shows a worldwide distribution [4]. However, only about 200 of these are described for the New World, a number that is more indicative of the lack of taxonomic study in this region than of the lack of biodiversity.

The size of this genus has been rightly cited by Jameson and collaborators (2003) [4] as one of the main reasons for the lack of taxonomic revision of *Anomala*, but the taxonomic study of species at a local level, with the description of new species, is revealing important information for identifying and characterizing natural groups of species [9, 12], which hopefully will be helpful in elucidating the structure of this huge genus.

The species described in this work are morphologically heterogeneous, showing part of the variability that is grouped under the genus *Anomala*, and their relative relations have not been investigated.

2. Materials and Methods

The material cited in this publication is deposited in the following collections:

CEUA Colección Entomológica de la Universidad Alicante, Spain

INBIO Instituto Nacional de Biodiversidad, Costa Rica

MNHUB Museum für Naturkunde der Humboldt Universität zu Berlin, Germany

MUCR Museo de insectos, Universidad de Costa Rica, Costa Rica

To prepare the endophallus for study, the following procedure was used: the aedeagus was washed in a 10% hot KOH solution for 5–10 minutes and then rinsed in distilled water. It was then kept in lactic acid for a minimum of 48 hours until the structures of the aedeagus and endophallus became translucent. The endophallus was everted by injecting water from the base of aedeagus with a syringe equipped with a suitable needle or microforceps (WPI Dumont #5) when the length of the internal sac made the syringe method inefficient. The dissection was transferred to a microvial containing glycerin, which was attached to the insect pin. From 3 to 6 specimens of each species were dissected.

Line drawings were traced in GIMP image manipulation program (version 2.8, www.gimp.org). Original drawings were done with the aid of a camera lucida attached to a stereo microscope (Leica M80) for endophalli or from photographs for aedeagi (taken with a Leica DFC450 camera mounted on a Leica M205C stereo microscope).

All measurements were taken from photographs of the specimens, using Leica Application software. A Leica DFC450 camera mounted on a Leica M205C stereo microscope was used to take the photographs.

The following definitions were used in the description: body length: from tip of clypeus to pygidium. Body width: measured at widest point of elytra. Clypeus width: measured at half height. Ratio interocular width/width of eye: widths measured at half the height of eyes. Pronotum width: measured at base. Metatibia ratio: length measured from below the articulation with femur to tip, on the median axis; width measured at widest point.

Clypeus thickness in frontal view: thick if more or equal to 0.3 mm; thin if less than 0.3 mm.

We follow the traditional taxonomic inclusion of the New World species in the genus *Anomala* [4], in contrast to the recent paper by Ramírez-Ponce and Morón (2009) [8] who group them into a new genus *Paranomala*, as a more conservative classification, waiting for a more extensive study at global scale.

This work is meant to be part of a general taxonomical work on *Anomala* in Costa Rica. To exclude cases of synonymy, the type specimens for 173 Neotropical species (about 80% of species cited) have been studied (listed in Appendix 1), and available literature has been consulted for the rest.

3. Results

Anomala arthuri sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Est. Maritza, 600m, lado O Vol. Orosi, Prov. Guan. COSTA RICA R. Blanco, May 1990, L- N 326900_373000 / INBIOCRI000264744".

Paratypes (6): 2♂ 2♀ "Est. Maritza, 600m, lado O Vol. Orosi, Prov. Guan. COSTA RICA R. Blanco, May 1990, L- N 326900_373000" / INBIOCRI000264750, INBIOCRI000264752, CEUA00106166 and INBIOCRI000264745; 1♂ "La Maritza, Hda. Orosi Gste. Pr. Costa Rica 550 m. 25 May 1986 W. Hallwachs, D.H. Janzen / CEUA00106165"; 1♀ "La Maritza. Hda. Orosi Gste. Pr. Costa Rica 550m. 2-5 June 1986 W. Hallwachs, D.H. Janzen / INBIOCRI002754779".

Holotype male: Body shape elongated. Length 13.3 mm. Width 7.1 mm.

Color. (Fig. 1). Head metallic green, clypeus light green. Pronotum metallic green with sides and median longitudinal band ochre with green luster. Scutellum, elytra and venter ochre with green luster, elytral suture metallic green. Pygidium ochre with green luster and green basal corners. Legs ochre with green luster, apex of pro- and mesotibia brownish, metatibia with green base and apical third. Pro- and mesotarsi brownish, metatarsi metallic green with bronze luster. Abdominal sternites light green.

Clypeus trapezoidal, surface densely punctate-reticulate, flat. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 1.9. Frons densely punctate, flat. Ocular canthum long, thin, and with rounded apex. Interocular ratio (interocular width/width of eye): 3.0. Antenna: ratio funiculus/club 0.7.

Pronotum subtrapezoidal. Ratio width/length 1.7. Lateral margins angulated at 1/3 of pronotum length. Anterior angles acute, sharp, posterior angles obtuse, blunt. Basal margin sinuate, subapical bead obliterated in the middle. Surface with deep dense punctures.

Scutellum subpentagonal, with rounded sides and acute apex. Ratio width/length 1.4. Surface sparsely punctate.

Elytra with costae defined by regular rows of punctures. Subsutural interstice with 1–2 rows of punctures, 2nd–4th interstices with 1 irregular secondary stria. Surface covered with secondary punctures.

Pygidium strigate with short setae on disc, long setae at hind margin. Ratio width/length 1.4.

Space between the mesocoxae narrow, slightly convex. Mesometasternal suture obliterated in the middle, at base of mesocoxae. Abdominal sternites with 1–2 rows of setae and 5–7 rows of punctures per sternite. Last sternite punctate with subapical bead thin and sinuate, apical membrane narrow.

Protibia (Fig. 9) bidentate, apical tooth short and curved, proximal tooth at same level as internal apex of protibia, triangular in shape, sharp, acute. Metatibia stout, slightly narrower subapically. Ratio length/width 2.9. First external carina obliterated, surface punctate above second external carina and rugose below. Protarsal claws: internal claw bifurcate, with upper branch slightly shorter and 2/3 the width of the lower one. Inferior margin sinuate.

Genitalia. Aedeagus (Fig. 17): parameres with acute apex pointing downwards in a lateral view, ventral margin curved. Endophallus (Fig. 25) with a coiled sacculus tapering at apex; ejaculatory duct opening on a lateral inflation.

Variation: Ochre median band on pronotum of variable width; elytra with green or bronze luster; venter from ochre to metallic green. Body length 13.3–14.3 mm, body width 7.1–7.6 mm. Clypeus w/l: 1.9–2.2. Interocular ratio (interocular width/width of eye): 2.9–3.3. Antenna: ratio funiculus/club 0.7–0.8. Pronotum w/l: 1.6–1.7. Scutellum w/l: 1.4–1.5. Metatibia l/w: 2.5–2.9. Females: similar to males, pronotum with more curved lateral margins; protibia (Fig. 9) with longer and wider apical tooth; internal protarsal claw with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, green head, bands on pronotum and elytral suture, rest of body light green or ochre with green or bronze luster; costae defined and interstices with rows of punctures; parameres with acute apex pointing downwards in a lateral view, ventral margin curved; endophallus coiled.

It is related to *A. arara* Ohaus 1897 [4] and *A. semicineta* Bates 1888, [3] both present in Costa Rica, but it is easily separated from them by color (*A. arara* has head and pronotum entirely green, *A. semicineta* dorsally is nearly completely green except for apical part of elytra) and aedeagus (Figs. 33 and 34 respectively)

Etymology: this species is dedicated to my grandfather, Arturo Filippini, who first taught me the wonders of nature (V.F.)

Distribution: Guanacaste mountain range, from 550 to 600 m (Fig. 41).

Anomala cupreovariolosa sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Puntarenas. Costa Rica. San Vito Las Cruces. 20 NOV 1988. A. Solis / INBIOCRI002517681".

Paratypes (8): 1♀ "COSTA RICA, Prov. Puntarenas, Coto Brus, Sabalito, Z. P. Las Tablas, Est. Las Alturas. 1600m. 16 MAY 1999. I. A. Chacón. Manual, L_S_323100_591500 #55283 / INB0003316144"; 1♂ 1♀ "Zona Protectora Las Tablas, Prov. Punta, COSTA RICA. 1380m. 21 SET 1995. M. Chinchilla, de Luz L_S_319300_594700 #6296" / CEUA00106170 and INBIOCRI002341975; 2♂ "Puntarenas. Costa Rica. San Vito Las Cruces. 20 NOV 1988. A. Solis" / INBIOCRI002517682 and INBIOCRI002517683; 1♂ "Est. Biol. Las Alturas 1500 m, Coto Brus, Prov. Puntarenas, Costa Rica, F. Araya, 23 mar a 2 may 1992, L- S 322500_591300 / CEUA00106171"; 1♂ "Estacion Biologica Las Alturas, Coto Brus, Prov. Punta, COSTA RICA. 1500m. Abr 1992. M. Ramirez, L S 322500_591300 #1184 / INBIOCRI001717589";

1♂ "COSTA RICA, Prov. Puntarenas, Est. Biologica Las Alturas, Send. a Cerro Echandi. 1580m. 28 FEB 1998. B. Gamboa. Tp. Luz. L_S_322900_591050 #49700 / INBIOCRI002601796".

Holotype male: Body shape oval. Length 12.3 mm. Width 7.4 mm.

Color. (Fig. 2). Head and pronotum black with bronze and green luster. Scutellum and elytra black. Pygidium reddish black. Legs and venter brownish black.

Clypeus trapezoidal, surface densely punctate-reticulate, convex. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.2. Frons densely punctate, flat. Ocular canthum long, thin, with rounded apex. Interocular ratio (interocular width/width of eye): 3.1. Antenna: ratio funiculus/club 0.7.

Pronotum subtrapezoidal. Ratio width/length 1.6. Lateral margins angulated at 1/3 of pronotum length. Anterior angles right and sharp, posterior angles obtuse and blunt. Basal margin sinuate, subapical bead obliterated in the middle. Surface with coalescing punctures, irregular.

Scutellum. Shape subtriangular, with rounded sides and blunt apex. Ratio width/length 1.5. Surface sparsely punctate.

Elytra with costae defined by irregular rows of coarse punctures. Interstices with dense irregular coalescing punctures. Surface covered with secondary punctures that with coarse main punctuation give an irregular appearance.

Pygidium with coalescing punctures and long setae at hind margin.

Space between the mesocoxae narrow, slightly convex. Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1–3 rows of setae, denser on second sternite, and 3–7 rows of punctures per sternite. Last sternite punctate, with subapical bead thin and sinuate, apical membrane wide.

Protibia (Fig. 10) bidentate, apical tooth long and curved, proximal tooth at same level as internal apex of protibia, triangular in shape, sharp. Metatibia stout, fusiform. Ratio length/width 2.8. First external carina well developed. Surface punctate above second external carina, and rugose below. Protarsal claws: external claw strongly curved, internal claw bifurcate, with upper branch of same length and 2/3 the width of the lower one, inferior margin sinuate.

Genitalia. Aedeagus (Fig. 18): parameres with blunt apex on lateral view, ventral margin slightly sinuate. Endophallus (Fig. 26) with one long sacculus with setae at apex, and a shorter sacculus on the other side, where ejaculatory duct opening is located, with tapering apex and a sclerotized ridged plate.

Variation: Pronotum with green or bronze luster; elytra from reddish brown to black, green luster may be present; venter from reddish to greenish and brownish black. Body length 12.3–13.7 mm, body width 7.2–7.9 mm. Clypeus w/l: 2.2–2.4. Interocular ratio (interocular width/width of eye): 3.1–3.6. Antenna: ratio funiculus/club 0.7–0.8. Scutellum w/l: 1.2–1.5. Pygidium w/l: 1.6–1.7. Metatibia l/w: 2.6–2.8. Females: similar to males, protibia (Fig. 10) with wider apical tooth; proximal tooth above internal apex; internal protarsal claw narrower with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, dark color with metallic luster, irregular elytral surface, parameres wide with blunt apex and slightly sinuate ventral margin.

Similar to *A. variolosa* Ohaus 1928 [6] and *A. semilla* sp.n., it can be differentiated by the presence of metallic luster, smaller size in respect to *A. variolosa*, and shape of male genitalia: *A.*

variolosa has parameres with squared apex and strongly sinuate ventral margin (Fig. 35), *A. semilla* has long and slender parameres (Fig. 21).

Etymology: from Latin adjective *cupreus*, -a, -um, coppery, and *variolosa*, for its metallic luster and irregular elytral surface as in *A. variolosa*.

Distribution: Coastal and Talamanca mountain range, from 1180 to 1670 m (Fig. 42).

Anomala ferrea sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Puntarenas. Costa Rica. San Vito Las Cruces. 20 NOV 1988. Col. A. Solis / INBIOCRI002517845".

Paratypes (6): 1♂ 5♀ "Puntarenas. Costa Rica. San Vito Las Cruces. 20 NOV 1988. Col. A. Solis" / INBIOCRI002517848, INBIOCRI002517847, INBIOCRI002517843, INBIOCRI002517850, INBIOCRI002517844 and CEUA00106169.

Holotype male: Body shape oval. Length 12.12 mm. Width 7.13 mm.

Color. (Fig. 3). Head and pronotum dark metallic green. Scutellum, elytra, pygidium, legs and venter dark reddish brown.

Clypeus rectangular, with anterior angles widely curved, surface densely punctate-reticulate, flat. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.0. Frons densely punctate, flat. Ocular canthum long, thin, with acute apex. Interocular ratio (interocular width/width of eye): 3.3.

Pronotum subtrapezoidal. Ratio width/length 1.5. Lateral margins sinuate. Anterior angles right, blunt, posterior angles obtuse, blunt. Basal margin sinuate, subapical bead obliterated in the middle. Surface with sparse fine punctures.

Scutellum. Shape subtriangular, with rounded sides and acute apex. Ratio width/length 1.4. Surface densely punctate.

Elytra with evident costae, defined by regular rows of punctures. Subsutural interstice with 2 rows of punctures, 2nd–4th interstices with 1 irregular secondary stria. Surface covered with secondary punctures.

Pygidium strigate with long setae at hind margin. Ratio width/length 1.6.

Space between the mesocoxae wide. Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1–3 rows of setae and 5–7 rows of fine punctures per sternite. Last sternite strigate, with subapical bead thick and sinuate, apical membrane narrow.

Protibia (Fig. 11) bidentate, apical tooth short and curved, proximal tooth below internal apex of protibia, triangular in shape, obtuse. Metatibia slender, fusiform. Ratio length/width 2.9. First external carina constituted by a row of sparse setae. Surface punctate. Protarsal claws: internal claw bifurcate, with upper branch slightly shorter and 2/3 the width of the lower one, inferior margin showing a sharp angle near base.

Genitalia. Aedeagus (Fig. 19): parameres with angulated dorsal margin in lateral view, narrow apex and sharp ventral angle in a lateral view. Endophallus (Fig. 27) with a heavily sclerotized median lobe, ending in a bilobed projection; endophallus developing dorsally, with a wide sacculus with a large patch of long and somewhat sparse sclerotized spines; bases for attachment of spines are small rectangular lightly sclerotized plates; ejaculatory duct opening lateral at base.

Variation. Head and pronotum from reddish brown to metallic green; elytra from reddish to greenish black; pygidium and venter from reddish to greenish dark brown. Body length

12.1–13.5 mm, body width 7.0–7.8 mm. Clypeus w/l: 2.0–2.1. Interocular ratio (interocular width/width of eye): 2.9–3.5. Antenna: ratio funiculus/club 0.6–0.7. Scutellum w/l: 1.4–1.5. Metatibia l/w: 2.7–3.5. Females: similar to males, antennal club shorter, protibia (Fig. 11) with longer and wider apical tooth; internal protarsal claw narrower, with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, pronotum dark metallic green, elytra dark reddish brown, elytra with defined costae, subsutural interstices with 2 rows of punctures, parameres with angulated dorsal margin in lateral view, narrow apex and sharp ventral angle in a lateral view, median lobe heavily sclerotized, ending in a bilobed projection, endophallus with a large patch of long and sclerotized spines.

Similar to dark forms of *A. cincta* Say 1835 [11] and *A. testaceipennis* Blanchard 1851 [2], it can be differentiated by the brownish color of elytra, more evident costae, subsutural interstice on elytra narrower than in *A. cincta*, and different male genitalia, with both *A. cincta* and *A. testaceipennis* having shorter parameres with the apex squared in a lateral view (Figs 36 and 37 respectively).

Etymology: from Latin adjective *ferreus*, *-a*, *-um*, iron, for its dark glossy color.

Distribution: one locality in the southern part of Coastal mountain range, 1200 m (Fig. 41).

Anomala nigroflava sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Rio Rincon, Prov. Punta, COSTA RICA. 0 m. 10 MAY 1995. M. Moraga, de Luz L N 280450 517500 #4635 / INBIOCRI002169259".

Paratypes (5): 1♂ 1♀ "COSTA RICA. Prov. Puntarenas. Golfito. Jiménez. Est. El Tigre, Area Administrativa. 47m. 8-9 NOV 2007. J. A. Azofeifa. Tp. Luz. L_S_277800_529600 #92860" / INB0004127874 and CEUA00106191; 1♂ "COSTA RICA. Prov. Puntarenas. Golfito. Jiménez. Est. El Tigre, Area Administrativa. 47m. 28-29 NOV 2007. J. A. Azofeifa. Tp. Luz. L_S_277800_529600 #92870 / CEUA00106190"; 1♀ "Est. Esquinas, 0m, Peninsula de Osa., Prov. Punt., COSTA RICA Ene 1993, M. Segura, L S 301400,542200 / INBIOCRI001303744"; 1♀ "Rio Rincon, Prov. Punta, COSTA RICA. 0m. 10 MAY 1995. M. Moraga, de Luz L N 280450 517500 #4635 / INBIOCRI002169264".

Holotype male: Body shape oval. Length 11.58 mm. Width 6.2 mm.

Color. (Fig. 4). Head, pronotum and scutellum blackish brown. Elytra light brown with suture reddish brown. Pygidium, venter and legs from reddish brown to dark orange.

Clypeus rectangular, with anterior angles widely curved, surface densely punctate-reticulate, convex. Anterior margin slightly sinuate, clypeus thickness frontally thick. Ratio width/length 2.2. Frons densely punctate, flat. Ocular canthum long, thin, with rounded apex. Interocular ratio (interocular width/width of eye): 2.3. Antenna: ratio funiculus/club 0.7.

Pronotum trapezoidal. Ratio width/length 1.9. Lateral margins angulated at 1/2 of pronotum length. Anterior angles quadrate, sharp, posterior angles obtuse, blunt. Basal margin sinuate, subapical bead obliterated in the middle. Surface with deep dense punctures.

Scutellum. Shape subtriangular, with rounded sides, and acute apex. Ratio width/length 1.4. Surface sparsely punctate.

Elytra with striae defined by regular rows of punctures. Subsutural interstice with 2–3 rows of sparse punctures, 2nd–4th interstices with 1 irregular secondary stria.

Pygidium finely granulated with long setae at hind margins.

Ratio width/length 1.8.

Space between the mesocoxae narrow, flat. Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1 rows of setae and 5–7 rows of punctures per sternite. Last sternite strigate, with subapical bead thick and sinuate, apical membrane narrow.

Protibia (Fig. 12) bidentate, apical tooth long and curved, proximal tooth above internal apex of protibia, triangular in shape, acute. Metatibia slightly narrower subapically. Ratio length/width 3.1. First external carina constituted by a row of sparse setae. Surface punctate above second external carina and rugose below. Protarsal claws: external claw strongly curved, internal claw bifurcate, with upper branch of same length and 2/3 the width of the lower one, inferior margin sinuate.

Genitalia. Aedeagus (Fig. 20): parameres with blunt point in a lateral view, slightly sinuate ventral margin. Endophallus (Fig. 28) globular, median lobe as two weakly sclerotized plates.

Variation. Venter and legs from orange to reddish brown. Body length 11.5–12.7 mm, body width 5.9–7.1 mm. Clypeus w/l: 2.0–2.2. Interocular ratio (interocular width/width of eye): 2.3–2.7. Antenna: ratio funiculus/club 0.7–0.9. Pronotum w/l: 1.8–1.9. Scutellum w/l: 1.4–1.6. Pygidium w/l: 1.6–1.9. Metatibia l/w: 2.9–3.0. Females: similar to males, protibia (Fig. 12) with wider teeth; internal protarsal claw narrower with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, pronotum completely black, elytra ochre.

Another species with black pronotum and light colored elytra is *A. hoepfneri* Bates 1888 [3], but it's bigger, with reddish brown head and thorax, pronotum with light colored and slightly sinuate lateral margins, denser punctuation on elytra, a dark wide band on elytral suture and maculae on calli.

Etymology: from Latin adjectives *nigrus*, *-a*, *-um*, black, and *flavus*, *-a*, *-um*, yellow, for the combination of black pronotum and ochre elytra.

Distribution: Osa peninsula and southern Puntarenas province lowlands, from 0 to 47 m (Fig. 43).

Anomala semilla sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "COSTA RICA. Prov. Alajuela. Upala. P.N. Volcán Tenorio. Alb. Heliconias. Send. a Laguna Danta. 900m. 15 JUN 2007. J. D. Gutiérrez. Tp. Luz 1. L_N_299100_424000 #92206 / CEUA00106176".

Paratypes (8): 1♂ "Albergue Heliconias, Prov. Alajuela, Costa Rica. 15/06/2007 Leg. D. Gutiérrez / CEUA00106174"; 1♂ "COSTA RICA. Prov. Alajuela. Upala. P.N. Volcán Tenorio. Alb. Heliconias. Send. a Laguna Danta. 900m. 15 JUN 2007. J. D. Gutiérrez. Tp. Luz 1. L_N_299100_424000 #92206 / CEUA00106175"; 1♀ "COSTA RICA. Prov. Alajuela. Upala. P.N. Volcán Tenorio. Alb. Heliconias. Send. a Laguna Danta. 900m. 15 JUL 2007. J. D. Gutiérrez. Tp. Luz 1. L_N_299100_424000 #92233 / CEUA00106177"; 1♂ 4♀ "Estación Cabro Muco. Repr. ICE-Z.P. Miravalles. Guanacaste, Costa Rica. 1000 m 12/06/2010 L. V.Filippini, M.Moraga" / CEUA00106178, CEUA00106181, CEUA00106182 and 2 INBIO.

Holotype male: Body shape oval. Length 13.61 mm. Width 7.89 mm.

Color. (Fig. 5). Entire body blackish brown.

Clypeus trapezoidal, surface densely punctate-reticulate, flat. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.4. Frons densely punctate, flat. Ocular canthum short, thin, with rounded apex. Interocular ratio

(interocular width/width of eye): 4.0. Antenna: ratio funiculus/club 0.7.

Pronotum trapezoidal. Ratio width/length 1.5. Lateral margins sinuate. Anterior angles right, sharp, posterior angles obtuse, sharp. Basal margin sinuate, subapical bead obliterated in the middle. Surface rugose.

Scutellum. Shape subpentagonal, with rounded sides and blunt apex. Ratio width/length 1.4. Surface densely punctate.

Elytra with irregular rows of coalescing punctures. Surface covered with secondary punctures, irregular.

Pygidium finely strigate, with long setae at hind margin. Ratio width/length 1.7.

Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1–3 rows of setae (denser on second sternite) and 4–7 rows of punctures per sternite. Last sternite strigate, with subapical bead thin and sinuate, apical membrane wide.

Protibia (Fig. 13) bidentate, apical tooth long and curved, proximal tooth at same level as internal apex of protibia, triangular in shape, sharp, acute. Metatibia stout, slightly narrower subapically. Ratio length/width 2.4. First external carina constituted by a row of sparse setae. Surface rugose. Protarsal claws: internal claw bifurcate, with upper branch of same length and 2/3 the width of the lower one, branches widely open, inferior margin sinuate.

Genitalia. Aedeagus (Fig. 21): parameres long with narrow apex, ventral margin strongly sinuate in a lateral view. Ventral plate with two long and narrow projections at apical sides. Endophallus (Fig. 29) with one long dorsal sacculus, and a shorter ventral sacculus, where ejaculatory duct opening is located, with a sclerotized flattened plate at apex and a patch of sclerotized setae at base.

Variation. Color from reddish to blackish brown. Body length 12.2–13.7 mm, body width 7.2–7.9 mm. Clypeus w/l: 2.2–2.4. Interocular ratio (interocular width/width of eye): 3.5–4.0. Antenna: ratio funiculus/club 0.7–0.8. Pronotum w/l: 1.5–1.6. Scutellum w/l: 1.4–1.5. Pygidium w/l: 1.5–1.7. Metatibia l/w: 2.2–2.7. Females: similar to males, protibia (Fig. 13) with longer and wider apical tooth; internal protarsal claw with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, blackish or reddish brown color, lateral margins of pronotum weakly curved, irregular elytral surface, parameres long with narrow apex, ventral plate with two long and narrow projections at apical sides.

Similar to *A. variolosa* and *A. cupreovariolosa*, it can be differentiated by the complete absence of metallic luster, smaller size respect to *A. variolosa*, less curved lateral margins of pronotum, and shape of male genitalia, with longer and slender parameres and presence of projections on ventral plate (Fig. 21 vs. Figs. 18, 35).

Etymology: from Spanish noun *semilla*, seed, used as a noun in apposition, for its rounded shape and irregular surface that resemble a seed.

Distribution: Guanacaste mountain range, from 900 to 1000 m (Fig. 43).

Anomala solisi sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Amubri, 70m, Talamanca, Prov. Limon, Costa Rica, 1 a 22 jul 1992, G. Gallardo, L-S 385500_578050 / INBIOCRI000751373".

Paratypes (11): 1♀ "COSTA RICA. Prov. Guanacaste. P.N. Rincón de la Vieja. Hda. Santa Maria. 839m. 21 MAY 2003. Cate, Barries, Uhler. Tp. Luz. L_N_304918_394213 #86772 / CEUA00106163"; 1♀ "Sector San Ramon, Prov. Alaju,

COSTA RICA. 620 m. 13-28 Mar 1994, K. Taylor, L N 318100_381900 # 2763 / INB001711642"; 1♀ "Rio Sardinas, R.N.F.S. Barra del Colorado, Prov. Limon, COSTA RICA. 10m. 6-14 Abr 1994, F. Araya, L N 291500_564700 # 2854 / INBIOCRI001794815"; 2♂ "Estac. Pitilla, 700m, 9 km S Sta. Cecilia, Guanacaste, COSTA RICA, Mar 1990, P. Rios, C. Moraga & R. Blanco, L- N 330200_380200" / INBIOCRI000195592 and INBIOCRI000195830; 1♂ "Est. Cacao, 1000-1400m, Lado suroeste del Volcan Cacao, Prov. Guan., COSTA RICA, II curso Parataxon., Jun 1990, L- N 323300_375700 / INBIOCRI000255275"; 1♂ "Est. Cacao, 1000-1400m, Lado SO Vol. Cacao, P. N. Guan. Prov. Guanacaste, Costa Rica, R. Guzman, 21 a 28 may 1992, L- N 323300_375700 / CEUA00106162"; 1♂ "Rio Sardinas, 10 m, R.N.F.S. Barra del Colorado, Prov. Limon, Costa Rica, Set 1992, F. Araya, L N 291500_564700 / INBIOCRI000819517"; 1♂ 1♀ "Estac. Pitilla, 700m, 9 Km S. Santa Cecilia, Guanac. Pr. COSTA RICA Jun 1988 GNP Biodiversity Survey W85 25°40' N, 105°26' W" / INBIOCRI002517383 and INBIOCRI002517690; 1♂ "Est. Pitilla, 700 m, 9 km S Sta. Cecilia, Prov. Guan, COSTA RICA C. Moraga, Abr 1991, L- N 330200_380200 / INBIOCRI000693146".

Holotype male: Body shape oval. Length 10.4 mm. Width 6.6 mm.

Color. (Fig. 6a). Head brown with bronze luster, anterior margin of clypeus lighter. Pronotum brown with bronze luster and ochre sides. Scutellum ochre with dark margins. Elytra dark brown with ochre elongated maculae arranged on sub-basal, median and apical transversal bands. Pygidium ochre with brown flecks. Legs mottled in ochre and brown. Venter dark brown with ochre maculae, bronze luster.

Clypeus trapezoidal, surface densely punctate-reticulate, flat. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.0. Frons densely punctate with a triangular concavity. Ocular canthum long, thin, with rounded apex. Interocular ratio (interocular width/width of eye): 2.5. Antenna: ratio funiculus/club 0.6.

Pronotum subtrapezoidal, ratio width/length 1.9, lateral margins regularly convex. Anterior angles right and sharp, posterior angles obtuse and blunt. Basal margin sinuate, subapical bead complete. Surface densely punctate.

Scutellum subtriangular, with rounded sides and blunt apex. Ratio width/length 1.4. Surface sparsely punctate, slightly convex and with a subapical sulcus.

Elytra with costae defined by regular rows of punctures. Subsutural interstice with 2–3 rows of punctures, 2nd–4th interstices with 1–2 rows of punctures. Surface covered with secondary punctures.

Pygidium coarsely punctate with long setae at hind margin. Ratio width/length 2.1.

Space between the mesocoxae narrow, slightly convex. Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1 row of setae and 3–5 rows of punctures per sternite. Last sternite strigate, with subapical bead thick and sinuate and wide apical membrane.

Protibia (Fig. 14) bidentate, apical tooth short and curved, proximal tooth at same level as internal apex of protibia, triangular in shape, sharp, acute. Metatibia stout, fusiform. Ratio length/width 2.6. First external carina constituted by a row of sparse setae, surface punctate-rugose above second external carina and rugose below. Protarsal claws: internal claw bifurcate, with upper branch of same length and half the width of the lower one, inferior margin sinuate.

Genitalia. Aedeagus (Fig. 22): parameres with indented apex

and strongly sinuate ventral margin; hairy at apex. Endophallus (Fig. 30): median lobes heavily sclerotized, endophallus developing dorsally, T-shaped, with a flattened plate of sclerotized spines on one extreme, and a long diverticle on the other one; ejaculatory sclerite and ejaculatory opening in the middle; presence of wide based spines at apex of diverticle and posterior extremity of endophallus; a small patch of setae is present medially on a side and sparse setae are present near apical plate.

Variation: Head and pronotum with bronze or green luster; elytra from nearly completely ochre with sparse brown maculae, to mainly brown with few light maculae (Fig. 6a and 6b); green or bronze luster can be present. Isolated spines on endophallus are present in groups of two-four, and can be present also at base of diverticle and frontally above apex of median lobe. Body length 10.3–11.5 mm, body width 6.2–7.4 mm. Clypeus w/l: 2.0–2.1. Interocular ratio (interocular width/width of eye): 2.5–3.0. Pronotum w/l: 1.8–1.9. Scutellum w/l: 1.4–1.5. Pygidium w/l: 1.8–2.1. Metatibia l/w: 2.4–2.8. Females: similar to males, protibia (Fig. 14) with longer and wider apical tooth; proximal tooth above internal apex; internal protarsal claw narrower with curved inferior margin; last sternite with curved apex.

Diagnosis: very similar to *A. oreas* Ohaus 1897 [1], it is differentiated by the slightly smaller size and symmetrical parameres, whereas in *A. oreas* (Colombia, MNHUB) the left paramere is wider and curved internally and downwards (Fig. 38); the right paramere is similar to those of *A. solisi*, but with different proportions.

Etymology: we are pleased to dedicate this species to Ángel Solís, curator of the beetle collection at INBio, for his kind help with the consultation of the scarab collection and his efforts in its expansion.

Distribution: Guanacaste mountain range and Caribbean lowlands, from 10 to 850 m (Fig. 42).

Anomala volsellata sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "COSTA RICA. Prov. Puntarenas. Osa. R.F. Golfo Dulce. Cerro Brujo. 612m. 24-25 ENE 2009. J. A. Azofeifa, A. Chamorro. Tp. Luz Mercurio. L_S_290700_509100 #95674 / INB0004191779".

Paratypes (6): ♂ "COSTA RICA. Prov. Puntarenas, Golfito, P. N. Corcovado, Cerro Rincón, Las Quebraditas, 500m, 1 MAY 2002, A. Azofeifa, A. Solís, Tp. Luz, L_S_275200_520100 #70567 / CEUA00106205"; ♀ "COSTA RICA. Prov. Puntarenas. Osa. R.F. Golfo Dulce. Cerro Brujo. 612m. 24-25 ENE 2009. J. A. Azofeifa, A. Chamorro. Tp. Luz Mercurio. L_S_290700_509100 #95674 / INB0004191843"; ♂ "Estac. Carara, 200m R. B. Carara, Puntarenas COSTA RICA. Mar. 1990, R. Zuñiga, L N 195250_478700 / INBIOCRI000168281"; 2♀ "Est. Bijagual, 600 m. N de Bijagualito, Prov. San J, COSTA RICA. 500m. ABR 1995. J. C. Saborio, L_N_191800_476800 #4826" / INBIOCRI002190664 and CEUA00106206; 1 F# "MUSEO DE INSECTOS UNIVERSIDAD DE COSTA RICA. COSTA RICA, PROV. San José, 16 km N Quepos. 19-11-66 G. Fuentes" MUCR.

Holotype male: Body shape oval. Length 11.33 mm. Width 6.21 mm.

Color. (Fig. 7). Head reddish brown, with lighter clypeus. Pronotum ochre with an inverted pentagonal reddish brown macula on disc, not reaching posterior margin. Scutellum ochre with darker margins. Elytra ochre with dark brown maculae on apical calli, and on 2 transversal bands. Pygidium

ochre with dark brown pairs of maculae at sides and on basal margin. Legs ochre, tibiae with dark brown base, apex and external carinae, metatibiae with brown apical third; tarsi reddish brown. Venter ochre with dark brown median metasternal disc, abdominal sternites reddish brown.

Clypeus trapezoidal, with anterior angles widely curved, surface densely punctate-reticulate, convex. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.0. Frons densely punctate, with a small circular concavity near suture with clypeus. Ocular canthum long, thin, with acute apex. Interocular ratio (interocular width/width of eye): 2.8. Antenna: ratio funiculus/club 0.7.

Pronotum subtrapezoidal. Ratio width/length 1.8. Lateral margins regularly convex. Anterior angles quadrate, sharp, posterior angles obtuse, blunt. Basal margin absent. Surface densely punctate.

Scutellum. Shape subtriangular, with rounded sides and acute apex. Ratio width/length 1.5. Surface sparsely punctate.

Elytra with costae defined by regular rows of punctures. Subsutural interstice with 2 rows of punctures, 2nd–4th interstices with 1 secondary stria. Surface covered with secondary punctures.

Pygidium strigate with long setae at hind margin. Ratio width/length 1.9.

Space between the mesocoxae narrow, slightly convex. Mesometasternal suture obliterated in the middle, at base of mesocoxae. Abdominal sternites with 1 row of setae and 3–6 rows of punctures per sternite. Last sternite punctate, with subapical bead thin and sinuate, apical membrane wide.

Protibia (Fig. 15) bidentate, apical tooth long and curved, proximal tooth below internal apex of protibia, triangular in shape, acute. Metatibia stout, slightly narrower subapically. Ratio length/width 3.0. First external carina well developed. Surface punctate above second external carina, punctate-rugose below. Protarsal claws: external claw strongly curved, internal claw bifurcate, with upper branch of same length and half the width of the lower one, inferior margin showing a sharp angle near base.

Genitalia. Aedeagus (Fig. 23): parameres short, with a blunt apex in a lateral view. Endophallus (Fig. 31): one elongated sacculus, with ejaculatory duct opening frontally at apex, a subapical diverticle covered in long setae; dorsally at median point a pair of facing curved claws, lodged inside membranes at rest, but that can potentially be everted.

Variation: Pronotum from reddish brown to green; size and number of maculae on elytra variable, abdominal sternites from reddish brown to ochre with dark brown sides and last sternite. Body length 10.4–11.6 mm, body width 5.7–6.4 mm. Interocular ratio (interocular width/width of eye): 2.8–3.3. Pronotum w/l: 1.7–1.9. Scutellum w/l: 1.2–1.5. Pygidium w/l: 1.7–1.9. Metatibia l/w: 2.9–3.3. Females: are similar to males, protibia (Fig. 15) with wider apical tooth; proximal tooth above internal apex; internal protarsal claw narrower with curved inferior margin; last sternite with curved apex.

Diagnosis: medium size, rounded shape, elytra with rounded maculae arranged in bands, parameres short, with a blunt apex in a lateral view, endophallus with a pair of claws.

The shape and elytral pattern relate this species to *A. semitonsa* Bates 1888 [3] and *A. balzapambae* Ohaus 1897 [4], but these latter species are covered in setae, and have different shaped male genitalia [3].

Etymology: adjective from noun *volsella*, -ae, tongs, claws, for the peculiar structure in the endophallus.

Distribution: Coastal mountain range and Osa peninsula,

from 200 to about 600 m (Fig. 42).

Anomala zumbadoi sp.n. Filippini, Galante & Micó

Material examined: Holotype: ♂ "Rancho Quemado, Peninsula de Osa, 200m. Prov, Punt., COSTA RICA, F. Quesada, Dic 1991, L- S 292500_511000 / INBIOCRI000483151".

Paratypes (8): 1♀ "Rancho Quemado, Peninsula de Osa, 200 m. Prov, Punt., COSTA RICA, F. Quesada, Dic 1991, L- S 292500_511000 / INBIOCRI000483150"; 1♂ "Rancho Quemado, 200 m, Peninsula de Osa, Prov. Puntarenas, Costa Rica, Nov 1992, R. Aguilar, M. Segura y F Quesada L-S 292500, 511000 / INBIOCRI000938231"; 1♂ "COSTA RICA. Prov. Puntarenas. Pen. de Osa. P.N. Piedras Blancas. Est. Esquinas. Boca del Río Esquinas. 200m. DEC 1993. M. Segura, J. Quesada. L_S 301400_542200 #2537/CEUA00106203"; 1♂ 1♀ "Rancho Quemado, 200m, Peninsula de Osa, Prov. Puntarenas, Costa Rica, Nov 1992, R. Aguilar, M. Segura y F Quesada L-S 292500, 511000" / INBIOCRI000938230 and INBIOCRI000938232; 2♀ "Rancho Quemado, Peninsula de Osa, 200m. Prov, Punt., COSTA RICA, F. Quesada, Dic 1991, L- S 292500_511000" / INBIOCRI000483153 and INBIOCRI000483154; 1♀ "Rancho Quemado, Peninsula de Osa, 200m, Prov. Punt., Costa Rica, F. Quesada, Dic 1991. L_S_292500_511000 #990 / CEUA00106204".

Holotype male: Body shape oval. Length 11.0 mm. Width 6.5 mm.

Color. (Fig. 8). Head and pronotum reddish brown. Scutellum reddish brown with darker margins. Elytra ochre with black suture, lateral margins, maculae on apical calli and a black wavy median transversal band. Pygidium, legs, venter dark reddish brown.

Clypeus rectangular, surface densely punctate-reticulate, flat. Anterior margin straight, clypeus thickness frontally thin. Ratio width/length 2.1. Frons densely punctate, flat. Ocular canthum long, stout, with rounded apex. Interocular ratio (interocular width/width of eye): 3.3. Antenna: ratio funiculus/club 0.7.

Pronotum subtrapezoidal. Ratio width/length 1.5. Lateral margins angulated at 1/3 of pronotum length. Anterior angles acute, posterior angles obtuse, blunt. Basal margin sinuate, subapical bead obliterated in the middle. Surface with deep dense punctures.

Scutellum with rounded sides and blunt apex. Ratio width/length 1.4.

Elytra with costae defined by regular rows of punctures. Subsutural interstice with 2–3 rows of punctures, 2nd–4th interstices with 1 secondary stria. Surface covered with

secondary punctures.

Pygidium finely strigate with short setae on disc, long setae at hind margin.

Space between the mesocoxae narrow, slightly convex. Mesometasternal suture well defined, at base of mesocoxae. Abdominal sternites with 1 row of setae and 3–5 rows of punctures per sternite. Last sternite strigate, with subapical bead thin and curved, apical membrane narrow.

Protibia (Fig. 16) bidentate, apical tooth long and curved, proximal tooth at same level as internal apex of protibia, triangular in shape, obtuse. Metatibia stout, fusiform. Ratio length/width 2.4. First external carina constituted by a row of sparse setae. Surface rugose. Protarsal claws: internal claw bifurcate, with upper branch of same length and 2/3 the width of the lower one. Inferior margin sinuate.

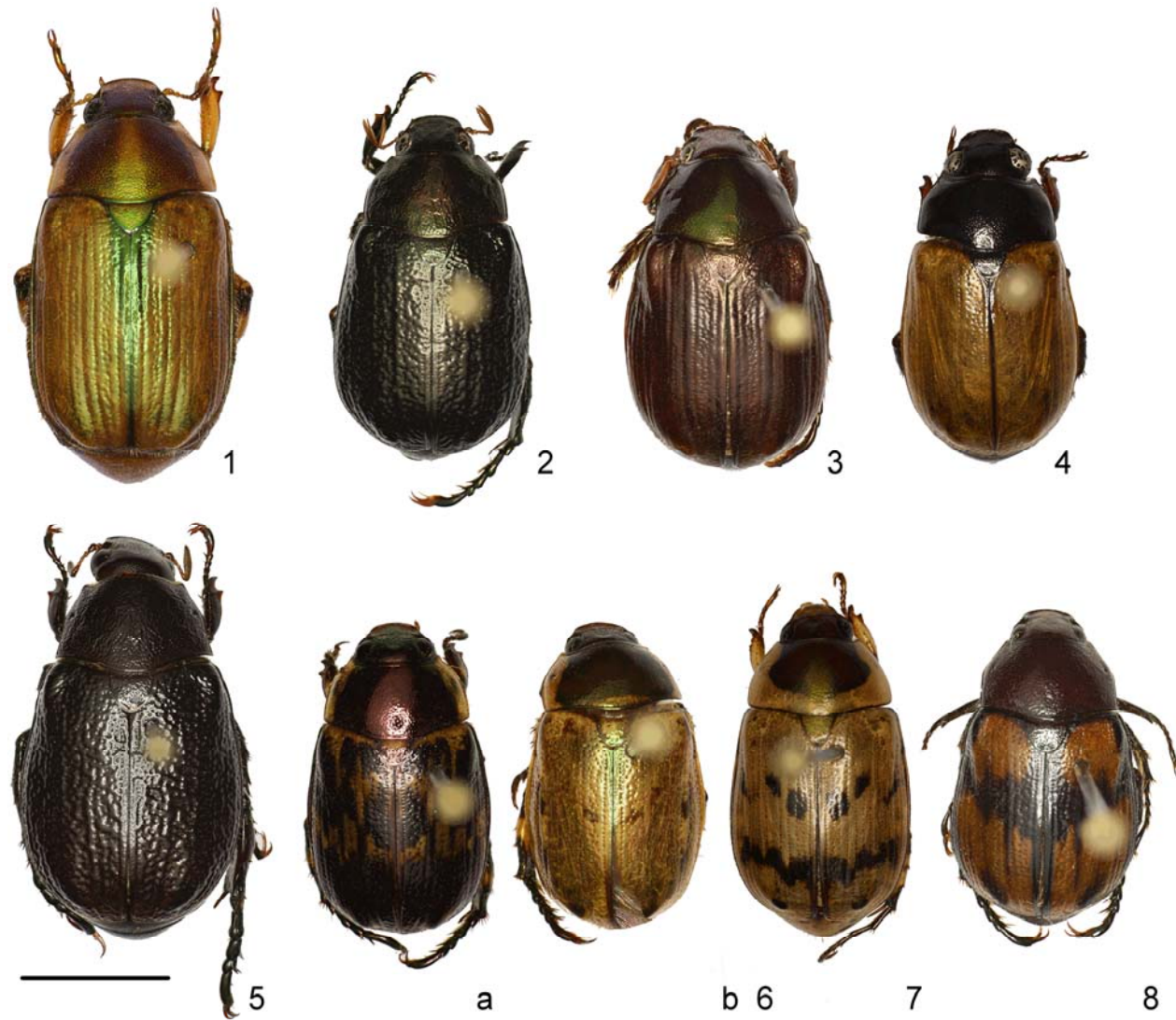
Genitalia. Aedeagus (Fig. 24): parameres long, with narrow and curved apex pointing downwards in a lateral view. Endophallus (Fig. 32) with one long sacculus, covered with microsetation, curved backwards; one small patch of spines dorsally at base; ejaculatory duct opening ventrally at base. Median lobe absent.

Variation: Head and pronotum from reddish to blackish brown; black transversal band on elytra of variable width, additional black longitudinal stripes may be present on costae, of variable length. Body length 10.7–12.8 mm, body width 6.4–7.0 mm. Clypeus w/l: 2.1–2.5. Interocular ratio (interocular width/width of eye): 2.8–3.4. Antenna: ratio funiculus/club 0.6–0.8. Pronotum w/l: 1.5–1.6. Scutellum w/l: 1.4–1.5. Pygidium w/l: 1.9–2.0. Metatibia l/w: 2.2–2.5. Females: similar to males, protibia (Fig. 16) with wider apical tooth, internal protarsal claw narrower with curved inferior margin, last sternite with curved apex.

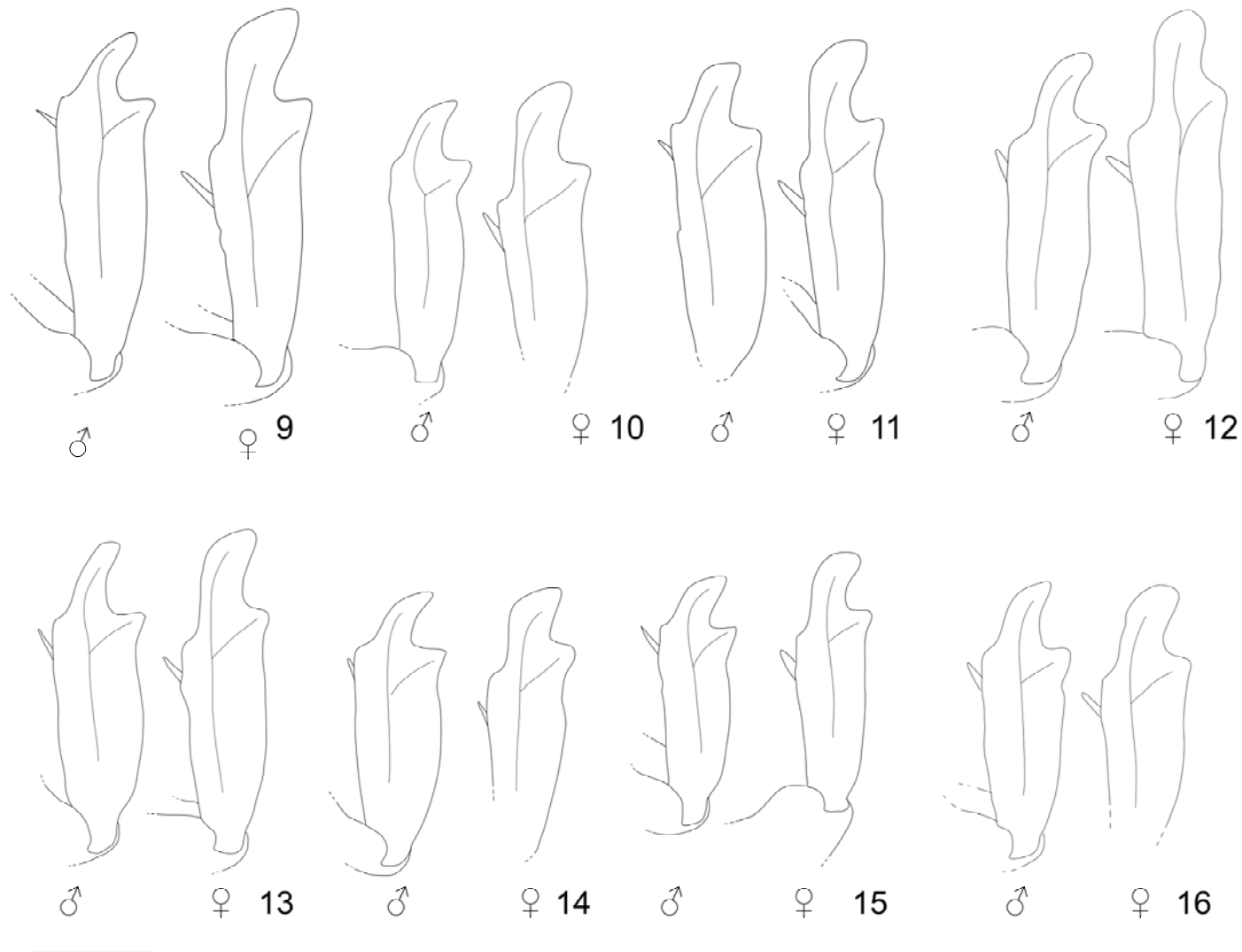
Diagnosis: medium size, pronotum reddish brown, elytra with a black wavy median transversal band, parameres long, with narrow and curved apex pointing downwards in a lateral view. Related to *A. chapini* Robinson 1948^[10], *A. clathrata* Ohaus 1930^[6] and *A. popayana* Ohaus 1897^[4], which share the elytral pattern, but these species are bigger, *A. chapini* and *A. clathrata* have darker pronotum and venter, elytra with narrower and often interrupted transversal band, long and well-marked dark strips on costae. *A. clathrata* has shorter and wider parameres (Fig. 39); *A. popayana* have black, less punctated pronotum with steeper lateral margins, parameres with short squared apex in lateral view (Fig. 40).

Etymology: we are pleased to dedicate this species to Manuel Zumbado, coordinator of the Biodiversity Unit at INBio, for its invaluable help during our joint researches in Costa Rica.

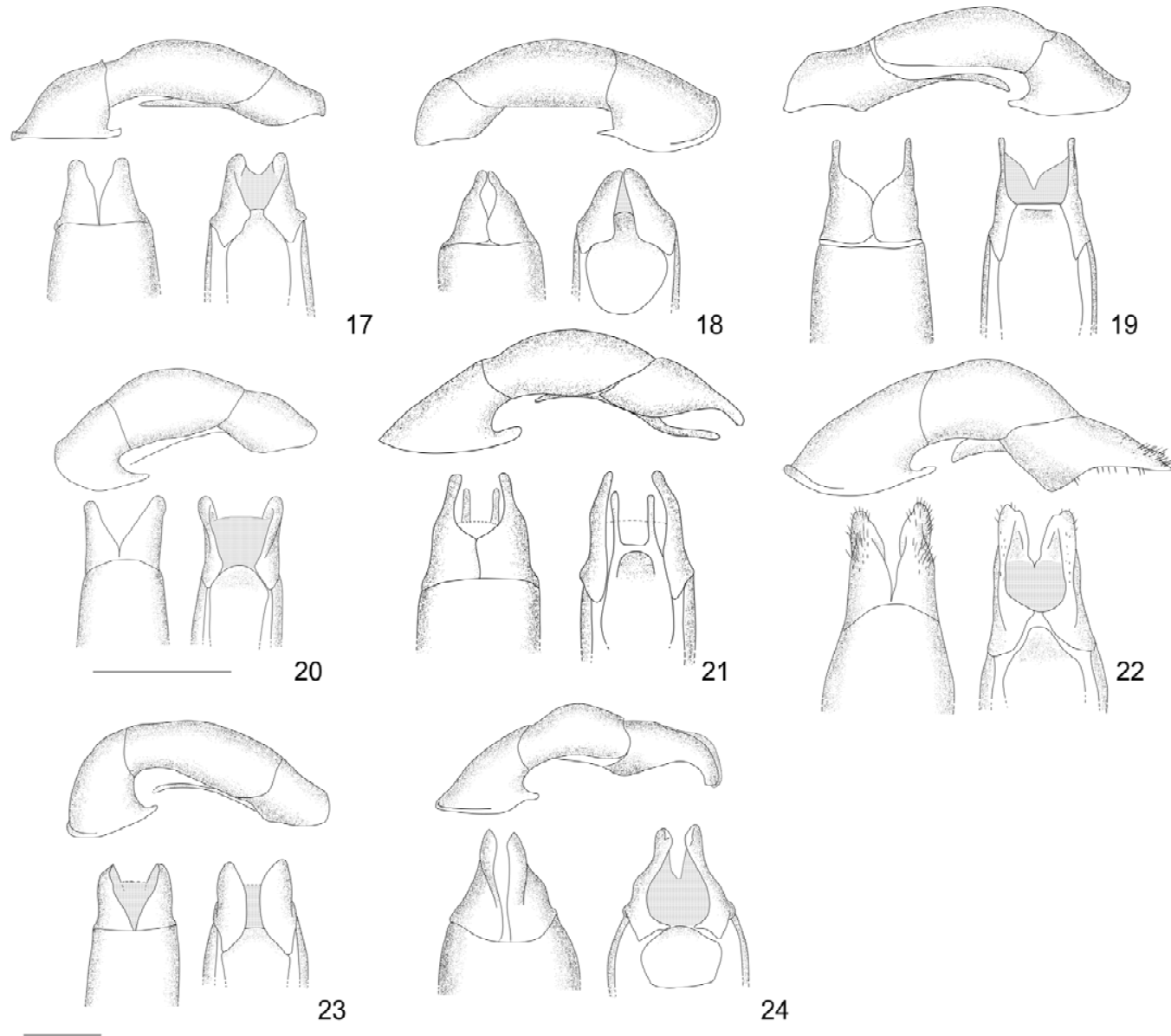
Distribution: Coastal mountain range and Osa peninsula, from 200 to 300 m (Fig. 41).



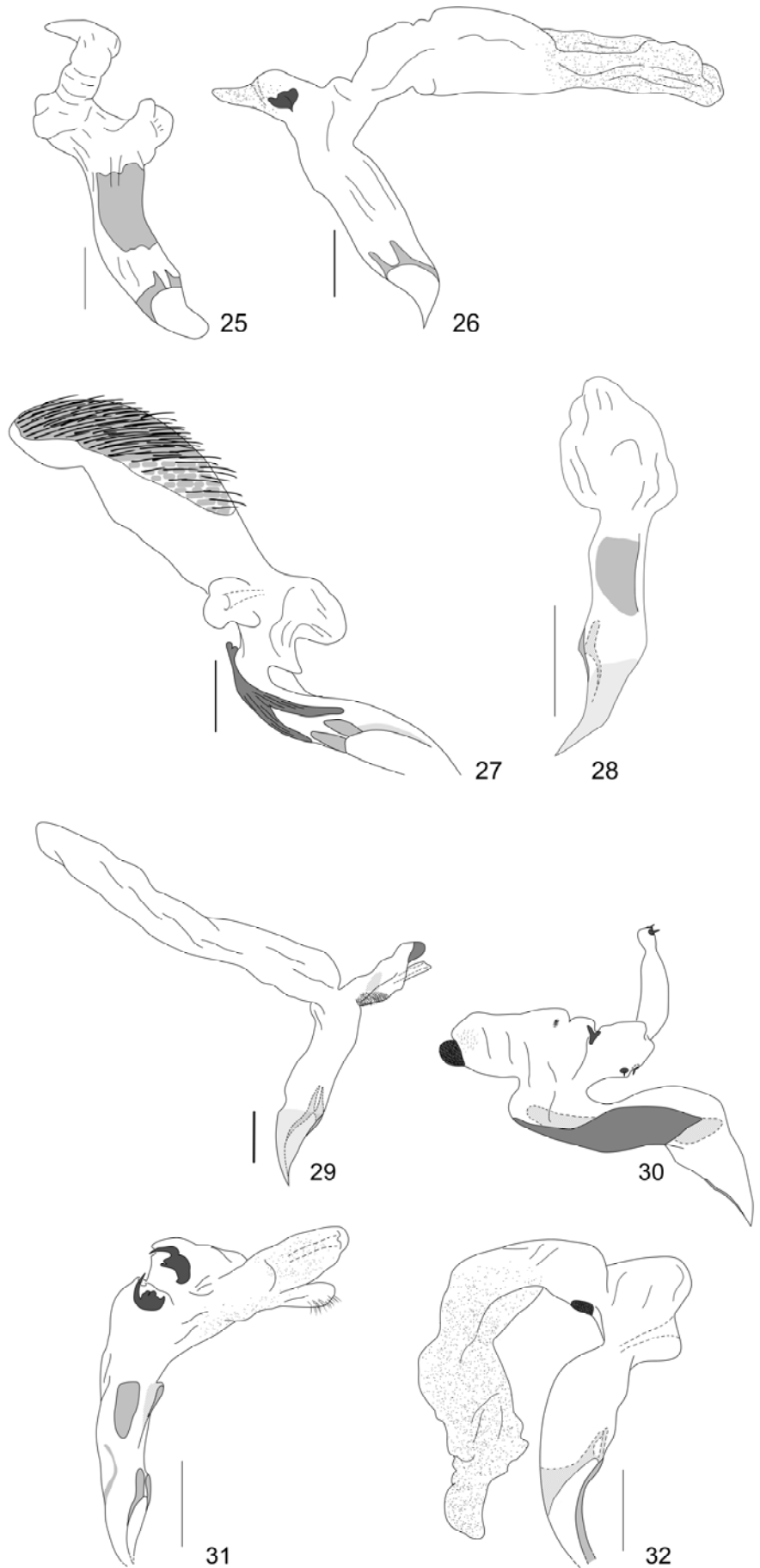
Figs. 1–8: Habitus. 1: *Anomala arthuri* (holotype). 2: *A. cupreovariolosa* (holotype). 3: *A. ferrea* (holotype). 4: *A. nigroflava* (holotype). 5: *A. semilla* (holotype). 6: *A. solisi* a): male (holotype), b): female (paratype, Sector San Ramón, Alajuela). 7: *A. volsellata* (holotype). 8: *A. zumbadoi* (holotype). Scale = 5 mm.



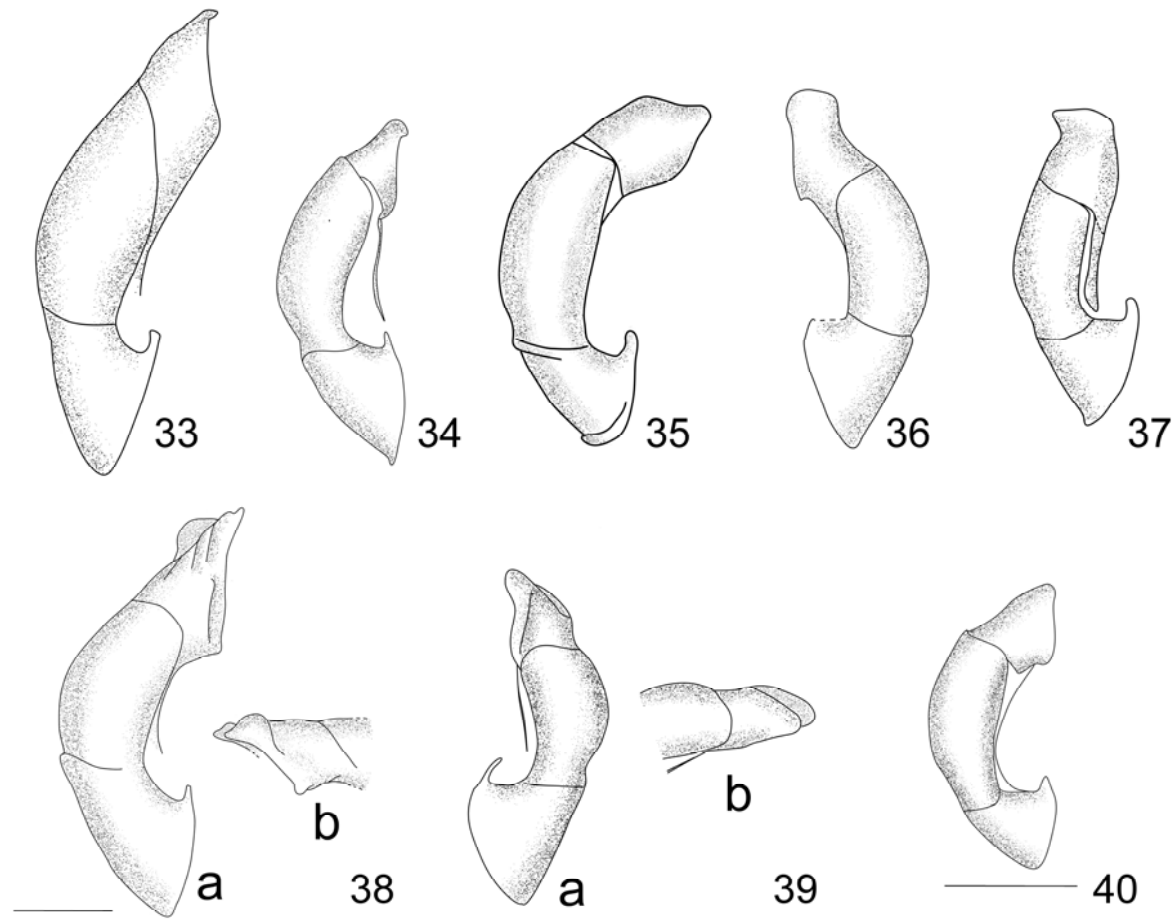
Figs. 9–16: Shape of protibia in 9: *Anomala arthuri* (male: paratype, La Maritza, Costa Rica; female: paratype, La Maritza, Costa Rica). 10: *A. cupreovariolosa* (male: holotype; female: paratype, Zona Protectora Las Tablas, Costa Rica). 11: *A. ferrea* (male: holotype; female: paratype, San Vito Las Cruces, Costa Rica). 12: *A. nigroflava* (male: holotype; female: paratype, Estación El Tigre, Costa Rica). 13: *A. semilla* (male: holotype; female: paratype, Albergue Heliconias, Costa Rica). 14: *A. solisi* (male: holotype; female: paratype, sector San Ramon, Costa Rica). 15: *A. volsellata* (male: holotype; female: paratype, Estación Bijagual, Costa Rica). 16: *A. zumbadoi* (male: paratype, Boca del Río Esquinas, Costa Rica; female: paratype, Rancho Quemado, Costa Rica). Scale = 1mm



Figs. 17–24: Shape of aedeagus, lateral view (top), dorsal view (bottom left), ventral view (bottom right). 17: *Anomala arthuri* (holotype). 18: *A. cupreovariolosa* (paratype, San Vito Las Cruces, Costa Rica). 19: *A. ferrea* (paratype, San Vito Las Cruces, Costa Rica). 20: *A. nigroflava* (holotype). 21: *A. semilla* (holotype). 22: *A. solisi* (holotype). 23: *A. volsellata* (paratype, Las Quebraditas, Costa Rica). 24: *A. zumbadoi* (holotype). Scale = 1mm. Scale at bottom left unless otherwise specified.



Figs. 25–32: Endophallus of 25: *Anomala arthuri* (holotype). 26: *A. cupreovariolosa* (Zona Protectora Las Tablas, Costa Rica). 27: *A. ferrea* (holotype). 28: *A. nigroflava* (holotype). 29: *A. semilla* (Albergue Heliconias, Costa Rica). 30: *A. solisi* (paratype, Estación Pitilla, Costa Rica). 31: *A. volsellata* (paratype, Las Quebraditas, Costa Rica). 32: *A. zumbadoi* (holotype). Scale = 1mm.



Figs. 33–40: Shape of aedeagus, lateral view. 33: *A. arara* (Estación Cabro Muco, Costa Rica, CEUA). 34: *A. semicineta* (Albergue Heliconias, Costa Rica, CEUA). 35: *A. variolosa* (Colombia, type, MNHUB). 36: *A. cincta* (Los Tuxtlas, Mexico, CEUA). 37: *A. testaceipennis* (Boca Tapada, Costa Rica, INBIO). 38: *A. oreas*, a. lateral view, b. other side of parameres (Río Yurumanguí, Colombia, MNHUB). 39: *A. clathrata*, a. lateral view, b. other side of parameres (Cerro Bitárkara, Costa Rica, CEUA). 40: *A. popayana* (Estación Hitoy Cerere, Costa Rica, INBIO). Scale = 1 mm. Scale at bottom left unless otherwise specified.

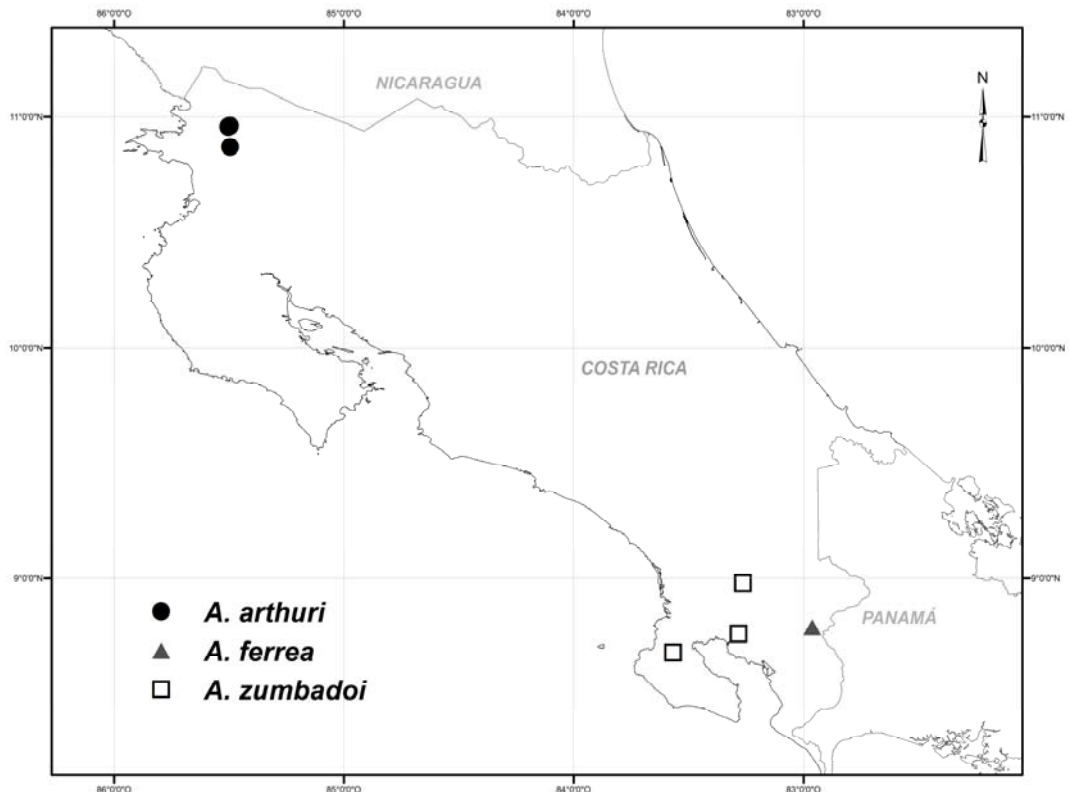


Fig 41: Distribution of *Anomala arthuri*, *A. ferrea* and *A. zumbadoi*.

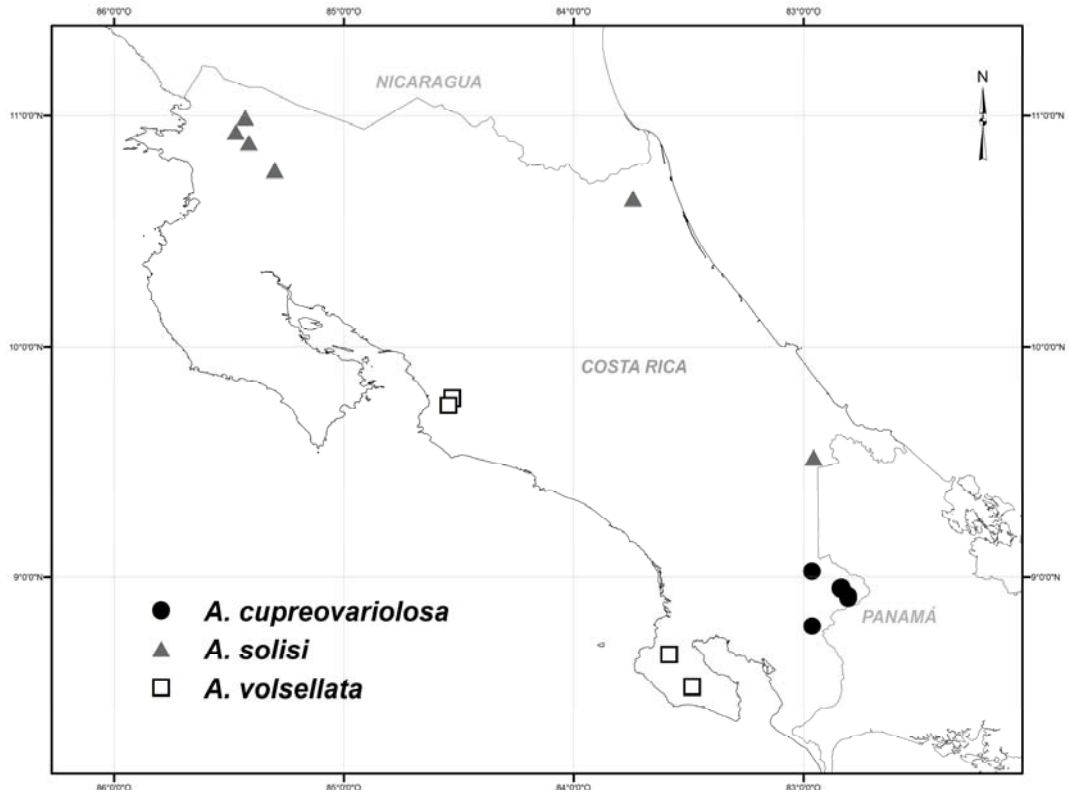


Fig 42: Distribution of *A. cupreovariolosa*, *A. solisi* and *A. volsellata*

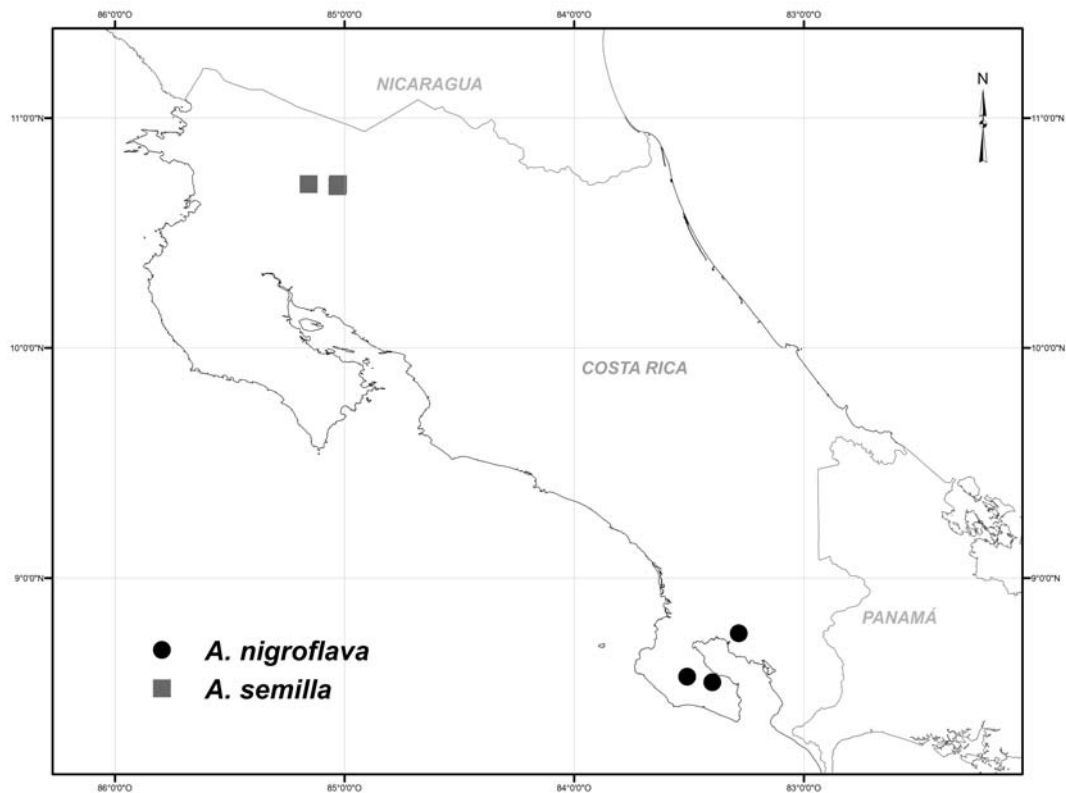


Fig 43: Distribution of *A. nigroflava* and *A. semilla*.

4. Acknowledgements

We thank Mr. Ángel Solís, from the Instituto Nacional de Biodiversidad, Costa Rica for the loan of specimens; Johannes Frisch and Joachim Willers from the Museum für Naturkunde der Humboldt-Universität, Berlin for assistance with type material consultation. We also thank Dr. Miguel A. Alonso Zarazaga for his tips on nomenclature.

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Appendix 1: Type specimens of *Anomala* and *Callistethus* compared with species here treated. Subspecies and varieties are included. BMNH: The Natural History Museum, London, United Kingdom MLUH: Martin-Luther-Universität, Halle, Germany. MNHN: Muséum National d'Histoire Naturelle, Paris, France. MNHUB: Museum für Naturkunde der Humboldt Universität zu Berlin, Germany.

Species	Author	Museum
<i>A. amphicomma</i>	Bates 1888	BMNH MNHN
<i>A. antica</i>	Ohaus 1897	MNHUB
<i>A. arara</i>	Ohaus 1897	MNHUB
<i>A. arawaka</i>	Ohaus 1902	MNHUB
<i>A. atomogramma</i>	Bates 1888	BMNH MNHN
<i>A. attenuata</i>	Bates 1888	BMNH MNHN
<i>A. balzapambae</i>	Ohaus 1897	MNHN MNHUB
<i>A. barbarae</i>	Frey 1968	BMNH MNHUB
<i>A. barbicollis</i>	Bates 1888	BMNH MNHN
<i>A. batesi</i>	Ohaus 1902	MNHUB
<i>A. beckeri</i>	Ohaus 1897	MNHUB
<i>A. bogotensi</i>	Ohaus 1897	MNHUB
<i>A. boliviana</i>	Ohaus 1897	MNHUB
<i>A. bruchiana</i>	Ohaus 1911	MNHUB
<i>A. calceata</i>	Chevrolat 1865	MNHUB
<i>A. calligrapha</i>	Bates 1888	MNHUB
<i>A. capito</i>	Ohaus 1897	MNHUB
<i>A. carinifrons</i>	Bates 1888	MNHN
<i>A. castaniceps</i>	Bates 1888	BMNH MNHN
<i>A. catoxantha</i>	Burmeister 1855	MLUH
<i>A. championi</i>	Bates 1888	BMNH
<i>A. chevrolati</i>	Bates 1888	BMNH MNHUB
<i>A. chiriquina</i>	Bates 1888	BMNH
<i>A. chloroptera</i>	Burmeister 1844	MLUH
<i>A. chloropyga</i>	Ohaus 1897	BMNH MNHUB
<i>A. chromicolor</i>	Burmeister 1855	MLUH
<i>A. chrysanthe</i>	Bates 1888	BMNH MNHN MNHUB
<i>A. chrysomelina</i>	Bates 1888	BMNH
<i>A. cincta</i>	Say 1835	MNHUB
<i>A. clathrata</i>	Ohaus 1930	MNHUB
<i>A. cnetropyga</i>	Bates 1888	BMNH MNHN
<i>A. columbica</i>	Ohaus 1902	MNHUB
<i>A. compressicollis</i>	Bates 1888	BMNH
<i>A. conradti</i>	Bates 1888	BMNH
<i>A. cribriceps</i>	Bates 1888	BMNH
<i>A. decolor</i>	Bates 1888	BMNH MNHN
<i>A. denticollis</i>	Bates 1888	BMNH
<i>A. discoidalis</i>	Bates 1888	BMNH MNHUB
<i>A. donovani</i>	Stephens 1830	MNHN
<i>A. doryphorina</i>	Bates 1888	BMNH MNHN
<i>A. eucoma</i>	Bates 1888	BMNH MNHN
<i>A. eulissa</i>	Bates 1888	BMNH MNHUB
<i>A. flamina</i>	Ohaus 1933	MNHUB
<i>A. flavilla</i>	Bates 1888	BMNH MNHN
<i>A. flavizona</i>	Bates 1888	BMNH MNHN MNHUB
<i>A. flohri</i>	Ohaus 1897	MNHUB
<i>A. foraminosa</i>	Bates 1888	BMNH MNHUB
<i>A. forreri</i>	Bates 1888	BMNH MNHN
<i>A. foveiceps</i>	Ohaus 1897	MNHUB
<i>A. fulgidicollis</i>	Blanchard 1851	MNHN
<i>A. fulvocostata</i>	Ohaus 1902	MNHUB
<i>A. gemella</i>	Say 1835	MNHUB
<i>A. guatemalena</i>	Bates 1888	BMNH
<i>A. hispidipennis</i>	Ohaus 1897	MNHUB

Species	Author	Museum
<i>A. hispidula</i>	Bates 1888	BMNH MNHN
<i>A. histrionella</i>	Bates 1888	BMNH MNHN
<i>A. hoegei</i>	Ohaus 1897	MNHN MNHUB
<i>A. hoepfneri</i>	Bates 1888	BMNH MNHUB
<i>A. hoppi</i>	Ohaus 1928	MNHUB
<i>A. hylobia</i>	Ohaus 1897	MNHUB
<i>A. incostans</i>	Burmeister 1844	MLUH
<i>C. jansoni</i>	(Ohaus 1897)	MNHUB
<i>A. jordani</i>	Ohaus 1902	MNHUB
<i>A. juquilensis</i>	Ohaus 1897	MNHUB
<i>A. laesicollis</i>	Bates 1888	BMNH MNHN
<i>A. lepida</i>	Burmeister 1844	MLUH
<i>A. ligulipes</i>	Ohaus 1897	MNHUB
<i>A. limbaticollis</i>	Blanchard 1851	MNHN
<i>A. luciae</i>	Blanchard 1851	MNHN
<i>A. lucicola</i>	Fabricius 1798	MNHUB
<i>A. megalops</i>	Bates 1888	BMNH MNHN
<i>A. mesocnemis</i>	Ohaus 1902	MNHUB MNHN
<i>A. micans</i>	Burmeister 1844	MLUH
<i>A. millepora</i>	Bates 1888	BMNH MNHN
<i>A. mimeloides</i>	Ohaus 1902	MNHUB
<i>A. minima</i>	Ohaus 1897	MNHUB
<i>A. mutabilis</i>	Ohaus 1897	MNHUB
<i>A. nigrosellata</i>	Ohaus 1905	MNHUB
<i>A. nitescens</i>	Bates 1888	BMNH MNHN
<i>A. nitidula</i>	Blanchard 1851	BMNH MNHN
<i>A. nutans</i>	Bates 1888	BMNH
<i>A. obovata</i>	Ohaus 1933	MNHUB
<i>A. ochroptera</i>	Bates 1888	BMNH MNHN
<i>A. oreas</i>	Ohaus 1897	MNHUB
<i>A. pilosipennis</i>	(Ohaus 1897)	MNHUB
<i>A. plurisulcata</i>	Bates 1888	BMNH MNHUB
<i>A. polygona</i>	Bates 1888	MNHN
<i>A. popayana</i>	Ohaus 1897	MNHUB
<i>A. praecellens</i>	Bates 1888	BMNH MNHN
<i>A. punctatipennis</i>	Blanchard 1851	MNHN
<i>A. quiché</i>	Ohaus 1897	MNHUB
<i>A. quirina</i>	Ohaus 1933	MNHUB
<i>A. repressa</i>	Ohaus 1908	MNHUB
<i>A. retusicollis</i>	Bates 1888	BMNH MNHN
<i>A. rhizotrogoides</i>	Blanchard 1851	MNHN
<i>A. rhodope</i>	Bates 1888	BMNH MNHN MNHUB
<i>A. ruatana</i>	Bates 1888	BMNH MNHN
<i>A. salticola</i>	Ohaus 1897	MNHUB
<i>A. sejuncta</i>	Bates 1888	BMNH MNHN
<i>A. semicineta</i>	Bates 1888	BMNH MNHN
<i>A. semitonsa</i>	Bates 1888	BMNH MNHN MNHUB
<i>A. simillima</i>	Ohaus 1897	MNHUB
<i>A. stempelmanni</i>	Ohaus 1914	MNHUB
<i>A. sticticoptera</i>	Blanchard 1851	MNHN MNHUB
<i>A. strigicollis</i>	Ohaus 1902	MNHUB
<i>A. subaenea</i>	Nonfried 1893	MNHUB
<i>A. sylphis</i>	Bates 1888	BMNH MNHN
<i>A. tessellatipennis</i>	Blanchard 1851	MNHN

Species	Author	Museum
<i>A. testaceipennis</i>	Blanchard 1851	MNHUB MNHN
<i>A. tolensis</i>	Bates 1888	BMNH MNHN
<i>A. trapezifera</i>	Bates 1888	MNHN
<i>A. undulata</i>	Melsheimer 1844	BMNH MNHUB
<i>A. variolata</i>	Bates 1888	BMNH
<i>A. variolosa</i>	Ohaus 1928	MNHUB
<i>A. vayana</i>	Ohaus 1930	MNHUB
<i>A. veraecrucis</i>	Bates 1888	BMNH MNHN
<i>A. vespertilio</i>	Ohaus 1902	MNHN MNHUB
<i>A. villosella</i>	Blanchard 1851	MNHUB
<i>A. violacea</i>	Burmeister 1844	MLUH MNHUB
<i>A. vulcanicola</i>	Ohaus 1897	MNHN MNHUB
<i>A. xantholea</i>	Bates 1888	BMNH
<i>A. xiphostetha</i>	Bates 1888	BMNH MNHN MNHUB
<i>A. zapotensis</i>	Bates 1888	BMNH MNHN
<i>A. phosphora</i>	Bates 1888	BMNH MNHN
<i>A. tolucana</i>	Ohaus 1902	BMNH
<i>C. aequatorialis</i>	(Ohaus 1897)	MNHUB MNHN
<i>C. antis</i>	(Ohaus 1902)	MNHUB
<i>C. benicolus</i>	(Ohaus 1897)	MNHUB
<i>C. bimaculatus</i>	(Blanchard 1851)	MNHN
<i>C. buchwaldianus</i>	(Ohaus 1908)	MNHUB
<i>C. calonotus</i>	(Bates 1888)	BMNH MNHN
<i>C. caucanus</i>	(Ohaus 1897)	MNHUB
<i>C. cayapó</i>	(Ohaus 1902)	MNHUB
<i>C. chalcosomus</i>	(Blanchard 1851)	MNHN MNHUB
<i>C. chlorotoides</i>	(Bates 1888)	MNHN
<i>C. chontalensis</i>	(Bates 1888)	BMNH MNHN
<i>C. coeruleus</i>	(Ohaus 1908)	MNHUB
<i>C. collaris</i>	(Burmeister 1844)	MLUH
<i>C. cupricollis</i>	(Chevrolat 1834)	MNHN
<i>C. eckhardti</i>	(Ohaus 1897)	MNHUB
<i>C. flavofemoratus</i>	(Ohaus 1897)	MNHUB
<i>C. fulvopiceus</i>	(Ohaus 1928)	MNHUB
<i>C. granulipygus</i>	(Bates 1888)	BMNH MNHN
<i>C. hiekei</i>	(Frey 1968)	MNHUB
<i>C. kolbei</i>	(Ohaus 1897)	MNHUB
<i>C. kulzeri</i>	(Frey 1968)	MNHUB
<i>C. ladinus</i>	(Ohaus 1902)	MNHUB
<i>C. levii</i>	(Blanchard 1851)	MNHN
<i>C. marginicollis</i>	(Bates 1888)	BMNH MNHUB
<i>C. megalis</i>	(Bates 1888)	BMNH MNHN
<i>C. microcephalus</i>	(Burmeister 1844)	MLUH
<i>C. mojo</i>	(Ohaus 1897)	(MNHUB)
<i>C. naponensis</i>	(Ohaus 1897)	MNHUB
<i>C. nicoyus</i>	(Ohaus 1928)	MNHUB
<i>C. ochrogastrus</i>	(Bates 1888)	BMNH MNHN
<i>C. panamensis</i>	(Ohaus 1902)	MNHUB
<i>C. penai</i>	(Frey 1968)	MNHUB
<i>C. plagiatus</i>	(Nonfried 1894)	MNHUB
<i>C. porcatus</i>	(Blanchard 1851)	MNHN
<i>C. pulcher</i>	(Blanchard 1851)	MNHN
<i>C. pupillatus</i>	(Burmeister 1844)	BMNH MLUH MNHUB
<i>C. pyropygus</i>	(Nonfried 1891)	MNHUB
<i>C. rosenbergi</i>	(Ohaus 1902)	MNHUB
<i>C. rufomicans</i>	(Ohaus 1897)	MNHUB
<i>C. specularis</i>	(Bates 1888)	BMNH
<i>C. strigidiodes</i>	(Blanchard 1851)	MNHN

Species	Author	Museum
<i>C. sulcans</i>	(Bates 1888)	BMNH
<i>C. tricostulatus</i>	(Ohaus 1897)	MNHUB
<i>C. validus</i>	(Burmeister 1844)	MLUH
<i>C. vanpatteni</i>	(Bates 1888)	BMNH MNHN
<i>C. virescens</i>	(Burmeister 1844)	MLUH
<i>C. biolleyi</i>	(Ohaus 1902)	MNHUB
<i>C. vidua</i>	(Newman 1838)	BMNH