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New species and taxonomic notes for
Cacostola Fairmaire and Germain, 1859
(Coleoptera: Cerambycidae: Lamiinae: Onciderini)

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New species and taxonomic notes for *Cacostola* Fairmaire and Germain, 1859 (Coleoptera: Cerambycidae: Lamiinae: Onciderini)

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Abstract. Seven new species of *Cacostola* Fairmaire and Germain, 1859 (Coleoptera: Cerambycidae: Lamiinae: Onciderini) are described: *C. plotkini* Wappes and Santos-Silva from Costa Rica; *C. galenae* Wappes and Santos-Silva from Panama; *C. opitzi* Wappes and Santos-Silva from Bolivia; *C. howdenae* Wappes and Santos-Silva from Guatemala; *C. thomasorum* Wappes and Santos-Silva from Brazil; *C. nearnsi* Wappes and Santos-Silva from Bolivia and Panama; and *C. rothschildi* Wappes and Santos-Silva from Argentina and Brazil. Notes on *C. simplex* (Pascoe, 1859), and *C. mexicana* (Breuning, 1943) are also included.

Key words. Central America, South America, longhorned beetles, taxonomy.

Introduction

Dillon and Dillon (1946) reviewed the genus *Cacostola* Fairmaire and Germain, 1859, describing seven new species and providing a key to the 14 species known at that time: *C. brasiliensis* Thomson, 1868; *C. clorinda* Dillon and Dillon, 1946; *C. flexicornis* Bates, 1866; *C. fusca* Thomson, 1868; *C. grisea* Dillon and Dillon, 1946; *C. leonensis* Dillon and Dillon, 1946; *C. nitida* Dillon and Dillon, 1946 (currently, equal to *C. volvula*); *C. ornata* Fleutiaux and Sallé, 1889; *C. rugicollis* Bates, 1885; *C. simplex* (Pascoe, 1859); *C. sirena* Dillon and Dillon, 1946; *C. vagelineata* Fairmaire and Germain, 1859 (type species); *C. variegata* Dillon and Dillon, 1946; and *C. zanoa* Dillon and Dillon, 1946. Unfortunately, ambiguities, word choices and poorly phrased couplets make the key difficult to use. The first couplet is based only on the color of the general pubescence: “rosy-ashy and brown”, leading to *C. vagelineata*; with “not roseate”, leading to all other species. Although the general pubescence of the holotype of *C. vagelineata* could be called rosy, the variegated nature of its pubescence lends itself to intraspecific variability in coloration as is often the case with other *Cacostola* species, some of which could also be described as “rosy” thus making the character’s use in a descriptive couplet problematic. In the second couplet the shape of the lateral prothoracic tubercles: either “prominent”, leading to *C. flexicornis*; or “minute or wanting”, leading to the other species is similarly problematic. The tubercles of *C. flexicornis* are not always prominent and the tubercles may be distinct in other species such as *C. rugicollis* Bates (Fig. 10). Despite these examples of troublesome couplets and mindful that no key can include all possible variations within every species, the key by Dillon and Dillon (1946) is still useful and can be used as a starting place when identifying *Cacostola* specimens. It does allow the identification of some species. However, in our view, the Dillon and Dillon key is best used as a first step but certainly not as a final step to identify specimens to species. Unfortunately, since the validity of some species remains dubious and others are not available to us, no attempt has been made to construct a new “Key to *Cacostola* Species” at this time. Bezark (2019b) listed 34 species in *Cacostola*. With the seven new species described herein there are currently 41 species assigned to the genus.

Materials and Methods

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

For the shape of the frons description, we are using the Dillon and Dillon (1945, 1946) concept (postclypeus included when describing the frontal shape).

The acronyms used in the text are as follows:

- AACP** Alain Audureau Collection Privée, Saint Gilles Croix de Vie, France
ACMT American Coleoptera Museum (James Wappes), San Antonio, Texas, USA
FSCA Florida State Collection of Arthropods, Gainesville, Florida, USA
FWSC Frederick W. Skillman Collection, Pearce, Arizona, USA
GHNC Eugenio H. Nearn Collection, Gaithersburg, Maryland, USA
MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil
RFMC Roy F. Morris Collection, Lakeland, Florida, USA
SWLC Steven W. Lingafelter Collection, Hereford, Arizona, USA
TAMU Texas A & M University Insect Collection, College Station, Texas, USA
USNM National Museum of Natural History, Washington, D.C., USA

Results

Cacostola plotkini Wappes and Santos-Silva, new species

(Fig. 1–4)

Description. Male. Integument mostly dark brown, almost black in some areas; apex of palpomeres yellowish; anteclypeus testaceous; apex of antennomere XI yellowish-brown; elytra gradually dark reddish-brown toward apex.

Head. Frons quadrate; coarsely, moderately abundantly punctate; with yellowish-brown pubescence (more pale yellow in some areas), dense on some areas, slightly sparser in others. Vertex and area behind eyes with sculpturing as on frons; area between antennal tubercles (except glabrous median groove) with yellowish-brown pubescence obscuring integument; area from upper eye lobes and prothoracic margin with dense, elliptical yellowish-brown pubescent band on each side of median groove, nearly fused along median groove, with brownish and yellowish-brown pubescence inside them not obscuring integument; area behind eyes with dense yellowish-brown pubescence, not obscuring punctures, with brownish pubescent areas interspersed. Genae 0.75 times length of lower eye lobe; finely, shallowly punctate frontally, slightly coarser and more abundant toward side; with yellowish-brown pubescence, abundant but not obscuring integument, shorter than on frons. Antennal tubercles with inner projection distinctly elevated, wide, thick, with rounded apex, concave on the surface facing scape-ball; sculpturing as on frons, except smooth distal area and finely punctate projection; with yellowish-brown pubescence partially obscuring integument in some areas. Postclypeus with punctures finer, sparser on wide central area than on frons, smooth laterally; with pale yellow pubescence partially obscuring integument on wide central area, glabrous laterally; with long, sparse brownish setae directed forward on sides of wide central area close to anteclypeus. Labrum moderately finely punctate on transverse central area, nearly smooth on remaining surface; with pale yellow pubescence posteriorly not obscuring integument, yellower, denser anteriorly; with fringe of nearly golden setae at anterior margin; with long, sparse brownish setae directed forward at punctate area. Mandibles with yellowish-brown pubescence on basal half of outer surface, glabrous on remaining surface. Distance between upper eye lobes 0.37 times length of scape; in frontal view, distance between lower eye lobes 0.88 times length of scape. Antennae 3.3 times elytral length (only holotype measured), reaching elytral apex near apex of antennomere VI. Scape and pedicel with yellowish-brown pubescence nearly obscuring integument, with pale yellow pubescence interspersed; antennomere III with pale yellow pubescence basally, yellowish-brown with pale yellow

pubescence interspersed on remaining surface; antennomere IV with pale yellow pubescence on basal quarter, greenish-brown on remaining surface; antennomeres V–VII and IX with yellowish-white pubescence basally (this area wider ventrally), greenish-brown on remaining surface; antennomere VIII with yellowish-white pubescence on most of basal half, greenish-brown on remaining surface; antennomere X with yellowish-white pubescence on basal third, greenish-brown on remaining surface; antennomere XI with pale yellow pubescence basally and distally, greenish-brown on wide central area; ventral surface of pedicel, and antennomeres III–V with long, erect setae ventrally, distinctly more abundant on III. Antennal formula (ratio) based on length of antennomere III: scape = 0.65; pedicel = 0.18; IV = 1.24; V = 1.28; VI = 1.28; VII = 1.20; VIII = 1.18; IX = 1.26; X = 1.37; XI = 2.26.

Thorax. Prothorax wider than long, sides with rounded, slightly projected tubercle at posterior third. Pronotum with elongate, slightly elevated gibbosity on each side of central area, between anterior and posterior constrictions; coarsely, abundantly punctate, not transversely striate; with wide, pale yellow pubescent band centrally, and sides with dense pubescence of same color; remaining surface with greenish-brown pubescence, abundant but not obscuring integument; with a few long, erect brownish setae near posterolateral angles. Sides of prothorax with sculpturing and pubescence as on sides of pronotum. Prosternum finely, sparsely punctate; with yellowish-brown pubescence, denser laterally. Narrowest area of prosternal process 0.25 times width of procoxal cavity. Width of mesoventral process about half as wide as mesocoxal cavity. Ventral surface of meso- and metathorax with yellowish-brown pubescence not obscuring integument, slightly denser on mesanepisternum and mesepimeron. Scutellum with pale yellow pubescence not obscuring integument. **Elytra.** Humeri rounded, projected; coarsely, abundantly punctate on basal third, gradually finer, sparser toward apex; with wide, pale yellow pubescent band dorsally on anterior quarter, from humerus to middle, fused with longitudinal yellowish-white pubescent band centrally, from apex of anterior fifth to middle of elytra, then less distinct toward area near apex, where it is fused with moderately narrow, elongate yellowish-white pubescent band on dorsal side of posterior quarter; sutural area close to scutellum and close to apex with yellowish-brown pubescent band; remaining surface with yellowish-brown, pale yellow and greenish-brown pubescence mixed, denser on some areas, distinctly sparser in other. **Legs.** With yellowish-brown pubescence not obscuring integument, denser on tibiae, especially toward apex.

Abdomen. Ventrites with moderately dense yellowish-brown pubescence laterally, sparser centrally on I–IV, slightly less so on central area of V; apex of ventrite V truncate, centrally emarginate.

Variation. In one of the paratypes the surface of the pronotum is transversely striate.

Dimensions (mm), holotype/paratypes male. Total length, 13.10/10.45–11.55; prothoracic length, 2.00/1.65–1.75; anterior prothoracic width, 2.40/1.90–2.15; posterior prothoracic width, 2.60/2.05–2.35; maximum prothoracic width, 2.70/2.10–2.50; humeral width, 3.60/3.00–3.20; elytral length, 9.10/7.10–8.10.

Type material. Holotype male from COSTA RICA, Heredia: Estac. El Ceibo (10 km SE La Virgen, 450–550 m, 10°20'N / 84°05'W), 7–14.IV.2003, E.G. Riley col. (TAMU). Paratypes – COSTA RICA, Heredia: 1 male, same data as holotype (ACMT); Est. Biol. La Selva (50–150 m; 10°26'N / 84°01'W), 1 male, 15.V.2000, INBio-OET col. (MZSP); 1 male, Turrialba, May 14–17, 1974, E. Giesbert Coll. (FSCA).

Remarks. *Cacostola plotkini* sp. nov. is similar to *C. volvula* (Fabricius, 1787) (Fig. 5–7), *C. rugicollis* (Fig. 9–10), and *C. zanoa*, but differs by the longer antennae in males, and antennomere XI slightly shorter than IX–X together. In males of those three species the antennae are proportionally shorter, and antennomere XI is distinctly shorter than IX–X together, and often slightly longer than X. It also differs from *C. volvula* by the longer and wider projection of the antennal tubercles, and from *C. rugicollis* (Fig. 9) by the genae being distinctly shorter than the length of the lower eye lobe (Fig. 4) (slightly shorter in *C. rugicollis*). *Cacostola plotkini* differs from *C. mexicana* (Breuning, 1943) and *C. sirena* by the distinctly larger projection of the antennal tubercles.

Etymology. Named to thank and recognize David Plotkin, Chief Editor of *Insecta Mundi*, who has continually demonstrated a “Can Do” attitude when faced with the new and/or unusual demands of dealing with authors. David is not only a talented editor but, speaking as an author, also an absolute pleasure to work with!

***Cacostola galenae* Wappes and Santos-Silva, new species**

(Fig. 11–14)

Description. Female. Integument mostly dark brown; mouthparts yellowish-brown; gulamentum dark reddish-brown; scape, pedicel, and antennomere III dark reddish-brown; antennomere IV reddish-brown basally, gradually brown toward apex; antennomeres V, VII, and IX yellowish-brown on basal quarter, brown on remaining surface; antennomeres VI and VIII yellowish-brown on basal half, gradually brown on distal half toward apex; antennomere X yellowish-brown on basal third, brown on remaining surface; Antennomere XI yellowish-brown basally and distally, brownish on wide central area; elytra and legs with irregular dark reddish-brown areas.

Head. Finely, sparsely punctate; pubescence not obscuring integument, pale yellow centrally and close to eyes (this latter area very narrow), yellowish brown on remaining surface, with short white setae interspersed throughout. Vertex with sculpturing as on frons; with pale yellow and yellowish-white pubescence partially obscuring integument, except glabrous narrow area along median groove. Area behind eyes finely punctate (punctures slightly denser than on vertex); with yellowish-brown pubescence partially obscuring integument, with short white setae interspersed. Genae 0.55 times length of lower eye lobe; sculpturing as on frons, except smooth apex; with yellowish-white pubescence not obscuring integument, sparser toward frons, especially on wide central area, except distal area glabrous. Antennal tubercles in frontal view widely U-shaped, with small inner projection; sculpturing as on frons, except smooth apex; with yellowish-white and pale-yellow pubescence mixed, denser toward posterior area. Postclypeus finely, sparsely punctate close to frons, finer, sparser toward anteclypeus; with sparse yellowish-brown pubescence on wide central area (nearly glabrous close to anteclypeus), glabrous laterally; with long, erect brownish setae on sides of wide central area close to anteclypeus. Labrum with sparse yellowish-brown setae centrally, longer, directed forward laterally; with fringe of nearly golden setae on anterior margin. Mandibles with a few short white setae on outer surface. Distance between upper eye lobes 0.45 times length of scape; in frontal view, distance between lower eye lobes 0.82 times length of scape. Antennae 1.6 times elytral length, reaching elytral apex at middle of antennomere IX; antennal segments with yellowish-white pubescence not obscuring integument, appearing to be whiter on lighter areas; antennomeres III–VI with sparse, thick, dark setae ventrally (more abundant on III). Antennal formula (ratio) based on length of antennomere III: scape = 0.84; pedicel = 0.17; IV = 1.15; V = 1.06; VI = 0.92; VII = 0.81; VIII = 0.65; IX = 0.61; X = 0.61; XI = 0.61.

Thorax. Prothorax wider than long; sides unarmed, nearly parallel-sided at anterior 2/3, slightly convergent at posterior third. Pronotum coarsely, sparsely punctate; with slightly distinct, wide white pubescent band centrally (partially interspersed with yellowish pubescence), sides of posterior third with white pubescence, and remaining surface with yellowish-brown pubescence; with a few long, erect dark setae near posterolateral angles. Sides of prothorax coarsely, sparsely punctate; with white and yellow pubescence mixed, partially obscuring integument. Ventral surface of thorax with dense white and yellow pubescence mixed laterally, yellowish-white, slightly less dense centrally; narrowest area of prosternal process 0.4 times width of procoxal cavity; mesoventral process 0.65 times width of mescoxal cavity. Scutellum with sparse yellowish-white pubescence. **Elytra.** Humeri rounded, very slightly projected; coarsely, abundantly punctate on basal third, gradually finer, sparser toward apex; with dense, wide white pubescent band dorsally, from humerus to apex, longitudinally divided with yellowish-brown pubescent band from slightly before middle to posterior seventh, narrowed distally; sutural area with narrow white pubescent band, more distinct on basal third; area between sutural and lateral pubescent bands with sparse yellowish-brown pubescence, with white setae interspersed, from base to about posterior third (narrowed toward its apex); remaining surface with irregular white and yellowish-brown pubescent areas. **Legs.** Femora with white pubescence not obscuring integument, dorsally slightly yellower toward apex; protibiae with white pubescence not obscuring integument, except dark yellowish-brown pubescence on ventral surface of posterior 2/3; mesotibiae with white pubescence not obscuring integument, with pale yellow pubescence interspersed, except dark yellowish-brown pubescence on dorsal half, apex of sides, and distal third ventrally; metatibiae with white pubescence not obscuring integument, except distal third of posterior half with yellowish pubescence.

Abdomen. Ventrites I–IV with dense yellowish-brown pubescence laterally, sparser centrally, these two areas separated on each side by oblique band with denser pubescence, yellowish-brown on ventrite I, gradually lighter toward IV; with central band, from base to about middle denser pubescent. Ventrite V with dense yellowish-white pubescence laterally, with white pubescence interspersed, and slightly sparser pale-yellow pubescence centrally; apex concave.

Dimensions (mm). Total length, 7.80; prothoracic length, 1.25; anterior prothoracic width, 1.40; posterior prothoracic width, 1.30; maximum prothoracic width, 1.45; humeral width, 1.90; elytral length, 6.00.

Type material. Holotype female from PANAMA, Panama: Bayano dst. (3 km S Ipiti), 24.V.1992, J.E. Wappes col. (FSCA, formerly ACMT).

Remarks. *Cacostola galenae* sp. nov. resembles *C. janzeni* Chemsak and Linsley, 1986 (see photograph of the holotype at Bezark 2019a), but differs by the antennal tubercles not prominent, nor forming a broad V-shape from above (prominent and V-shaped in *C. janzeni*), and by the elytral punctures distinctly sparser (denser in *C. janzeni*). It is also similar to *C. colombiana* Martins and Galileo, 1999 (see photograph of the holotype at Bezark 2019a), differing by having antennal tubercles more separated from each other, and antennae slightly surpassing the elytral apex (distinctly longer in *C. colombiana*). It is also similar to *C. grisea* Dillon and Dillon, 1946, but differs by the antennal tubercles not being distinctly prominent (prominent in *C. grisea*), and by the area between antennal tubercles not distinctly concave (noticeably concave in *C. grisea*).

Etymology. Named to thank and recognize Galena Opitz, a delightful lady and spouse of Weston Opitz, who not only provides him with great technical assistance in his systematic research on Cleridae but also welcomes his friends as hers, making them most welcome in their home.

Cacostola opitzi Wappes and Santos-Silva, new species

(Fig. 15–19)

Description. Male. (Fig. 15–18). Integument mostly dark brown; anteclypeus testaceous; labrum dark reddish-brown; mouthparts reddish-brown with apex of palpomeres yellowish-brown; basal 2/3 of antennomeres IV–VI reddish-brown; basal 2/3 of antennomeres VII–X yellowish-brown; antennomere XI mostly yellowish-brown, with reddish-brown ring from about middle to distal quarter; tarsomere V dark reddish-brown (brownier depending on light intensity).

Head. Frons coarsely, abundantly punctate; with yellowish-brown and brownish pubescence not obscuring integument, denser on some areas, sparser in others, with short white setae interspersed. Vertex and superior area behind upper eye lobes coarsely, moderately abundantly punctate, forming distinct V-shaped punctate area toward prothoracic margin; remaining surface of area behind upper eye lobes coarsely, sparsely punctate close to eye, smooth on remaining surface; area behind lower eye lobes coarsely, sparsely punctate; area between antennal tubercles with yellowish-brown pubescence partially obscuring integument, with short white setae interspersed; area close to upper eye lobes with yellowish-brown pubescence, gradually sparser approaching area behind eye; area between upper eye lobes with yellowish-brown pubescence centrally; remaining surface of vertex and area behind upper eye lobes with abundant, brownish pubescence but not obscuring integument, with a few short white setae interspersed; area behind lower eye lobes with brown and yellowish-brown pubescence mixed, with a few short, white setae interspersed. Genae slightly shorter than length of lower eye lobe; finely, sparsely punctate toward frons, slightly coarser toward posterior area; pubescence as on area behind lower eye lobes. Antennal tubercles with inner projection distinctly elevated; together, in frontal view, U-shaped; sculpturing as on frons; with yellowish-brown and brown pubescence partially obscuring integument. Wide central area of postclypeus with sculpturing and pubescence as on frons, smooth and glabrous laterally. Labrum with short, sparse yellowish-white pubescence close to anteclypeus; with long, moderately abundant, decumbent, nearly golden setae on remaining surface. Mandibles with abundant yellowish-brown pubescence on basal half of outer surface, glabrous on remaining surface. Distance between upper eye lobes 0.36 times length of scape; in frontal view, distance between lower eye lobes 0.72 times length of scape. Antennae 1.85 times elytral length, reaching elytral apex at near apex of

antennomere VIII. Scape with light yellowish-brown and brown pubescence mixed, partially obscuring integument, with short white setae interspersed (more abundant laterally and ventrally); pedicel with brown pubescence nearly obscuring integument; antennomere III with pubescence as on scape, except distal area with brown pubescence; antennomeres IV–X with yellowish-white pubescence on light area, brown on dark area; antennomere XI with yellowish-white pubescence; pedicel and antennomeres III–VI with a few long, erect, thick dark setae ventrally (sparser toward VI). Antennal formula (ratio) based on length of antennomere III: scape = 0.92; pedicel = 0.24; IV = 1.41; V = 1.15; VI = 1.11; VII = 0.92; VIII = 0.85; IX = 0.78; X = 0.74; XI = 0.79.

Thorax. Prothorax slightly wider than long; sides constricted both anteriorly and posteriorly, with small, rounded tubercle at posterior third. Pronotum coarsely, abundantly punctate; with three longitudinal yellowish-brown pubescent bands, one centrally, wider about middle, one on each side, denser basally and posteriorly, partially fragmented on wide central area; remaining surface with brownish pubescence not obscuring integument; with short, sparse white setae interspersed throughout. Sides of prothorax with sculpturing as on pronotum, slightly denser dorsally; with longitudinal yellowish-brown pubescent band close to pronotum, with short white setae interspersed, brownish pubescence centrally, with small white setae interspersed, and yellowish-brown pubescence close to prosternum, with small white setae interspersed; with a few long, erect dark setae posteriorly near pronotum. Prosternum with yellowish-brown pubescence not obscuring integument, with white setae interspersed. Narrowest area of prosternal process 0.25 times width of procoxal cavity. Mesanepisternum, mesepimeron and sides of mesoventrite with dense yellowish-brown pubescence; central area of mesoventrite with dense yellowish-white pubescence; mesoventral process with dense white pubescence. Distal area of mesoventral process about 0.5 times width of mesocoxal cavity. Metanepisternum and sides of metaventrite with yellowish-white pubescence, with white setae interspersed; wide central area of metaventrite with abundant white pubescence. Scutellum with yellowish-brown pubescence not obscuring integument, absent along almost entire longitudinal center, with white setae interspersed. **Elytra.** Surface irregular, with irregular longitudinal carinae; humeri rounded, not projected; coarsely (punctures finer than on pronotum), abundantly punctate on basal half, gradually finer, sparser on distal half; with dense yellowish-brown pubescent maculae and bands, with shorter brown pubescence interspersed, and with small, sparse white setae interspersed throughout. **Legs.** Femora with white pubescence basally on ventral surface, yellowish-brown, partially obscuring integument, with short white setae interspersed (meso- and metafemora with dorsal and lateral brown band near apex). Tibiae with yellowish-brown pubescence partially obscuring integument, with small white setae interspersed (meso- and metatibiae with irregular areas with only brown pubescence); metatibiae tumid.

Abdomen. Ventricle I mostly brown pubescent, with yellowish-brown pubescence interspersed, more abundant on postero-central area; ventrites II–IV with abundant yellowish-brown pubescence, with white setae interspersed, and irregular areas with shorter, sparser brownish pubescence, except basal half of central area with dense yellowish-white pubescent macula; ventrite V not depressed centrally, with yellowish-brown pubescence on base and sides, with short white setae interspersed, except centrobasal area with dense yellowish-white pubescent macula, and sparser brown pubescence on remaining surface; apex of ventrite V slightly concave.

Female. (Fig. 19). Antennae 1.5 times elytral length, reaching elytral apex at about distal third of antennomere IX; metatibiae not tumid, gradually widened toward apex; ventrite V somewhat depressed centrally.

Variation. Antennomere III reddish-brown on basal 2/3.

Dimensions (mm), holotype/paratypes female. Total length, 8.80/9.90–10.95; prothoracic length, 1.35/1.50–1.80; anterior prothoracic width, 1.45/1.70–2.10; posterior prothoracic width, 1.55/1.75–2.20; maximum prothoracic width, 1.60/1.80–2.35; humeral width, 2.25/2.55–3.10; elytral length, 6.25/7.10–8.10.

Type material. Holotype male from BOLIVIA, Santa Cruz: 4 km SSE Buena Vista (Hotel Flora and Fauna, 350–400 m; 17°29'S / 63°49'W), 22–25.XI.2013, Wappes and Skillman col. (FSCA), formerly ACMT). Paratypes – BOLIVIA, Santa Cruz: 4–6 km SSE Buena Vista (Flora and Fauna Hotel), 1 female,

3–8.X.2004, Wappes and Morris col. (ACMT); 3.7 km SSE Buena Vista (Hotel Flora and Fauna; 430 m), 1 female, 5–15.XI.2001, M. C. Thomas and B.K. Dozier col. (MZSP); 1 female, Buena Vista vic. Flora and Fauna Hotel, 22–26.X.2002, Morris/Wappes col. (RFMC).

Remarks. *Cacostola opitzi* sp. nov. is similar to *C. variegata* (see photographs of the holotype at Bezark 2019a) by the lower eye lobes being shorter, slightly longer than the genae (nearly two and one-half times genal length in *C. variegata*), antenna shorter (distinctly longer in male of *C. variegata*), and metatibiae distinctly tumid (not so in male of *C. variegata*). It differs from *C. clorinda* by the antennomere IV being distinctly longer than III (slightly longer in male of *C. clorinda*), antennomeres distinctly annulated (not so in *C. clorinda*), and elytra without a dark central band on the basal half (present in *C. clorinda*).

Etymology. Named for Weston Opitz, great friend of the first author, and the leading taxonomist of Cleridae in the New World who goes to great lengths to be inclusive in his work. The first author is forever grateful for the more than 400 clerid paratypes (representing 80 plus species) that are in his collection and the direct result of Weston's talents and "inclusive nature".

Cacostola howdenae Wappes and Santos-Silva, new species

(Fig. 20–23)

Description. Male. Integument mostly dark brown; anteclypeus and labrum reddish-brown; apex of last palpomeres yellowish-brown; basal half of antennomere IV, and basal third of antennomere V reddish-brown; basal 2/3 of antennomere VI yellowish-brown; antennomeres VIII–X yellowish-brown, except narrow dark brown apex; antennomere XI yellowish-brown; elytra with wide dark reddish-brown band dorsally, oblique from humerus to near middle, then narrowed, following parallel to suture and gradually disappearing toward distal quarter; trochanteres reddish-brown; basal third of tibiae dark reddish-brown (less so depending on light intensity); tarsomere V dark reddish-brown, apex dark brown.

Head. Frons finely, moderately abundantly punctate; with yellowish-brown pubescence not obscuring integument, slightly denser laterally and centrally along superior area of median groove, with short white setae interspersed. Vertex with sculpturing as on frons; with dense yellowish-brown pubescence between antennal tubercles, close to upper eye lobes and centrally, remaining surface brown, with short white setae interspersed. Area behind upper eye lobes with sculpturing as on vertex; with dense yellowish-brown pubescence close to superior area of eye, with short white setae interspersed, brown, nearly obscuring integument on remaining surface. Area behind lower eye lobes with sculpturing as on vertex; with dense yellowish-brown pubescence, with short white setae interspersed on superior area close to eye and posterior area close to prothorax; remaining surface with sparse yellowish-brown pubescence and short white setae interspersed. Genae 0.7 times length of lower eye lobe; with sculpturing as on frons, distal area smooth; with sparse yellowish-brown pubescence and short white setae interspersed. Antennal tubercles with inner projection distinctly elevated, narrow; together, in frontal view, U-shaped; sculpturing as on frons basally, minutely punctate on remaining surface; with yellowish-brown pubescence not obscuring integument and short white setae interspersed. Wide central area of postclypeus with sculpturing and pubescence as on frons, smooth, glabrous laterally. Labrum with sparse yellowish-white pubescence close to anteclypeus, slightly denser, with white setae interspersed on anterior area. Mandibles with moderately sparse yellowish-brown pubescence on basal 2/3 of outer surface. Distance between upper eye lobes 0.34 times length of scape; in frontal view, distance between lower eye lobes 0.76 times length of scape. Antennae 2.1 times elytral length, reaching elytral apex about middle of antennomere VII. Scape with sparse yellowish-brown pubescence, slightly denser basally and short white setae interspersed. Pedicel with sparse yellowish-brown and yellowish-white pubescence basally, remaining surface brown. Antennomere III with yellowish-white pubescence on basal third, remaining surface brown; antennomeres IV–VI, with yellowish-white pubescence on light area, brown on dark area; antennomere VII with sparse yellowish-white pubescent maculae; antennomeres VIII–XI with yellowish-white pubescence; pedicel and antennomeres III–VIII with long, erect, thick dark setae ventrally. Antennal formula (ratio) based on length of antennomere III: scape = 0.72; pedicel = 0.15; IV = 1.25; V = 1.12; VI = 1.00; VII = 0.87; VIII = 0.80; IX = 0.67; X = 0.65; XI = 0.80.

Thorax. Prothorax wider than long; sides with distinct rounded tubercle from about middle to posterior constriction. Pronotum coarsely, sparsely punctate; transversely rugose centrally, from about anterior constriction to middle; with white pubescent band centrally on posterior quarter, surrounded by yellowish-brown pubescence; white pubescent on center of posterior margin; with moderately dense yellowish-brown and white pubescence mixed laterally; sparse yellowish-brown pubescence anteriorly and short white setae interspersed; remaining surface with brown pubescence not obscuring integument, with short white setae interspersed. Sides of prothorax with sculpturing as on pronotum; with yellowish-brown pubescence, denser toward prosternum and with short white setae interspersed. Prosternum with dense yellowish-brown pubescence laterally, with white setae interspersed, distinctly sparser centrally. Prosternal process with yellowish-brown pubescence, with white pubescence interspersed, slightly denser than on central area of prosternum; narrowest area of prosternal process about 0.2 times width of procoxal cavity. Mesanepisternum, mesepimeron, sides of mesoventrite, and base of metanepisternum with dense yellowish-brown pubescence; central area of mesoventrite with yellowish-brown pubescence, with white pubescence interspersed; remaining surface of metanepisternum and metaventrite with brownish pubescence not obscuring integument (distinctly sparser on posterocentral area of metaventrite), except sparse yellowish-brown pubescence on metaventrite close to meso- and metacoxae. Scutellum with sparse yellowish-brown pubescence. **Elytra.** Humeri slightly projected; sides slightly convergent from humeri to middle, parallel-sided from middle to distal sixth, then gradually narrowed toward rounded apex; with two moderately elevated carina from base to near apex, fused posteriorly; sides of posterior sixth depressed in relation to the dorsal surface; with white pubescent band dorsally, from base to posterior sixth, fused with another white pubescent band, also dorsally, from after middle to near apex; sides of dorsal surface with yellowish-brown and white pubescence mixed on anterior third; area between white pubescent band and suture with yellowish-brown pubescence not obscuring integument, except white pubescent band close to suture on about central third; inclined area with sparse yellowish-brown pubescence basally and about middle; remaining dorsal surface with brown pubescence not obscuring integument, sparse yellowish-brown pubescent laterally from middle. **Legs.** With yellowish-brown pubescence not obscuring integument; meso- and metatibiae tumid, especially the latter.

Abdomen. Ventrites with yellowish-white pubescence, denser laterally, yellower on ventrite V. Apex of ventrite V slightly concave.

Dimensions (mm). Total length, 10.00; prothoracic length, 1.35; anterior prothoracic width, 1.55; posterior prothoracic width, 1.60; maximum prothoracic width, 1.75; humeral width, 2.50; elytral length, 7.50.

Type material. Holotype male from GUATEMALA, Guatemala: 14.5 km SE Guatemala City, Puerta Parada, 1790 m, 13.VI.1991, A. Howden col. (FSCA, formerly ACMT).

Remarks. *Cacostola howdenae* sp. nov. is similar to *C. mexicana* (Breuning, 1943). As we do not know the sex of the holotype of *C. mexicana*, it is not possible to provide a detailed comparison, but the new species at least differs as follows: elytra more distinctly narrowed toward apex, which is also narrower, and not widened after middle; distance between upper eye lobes smaller, distinctly shorter than 1/3 of the basal width of the prothorax (equal to 1/3 of basal width of the prothorax in *C. mexicana*).

Etymology. Named for Anne Howden (now deceased), a wonderful lady and the collector of the holotype.

Cacostola thomasorum Wappes and Santos-Silva, new species

(Fig. 24–27)

Description. Male. Integument mostly dark brown, almost black on some areas; mouthparts dark reddish-brown, except palpomeres black with reddish-brown apex; anteclypeus yellowish-brown; basal area of antennomeres V–XI reddish-brown, gradually lighter toward distal segments.

Head. Frons finely, abundantly punctate; with dense yellowish-brown pubescence obscuring integument, except sparsely pubescent close to clypeus on each side of median groove, and dark yellowish-brown pubescent on each side near base of antennal tubercles. Vertex finely, abundantly punctate; area between antennal tubercles and beginning of upper eye lobes with dense yellowish-brown pubescence; central area

with inverted U-shaped brown pubescent band in middle of area between upper eye lobes, not reaching prothoracic margin; remaining surface with pale yellow pubescence obscuring integument, with a few punctures exposed. Area behind eyes finely, abundantly punctate; with pale yellow pubescence partially obscuring integument. Genae 0.55 times length of lower eye lobe; finely, abundantly punctate, less so toward frons; with pale yellow pubescence obscuring integument on some areas (more yellowish-brown depending on light intensity), sparser close to frons. Antennal tubercles with inner projection distinctly elevated, wide, thick, with apex rounded, concave on the surface facing scape-ball; together somewhat U-shaped; sculpturing as on frons, distal area smooth; with pale yellow pubescence obscuring integument. Wide central area of postclypeus close to frons with dense yellowish-brown pubescence (lighter depending on light intensity), glabrous laterally and close to anteclypeus (with a few short, sparse setae laterally close to anteclypeus); with a few long brownish setae directed forward on sides of wide central area. Labrum with sparse yellowish-white pubescence close to anteclypeus, yellowish-brown pubescence laterally on inclined area, and fringe of yellow pubescence at anterior margin; with short, erect dark setae on sides of central area. Mandibles with pale yellow pubescence on basal 2/3 of outer surface. Distance between upper eye lobes 0.34 times length of scape; in frontal view, distance between lower eye lobes 0.93 times length of scape. Antennae 2.6 times elytral length, reaching elytral apex at basal quarter of antennomere VII. Scape gradually, slightly widened toward apex; with yellowish-white pubescence partially obscuring integument, with brownish and pale-yellow pubescence irregularly interspersed on some areas. Antennomere III with yellowish-white pubescence, with brownish pubescence irregularly interspersed on small areas; antennomere IV with yellowish-white pubescence on basal 3/4, brownish, with yellowish-white pubescence interspersed on distal quarter; antennomeres V–XI with yellowish-white pubescence on light area, brown on dark area; pedicel, antennomere III, and base of IV with short, sparse, erect, thick dark setae ventrally. Antennal formula (ratio) based on length of antennomere III: scape = 0.72; pedicel = 0.17; IV = 1.20; V = 1.17; VI = 1.12; VII = 1.02; VIII = 0.95; IX = 1.00; X = 0.95; XI = 1.15.

Thorax. Prothorax wider than long; nearly parallel-sided; posterior margin slightly sinuous. Pronotum coarsely, abundantly punctate; with yellowish-white pubescence not obscuring integument, slightly yellow on anterior third, slightly denser on posterocentral area. Sides of prothorax coarsely, abundantly punctate; with yellowish-white pubescence not obscuring integument. Prosternum coarsely, sparsely punctate; with sparse pale-yellow pubescence. Prosternal process with pubescence slightly denser than on prosternum; narrowest area 0.25 times width of procoxal cavity. Mesoventrite, mesepimeron, metanepisternum and metaventrite with abundant yellowish-white pubescence, not obscuring integument; mesanepisternum with pale yellow pubescence partially obscuring integument. Scutellum glabrous centrally, with yellowish-white pubescence not obscuring integument laterally. **Elytra.** Humeri slightly projected; sides slightly narrowed from humeri to posterior fifth, then more distinctly narrowed toward obliquely truncate apex; coarsely, abundantly punctate on basal third, gradually finer, sparser toward apex; with small pale yellow pubescent macula, between humeri and scutellum basally; with yellowish-white pubescence not obscuring integument, more abundant, slightly yellower on posterior half, except longitudinal, fragmented white pubescent band from near base to distal third along center of dorsal surface, and dense, somewhat large yellowish-white pubescent macula near apex dorsally. **Legs.** Femora with yellowish-brown pubescence not obscuring integument, more yellowish-white basally on meso- and metafemora. Tibiae with pale yellow pubescence, gradually yellowish-brown, bristly toward apex, especially on meso- and metatibiae, and brownish pubescence interspersed on meso- and metatibiae.

Abdomen. Ventrites with pale yellow pubescence, denser laterally toward V, longer throughout toward V, and longitudinal, somewhat irregular tuft of dense yellow pubescence on each side of ventrites II–V. Apex of ventrite V slightly concave.

Dimensions (mm). Total length, 9.6; prothoracic length, 1.6; anterior prothoracic width, 1.8; posterior prothoracic width, 1.8; maximum prothoracic width, 1.9; humeral width, 2.6; elytral length, 6.9.

Type material. Holotype male from BRAZIL, Rondônia: 62 km SW Ariquemes (Fazenda Rancho Grande), 18.XI.1994, C.W. and L.B. O'Brien col. (FSCA, formerly ACMT).

Remarks. The general appearance of *Cacostola thomasorum* sp. nov. resembles some species of *Tres-tonia* Buquet, 1859. Dillon and Dillon (1946) defined *Cacostola* as follows: “Distinguished by the small,

elongate, slender, parallel-sided form of body; elytra and pronotum usually with pale vittae; antennal tubercles well-separated, very prominent, armed with an erect tooth in both sexes; eye with lower lobe large; antennae with third segment sometimes curved, the fourth often longer than third; legs short; and the mesosternum elongate before process." Still, according to Dillon and Dillon (1946), *Trestonia* is: moderate or small sized, elongate-oblong, rather slender; antennal tubercles prominent, well separated, in male produced into a long, robust tooth truncate at apex, in female tooth short and subacute; eyes with lower lobe oblong-ovate or oblong, one and one-half to more than twice height of gena; antennae one and one-third times body length in male, as long as body (or slightly longer) in female; antennomere III straight or feebly arcuate, IV either slightly shorter or slightly longer than third. Those features do not allow separating *Trestonia* from *Cacostola* and are not present in several species currently placed in the genus. We find a more reliable character is the scape, which is clavate in *Trestonia* versus being gradually widened toward the apex in *Cacostola*.

In *Cacostola*, *C. thomasorum* is slightly similar to *C. cana* Marinoni and Martins, 1982 (see photo of the holotype at Bezark 2019a), differing by the absence of a transverse white pubescent band on the base of the elytra (present in *C. cana*), and having the elytral apex widely, obliquely truncate (distinctly narrower and nearly rounded in *C. cana*). It also somewhat resembles *C. nordestina* Martins and Galileo, 1999, but differs by the antennomeres not being distinctly annulate (antennal annulations very distinct in *C. nordestina*), and elytra lacking large irregular orangish-brown areas (present in *C. nordestina*).

Etymology. Named in appreciation of Michael C. Thomas, former Head Curator of Entomology at FSCA (recently deceased) and spouse Sheila for their many years of hosting visitors to FSCA and providing welcome hospitality to all of them.

***Cacostola nearnsi* Wappes and Santos-Silva, new species**

(Fig. 28–33)

Description. Male. (Fig. 28–32). Integument mostly dark brown; anteclypeus and posterior area of labrum testaceous; mouthparts dark reddish-brown, except apex of palpomeres yellowish-brown; antennomeres III–IV brown with darker apex; antennomere V–VI reddish-brown on basal quarter, brown on remaining surface (lighter on VI), except apex narrowly darker; VIII–IX yellowish-brown basally, reddish-brown on remaining surface; antennomere X reddish-brown; antennomere XI yellowish-brown, gradually yellower toward apex; elytra with longitudinal, nearly indistinct dark reddish-brown band from base to near apex dorsally; tarsomere V dark reddish-brown, apex black.

Head. Frons elongate; finely, sparsely punctate; with yellowish-brown pubescence partially obscuring integument. Vertex and area behind eyes finely punctate (punctures slightly denser than on frons); area between antennal tubercles and upper eye lobes with yellowish-brown pubescence nearly obscuring integument; central area of vertex with yellowish-brown pubescent band fused with pubescence between upper eye lobes of same color; remaining surface of vertex and superior area behind upper eye lobes with greenish-brown pubescence, partially obscuring integument (shorter than yellowish-brown pubescence); remaining surface of area behind upper eye lobes and behind lower eye lobes with yellowish-brown pubescence partially obscuring integument, slightly sparser toward ventral surface of lower eye lobes. Genae 0.5 times length of lower eye lobe; finely, sparsely punctate; with yellowish-brown pubescence not obscuring integument, gradually sparser toward frons, except narrow distal area glabrous. Antennal tubercles elevated, with inner projection small; together V-shaped; sculpturing as on frons, distal area smooth; with yellowish-brown pubescence partially obscuring integument, sparser near apex. Postclypeus finely, sparsely punctate (punctures finer and sparser than on frons); with yellowish-brown pubescence denser close to frons, sparser toward anteclypeus, except pale-yellow pubescent centrally. Labrum glabrous close to anteclypeus, with yellowish-white pubescence not obscuring integument on central area, with abundant yellow setae directed forward anteriorly. Mandibles with sparse yellowish-brown pubescence on outer surface. Distance between upper eye lobes 0.23 times length of scape; in frontal view, distance between lower eye lobes 0.53 times length of scape. Antennae 2.55 times elytral length, reaching elytral apex near apex of antennomere VI. Scape and pedicel with yellowish-brown pubescence partially obscuring integument (more yellowish-white depending on light intensity); antennomere III

with grayish-white pubescence basally, light yellowish-brown on remaining surface; antennomeres IV–VIII with yellowish-white pubescence on light colored area, nearly inconspicuous, light yellowish-brown on remaining surface; antennomeres IX–XI with light yellowish-brown pubescence not obscuring integument; antennomeres III–IV with short, sparse, thick dark setae ventrally (distinctly sparser on IV). Antennal formula (ratio) based on length of antennomere III (only holotype measured): scape = 0.68; pedicel = 0.14; IV = 1.17; V = 1.14; VI = 1.03; VII = 0.90; VIII = 0.85; IX = 0.85; X = 0.88; XI = 1.00.

Thorax. Prothorax slightly wider than long; sides with small, rounded projection on posterior third, close to posterior constriction, slightly divergent from anterolateral angles to rounded projection. Pronotum coarsely, abundantly punctate; with three longitudinal, wide, dense pale-yellow pubescent bands, one centrally, one on each side; remaining surface with greenish-brown pubescence not obscuring integument. Sides of prothorax coarsely, abundantly punctate; with pale yellow pubescence partially obscuring integument. Ventral surface of thorax with dense pale-yellow pubescence nearly obscuring integument (more yellowish-brown depending on light intensity). Narrowest area of prosternal process 0.25 times width of procoxal cavity. Mesoventral process 0.7 times width of mescoxal cavity. Scutellum with pale yellow pubescence nearly obscuring integument. **Elytra.** Parallel-sided at basal 3/4, distinctly narrowed at posterior quarter toward rounded apex; coarsely, abundantly punctate on basal half, slightly finer, sparser toward apex; with longitudinal pale yellow pubescent bands from base to apex, starting dorsally between humerus and suture (three dorsally, one laterally), almost entirely fused on some areas, especially basally and apically; another pale yellow pubescent band along suture, from scutellum to apex, gradually narrowed at its basal third, partially white centrally; remaining surface with brownish pubescence not obscuring integument. **Legs.** Femora with yellowish-brown pubescence, abundant but not obscuring integument, more yellowish-white ventrally. Tibiae with yellowish-white pubescence, with yellowish-brown pubescence interspersed, except brownish pubescence on dorsal third of mesotibiae.

Abdomen. Ventrites with pale yellow pubescence, slightly denser laterally, denser on each side of central area, together forming sinuous band, and slightly denser centrally on ventrites I–IV. Apex of ventrite V ventrally concave, broadly transverse and fringed with darker pubescence.

Female (Fig. 33). Antennae shorter, reaching elytral apex at base of antennomere VIII. Apex of ventrite V broadly transverse, feebly notched and fringed with darker pubescence.

Dimensions (mm), holotype male/paratype females. Total length, 9.15/9.70–10.00; prothoracic length, 1.35/1.30–1.40; anterior prothoracic width, 1.35/1.45–1.50; posterior prothoracic width, 1.40/1.55–1.60; maximum prothoracic width, 1.45/1.65–1.60; humeral width, 2.00/2.20–2.40; elytral length, 6.70/7.20–7.40. The paratype males were not measured.

Type material. Holotype male from BOLIVIA, Santa Cruz: 4–6 km SSE Buena Vista (Flora and Fauna Hotel), 17-30.IV.2003, R. Clarke col. (FSCA). PARATYPES – BOLIVIA, Santa Cruz: 4–6 km SSE Buena Vista (Flora and Fauna Hotel), 1 female, 27-29.X.2000 (MZSP) Buena Vista (El Cairo), 1 female, 17.XI.2008, Galileo, Vanin and Martins col. (MZSP); 4.7 km SSE Buena Vista (Flora and Fauna Hotel), 430m, 1 female, 15–22.XI.2001, blacklight trap, transition forest, B. K. Dozier col. (FSCA); Achira Amoro, 2 females, 1.XII.2013, Skillman and Wappes col. (FWSC); Florida, 4 km N Bermejo, 1 female, 15.XII.2012, Refugio los Volcanes, 18°06'S, 63°36'W, 1000–1200 meters, Skillman and Wappes col. (FWSC); Buena Vista, vic. Flora and Fauna Hotel, 1 male, R. Morris col. (RFMC); Above Achira, 18°09'S, 63°47'W, 1 male, 10.XII.2011, Morris and Wappes col. (RFMC); Cord. Prv., Rd to Itai, 83 km N Camiri, 890 m, 1 male, 17–18.XII.2011, 19°20'S, 63°28'W, Wappes, Lingafelter and Woodley col. (ACMT); Achira area (N Rd. to Amboró on Achira ridge), 1 male, 5–6.II.2013, 18°09'S, 63°48'W, Wappes, Bonaso, Lingafelter and Garzon col. (SWLC); Chaco above Achira, 1 male, 1 female 22-25.I.2007, 1730 m, Prov. Florida, Vicoquin area, 18°07'S, 63°47'W, Wappes, Lingafelter and Prena col. (ACMT); Above Achira Rd. to Floripondo, 1900 m, 1 female, 10.XII.2011, 18°09'S 63°47'W, Wappes, Bonaso and Morris col. (ACMT); Rd to Amboró above Achira, 1 female, 10–11.X.2006, Ag cut and burn area, 18°07'43"S, 63°47'98"W, el. 1940 m, Wappes, Nearn and Eya col. (GHNC); 4 km N Bermejo, 1 female, 11–17.XII.2012, Refugio los Volcanes, 18°06'S, 63°36'W, 1045–1350 m, Wappes and Skillman col. (ACMT); 4–6 km SSE Buena Vista, F and F Hotel, 1 female, 27–29.X.2000, Wappes and Morris col. (ACMT). PANAMA, Coclé: Chiriqui, Arriba, 8°41.078'N, 80°11.526'W, 1 female, 04.XII.2016, local collector (AACP).

Remarks. *Cacostola nearnsi* sp. nov. is similar to *C. acuticauda* Marinoni and Martins, 1982 (Fig. 34–37), but differs as follows: distance between upper eye lobes shorter than widest area of scape; frons in male (Fig. 31) slightly longer than length of lower eye lobe; distance between antennal tubercles subequal to height of antennal tubercle. In *C. acuticauda*, the distance between the upper eye lobes (Fig. 34) is equal to the widest area of the scape, the frons in the male (Fig. 36) is much wider than the length of the lower eye lobe, and the distance between antennal tubercles (Fig. 36) is distinctly further than the height of the antennal tubercle. It differs from *C. gracilis* Marinoni and Martins, 1982 by the elytra lacking longitudinal deepening and not swelling slightly before the apex (both features present in *C. gracilis*). *Cacostola nearnsi* differs from *C. sirena* Dillon and Dillon, 1946 by the elytra being mostly darker (pale and dark reddish-brown in *C. sirena*), the distance between the upper eye lobes less than the widest area of the scape (distinctly wider in females of *C. sirena*), the dorsal pubescent bands of the elytra not distinctly separated from base to apex (separated in *C. sirena*), and the elytral apex distinctly narrowed toward the apex (feebly tapering to apices in *C. sirena*).

Etymology. Named to honor and recognize the entomological achievements of Eugenio H. Nearns, including his taxonomic expertise in New World Onciderini and as an editor for several entomological journals.

Cacostola rothschildi Wappes and Santos-Silva, new species

(Fig. 38–42)

Description. Female. Integument mostly dark brown; head mostly black; anteclypeus reddish-brown; apex of palpomeres yellowish-brown; basal half of antennomeres III–IV dark reddish-brown; basal half of antennomeres V–VI reddish-brown.

Head. Frons, vertex and area behind eyes finely, abundantly punctate; with testaceous and white pubescence mixed, partially obscuring integument. Genae 0.55 times length of lower eye lobe; finely, sparsely punctate; with sparse (denser close to eye), testaceous and white setae intermixed. Antennal tubercles moderately elevated, with nearly indistinct inner projection; widely separated; sculpturing as on frons; pubescence as on frons, but obscuring integument. Postclypeus finely, sparsely punctate close to frons, nearly smooth close to anteclypeus; with testaceous and white pubescence intermixed close to frons, distinctly sparser toward anteclypeus, glabrous laterally; with a few long, erect, dark setae on sides of wide central area. Labrum with white pubescence close to anteclypeus, not obscuring integument, with dense testaceous pubescence on remaining surface, and fringe of testaceous pubescence on anterior margin. Mandibles with testaceous and white pubescence on basal 2/3 of outer surface, not obscuring integument. Distance between upper eye lobes 0.47 times length of scape; in frontal view, distance between lower eye lobes 0.87 times length of scape. Antennae (missing distal portion of antennomere VI, and antennomeres VII–XI of right antenna of holotype; missing distal half of antennomere V, and antennomeres VI–XI of left antenna of holotype; missing antennomeres VII–XI of right antenna of paratype; missing antennomeres III–XI of left antenna of paratype) equal to elytral length, almost reaching posterior quarter of elytra (measured in the paratype, apex of antennomere VI). Scape with testaceous and white pubescence intermixed on basal 2/3, nearly entirely testaceous on posterior third, nearly obscuring integument; pedicel with white pubescence basally, testaceous on remaining surface, partially obscuring integument; antennomere III with testaceous pubescence nearly obscuring integument, with white setae interspersed (denser laterally and ventrally on basal half); light area of antennomeres IV–VI with white pubescence, nearly obscuring integument, and remaining surface with dark brown pubescence, with white pubescence interspersed; antennomeres with erect, sparse, thick dark setae ventrally (sparser toward VI). Antennal formula (ratio) based on length of antennomere III (only paratype measured): scape = 0.69; pedicel = 0.16; IV = 1.09; V = 1.00; VI = 0.84.

Thorax. Prothorax wider than long; sides slightly rounded centrally. Pronotum finely, abundantly punctate (punctures slightly coarser than on vertex); with reddish-brown pubescence partially obscuring integument, with white setae interspersed (white setae denser on some areas, forming distinct band laterally). Sides of prothorax with sculpturing as on pronotum; with reddish-brown pubescence nearly obscuring integument, with white setae interspersed (forming longitudinal, distinct band superiorly); with

a few long, erect, dark setae posteriorly near pronotum. Ventral surface of thorax with dense reddish-brown and white pubescence laterally, nearly entirely white centrally, except on prosternal process and mesoventral process with white pubescence interspersed by reddish-brown pubescence. Prosternal process gradually widened toward apex; narrowest area (base) 0.45 times width of procoxal cavity. Mesoventral process 0.75 times width of mesocoxal cavity. Scutellum with reddish-brown pubescence, not obscuring integument, with white setae interspersed. **Elytra.** Parallel-sided at basal 4/5, distinctly narrowed at posterior fifth toward rounded apex; finely, abundantly punctate throughout (punctures similar to those of pronotum); with yellowish-brown and white pubescence intermixed, partially obscuring integument on some areas (white pubescence more abundant on some areas) and irregular areas with sparse reddish-brown pubescence interspersed. **Legs.** With moderately abundant reddish-brown and white setae intermixed (white setae denser on some areas).

Abdomen. Ventrites with reddish-brown and white setae intermixed, nearly obscuring integument (white setae distinctly denser on ventrite V). Apex of ventrite V concave.

Variation. Integument mostly black; basal half of tarsomeres V dark reddish-brown; frons, vertex and area behind eyes with yellow and white pubescence intermixed; scape with yellow and white pubescence intermixed; white pubescence missing on distal area of antennomeres IV–VI; pronotum white pubescent, with yellow setae interspersed, except one large, semielliptical area on each side of anterior half with yellow pubescence not obscuring integument; sides of prothorax with yellow and white pubescence intermixed; scutellum, elytra, legs, ventral surface of thorax, and abdominal ventrites reddish-brown pubescent with yellow pubescence intermixed.

Dimensions (mm), holotype/paratype. Total length, 9.25/9.60; prothoracic length, 1.30/1.35; anterior prothoracic width, 1.50/1.55; posterior prothoracic width, 1.60/1.65; maximum prothoracic width, 1.70/1.70; humeral width, 2.30/2.50; elytral length, 7.15/7.30.

Type material. Holotype female from ARGENTINA, Entre Rios: 18 km NW Villaguay, 14.I.1989, O'Brien and G. Wibmer col. (FSCA, formerly ACMT). Paratype female from BRAZIL, Santa Catarina: Rio Vermelho, XII.1948, formerly Dirings col. (MZSP).

Remarks. The types of *Cacostola rothschildi* sp. nov. were initially found in the MZSP collection and identified as being *C. fusca*. However, each gena is shorter in *C. rothschildi* (0.55 times length of lower eye lobe; 0.75 in *C. fusca*), the distance between the lower eye lobes is less (from 1.3 to 1.4 times length of lower eye lobe; 1.65 times in *C. fusca*), the antennal tubercles are less elevated and further from each other (distance greater than the height of the antennal tubercle; about equal in *C. fusca*), the antennomeres are more slender (slightly thicker in *C. fusca*), and antennomere III is longer than the scape and pedicel together (about as long in *C. fusca*).

Etymology. Named to recognize and thank Mark Rothschild, Membracidae expert and FSCA volunteer, for his generous identification of thousands of these beautiful critters collected in the American tropics by the first author.

Notes

Cacostola mexicana (Breuning, 1943)

(Fig. 43)

Paratucumaniella mexicana Breuning 1943: 42; Breuning 1949: 27 (syn.).

Cacostola mexicana; Breuning 1961: 215 (cat.); Marinoni and Martins 1982: 247 (reval.); Chemsak et al. 1992: 124 (checklist); Monné and Giesbert 1994: 195 (checklist); Monné 1994: 36 (cat.); Noguera and Chemsak 1996: 405 (checklist); Monné 2005: 538 (cat.); Monné and Hovore 2006: 274 (checklist); Monné 2018: 729 (cat.).

This species was originally described based on a single specimen from Veracruz, Mexico (see photograph of the holotype at Bezark 2019a). Breuning (1949) synonymized *Paratucumaniella* with *Cacostola*, and *P. mexicana* with *Cacostola simplex*. Marinoni and Martins (1982), revalidated the species

(translated): “*C. mexicana* Breuning is equally distinct from *C. volvula* by having the light pubescence of the distal half of the elytra forming irregular bands, but distinct, strongly contrasting with the dark pubescence around it.” The authors compared *Paratucumaniella mexicana* with *Cacostola volvula*, because in the same work they revalidated *C. simplex*. Breuning (1959) had synonymized *C. simplex* with *C. volvula* and, accordingly, *P. mexicana* with *C. volvula*, too.

We know that Marinoni and Martins (1982) based this decision on a photograph taken by Jesus Santiago Moure in the 1970s at USNM (Fig. 43). Apparently, the specimen photographed has a “cotypus” label. However, since the species was described based on a single specimen: “Länge 13 mm, Breite 3 mm. Typ von Mexico: Jalapa in Museum von Hamburg” it cannot be a type (although it does appear to be a specimen of *C. mexicana*).

According to Monné (2018) the species remains known only from Mexico.

***Cacostola simplex* (Pascoe, 1859)**

(Fig. 44)

Pachypeza simplex Pascoe 1859: 55; Nearn et al. 2014: 265 (holotype).

Cacostola simplex; Bates 1866: 31; Thomson 1868: 68; Lacordaire 1872: 687; Prudhomme 1906: 36 (distr.); Aurivillius 1923: 352 (cat.); Blackwelder 1946: 605 (checklist); Dillon and Dillon 1946: 262; Breuning 1949: 27 (syn.); Buck 1959: 601 (distr.); Marinoni and Martins 1982: 247 (reval.); Monné and Giesbert 1994: 195 (checklist); Monné 1994: 36 (cat.); 2005: 538 (cat.); Monné and Hovore 2006: 275 (checklist); Monné et al. 2012: 43 (distr.); Morvan and Roguet 2013: 29 (distr.); Monné 2018: 730 (cat.).

Trestonia simplex; Gemminger 1873: 3128 (cat.).

According to Marinoni and Martins (1982) (translated): “The holotype of *C. simplex* has features (especially those referring to pronotal pubescence) that allow identifying it as a distinct species from *volvula* and, accordingly must be revalidated.” We do not see significant differences in the pronotal pubescence of those two species. However, the distance between the upper eye lobes is distinctly greater in *P. volvula* (larger than three times width of one lobe (Fig. 5)) than in *C. simplex* (Fig. 44) (slightly narrower than twice width of one lobe) and the width of the upper eye lobes is wider in *C. simplex* (Fig. 44) than in *C. volvula* (Fig. 5) thus are character differences that do support the revalidation of *C. simplex* by Marinoni and Martins (1982).

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Literature Cited

- Aurivillius, C. 1923.** Coleopterorum Catalogus, pars 74, Cerambycidae: Lamiinae II. W. Junk; Berlin. 382 p. [pagination 323–704]
- Bates, H. W. 1866.** Contributions to an insect fauna of the Amazon Valley. Coleoptera: Longicornes. The Annals and Magazine of Natural History (3)17: 31–42.
- Bezark, L. G. 2019a.** A photographic Catalog of the Cerambycidae of the World. New World Cerambycidae Catalog. Available at <http://bezbycids.com/byciddb/wdefault.asp?w=n> (Last accessed November 2019.)
- Bezark, L. G. 2019b.** Checklist of the Oxypeltidae, Vesperidae, Disteniidae and Cerambycidae (Coleoptera) of the Western Hemisphere. 2019 Edition (updated through 31 December 2018). Available at <https://apps2.cdfa.ca.gov/publicApps/plant/bycidDB/checklists/WestHemiCerambycidae2019.pdf> (Last accessed November 2019.)
- Blackwelder, R. E. 1946.** Checklist of the coleopterous insects of Mexico, Central America, the West Indies and South America. Part 4. Bulletin of the United States National Museum 185: 551–763.

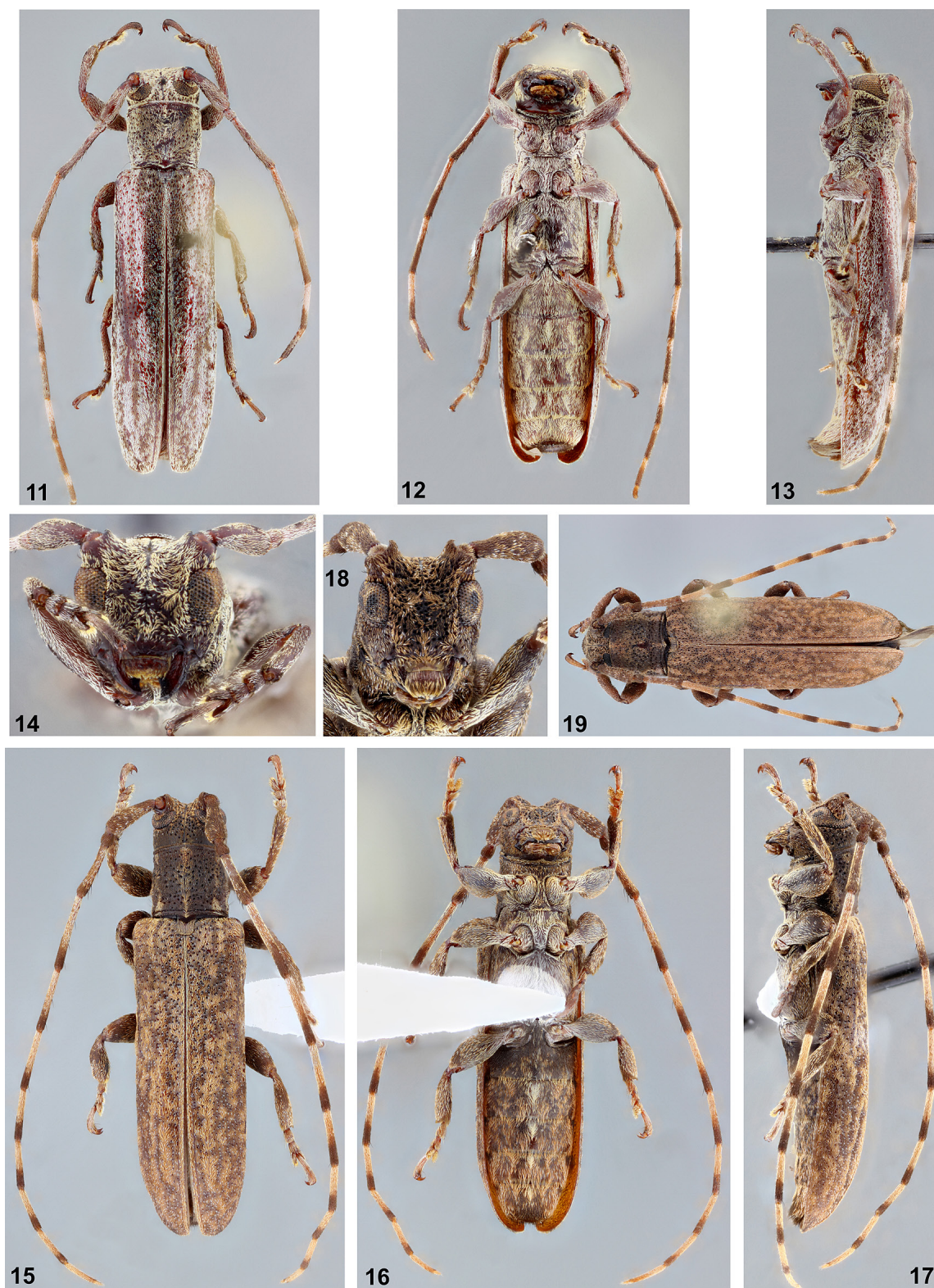
- Breuning, S. 1949.** Notes systématiques sur les lamiaires (Coleoptera, Cerambycidae). Bulletin de l'Institut de Sciences Naturelles de Belgique 25(38): 1–32.
- Breuning, S. 1959.** Nouvelles formes de lamiaires (Onzième partie). Bulletin de l'Institut de Sciences Naturelles de Belgique 35(6): 1–14.
- Breuning, S. 1961.** Catalogue des lamiaires du Monde (Col., Cerambycidae). Museum G. Frey, Tutzing bei München 4: 183–284.
- Buck, P. 1959.** Cerambycidae in der Sammlung des Instituto Anchietano de Pesquisas. Pesquisas 3: 577–609.
- Chemsak, J. A., E. G. Linsley, and F. A. Noguera. 1992.** Listados faunísticos de México. II. Los Cerambycidae y Disteniidae de Norteamérica, Centroamérica y las Indias Occidentales (Coleoptera). Universidad Nacional Autónoma; México, D. F. 204 p.
- Dillon, L. S., and E. S. Dillon. 1945.** The tribe Onciderini (Coleoptera: Cerambycidae). Part I. Scientific Publications of the Reading Public Museum 5: xv + 1–186.
- Dillon, L. S., and E. S. Dillon. 1946.** The tribe Onciderini (Coleoptera: Cerambycidae). Part II. Scientific Publications of the Reading Public Museum 6: 189–413.
- Gemminger, M. 1873.** v. 10. Cerambycidae (Lamiini), Bruchidae. p. 2989–3232. *In*: M. Gemminger and E. Harold. Catalogus coleopterorum hucusque descriptorum synonymicus et systematicus. Gummi; Munich. 3822 p.
- Lacordaire, J. T. 1872.** Histoire naturelle des insectes. Genera des coléoptères, ou exposé méthodique et critique de tous les genres proposés jusqu'ici dans cet ordre d'insectes. 9(2): 411–930.
- Marinoni, R. C., and U. R. Martins. 1982.** Notas e descrições em *Cacostola* Fairm. & Germ., 1859 (Onciderini, Lamiinae, Cerambycidae, Coleoptera). Revista Brasileira de Entomologia 26(3–4): 247–251.
- Monné, M. A. 1994.** Catalogue of the Cerambycidae (Coleoptera) of the Western Hemisphere. Part XV. Subfamily Lamiinae: Tribes Onciderini, Laticraniini and Pteropliini. Sociedade Brasileira de Entomologia; São Paulo. 108 p.
- Monné, M. A. 2005.** Catalogue of the Cerambycidae (Coleoptera) of the Neotropical Region. Part II. Subfamily Lamiinae. Zootaxa 1023: 1–759.
- Monné, M. A. 2018.** Catalogue of the Cerambycidae (Coleoptera) of the Neotropical region. Part II. Subfamily Lamiinae. Available at <http://cerambyxcat.com/> (Last accessed March 2019.)
- Monné, M. A., and E. F. Giesbert. 1994.** Checklist of the Cerambycidae and Disteniidae (Coleoptera) of the Western Hemisphere. Wolfsgarden Books; Burbank. 409 p.
- Monné, M. A., and F. T. Hovore. 2006.** A Checklist of the Cerambycidae, or longhorned wood-boring beetles, of the Western Hemisphere. BioQuip Publications; Rancho Dominguez, CA. 393 p.
- Monné, M. A., E. H. Nearn, S. H. Carbonel Carril, I. P. Swift, and M. L. Monné. 2012.** Preliminary checklist of the Cerambycidae, Disteniidae, and Vesperidae (Coleoptera) of Peru. Insecta Mundi 213: 1–48.
- Morvan, O., and J.-P. Roguet. 2013.** Inventaire des Cerambycidae de Guyane (Coleoptera). Supplément au Bulletin de liaison d'ACOREP France “Le Coléoptériste” 7: 3–44.
- Nearn, E. H., M. V. L. Barclay, and G. L. Tavakilian. 2014.** Onciderini Thomson, 1860 (Coleoptera, Cerambycidae, Lamiinae) types of the Natural History Museum (BMNH). Zootaxa 3857(2): 261–274.
- Noguera, F. A., and J. A. Chemsak. 1996.** Cerambycidae (Coleoptera). p. 381–409. *In*: J. Llorente-Bousquets, A. N. García Aldrete, and E. González-Soriano (eds.). Biodiversidad taxonomía, y biogeografía de artrópodos de México: Hacia una síntesis de su conocimiento. Volumen I. Universidad Nacional Autónoma de México; México, D. F. 660 p.
- Pascoe, F. P. 1859.** On new genera and species of longicorn Coleoptera. Part IV. The Transactions of the Entomological Society of London (2)5: 12–61.
- Prudhomme, F. 1906.** Catalogue des coléoptères de la Guyane Française recueillis par M. Prudhomme de 1870 à 1906. Imprimerie du Gouvernement; Cayenne, French Guiana. 46 p.
- Thomson, J. 1868.** Révision du groupe des oncidérites (Lamites, cérambycides, coléoptères). Physis Recueil d'Histoire Naturelle 2(5): 41–92.

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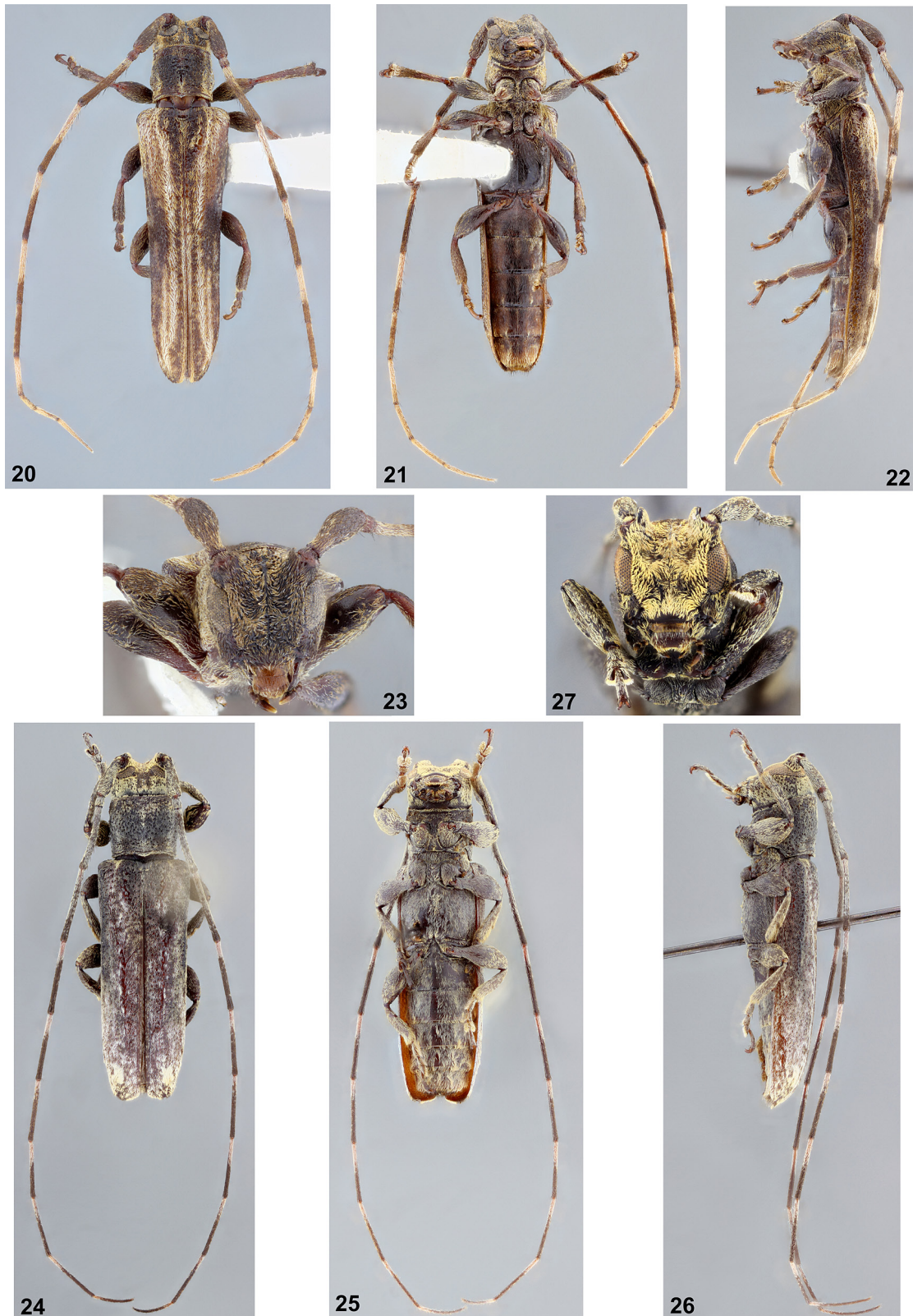
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Figures 1–10. *Cacostola* spp. 1–4) *Cacostola plotkini*, holotype male. 1) Dorsal habitus. 2) Ventral habitus. 3) Lateral habitus. 4) Head, frontal view. 5–7) *C. volvula*, male from Brazil (Espírito Santo). 5) Dorsal habitus. 6) Lateral habitus. 7) Head, frontal view. 8) *C. zanoa*, female from Bolivia, head, frontal view. 9–10) *C. rugicollis*, male from Mexico (Chiapas). 9) Head, frontal view. 10) Dorsal habitus.



Figures 11–19. *Cacostola* spp. 11–14) *Cacostola galenae*, holotype female. 11) Dorsal habitus. 12) Ventral habitus. 13) Lateral habitus. 14) Head, frontal view. 15–19) *Cacostola opitzi*, holotype male. 15) Dorsal habitus. 16) Ventral habitus. 17) Lateral habitus. 18) Head, frontal view. 19) *Cacostola opitzi*, paratype female, dorsal habitus.



Figures 20–27. *Cacostola* spp. 20–23) *Cacostola howdenae*, holotype male. 20) Dorsal habitus. 21) Ventral habitus. 22) Lateral habitus. 23) Head, frontal view. 24–27) *Cacostola thomasorum*, holotype male. 24) Dorsal habitus. 25) Ventral habitus. 26) Lateral habitus. 27) Head, frontal view.



Figures 28–37. *Cacostola* spp. 28–32) *Cacostola nearnsi*, holotype male. 28) Dorsal habitus. 29) Ventral habitus. 30) Lateral habitus. 31) Head, frontal view. 32) Head, dorsal view. 33) *Cacostola nearnsi*, paratype female, dorsal habitus. 34–37) *Cacostola acuticauda*. 34) Head, dorsal view, paratype male. 35) Head, frontal view, paratype male. 36) Head, frontal view, holotype male. 37) Dorsal habitus, holotype male.



Figures 38–44. *Cacostola* spp. **38–41)** *Cacostola rothschildi*, holotype female. **38)** Dorsal habitus. **39)** Ventral habitus. **40)** Lateral habitus. **41)** Head, frontal view. **42)** Dorsal habitus, *Cacostola rothschildi*, paratype female. **43)** *C. mexicana*, dorsal habitus, specimen from USNM. **44)** *Pachypeza simplex*, holotype, dorsal habitus.