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(Coleoptera, Cerambycidae, Lamiinae, Hemilophini)

James E. Wappes
American Coleoptera Museum
8734 Paisano Pass
San Antonio, TX 78255-3523, USA

Antonio Santos-Silva
Museu de Zoologia
Universidade de São Paulo
CP 188, 90001-970
São Paulo, SP, Brazil

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James E. Wappes and Antonio Santos-Silva
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Description of a new species of *Adesmus* Lepeletier and Audinet-Serville, 1825, displaying chromatic dimorphism, from Bolivia (Coleoptera, Cerambycidae, Lamiinae, Hemilophini)

James E. Wappes
American Coleoptera Museum
8734 Paisano Pass
San Antonio, TX 78255-3523, USA
wappes@earthlink.net

Antonio Santos-Silva
Museu de Zoologia
Universidade de São Paulo
CP 188, 90001-970
São Paulo, SP, Brazil
toncriss@uol.com.br

Abstract. *Adesmus martinsi* (Coleoptera, Cerambycidae, Lamiinae, Hemilophini), a new species from Bolivia, is described, illustrated, and included in a previous key. The new species displays gender dimorphism in the pubescent pattern and in anatomical structure. Thus, *Adesmus* becomes the second genus recorded in the Hemilophini to have visual chromatic dimorphism.

Key Words. Neotropical, sexual dimorphism, South America, taxonomy.

Introduction

Previously, *Adesmus divus* (Chabrillac, 1857), *A. nevisi* (Gounelle, 1909), *A. temporalis* (Aurivillius, 1908) and *A. tribalteatus* (Bates, 1881) comprised the known Bolivian species of *Adesmus*. The description of this new species brings the total number of *Adesmus* species recorded in Bolivia to a surprisingly small total of five (Bezark, 2017 listed 68 species for this large genus).

The new species, *Adesmus martinsi* Wappes and Santos-Silva, described here, has an extremely variable pubescent pattern. It not only differs between the sexes, sometimes referred to as genetic chromatic dimorphism (Perger et al. 2017) but, also within the same sex. Fortunately, participants in the Bolivian Cerambycidae Project (BCP), from 2000 to 2013, collected some 53 specimens (35 males and 18 females) of the new species (almost 80 percent within a 1–2 km section of Amboro road above Achira). This large sample makes it possible to observe, not only the “dimorphism” between sexes, but, also the extreme variability of the pubescent pattern within the same sex and within the population as a whole.

Materials and Methods

Photographs were taken with a Canon EOS Rebel T3i DSLR camera, Canon MP-E 65mm f/2.8 1–5X macro lens, controlled by Zerene Stacker AutoMontage software. Measurements were taken in “mm” using a micrometer ocular Hensoldt/Wetzlar-Mess 10 in the Leica MZ6 stereomicroscope, also used in the study of the specimen.

The collection acronyms used in this study are as follows:

ACMT – American Coleoptera Museum (James Wappes), San Antonio, Texas, USA;

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

FWSC – Frederick W. Skillman Jr., Collection, Pearce, Arizona, USA;

MNKM – Museo de Historia Natural, Noel Kempff Mercado, Santa Cruz de la Sierra, Bolivia;

MZSP – Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil;

PERC – Purdue Entomological Research Collection, Purdue University, West Lafayette, Indiana, USA;
RCSZ – Robin Clarke/Sonia Zamalloa Collection, Hotel Flora and Fauna, Buena Vista, Bolivia;
RFMC – Roy F. Morris II, Collection, Lakeland, Florida, USA;
SLPC – Steven W. Lingafelter Personal Collection, Hereford, AZ, USA.

Results

Adesmus martinsi Wappes and Santos-Silva, new species

(Fig. 1–6, 7, 10, 13–14, 16 left, 17–23)

Description. Holotype male. Head mostly dark reddish brown, darkened on apex of genae and sides of postclypeus; anteclypeus light reddish brown; labrum light reddish brown, brown on narrow transverse crest; mandibles light reddish brown on basal half, gradually black toward apex; mouth parts reddish brown except pale yellow palpi; scape reddish brown dorsally, dark brown at about basal 2/3 laterally and ventrally; basal antennomeres light yellowish brown, gradually reddish brown toward distal antennomeres; pronotum reddish brown, darker lateral and basal to center; sides of prothorax dark brown; prosternum, prosternal process, meso- and metaventrite and mesoventral process almost black; elytra reddish brown, except carinae and part of vertical sides dark brown; legs yellowish; abdominal ventrites I–II dark brown, III dark brown on basal half, gradually dark reddish brown toward apex, IV–V reddish brown on basal third, light reddish brown on remaining surface, V entirely light reddish brown.

Head. Frons, antennal tubercles, postclypeus, area surrounding upper eye lobes, nearly all area behind lower eye lobes (area of connection between eye lobes without white pubescence), area between antennal tubercles, and genae covered with dense white pubescence, except glabrous distal area of genae, and narrow band along median groove (this slightly widened between antennal tubercles and upper eye lobes); frons with long, erect, sparse yellowish white setae (longer close to eyes). Remaining surface of vertex and area behind upper eye lobes (except white pubescent band close to eyes) with yellowish brown pubescence partially obscuring integument; with a few long, erect, yellowish white setae close to eyes. Genae 0.55 times length of lower eye lobe. Median groove distinct from clypeus to prothorax. Labrum coplanar with anteclypeus on basal third, inclined on distal third; with narrow carinae between coplanar and inclined area; coplanar area smooth, with short, sparse yellowish white setae; inclined area minutely punctate, with short, yellowish white setae (distinctly longer and more abundant than on coplanar area, with long, erect setae interspersed and directed forward. Distance between upper eye lobes 0.27 times length of scape; in frontal view, distance between lower eye lobes 0.85 times length of scape. Antennae 2.3 times elytral length, reaching elytral apex at distal third of antennomere VI; scape, pedicel and antennomeres with yellowish pubescence, distinctly not obscuring integument; scape with long, erect yellow setae ventrally; pedicel and antennomeres III–XI with long, erect dark brown setae ventrally, gradually shorter and sparser toward XI; antennal formula (ratio) based on antennomere III: scape = 0.63; pedicel = 0.10; IV = 0.80; V = 0.58; VI = 0.57; VII = 0.48; VIII = 0.43; IX = 0.43; X = 0.40; XI = 0.43.

Thorax. Prothorax slightly wider than long (1.05 times); sides without distinct tubercle. Pronotum with sub-elliptical gibbosity centrally, from about apex of basal quarter to just after middle; with wide, dense white pubescent band laterally, reaching superior area of sides of prothorax; central area with yellowish white pubescence distinctly exposing integument (glabrous on tip of gibbosity), this area widened basally and distally; central area moderately coarsely and abundantly punctate, except smooth tip of gibbosity. Sides of prothorax with wide, longitudinal band with yellowish white pubescence on basal half (except narrow area with dense white pubescence close to pronotum), not obscuring integument; remaining surface with dense, white pubescence; area with yellowish white pubescence coarsely, moderately abundantly punctate (punctures coarser than on pronotum). Prosternum and prosternal process with yellowish brown pubescence not obscuring integument. Mesoventrite at center coarsely, moderately sparsely punctate, with short, sparse yellowish-brown pubescence on wide central area, with dense white pubescence laterally; mesoventral process with yellowish brown pubescence not obscuring integument, more distinct than on central area of mesoventrite. Mesanepisternum and mesepimeron with dense white pubescence. Metanepisternum with dense white pubescence except narrow basal area with pubes-

cence exposing integument. Metaventrite with dense white pubescent band close to metanepisternum, gradually widened from base to apex; remaining surface with abundant yellowish-brown pubescence not obscuring integument, except central area with sparse pubescence. Scutellum with dense white pubescence. **Elytra.** Coarsely, moderately abundantly punctate on basal half, gradually finer, sparser toward apex on distal half; with six dense white pubescent maculae: one small, inclined, placed basally between humeri and scutellum, one large, subelliptical, placed on dorsal basal third, reaching suture and not reaching lateral carina, one moderately small, elliptical, placed at about center, one moderately large, semicircular, placed on dorsal distal third, reaching suture and not reaching lateral carina, one small, subtriangular, placed on lateral base, and one elongate, small, placed laterally near middle close to humeral carina; remaining surface with light yellowish brown pubescence not obscuring integument, more yellowish toward apex; with sparse, long, erect, yellow setae interspersed on basal quarter. **Legs.** Femora with very short pale-yellow pubescence distinctly exposing integument; tibiae with pale yellow pubescence distinctly exposing integument, with sparse, erect yellow setae interspersed dorsally on protibiae, abundant on meso- and metatibiae (especially in the latter).

Abdomen. Ventrites with very short pale-yellow pubescence distinctly exposing integument, except dense white pubescent macula on each side of ventrites I–II (together forming longitudinal band); with sparse, long, erect yellow setae; apex of ventrite V truncate.

Female. Differing from male by frons (Fig. 13) with dense grayish white pubescence obscuring or not obscuring integument depending on angle of light source (but always notably different from that in male (Fig. 14)), except dense white pubescent band close to lower eye lobes (this band surrounding entire inner side of eyes, and between antennal tubercles projected toward median groove). Genae longer, from 0.70 to 0.85 times length of lower eye lobe; with dense white pubescence toward ventral side, with yellowish brown pubescence on remaining surface except glabrous distal area. Antennal tubercles with yellowish brown pubescence centrally partially obscuring integument, with dense white pubescence, anteriorly and posteriorly. Distance between upper eye lobes from 0.38 to 0.45 times length of scape; distance between lower eye lobes from 0.95 to 1.05 times length of scape; sides of prothorax usually with area close to pronotum covered with pubescent white band wider than in male; antennae shorter, from 2.05 to 2.15 elytral length.

Variation. Brown and reddish brown areas may be lighter or darker (brown, becoming reddish brown; reddish brown becoming brown, light brown or somewhat orange); dark brown areas of ventral side of pro- and mesothorax may be dark reddish brown; frons, antennal tubercles and genae covered with white pubescence not notably dense; erect setae on frons more abundant and present also on central area; genae in female from 0.70 to 0.85 times length of lower eye lobe; genae in male from 0.55 to 0.60 times length of lower eye lobe; distance between upper eye lobes in male from 0.20 to 0.27 times length of scape; white pubescent band behind eyes not interrupted; antennae in male from 2.25 to 2.30 times elytral length; central area of pronotum in female not widened distally and/or basally; central area of pronotum and sides of prothorax with golden pubescence partially obscuring integument, including on pronotal gibbosity; central area of pronotum with whitish pubescence on base, but not obscuring integument; pubescence on central area of metaventrite yellow; elytral white pubescent maculae variable in size and number.

Dimensions in mm (holotype male/male paratypes/female paratypes). Total length, 7.60/5.85–7.78/7.69–9.27; prothorax: central length, 1.50/1.03–1.44/1.44–1.86; distal width, 1.50/1.14–1.57/1.62–2.18; basal width, 1.45/1.08–1.48/1.50–2.11; greatest width, 1.60/1.17–1.62/1.67–2.25; humeral width, 2.25/1.21–2.38/2.34–3.28; elytral length, 5.50/4.18–5.71/5.53–7.02.

Type material. Holotype male from BOLIVIA, *Santa Cruz*: Road to Amboro (above Achira), 10–11.X.2006, Wappes, Nearn & Eya col. (MNKM). Paratypes – BOLIVIA, *Santa Cruz*: Amboro road (above Achira Campo; 5000–5800'), 1 male, 1 female, 9–11.X.2004, Morris & Wappes col. (MZSP); 1 male, 9–11.X.2004, Wappes & Morris col. (ACMT); above Achira (18°09'S / 63°47'W), 8 males, 3 females, 10.XII.2011, Morris & Wappes col. (5 males, 2 females, RFMC, 3 males, 1 female ACMT); (Road to Floripondo; 1900 m; 18°09'S / 63°47'W), 1 male, 1 female, 27–28.X.2011, Skillman & Wappes col. (FWSC); 1 male, 2 females, 10.XII.2011, Wappes, Bonaso & Morris col. (ACMT); 4 males, 1 female, 19.XII.2011,

Wappes, Lingafelter & Woodley col. (ACMT); Chaco above Achira (Florida, Vicoquin area; 18°07'S / 63°47'W; 1730 m; W Jens Prena), 1 male, 2 females, 22–25.I.2007, Wappes & Lingafelter col. (ACMT); Achira ridge (Vicoquin area; 18°07'S / 63°47'W), 2 males, 1.XII.2013, Wappes & Skillman col. (ACMT); 4 km N Bermejo (Refugio Los Volcanes; 18°06'S / 63°36'W, 1045–1350 m), 1 female, 11–17.XII.2012, Wappes & Skillman col. (FSCA); Achira area (N road to Amboro, on Achira ridge; 18°09'S / 63°48'W), 1 female, 5–6.II.2013, Wappes, Bonaso, Lingafelter and Garzon col. (ACMT); Florida (Vicoquin area above Achira, rd to Amboro, 18°07'S/63°47'W, 2000m), 1 male, 5–6.II.2013, Lingafelter, Wappes, Garzon (SLPC); 18°07'S/63°48'W, 1 male, 1 female, 19.XII.2011, daytime, N. E. Woodley (SLPC); 2000–2100m, 4 males, 25.XI.2013, N. E. Woodley, S.W. Lingafelter (SLPC); 5 km W Buena Vista (El Cairo), 1 female, 28–29.IV.2004, Wappes & Cline col. (ACMT); 1 male, 18–30.VI.2004, R. Clarke col. (FSCA); 4–5 km N Achira (Road to Amboro), 1 male, 12–13.X.2000, Wappes & Dozier col. (ACMT); Achira (ridge road to Amboro; 18°07'S / 63°48'W; W Jens Prena; 2000 m), 1 male, 24–25.I.2007, Wappes & Lingafelter col. (ACMT); 4–6 km N Achira (5400–5800'), 1 male, 20.XI.2003, Wappes, Morris & Nearn col. (ACMT); Floripondo/Vicoquin, 18°08'S/63°45'W, on/flying to flowers of *Croton* sp., 2 males, 30–31.X.2009, R. Clarke, Sonia Zamalloa (RCSZ); 5 km W Buena Vista (El Cairo), 1 female, 28.IV.2004, Elias Ortez col. (PERC); 4 km N Bermejo, Refugio los Volcanes, 18°06'S/63°36'W, 1000–1200 m, 1 male, 6.XII.2013, Skillman & Wappes col. (FWSC); 1045–1350m, 1 female, 5–6.XII.2013, Beating, Steven Lingafelter col. (SLPC); 1100m, 1 male, 11.XII.2011, daytime, N. E. Woodley col. (SLPC); Florida Prov. 6.2 km SE of Cuevas, 1310m, 18°12.42'S/63°40.82'W, 1 female, 27.XI.2013, Beating, S. W. Lingafelter col. (SLPC); 10.4 km SE of Cuevas, 1450m, 18°13.93'S/63°40.77'W, 1 male, 28.XI.2013, foliage sweeping, N. E. Woodley col. (SLPC); Cochabamba Dept., Chapare region, Highway 4 at Rio Antahuacan bridge, 38 km SW of Villa Tunari, 850m, 17°05.35'S/63°40.62'W, 1 male, 12.XII.2013, N. E. Woodley (SLPC).

Etymology. The new species is named after Ubirajara Ribeiro Martins de Souza, for his numerous contributions to our knowledge of New World Cerambycidae, including the genus *Adesmus*.

Remarks. *Adesmus martinsi*, **new species**, is similar to *A. albiventris* (Bates, 1881), *A. icambi* Martins and Galileo, 2009, *A. leucodryas* (Bates, 1881), *A. pulchellus* Galileo and Martins, 1999, and *A. sexguttatus* (Lucas, 1857). It differs from *A. albiventris* by the connection between ocular lobes with one row of ommatidia, antennae distinctly lighter (scape reddish-brown, antennomeres yellowish), not contrasting with leg color, and pronotum, at most, with sparse whitish pubescence on center of base. In *A. albiventris*, the connection between ocular lobes has more than one row of ommatidia, antennae distinctly darker (from brown to dark brown), contrasting with leg color, and pronotum with small, distinct densely pubescent spot on basal center; additionally, based on a photograph of the holotype female, the dense white pubescent band on sides of prothorax is distinctly narrower than in specimens of the type series of *A. martinsi*, and the antennae are distinctly shorter. *Adesmus martinsi* differs from *A. icambi* by the lighter colored antennae, not contrasting with leg color (darker and contrasting in *A. icambi*), and basal elytral macula smaller, not reaching scutellum and beginning on base (larger, transverse, reaching scutellum and not reaching elytral base in *A. icambi*). It differs from *A. leucodryas* by the reddish-brown scape and antennomeres yellowish (scape black and distal antennomeres darkened in *A. leucodryas*), and second discal white pubescent macula not reaching middle of elytra (reaching in *A. leucodryas*). *Adesmus martinsi* differs from *A. sexguttatus* (Fig. 26) by the connection between ocular lobes (Fig. 6, 7) with a single row of ommatidia (two rows in *A. sexguttatus* (Fig. 9, 11)). Finally, the new species differs from *A. pulchellus* by the dense white pubescent band behind eyes widened and fused with that on genae (Fig. 3, 6) (not widened and reaching only about middle of lower eye lobes in *A. pulchellus* (Fig. 12), by the larger lower eye lobes (Fig. 16 left) (distinctly smaller and about as long as gena in *A. pulchellus* (Fig. 16 right)), and connection between ocular lobes with distinct ommatidia (lacking ommatidia in *A. pulchellus* – this area with only a slightly elevated black carina).

In the following, *Adesmus martinsi* is included in the alternative of couplet “49” (when considered the typical form, with four dense white pubescent discal maculae), from Martins and Galileo (2014), but completely modified, since the shape of the white elytral maculae is variable, and different in the sexes, in *A. martinsi* (and likely varies in many other species of *Adesmus* as well):

- 49(48). Connection between ocular lobes with more than one row of ommatidia 50
 — Connection between ocular lobes with a single row of ommatidia 51
- 50(49). Elytra about 3 times prothorax length; pronotum with small, dense, white pubescent macula, on center of base. Venezuela *A. albiventris* (Bates, 1881)
 — Elytra about 4 times prothorax length; pronotum without macula with dense pubescence on center of base. Brazil (Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul), Argentina (Misiones) *A. sexguttatus* (Lucas, 1857)
- 51(49). Dense white pubescent band behind eyes widened and fused with that on genae; genae shorter than lower eye lobe. Bolivia *A. martinsi* Wappes and Santos-Silva, n.sp.
 — Dense white pubescent band behind eyes not widened and reaches only about middle of lower eye lobe; genae as long as lower eye lobe (female). Argentina (Salta) *A. pulchellus* Galileo and Martins, 1999

We take this opportunity to bring attention to additional problems in the key to species of *Adesmus* from Martins and Galileo (2014):

1. 34(33). Pronotal base with small white pubescent macula centrally in front of the scutellum 35
 — This macula lacking from pronotal base 36

The first option leads to *A. diana* (Thomson, 1860), and *A. facetus* Martins and Galileo, 2008. Notwithstanding, *A. albiventris* (Bates, 1881) also has the white pubescent macula on basal center of pronotum, and was considered as included in the alternative of couplet “36” (pronotum lacking white pubescent macula on base).

2. 44(39). Each elytron with 2 large, densely pubescent white maculae, reaching suture, one at middle of anterior half, another on distal half. Peru (Cuzco) *A. calca* Galileo and Martins, 2005
 — Each elytron with 3 or 4 white pubescent maculae 45

As shown (Fig. 17–23), the number and size of elytral macula is extremely variable in *A. martinsi* (and likely in other species too). Thus, this alternative couplet is misleading and unreliable, which can lead to incorrect identification of species.

Gender dimorphism. Perger et al. (2017) recorded the first chromatic gender dimorphism in Hemilophini (*Phoebe ornator* Tippmann, 1960): males with white pubescence on head and vertical sides of the elytra (in females, the pubescence on the head and vertical sides of the elytra was completely brownish black or, at most, had white pubescence only on the vertex, behind the eyes and on a small area at the distal quarter of the elytra). *Adesmus martinsi* also displays chromatic gender dimorphism in pubescence of the head: in male, frons, antennal tubercles and genae entirely covered with dense white pubescence; in female, frons and antennal tubercles mostly without dense white pubescence, and genae not entirely covered with dense white pubescence. Additionally, the lower eye lobes are somewhat larger in male than in female (making genae shorter in the former), and the distance between upper eye lobes is notably narrower in males than in females.

Host plant (Fig. 27–29). *Adesmus martinsi* has routinely been collected from the foliage and stems of the *Croton* sp. (Euphorbiaceae) shown in Fig. 27–29. Including, in a few instances, mating pairs collected from the stems, suggesting the plant as a possible host for the species. Typically, the plant has been in bloom when adults are collected, but not always (this *Croton* sp. blooms along the stem for several weeks or longer, depending on available moisture), and in one instance recorded on or flying to flowers. The plant illustrated is a common roadside plant along Amboro road above Achira (1800–2100 m), a favorite collecting area of BCP participants, which explains the long series of specimens collected from there. It should be mentioned that an occasional specimen of this *Adesmus* has also been collected at much lower elevations, normally associated with *Croton* species.

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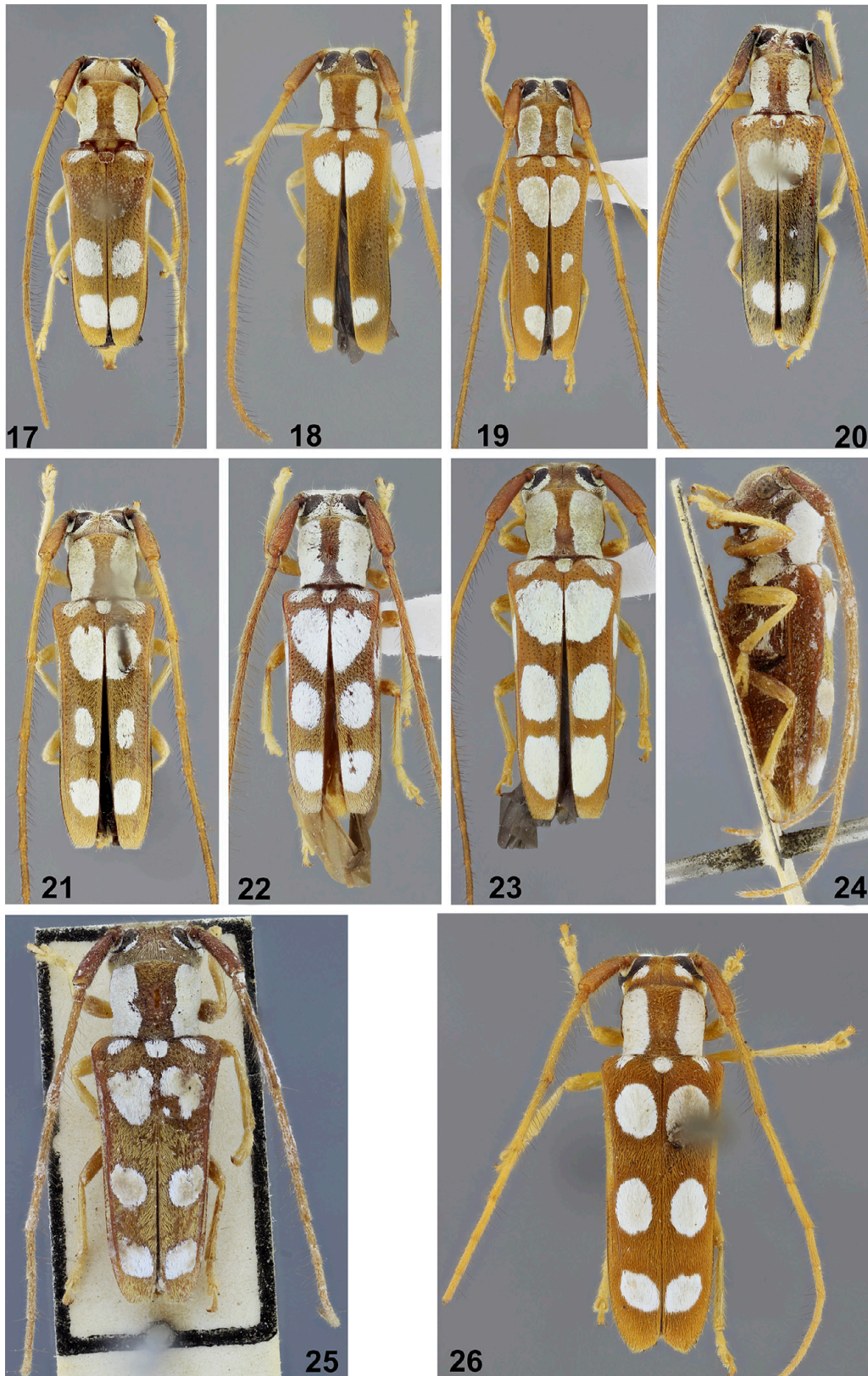
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Figures 1–6. *Adesmus martinsi*. 1–3) Holotype male: 1) Dorsal habitus; 2) Ventral habitus; 3) Lateral habitus. 4–6) Paratype female: 4) Dorsal habitus; 5) Ventral habitus; 6) Lateral habitus.



Figures 7–16. *Adesmus* spp. 7–9) Eye: 7) *Adesmus martinsi*, paratype female; 8) *A. pulchellus*, holotype female; 9) *A. sexguttatus*, female. 10–12) Head and prothorax, lateral view: 10) *A. martinsi*, paratype female; 11) *A. sexguttatus*, female; 12) *A. pulchellus*, holotype female. 13–14) *A. martinsi*, head, frontal view: 13) Paratype female; 14) Holotype male. 15) *Adesmus pulchellus*, holotype female, head, frontal view. 16) Head, lateral view showing lower eye lobe: left, *A. martinsi*, paratype female; right, *A. pulchellus*, holotype female.



Figures 17–26. *Adesmus* spp. 17–23) *Adesmus martinsi*, variation of the elytral pubescence: 17, 23) Female paratypes; 18–20, 22) Male paratypes; 21) Male holotype. 24–25) *A. pulchellus*, holotype female: 24) Lateral habitus; 25) Dorsal habitus. 26) *A. sexguttatus*, female, dorsal habitus.



Figures 27–29. *Croton* sp. (Euphorbiaceae) growing along the roadside of Amboro Road, above Achira, Bolivia, upon which *A. martinsi* is commonly collected.