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New species of the stingless bee genus *Plebeia* (Hymenoptera: Apidae)

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Abstract. Nine new species of the stingless bee genus *Plebeia* Schwarz (Meliponini: Meliponina) are described and figured, all of the nominate subgenus. The new species are: ***Plebeia* (*Plebeia*) *amydra*** Engel, new species, from Venezuela; ***P.* (*P.*) *deceptrix*** Engel, new species, from Peru; ***P.* (*P.*) *hyperplastica*** Engel, new species, from Venezuela; ***P.* (*P.*) *mutisi*** Engel, new species, from Colombia; ***P.* (*P.*) *plectoforma*** Engel, new species, from Venezuela; ***P.* (*P.*) *roubiki*** Engel, new species, from Ecuador; ***P.* (*P.*) *silveirai*** Engel, new species, from Peru; ***P.* (*P.*) *tigris*** Engel, new species, from Ecuador; ***P.* (*P.*) *vidali*** Engel, new species, from Costa Rica.

INTRODUCTION

The stingless bee genus *Plebeia* Schwarz includes a considerable diversity of small to minute species that are nearly ubiquitous from Mexico to Argentina (Michener, 2007), spanning the entire extent of the range of New World meliponines. The species as currently understood are often challenging to identify, with many taxa looking quite similar, although when males are known the genitalia between these seemingly identical species are actually remarkably divergent. Where known, species tend to be quite docile and to nest in cavities within trees or the ground (Michener, 2007), and in many localities individuals of *Plebeia* can be quite abundant. The honey of various species of *Plebeia* are harvested for both food and medicines (*e.g.*, Geisa & Hilgert, 2019).

Presented here are descriptions of several new species of *Plebeia*, all of the nominate subgenus and most from South America. Some of these are described in order that their names may be available for ecological studies by other researchers.

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MATERIAL AND METHODS

Specimens of the new species are located in the Division of Entomology (Snow Entomological Collection), University of Kansas Natural History Museum, Lawrence, Kansas, USA (SEMC) (M.S. Engel, curator). Morphological terminology used in the description largely follows that of Engel (2001), Michener (2007), Rasmussen *et al*. (2017), and Engel *et al*. (2021). Photographs were made with a Canon EOS-7 digital camera, illuminated by a Xenon flash, and arranged in Adobe Photoshop®. Measurements were taken with an ocular micrometer on an Olympus SZX-9 stereomicroscope. To minimize repetition of character states, the first species is described in full and the remainder are described in reference to that account.

SYSTEMATICS

Genus *Plebeia* Schwarz
Subgenus *Plebeia* Schwarz, *s.str*.

Plebeia* (*Plebeia*) *deceptrix Engel, new species
ZooBank: urn:lsid:zoobank.org:act:EC6C8DC1-691E-436D-A294-2E582FFE751D
(Figs. 1–7)

DIAGNOSIS: The new species is noteworthy for the combination of its comparatively long malar space (0.4–0.6× flagellar diameter), a short and broad clypeus (width 2.7–2.9× length), a yellowish metasoma, and facial and mesosomal maculation as depicted in figures 2–6. It is somewhat similar to *Plebeia roubiki* (*vide infra*), which superficially resembles *P. deceptrix* at least in the yellow metasoma, but in *P. roubiki* the facial and mesosomal patterning is more extensive and yellowish (*cf*. Figs. 12, 13), the shorter malar space, and the narrower clypeus (*vide* metrics under *P. roubiki*, *infra*).

DESCRIPTION: ♀: Total body length approximately 3.42–3.67 mm, forewing length (to base of humeral sclerite) 3.00–3.17 mm. Head wider than long, width 1.43–1.47 mm, length 1.17–1.20 mm; compound eye length 0.92–0.93 mm; upper interorbital distance 0.93–0.97 mm, lower interorbital distance 0.83–0.85 mm. Scape length 0.47–0.50 mm. Malar area 0.4–0.6× flagellar diameter; clypeus broad, width 2.7–2.9× length. Preoccipital ridge rounded. Intertegular distance 0.97–1.03 mm. Hind wing with 5 distal hamuli.

Integument of head and mesosoma black to dark reddish brown; labiomaxillary complex yellow; mandible and labrum yellow except mandibular pale reddish brown apically; clypeus light yellowish brown to orange except sometimes fading to yellow in apicolateral corners and with black in basolateral corners at and above tangent of anterior tentorial pits, and often along apical margin; supraclypeal area light yellowish brown, sometimes with medial spot of brown; scape yellowish brown to orange ventrally except apically brown, dorsal surface dark brown, pedicel light brown, flagellomere I light yellowish brown ventrally, brown dorsally; remainder of flagellum brown to dark brown; lower paraocular area largely yellow to pale yellow, yellow forming a narrow triangle from anterior tentorial pit to anterior mandibular articulation and then tapering upward along inner orbit to about just below compound eye midlength (at upper tangent of glabrous scapal basins bordering upper portion of supraclypeal area and above antennal toruli); remainder of head black except blending to reddish brown on anterior portion of postgena. Pronotum light brown except nearly black

Figures 1–3. Holotype worker of *Plebeia* (*Plebeia*) *deceptrix*, new species. **1.** Lateral habitus. **2.** Dorsal habitus. **3.** Facial view.

along anterior rim and pale yellow posteriorly bordering mesoscutum, with yellow elongate ovoid spot laterally near and slightly above propleuron and yellow spot at anterolateral angles, pronotal lobe yellow; propleura yellow; mesoscutum black with thin stripes of pale yellow along lateral borders; axilla pale yellow; tegula translucent yellow; mesoscutellum dark reddish brown to black with yellow band medioapically, band with anterior medial indentation of brown, and narrow, elongate ovoid spots of yellow to yellowish brown laterally on mesoscutellum in mesoscutal-mesoscutellar transverse furrow; metanotum reddish brown; pleura dark reddish brown to black except yellow to yellowish brown on hypoepimeral area; propodeum reddish brown to black; legs largely yellow to light yellowish brown except blending toward light brown apically on ventral surfaces of femora and dorsally at apex near tibial joints, blending to brown or dark brown apically on tibiae, mesobasitarsus brown, metatibia with brown margins, and metabasitarsus with areas of brown to light brown; wing membranes hyaline and faintly infumate, veins brown to light brown; metasoma yellow.

Integument generally smooth and shining between minute, widely spaced punctures except as noted. Clypeus with coarser, shallow, faint, setiferous punctures separated by less than a puncture width; supraclypeal area sculptured as on clypeus; lower and upper face with minute, punctures separated by a puncture width or frequently less, integument between punctures smooth and shining, such punctures become gradually sparser near ocelli and ocellocular space, eventually becoming smaller and separated by 2–3× a puncture width in ocellocular space, although small impunctate strip bordering lateral ocellus; vertex with punctures larger, shallower, more irregular, and separated by a puncture width or often less, gena as on upper face; postgena smooth to faintly imbricate. Mesoscutum smooth, shining, with minute, setiferous punctures separated by 1–2.5× a puncture width, punctures somewhat more spaced along posterior border; punctures of mesoscutellum slightly larger and sparser, separated by 2–5× a puncture width, sparser posteriorly than anteriorly, integument otherwise smooth and shining between punctures; mesepisternum smooth, shining, with minute, setiferous punctures separated by 2–7× a puncture width, those anteriorly closer than those posteriorly, particularly sparse on hypoepimeral area and sparser ventrally; metepisternum smooth with somewhat shallower and coarser setiferous punctures, punctures separated by less than a puncture width; basal area of propodeum faintly microreticulate-imbricate, shining, glabrous; lateral surface of propodeum with shallower setiferous punctures; posterior surface of propodeum smooth and nearly glabrous. Metasoma impunctate and shining, tergum I smooth, remaining terga and sterna faintly and finely imbricate.

Pubescence generally white to yellowish; clypeus with abundant, short, subdecumbent, minutely feathery setae, such setae present across supraclypeal area and entire face although becoming suberect on uppermost face; scape with minute, appressed, simple setae, intermixed with short, sparse, erect simple setae ventrally, such erect setae shorter than diameter of scape; vertex with feathery setae becoming sparse, replaced by scattered erect, simple setae and some appressed to subdecumbent largely simple setae; gena with setae similar to those of face; postgena with sparsely scattered, moderately long, erect, simple setae. Mesoscutum with abundant, fine, subdecumbent to suberect, laterally directed (directed away from midline), simple setae, such setae with a few minute branches posteriorly, along lateral and anterior borders such setae shorter, more erect, and minutely branched, anteriorly numerous elongate, erect setae with minute branches along rachis; mesoscutellum with scattered, fine, suberect to erect, short, simple setae, posteriorly with abundant elongate, erect setae and bristles with minute branches along one side of rachis; mesepisternum with short, decumbent to suberect, plumose setae, such setae dense anteriorly and becoming sparser ventrally and posteriorly, intermixed with short, erect, largely simple setae, such setae sparse anteriorly and more noticeably posteriorly, becoming more numerous and longer ventrally; hypoepimeral area with plumose setae numerous on upper three quarters; metepisternum with dense, short, decumbent, plumose setae, largely obscuring integument; basal area of propodeum glabrous, posterior surface largely glabrous except sparse, erect, simple setae, lateral surface as on metepisternum except intermixed with sparse, elongate, erect, simple setae/bristles. Setae and bristles of legs largely simple and yellow except tawny in places (*e.g.*, retrolateral surface of metabasitarsus); metatibial fringe setae elongate, simple except setae at superior distal angle minutely branched; penicillum, inferior parapenicillum, and rastellum more amber golden to fuscous. Setae of metasomal terga rather sparse, discs of terga I–II nearly glabrous, with minute, decumbent, simple setae laterally; remaining terga with sparse, short,

Figures 4–7. Workers of *Plebeia* (*Plebeia*) *deceptrix*, new species. **4–6.** Variations in mesosomal maculation. **7.** Prolateral surfaces of metatibia and metatarsus.

erect to suberect, simple setae, such setae progressively longer on terga III–VI; sternal discs with long, erect, simple setae, otherwise with sparse, simple, short, subappressed setae.

♀: *Latet*.

♂: *Latet*.

Holotype: ♀, Peru: Dept. Loreto, 1.5 km N Teniente Lopez, 2°35.66'S, 76°06.92'W, 18 July 1993, 210–240 m, Richard Leschen, ex: flight intercept trap (SEMC).

Paratypes (6♀♀): 5♀♀, Peru: Dept. Loreto, 1.5 km N Teniente Lopez, 2°35.66'S, 76°06.92'W, 18 July 1993, 210–240 m, Richard Leschen, ex: flight intercept trap (SEMC); 1♀, Peru: Dept. Loreto, Campamento San Jacinto, 2°18.75'S, 75°61.77'W, 11 July 1993,

175–215 m, Richard Leschen, ex: flight intercept trap (SEMC).

NON-TYPE MATERIAL: 1♀, Brasil: Rondonia, 62 km S Ariquemes, Faz. Rancho Grande, nr. Cacaolandia, 10°32′0′′S, 62°48′0′′W, 29 Dec 1995, D. Kistner, ex: flight intercept trap (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 22-II–4-III 1994 [22 February–4 March 1994], Hibbs, ex: malaise (SEMC); 2♀♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 13–23-III 1994 [13–23 March 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 14–24-III 1994 [14–24 March 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 3–13-IV 1994 [3–13 April 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 3-IV–4-V 1994 [3 April–4 May 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 31-X–10-XI 1994 [31 October–10 November 1994], Hibbs, ex: malaise (SEMC).

ETYMOLOGY: The specific epithet is the Latin adjective *dēceptrīx*, meaning, "one who deceives", and refers to the cryptic nature of the species.

Plebeia* (*Plebeia*) *tigris Engel, new species

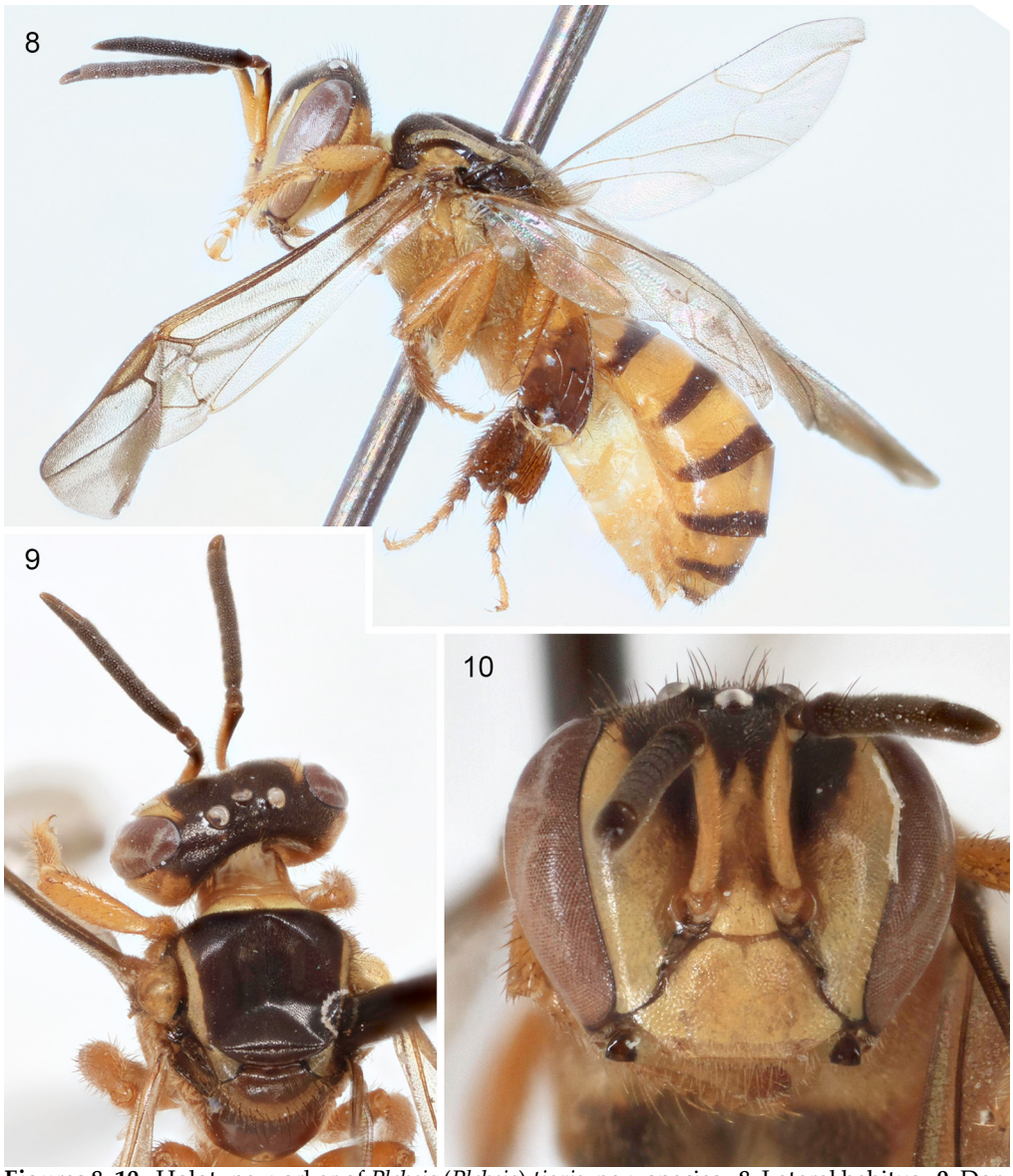
ZooBank: urn:lsid:zoobank.org:act:92862347-7A56-4FE9-B78D-F4885D6FF1EC

(Figs. 8–10)

DIAGNOSIS: This species is immediately recognizable for the distinctively striped metasoma (Fig. 8), as well as its larger body size. In addition, unlike other yellowish species of the region, the face is largely yellow (Fig. 10), the malar space is virtually linear, and the mesosomal coloration is more yellow (rather than whitish), with the yellow marginal maculation of the mesoscutellum extending the entire length of the mesoscutellum to the axillae (Fig. 9).

DESCRIPTION: As described for *P. deceptrix* (*vide supra*), with the following modifications: ♀: Total body length approximately 5.58–5.67 mm, forewing length (to base of humeral sclerite) 5.00–5.17 mm. Head wider than long, width 1.80–1.83 mm, length 1.53–1.57 mm; compound eye length 1.30 mm; upper interorbital distance 1.03–1.07 mm, lower interorbital distance 0.97–1.01 mm. Scape length 0.70–0.73 mm. Malar area linear; clypeus width 2.0× length. Preoccipital ridge rounded. Intertegular distance 1.23–1.27 mm. Hind wing with 5 distal hamuli.

Integument of head largely yellow except vertex, ocellocular and ocellar areas, upper posterior of head, uppermost margin of gena, and upper face in two inverted triangular areas extending from lateral ocelli down to near upper antennal margins of antennal toruli dark brown; labiomaxillary complex yellow; mandible and labrum yellow except mandibular pale reddish brown apically; clypeus yellow, with epistomal sulcus black; supraclypeal area yellow; scape yellow except small area of dark brown apicodorsally, pedicel brown, flagellomere dark brown. Pronotum yellow, paler on dorsal collar; propleuron yellow; mesoscutum dark brown to black with thin stripes of yellow to pale yellow along lateral borders; axilla yellow, sometimes a bit dusky yellow; tegula translucent yellow; mesoscutellum reddish brown with yellow along entire posterior border; metanotum reddish brown; pleura yellow, sometimes dusky yellow with dark brown spot ventrally; propodeum yellow except reddish brown to light brown on basal area; legs yellow except light brown on prolateral surface of mesobasitarsus, and brown to dark brown on much of prolateral surface of metatibia and entire prolateral surface of metabasitarsus; wing membranes hyaline and faintly infumate, veins light brown to brown; metasoma yellow with dark brown in broad apical margins of all terga; sterna pale yellow.



Figures 8–10. Holotype worker of *Plebeia* (*Plebeia*) *tigris*, new species. **8.** Lateral habitus. **9.** Dorsal habitus. **10.** Facial view.

Clypeus with small punctures separated by less than a puncture width, such punctures a bit more irregular laterally; supraclypeal area sculptured as on clypeus; face below tangent of antennal toruli with minute punctures widely spaced, becoming denser by level of antennal toruli, upper face with minute punctures separated by a puncture width or less, integument between punctures smooth and shining, such punctures similar in ocellocular area, on vertex, and on gena; postgena smooth to faintly imbricate and largely impunctate. Mesoscutum smooth, shining, with minute punctures separated by 0.5–2× a puncture width on disc, punctures coarser, shallower, and contiguous anteriorly, somewhat more spaced along posterior border; punctures of mesoscutellum slightly larger and sparser, separated by 1–3.5× a puncture width,

sparser anteriorly and along posteriormost border, integument otherwise smooth and shining between punctures; mesepisternum smooth, shining, with minute punctures separated by 1–2× a puncture width anteriorly, becoming sparser posteriorly and ventrally, until separated by up to 6× a puncture width posteriorly, hypoepimeral area with punctures minute and quite sparse; metepisternum punctured as on anterior of mesepisternum; basal area of propodeum faintly microreticulate-imbricate, shining, glabrous; lateral surface of propodeum with shallower punctures; posterior surface of propodeum smooth and nearly glabrous. Metasoma impunctate and shining, tergum I smooth, remaining terga largely smooth although blending to faintly imbricate in apical marginal zones; sterna faintly and finely imbricate.

Pubescence generally white to yellowish; clypeus with scattered, minute, subdecumbent to suberect simple setae, such setae on supraclypeal area albeit more erect and tinged fuscous; scape with minute, appressed, simple setae, intermixed with scattered, short, erect simple setae, such erect setae shorter than diameter of scape; face with minute, subdecumbent, simple setae becoming more numerous on uppermost frons, becoming intermixed on vertex with erect, short to long, fuscous bristles; gena with setae as on face; postgena with sparsely scattered, moderately long, erect, simple setae. Mesoscutum with numerous, fine, decumbent, posteriorly directed, simple setae, anteriorly numerous short to elongate, erect setae, some with minute branches; mesoscutellum with scattered, fine, decumbent setae as on mesoscutum except slightly longer posteriorly, such setae intermixed with longer, erect, simple setae, posteriorly with abundant elongate, erect, fuscous bristles; mesepisternum with short, decumbent to suberect, plumose setae, such setae denser anteriorly and becoming sparser ventrally and posteriorly, intermixed with short, erect, largely simple setae; hypoepimeral area with such setae typically sparser; metepisternum with abundant, short, decumbent, plumose setae; basal area of propodeum glabrous, posterior surface largely glabrous, lateral surface as on metepisternum except intermixed with sparse, elongate, erect, simple bristles. Setae and bristles of legs largely simple and yellow except tawny to fuscous on retrolateral surfaces of mesobasitarsus and fuscous on metabasitarsus; metatibial fringe setae elongate and corbicular bristles fuscous, simple except setae at superior distal angle minutely branched; penicillum, inferior parapenicillum, and rastellum fuscous. Setae of metasomal terga rather sparse, tergum I and discs of terga II–IV largely glabrous, apical marginal zones of terga II–IV with minute, short, subdecumbent, simple setae; such setae longer, more numerous, and extending onto discs of remaining terga, such setae also progressively more fuscous on more apical terga; sternal discs with short, erect, simple setae, otherwise with scattered, minute to short, simple, subappressed to suberect setae.

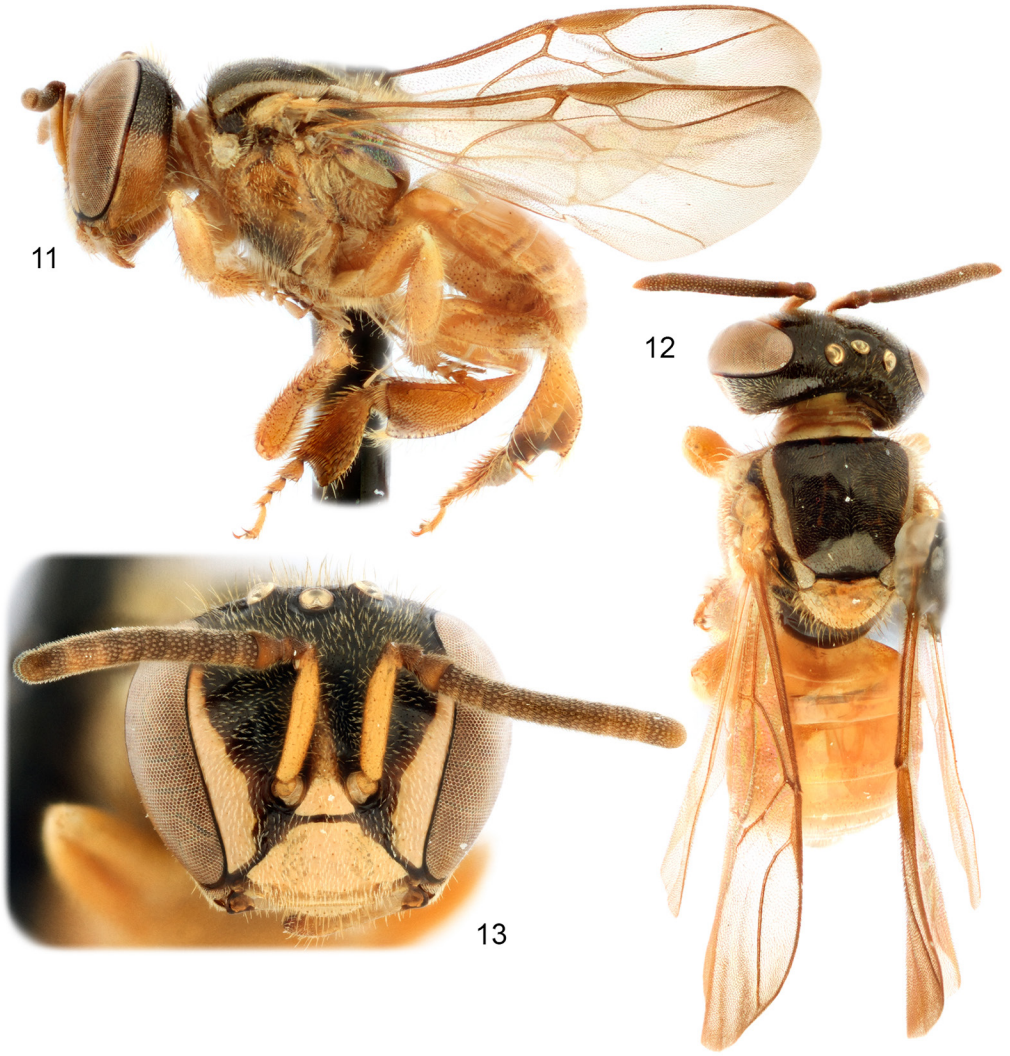
♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Ecuador: Napo Prov., Km 11.1 Sarayacu-Loreto rd., 20 VII 1994, 1200 m, Génier, ex: feces trap (SEMC).

PARATYPES (2♀♀): 1♀, Ecuador: Napo Prov., Km 11.1 Sarayacu-Loreto rd., 20 VII 1994, 1200 m, Génier, ex: feces trap (SEMC); 1♀, Ecuador: Napo, 1200 m, Km 7.3 Sarayacu-Loreto rd., 20 July 1994, F. Génier, ex: feces trap (SEMC).

ETYMOLOGY: The specific epithet is taken from the Ancient Greek noun *tígris* (τίγρις, meaning, "tiger"), and refers to the striped metasoma, which superficially brings to mind the stripes of *Panthera tigris* (L.).



Figures 11–13. Holotype worker of *Plebeia* (*Plebeia*) *roubiki*, new species. **11.** Lateral habitus. **12.** Dorsal habitus. **13.** Facial view.

Plebeia* (*Plebeia*) *roubiki Engel, new species
ZooBank: urn:lsid:zoobank.org:act:BA4341FF-51AE-47C0-8F12-DF82CACB046A
(Figs. 11–15)

Diagnosis: This species is superficially similar to *P. deceptrix* (*vide supra*) but differs by the more extensive facial and mesosomal maculation (Figs. 12, 13), the shorter malar space (at most 0.25× flagellar diameter), and the narrower clypeus (width 1.7–1.8× length).

Description: As described for *P. deceptrix* (*vide supra*), with the following modifications: ♀: Total body length approximately 3.83–4.67 mm, forewing length (to base of humeral sclerite) 3.50–4.08 mm. Head wider than long, width 1.53–1.67 mm, length 1.20–1.40 mm; compound eye length 1.03–1.17 mm; upper interorbital distance 0.90–

0.97 mm, lower interorbital distance 0.77–0.87 mm. Scape length 0.53–0.57 mm. Malar area 0.25× flagellar diameter; clypeus broad, width 1.7–1.8× length. Preoccipital ridge carinate. Intertegular distance 0.93–1.03 mm. Hind wing with 5 distal hamuli.

Integument of head and mesosoma largely black to dark reddish brown; clypeus light yellow to yellow except sometimes with basolateral areas of light brown to brown bordering anterior tentorial pits and often light brown along apical margin; supraclypeal area light yellow to yellow; scape yellow to yellowish brown, sometimes with some brown on dorsal apical surface, pedicel brown, flagellomere I brown, sometimes a bit lighter ventrally, remainder of flagellum brown to dark brown; lower paraocular area largely light yellow to yellow except black to reddish brown bordering antennal toruli ventrally to anterior tentorial pit, yellow then tapering in width upward to a point slightly above upper tangent of concavity in ocular border, remainder of face black; vertex and upper gena black, lower half of gena and postgena yellowish brown to orange. Pronotum light yellowish brown to orange and pale yellow on pronotal lobe; propleura yellow; mesoscutum black with stripes of pale yellow along lateral borders; mesoscutellum yellowish brown to orange with pale yellow along apical margin, sometimes narrower or even faintly interrupted medioapically; metanotum black; pleura yellowish brown to orange except blending to brown to dark brown (nearly black in some individuals) ventrally; propodeum yellowish brown to orange laterally and posteriorly, basal area brown to light brown; legs largely yellow except blending toward light brown apically on metatibia and much of prolateral surface of metabasitarsus; wing membranes hyaline and faintly infumate, particularly apically, veins brown to light brown; metasoma yellow to orange.

Lower and upper face with minute punctures separated by 2–5× puncture width, integument between punctures smooth and shining; vertex with punctures somewhat larger, more irregular, and separated by about a puncture width, gena as on upper face except punctures slightly denser. Mesoscutum smooth, shining, with minute setiferous punctures separated by 1–3× a puncture width, punctures somewhat more spaced along anterior and posterior borders; punctures of mesoscutellum larger, shallower, and sparse, integument otherwise smooth and shining. Metasoma impunctate and shining, tergum I smooth, remaining terga smooth except faintly imbricate in apical marginal zones; sterna largely faintly and finely imbricate.

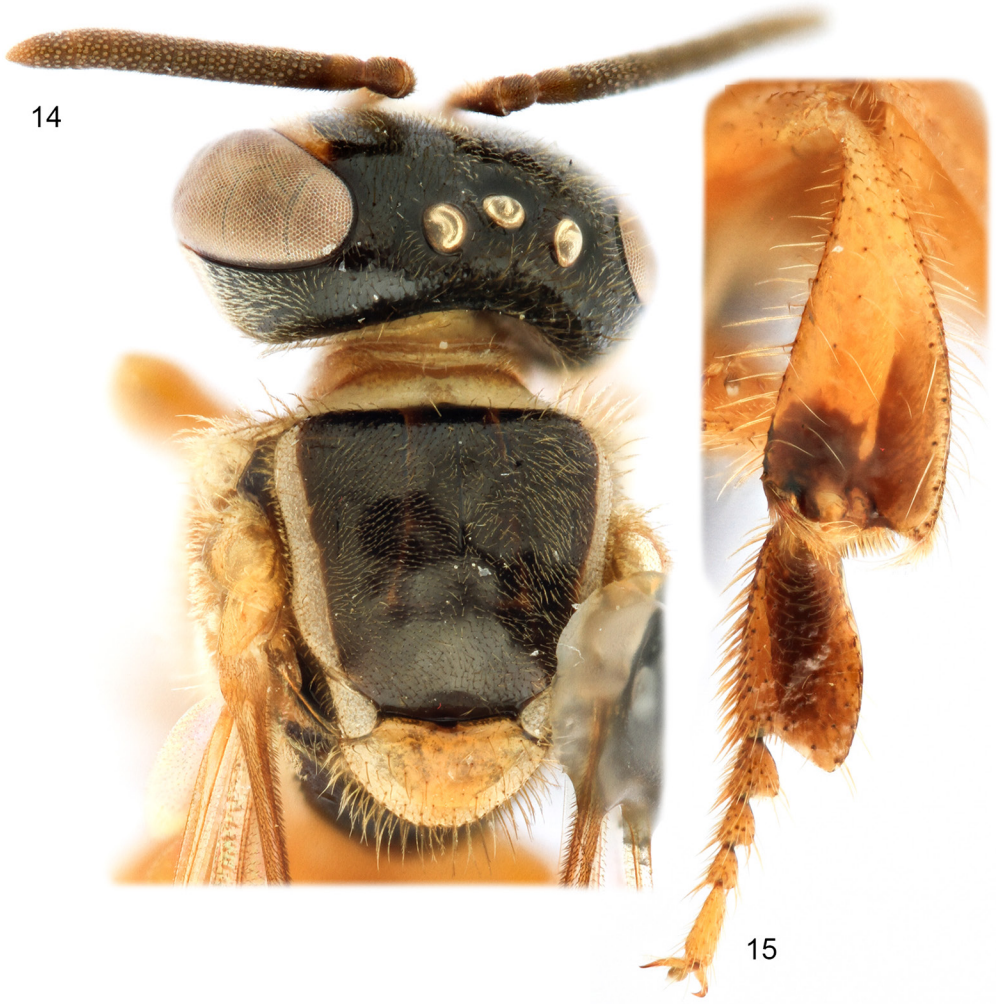
Setae and bristles of legs largely simple and yellow except tawny on retrolateral surface of metabasitarsus; penicillum, inferior parapenicillum, and rastellum yellow. Setae of metasomal terga rather sparse, tergum I glabrous, remaining terga largely glabrous with suberect, simple setae scattered on apical marginal zones, such setae more numerous on more distal terga.

♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 3-IV–4-V 1994 [3 April–4 May 1994], Hibbs, ex: malaise (SEMC).

PARATYPES (18♀♀): 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 4–14-III 1994 [3–14 March 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 14–24-III 1994 [14–24 March 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 24-III–3-VI 1994 [24 March–3 April 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 3-IV–4-V 1994 [3 April–4 May 1994], Hibbs, ex: malaise (SEMC); 2♀♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 13–23-VI 1994 [13–23 June 1994], Hibbs, ex: malaise (SEMC); 4♀♀, Ecuador: Sucumbios, Sacha



Figures 14–15. Worker of *Plebeia* (*Plebeia*) *roubiki*, new species. **14.** Detail of head and mesosomal dorsum. **15.** Prolateral surfaces of metatibia and metatarsus.

Lodge, 0.5°S, 76.5°W, 270 m, 23-IV–3-VII 1994 [23 June–3 July 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 25VII–3VIII 1994 [25 July–3 August 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 3–16-VIII 1994 [3–16 August 1994], Hibbs, ex: malaise (SEMC); 2♀♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 27VIII–10XI 1994 [27 August–10 November 1994], Hibbs, ex: malaise (SEMC); 2♀♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 10–21-X 1994 [10–21 October 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Sucumbios, Sacha Lodge, 0.5°S, 76.5°W, 270 m, 1–31-XII 1994 [1–31 December 1994], Hibbs, ex: malaise (SEMC); 1♀, Ecuador: Napo Prov., Puerto Misahualli, 350 m, II-1983, Sharkey (SEMC).

Non-type material: 2♀♀, Brasil: Rio Trairão, PA, 50 km NE Gradaús, SB-22, 51°49′W, 7°21′S, 21, 24-vii-79 [21, 24 July 1979], Mazucato (SEMC).

Etymology: The specific epithet honors David W. Roubik, in recognition of his extensive work on bee ecology, conservation, and evolution, particularly that of Meliponini.

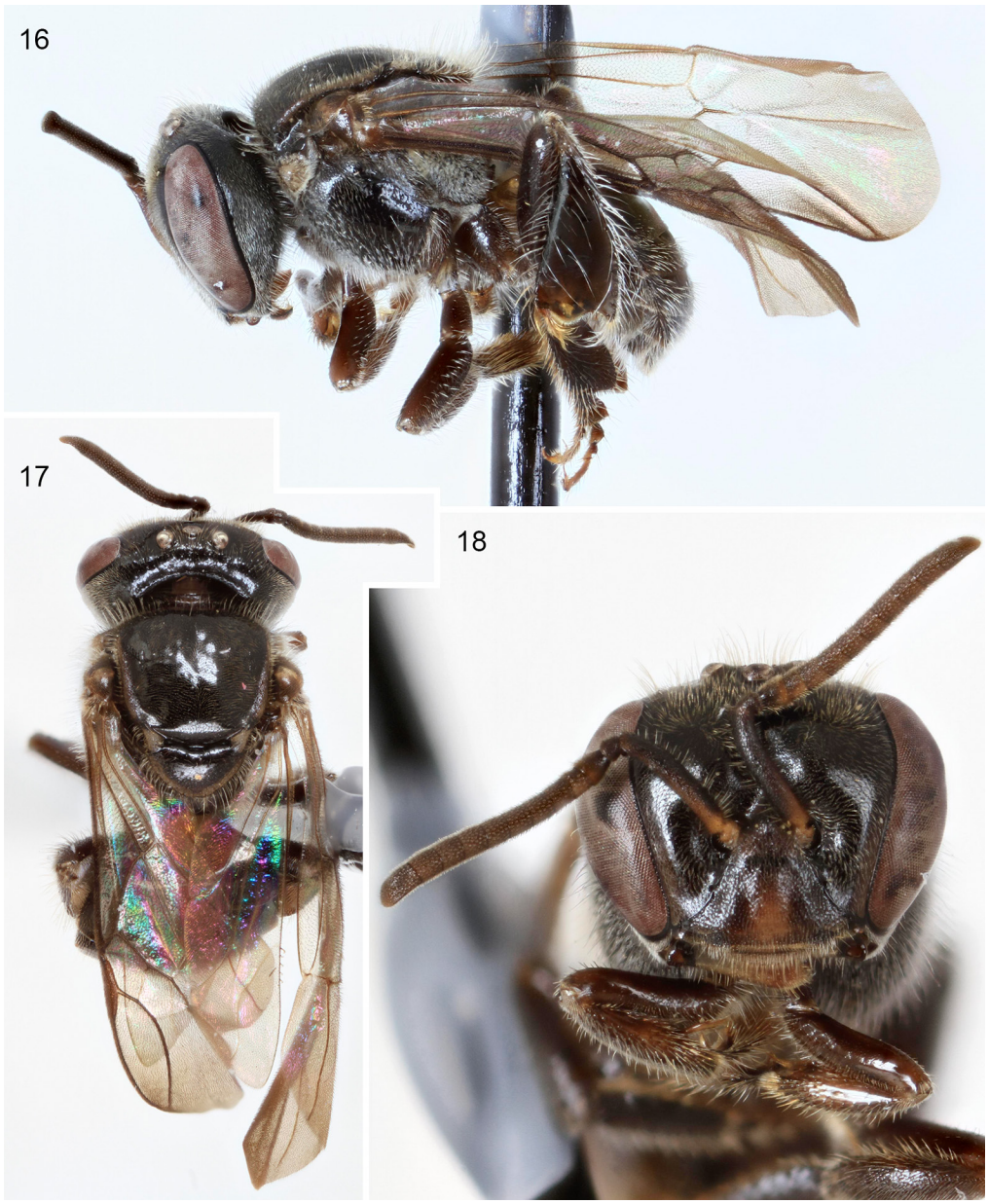
Plebeia* (*Plebeia*) *amydra Engel, new species
ZooBank: urn:lsid:zoobank.org:act:7CB352E1-5CAC-49C4-BCB2-884A2CA51433
(Figs. 16–26)

DIAGNOSIS: This species is superficially similar to other dark *Plebeia*, such as *P. melanica* Ayala and *P. fulvopilosa* Ayala, but can be distinguished by the combination of noticeably lighter brown on the venter of the scape and mesally on the clypeus (Fig. 18), along with pale brown to pale yellow markings on the mesoscutum, axillae, and apical margin of the mesoscutellum (Fig. 17). In the former species these markings are either absent or are bright yellow, and the facial patterns are completely different. The male terminalia, although showing some similarity to that of *P. frontalis* (Friese), are quite distinctive, particularly the sterna (Figs. 22–26).

DESCRIPTION: As described for *P. deceptrix* (*vide supra*), with the following modifications: ♀: Total body length approximately 4.25–5.00 mm, forewing length (to base of humeral sclerite) 4.42–4.67 mm. Head wider than long, width 1.83–1.90 mm, length 1.50–1.57 mm; compound eye length 1.23–1.26 mm; upper interorbital distance 1.13–1.20 mm, lower interorbital distance 0.97–1.07 mm. Scape length 0.63–0.67 mm. Malar area 0.3× flagellar diameter; clypeus width 2× length. Preoccipital ridge carinate. Intertegular distance 1.27–1.33 mm. Hind wing with 5–6 distal hamuli.

Integument of head and mesosoma dark brown to black; labiomaxillary complex dark brown to yellow; mandible and labrum yellow except mandible pale reddish brown apically; clypeus dark brown with mesal spot of yellowish brown to pale brown; supraclypeal area brown; scape dark brown, sometimes with yellow brown on proximal half ventrally, pedicel and flagellum brown to dark brown, typically slightly lighter ventrally; paraocular borders faintly pale brown, extending to point one antennal torular diameter below concavity in ocular margin. Mesosoma dark brown to black except as noted: pronotal lobe yellow to yellow brown; mesoscutum with exceptionally thin stripes of pale yellow to pale brown along lateral borders; axilla pale yellow to pale brown; tegula translucent brown to light brown; mesoscutellum with pale yellow to pale brown apical margin; legs largely brown to dark brown; wing membranes hyaline and faintly infumate, veins brown to dark brown; metasoma dark brown except lighter on proximal terga and sterna.

Clypeus with coarse, shallow, contiguous to nearly contiguous punctures; supraclypeal area sculptured as on clypeus; lower and upper face with minute punctures separated by 1–2.5× a puncture width below, blending to 2–3.5× a puncture width above, integument between punctures smooth and shining; vertex and posterior of head with punctures similar to those of clypeus; gena as on upper face; postgena smooth to faintly imbricate. Mesoscutum smooth, shining, with minute punctures separated by 1–2.5× a puncture width, punctures more spaced posteriorly and denser anteriorly; punctures of mesoscutellum similar but sparser and somewhat coarser, integument otherwise smooth and shining between punctures; mesepisternum smooth, shining, with minute punctures, punctures coarser anteriorly and separated by a puncture width or less, blending posteriorly and ventrally to smaller punctures separated by 4–6× a puncture width, punctures on hypoepimeral area as on anterior portion of mesepisternum; metepisternum smooth with minute punctures separated by a puncture width above, sparser ventrally; basal area of propodeum faintly microreticulate-imbricate, shining, glabrous; lateral surface of propodeum with punctures as on metepisternum, posterior surface of propodeum smooth and nearly glabrous.



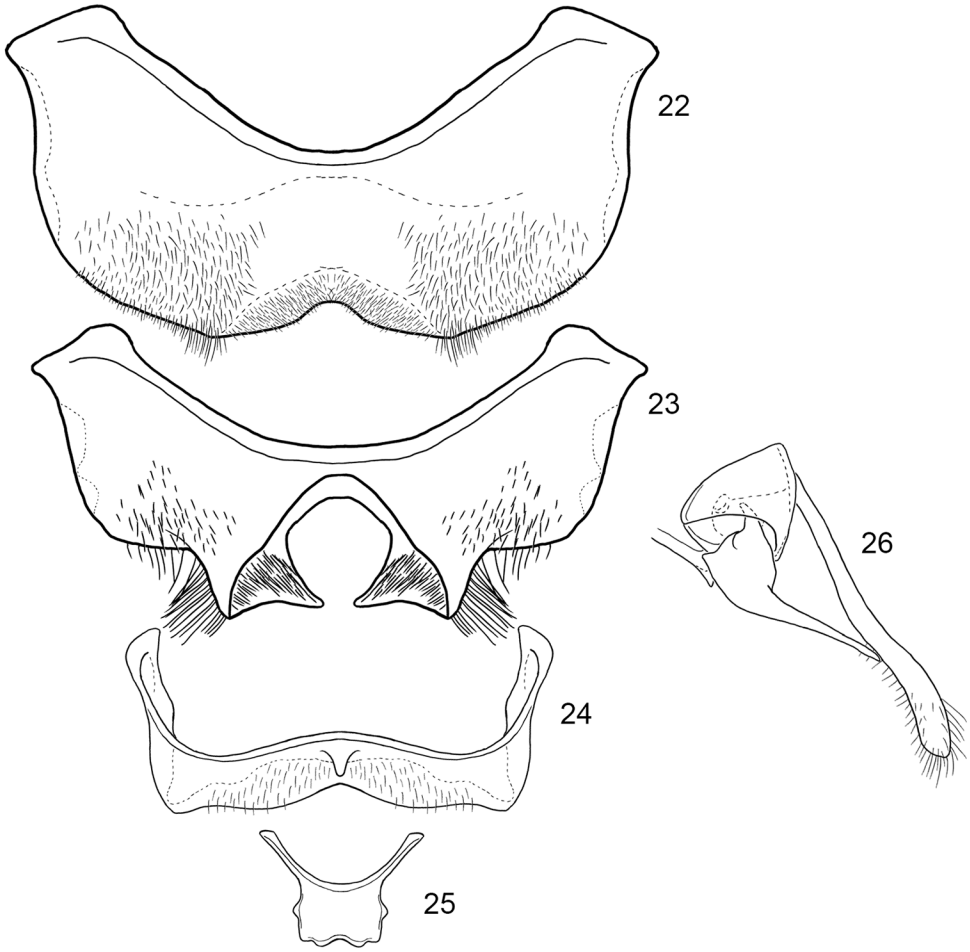
Figures 16–18. Worker of *Plebeia* (*Plebeia*) *amydra*, new species. **16.** Lateral habitus. **17.** Dorsal habitus. **18.** Facial view.

Metasoma impunctate and shining, tergum I smooth, remaining terga smooth on discs and blending to faintly and finely imbricate integument in broad marginal zones, terga III onward with scattered shallow punctures also in marginal zones and apicalmost portion of discs bordering marginal zones; sterna faintly and finely imbricate.

Pubescence generally white to translucent, sometimes slightly tinged pale yellowish; clypeus with abundant, minute, subdecumbent, simple to minutely feathery setae, such setae present across supraclypeal area and lower face although slightly longer,

Figures 19–21. Drone of *Plebeia* (*Plebeia*) *amydra*, new species. **19.** Lateral habitus. **20.** Dorsal view of head and mesosoma. **21.** Facial view.

such setae present on remainder of face although slightly sparser than on clypeus, intermixed with short to long, erect simple, bristles on vertex; scape with minute, appressed, simple setae intermixed with erect, simple bristles typically about as long as diameter of scape; gena with setae similar to those of face; postgena with sparsely scattered, long, erect, simple setae. Mesoscutum with abundant, fine, subdecumbent to suberect, laterally directed, simple setae, such setae with a few minute branches and more erect along borders, anteriorly numerous elongate, erect bristles, typically with



Figures 22–26. Male terminalia of *Plebeia* (*Plebeia*) *amydra*, new species. **22.** Metasomal sternum V. **23.** Sternum VI. **24.** Sternum VII. **25.** Sternum VIII. **26.** Genital capsule, ventral view.

minute branches; mesoscutellum with scattered, fine, suberect to erect, short, simple setae, posteriorly with abundant elongate, erect bristles with minute branches; mesepisternum with short, decumbent to suberect, plumose setae, such setae dense anteriorly and becoming sparser ventrally and posteriorly, intermixed with short to long, suberect to erect, largely simple bristles, such bristles longer ventrally and along anterior margin; hypoepimeral area with plumose setae numerous on upper three quarters; metepisternum with dense, short, decumbent, plumose setae; basal area of propodeum glabrous, posterior surface largely glabrous except sparse, erect, simple setae, lateral surface as on metepisternum except intermixed with elongate, erect, simple bristles. Setae and bristles of legs largely simple and white except tawny on retrolateral surfaces of meso- and metatarsi and on penicillum, inferior parapenicillum, and rastellum. Metasomal tergum I largely glabrous; discs of terga II–V nearly glabrous, with minute, decumbent to suberect, simple setae laterally and apically, such setae progressively longer and more numerous on terga II–VI; sternal discs with some long, erect, simple setae, otherwise with scattered, simple, short, subappressed setae.

♂: As described for worker except for typical caste and gender differences and as follows: Total body length approximately 5.3 mm, forewing length (to base of humeral sclerite) 4.5 mm. Head wider than long, width 1.87 mm, length 1.50 mm; compound eye length 1.23 mm; upper interorbital distance 1.10 mm, lower interorbital distance 0.77 mm. Scape length 0.53 mm. Clypeus width 1.4× length. Malar area linear. Terminalia in figures 22–26.

Clypeus pale yellow except sometimes with brownish patches near anterior tentorial pits; supraclypeal area pale yellow; face below tangent of antennal toruli pale yellow in lateral half, yellow paraocular area tapering above to bottom of concavity in ocular margin; scape largely yellow ventrally, otherwise dark brown to black dorsally; pedicel and flagellum dark brown, lighter ventrally on pedicel and flagellomere I. Legs brown to dark brown except protibia, protarsus, apex of profemur, anterior of mesotibia, and mesotarsus pale yellow to yellow brown.

Setation generally as described for worker except more numerous, prominent, and slightly longer on face, mesoscutum, and pleura.

♀: *Latet*.

HOLOTYPE: ♀, Venezuela: Aragua, Rancho Grande Biol. Stn., Portochuelo Pass, 10°21′0′′N, 67°41′0′′W, 1100 m, 4 June 1998, J. Ashe, R. Brooks, R. Hanley, ex: insects moving thru pass against wind-migration (SEMC).

PARATYPES (18♀♀, 2♂♂): 18♀♀, 2♂♂, Venezuela: Aragua, Rancho Grande Biol. Stn., Portochuelo Pass, 10°21′0′′N, 67°41′0′′W, 1100 m, 4 June 1998, J. Ashe, R. Brooks, R. Hanley, ex: insects moving thru pass against wind-migration (SEMC).

ETYMOLOGY: The specific epithet is taken from the Ancient Greek adjective *amudrós* (*ἀμῦδρός*, meaning, "indistinct", "dim", or "vague"), and refers to the poorly developed maculation.

Plebeia* (*Plebeia*) *hyperplastica Engel, new species

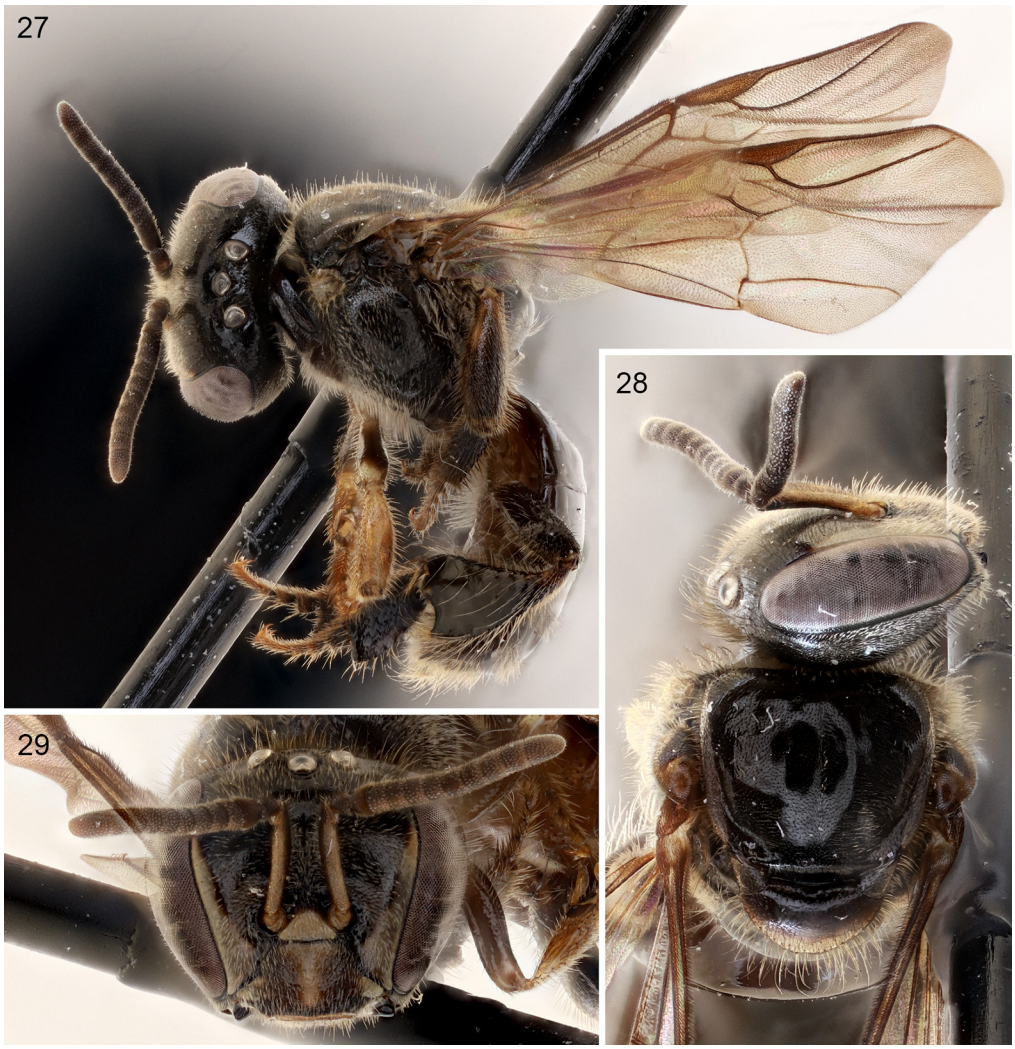
ZooBank: urn:lsid:zoobank.org:act:A23B37A5-2A1C-4E93-9F53-6087D08E4218

(Figs. 27–38)

DIAGNOSIS: While this species is quite similar to *P. amydra* from the same region, the male terminalia is wholly unique (Figs. 33–38) and cannot be confused for any other *Plebeia* with which I am familiar. In addition, *P. hyperplastica* has well-developed facial maculation (Fig. 29), although the markings of the mesosomal dorsum are rather pale (Fig. 28), as in *P. amydra*. *Plebeia hyperplastica* is a bit smaller than *P. amydra*, although their size ranges do partially overlap and as more populations are sampled, this distinction may become even less pronounced.

DESCRIPTION: As described for *P. amydra* (*vide supra*), with the following modifications: ♀: Total body length approximately 4.00–4.30 mm, forewing length (to base of humeral sclerite) 3.58–3.83 mm. Head wider than long, width 1.73–1.80 mm, length 1.43–1.50 mm; compound eye length 1.17–1.23 mm; upper interorbital distance 1.10 mm, lower interorbital distance 0.90–0.93 mm. Scape length 0.60–0.62 mm. Malar area 0.2–0.3× flagellar diameter; clypeus width 1.9× length. Preoccipital ridge carinate. Intertegular distance 1.23–1.27 mm. Hind wing with 5 distal hamuli.

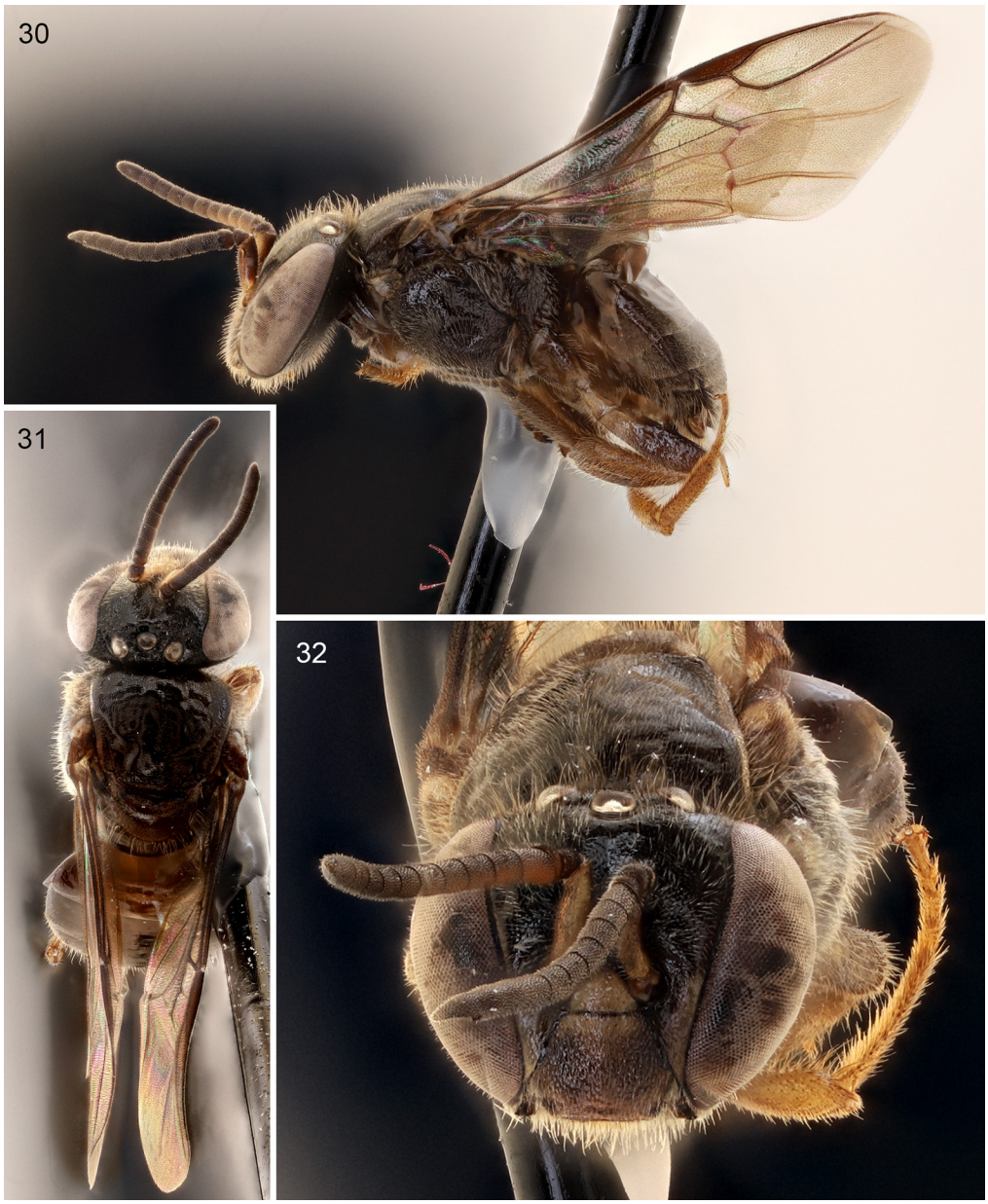
Clypeus dark brown with mesal line of pale yellow, apicolateral corners pale yellow; supraclypeal area yellow; scape largely pale yellow below and dark brown above, pedicel and flagellum brown to dark brown; lower face with yellow occupying majority of surface except area bordering antennal torulus by distance slightly less than



Figures 27–29. Worker of *Plebeia* (*Plebeia*) *hyperplastica*, new species. **27.** Lateral habitus. **28.** Dorsal view of head and mesosoma. **29.** Facial view.

torular diameter, yellow then tapering upward with paraocular borders yellow and extending to concavity in ocular margin. Mesosoma dark brown to black except as noted: pronotal collar and lobe pale yellow; mesoscutum with thin stripes of pale yellow to nearly white along lateral borders; axilla pale yellow to nearly white; mesoscutellum black but blending apically to pale yellow to nearly white on medial apical margin; legs largely brown to dark brown except fore and midlegs with yellow at joints and on protibia and typically outer surface of mesotibia with strip of yellowish brown, tarsi yellow to yellowish brown except metatarsus dark brown with yellowish brown on metadistitarsus; metasoma dark brown.

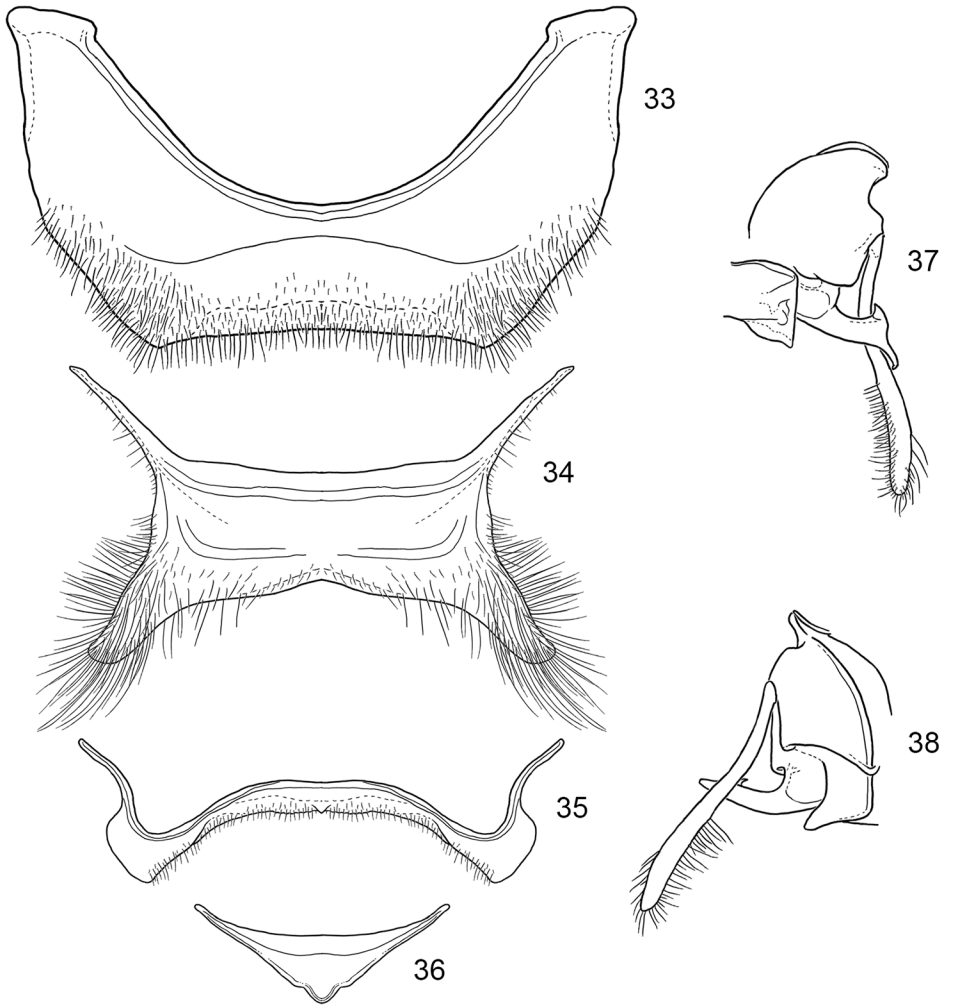
♂: As described for worker except for typical caste and gender differences and as follows: Total body length approximately 4.6 mm, forewing length (to base of humeral sclerite) 4.3 mm. Head wider than long, width 1.60 mm, length 1.40 mm; compound eye length 1.20 mm; upper interorbital distance 0.93 mm, lower interorbital distance



Figures 30–32. Drone of *Plebeia* (*Plebeia*) *hyperplastica*, new species. **30.** Lateral habitus. **31.** Dorsal habitus. **32.** Facial view.

0.63 mm. Scape length 0.52 mm. Clypeus width 1.4× mm. Malar area linear. Terminalia in figures 33–38.

Clypeus largely brown except with yellowish patch basomesally; supraclypeal area pale yellow; face below tangent of antennal toruli largely pale yellow except near upper portion epistomal sulcus and antennal torulus, yellow paraocular area tapering above as pale yellow or brown stripe to near bottom of concavity in ocular margin; scape largely pale yellow ventrally, otherwise dark brown dorsally; pedicel and flagellomere I dark brown, remainder of flagellum dark brown except orangish brown ven-



Figures 33–38. Male terminalia of *Plebeia* (*Plebeia*) *hyperplastica*, new species. **33.** Metasomal sternum V. **34.** Sternum VI. **35.** Sternum VII. **36.** Sternum VIII. **37.** Genital capsule, dorsal view. **38.** Genital capsule, ventral view.

trally. Legs largely yellowish brown to brown except darker on femora and superior prolateral portion of metatibia.

Setation generally as described for worker except more numerous, prominent, and slightly longer on face, mesoscutum, and pleura.

♀: *Latet*.

Holotype: ♀, Venezuela, Aragua, Rancho Grande Biol. Stn., Portachuelo Pass, 10°21′0′′N, 67°41′0′′W, 1100 m, 4 June 1998, J. Ashe, R. Brooks, R. Hanley, ex: insects moving thru [sic] pass against wind-migration (SEMC).

Paratypes (2♀♀, 1♂): 2♀♀, 1♂, Venezuela, Aragua, Rancho Grande Biol. Stn., Portachuelo Pass, 10°21′0′′N, 67°41′0′′W, 1100 m, 4 June 1998, J. Ashe, R. Brooks, R. Hanley, ex: insects moving thru [sic] pass against wind-migration (SEMC).

Etymology: The specific epithet is a combination of the Ancient Greek preposition *hupér* (ὑπέρ, meaning, "over", "beyond", or "exceeding") and the adjective *plastikós*

(πλᾰστῐκός, meaning, "pertaining to shaping"), and is a reference to the rather unique male terminalia.

Plebeia* (*Plebeia*) *plectoforma Engel, new species
ZooBank: urn:lsid:zoobank.org:act:E5990BBC-AD99-468B-82BD-AA87044A31EA
(Figs. 39–41)

DIAGNOSIS: This species is quite similar to *P. hyperplastica* (*vide supra*), sharing with a rather similar pattern of maculation, although in *P. plectoforma* the yellow is more intense (Figs. 39–41), rather than somewhat muted in the former species (Figs. 27–28). *Plebeia plectoforma* is also distinctly larger, with forewing lengths 4.3–4.7 mm vs. 3.6–3.8 mm in *P. hyperplastica*.

DESCRIPTION: As described for *P. amydra* (*vide supra*), with the following modifications: ♀: Total body length approximately 4.50–5.17 mm, forewing length (to base of humeral sclerite) 4.33–4.67 mm. Head wider than long, width 1.83–1.90 mm, length 1.47–1.50 mm; compound eye length 1.17–1.23 mm; upper interorbital distance 1.13–1.17 mm, lower interorbital distance 0.90–0.93 mm. Scape length 0.63–0.67 mm. Malar area 0.3× flagellar diameter; clypeus broad, width 1.8–1.9× length. Preoccipital ridge carinate. Intertegular distance 1.27–1.37 mm. Hind wing with 5–6 distal hamuli.

Clypeus dark brown with mesal line of yellow, sometimes with thin yellow line bordering supraclypeal area to form a sort of T-shaped yellow mark, apicolateral corners typically yellow to yellow brown; supraclypeal area yellow; scape yellow ventrally; lower face largely yellow except separated from antennal torulus by less than torular diameter, yellow tapering upward to concavity in ocular margin. Mesoscutum with strip of yellow to pale yellow along lateral borders; axilla yellow to pale yellow; mesoscutellum with yellow to pale yellow apical margin, sometimes yellow not meeting axilla laterally; legs largely brown to dark brown, although lighter on forelegs and yellow sometimes present at femorotibial joints; wing membranes hyaline and infumate, veins brown to dark brown.

♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Venezuela, Lara, Sanaré, 16.1 km SE Yacambú N.P., 1450 m, 9°42′0′′N, 69°35′6′′W, 2 June 1998, J. Ashe, R. Brooks, R. Hanley (SEMC).

PARATYPES (8♀♀): 8♀♀, Venezuela, Lara, Sanaré, 16.1 km SE Yacambú N.P., 1450 m, 9°42′0′′N, 69°35′6′′W, 2 June 1998, J. Ashe, R. Brooks, R. Hanley (SEMC).

ADDITIONAL MATERIAL: 1♀, Venezuela, Tachira, San Cristobol, 10 km SE P.N. Chorro El Indio, 1320 m, 7°44′3′′N, 72°13′1′′W, 29 May 1998, J. Ashe, R. Brooks, R. Hanley (SEMC).

ETYMOLOGY: The specific epithet is a combination of the Latin verb *plectō*, meaning, "twist" or "bend", and the noun *fōrma*, meaning, "form" or "shape".

REMARKS: Some of the larger species reported herein, and particularly *P. plectoforma*, tend to further blur the distinctions between *Plebeia s.str*. and *Plectoplebeia* Melo (*e.g*., Engel, 2022). The body sizes are similar to those of *Plectoplebeia* and like the two species included in that genus, all occur in cloud forests at elevations above 1000 m. They also sometimes have a larger number of hamuli, such that there is a continuous range from the typical 5 of most lower elevation *Plebeia*, the 5–6 of some of the species reported herein (including *P. plectoforma*), and ultimately the 5–7 in the two

Figures 39–41. Worker of *Plebeia* (*Plebeia*) *plectoforma,* new species. **39.** Lateral habitus. **40.** Dorsal view of head and mesosoma. **41.** Facial view.

species currently assigned to *Plectoplebeia*. The faint sinuation along the margin of the metatibia is also approximated in several of the larger *Plebeia* such that virtually all distinctions of *Plectoplebeia* now wholly intergrade with *Plebeia*. The shape of metasomal tergum I in *Plectoplebeia nigrifacies* (Friese) seems to be autapomorphic to that species. It seems as though *Plectoplebeia* should be synonymized and considered nothing more than cloud forest *Plebeia*.

Plebeia* (*Plebeia*) *mutisi Engel, new species
ZooBank: urn:lsid:zoobank.org:act:CC8E49DF-B920-4707-8997-A3A222563A4D
(Figs. 42–44)

DIAGNOSIS: *Plebeia mutisi* is somewhat similar to *P. amydra* (*vide supra*), as both have poorly developed facial maculation (Fig. 44). The former differs from *P. amydra* by its smaller body size (*cf*. metrics for *P. amydra*, *supra*), narrower clypeus (*cf*. metrics for *P. amydra*, *supra*), and typically lighter coloration (Figs. 42–44).

DESCRIPTION: As described for *P. amydra* (*vide supra*), with the following modifications: ♀: Total body length approximately 3.67–3.92 mm, forewing length (to base of humeral sclerite) 3.54–3.83 mm. Head wider than long, width 1.63–1.67 mm, length 1.33–1.40 mm; compound eye length 1.03–1.10 mm; upper interorbital distance 1.02–1.05 mm, lower interorbital distance 0.83–0.87 mm. Scape length 0.53–0.67 mm. Malar area 0.25–0.3× flagellar diameter; clypeus broad, width 1.5–1.8× length. Preoccipital ridge carinate. Intertegular distance 1.10–1.17 mm. Hind wing with 5 distal hamuli.

Integument of head and mesosoma dark brown to black; labiomaxillary complex dark brown to light brown; mandible and labrum dark brown except in lighter morphs more orange brown; clypeus dark brown with mesal spot or line of brown to yellowish brown, with apicolateral corners with small spots of brown to light brown, except lighter individuals with yellowish brown over majority of clypeus aside from basolateral corners of dark brown; supraclypeal area yellowish brown to brown; scape dark brown, sometimes yellowish brown in lighter individuals, pedicel and flagellum brown to dark brown; paraocular borders from tangent of antennal toruli ventrally yellowish brown to brown, otherwise area dark brown. Mesosoma dark brown to black except as noted: pronotal lobe yellowish brown to yellow; mesoscutum with thin stripes of yellowish brown to yellow along lateral borders; axilla yellow to brown; tegula translucent brown to light brown; mesoscutellum with yellow to pale brown medioapical margin; legs largely brown to dark brown except in lighter forms those areas of brown largely yellowish brown with more yellow at joints; metasoma dark brown to nearly black, except in some individuals lighter on proximal terga and sterna or even brown throughout with darker brown on marginal zones.

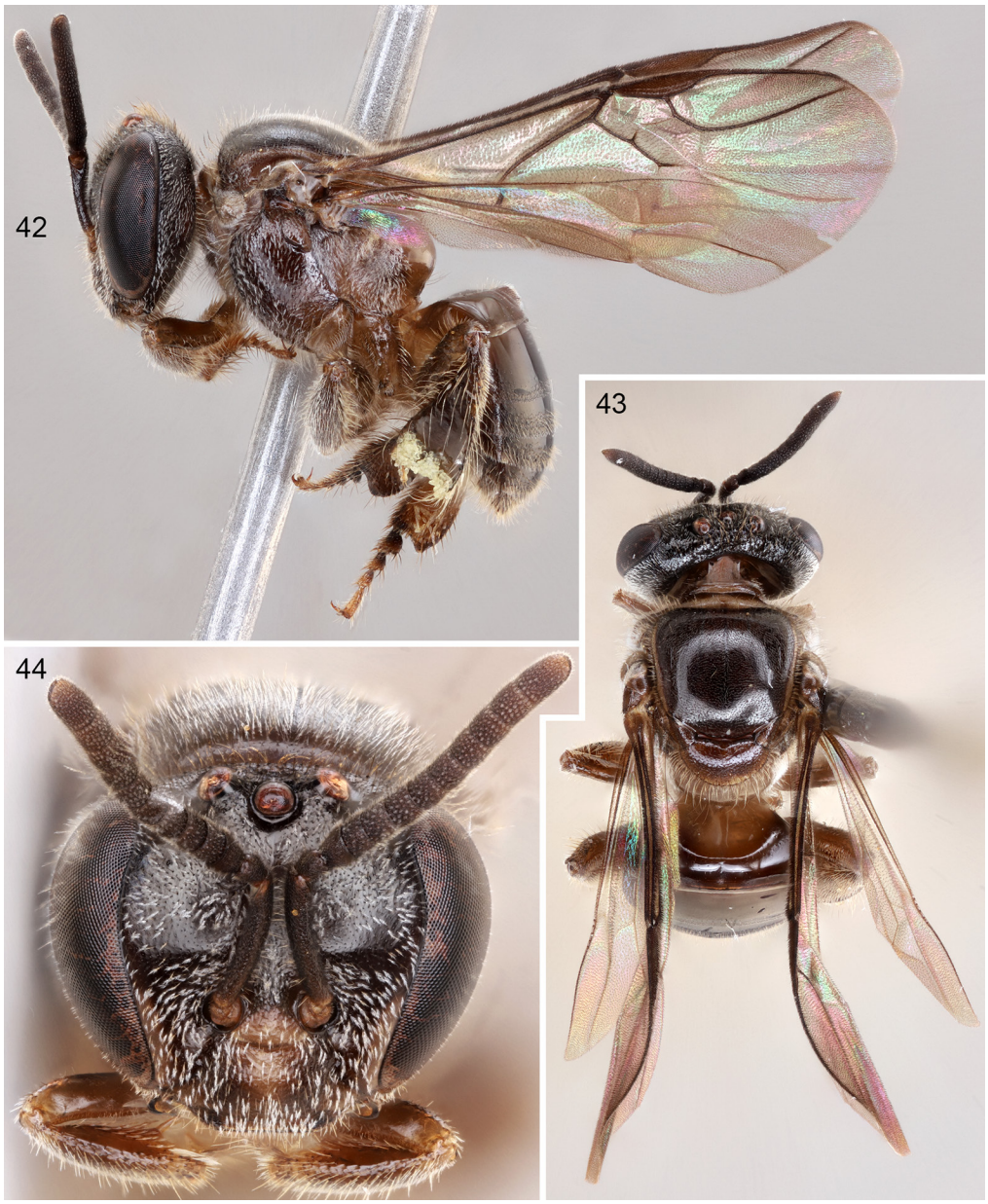
Lower and upper face with minute punctures separated by 2–3× a puncture width below, blending to 2–4× a puncture width above. Mesoscutum smooth, shining, with minute punctures separated by 1–3× a puncture width, punctures more spaced posteriorly and denser anteriorly; punctures of mesoscutellum similar but sparser, integument otherwise smooth and shining between punctures.

Pubescence generally white to translucent, sometimes slightly tinged pale yellowish; clypeus with abundant, minute, subdecumbent, minutely feathery setae, such setae across supraclypeal area and lower face although sparser on supraclypeal area, such setae present on remainder of face although slightly sparser than on lower face, intermixed with sparse, minute, erect, simple setae, by vertex replaced by fuscous to somewhat tawny bristles; scape with sparse minute, appressed, simple setae intermixed with erect, simple bristles typically slightly shorter than diameter of scape. Metasomal tergum I largely glabrous; discs of terga II–V nearly glabrous, with short decumbent to suberect, simple setae laterally and apically, such setae progressively longer and more numerous on terga II–VI.

♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Colombia: Cundinamarca, La Mesa, La Esperanza, 4°41′38.37′′N,



Figures 42–44. Worker of *Plebeia* (*Plebeia*) *mutisi*, new species. **42.** Lateral habitus. **43.** Dorsal habitus. **44.** Facial view.

74°25′49.31′′W, 1330 m, 17-Apr-2021, V.H. Gonzalez (SEMC).

Paratypes (7♀♀): 7♀♀, Colombia: Cundinamarca, La Mesa, La Esperanza, 4°41′38.37′′N, 74°25′49.31′′W, 1330 m, 17-Apr-2021, V.H. Gonzalez (SEMC).

Etymology: The specific epithet honors José Celestino Bruno Mutis y Bosio (1732–1808), priest, botanist, and explorer who led the New Kingdom of Granada's (Nuevo Reino de Granada) Botanical Expeditions, which were initially launched from the region of La Mesa in 1783. Mutis was a key aid to Alexander von Humboldt (1769–1859) during his own exploration of Spanish America, meeting with Mutis in Bogota in 1801.

Plebeia* (*Plebeia*) *silveirai Engel, new species
ZooBank: urn:lsid:zoobank.org:act:CC12986B-0671-4CE2-8DC5-680986848F67
(Figs. 45–47)

DIAGNOSIS: Like others represented in this work, *P. silveirai* is among a group of species with poorly developed facial markings (Fig. 47). However, unlike the others reported herein the mesosomal markings are more clearly delineated and of a brighter yellow, with the maculation of the mesoscutellum particularly thin along the margin but extending its full length. It also has a slightly more developed malar space, which ranges up to 0.4× the flagellar diameter, although many individuals have it as short as 0.25× the flagellar diameter.

DESCRIPTION: As described for *P. amydra* (*vide supra*), with the following modifications: ♀: Total body length approximately 3.75–4.75 mm, forewing length (to base of humeral sclerite) 4.25–4.67 mm. Head wider than long, width 1.80–1.83 mm, length 1.43–1.47 mm; compound eye length 1.20 mm; upper interorbital distance 1.10–1.17 mm, lower interorbital distance 0.90–0.97 mm. Scape length 0.62–0.63 mm. Malar area 0.25–0.4× flagellar diameter; clypeus broad, width 1.8–2.1× length. Preoccipital ridge carinate. Intertegular distance 1.23–1.27 mm. Hind wing with 5 distal hamuli.

Clypeus dark brown to black; supraclypeal area black; scape dark brown to black, pedicel and flagellum dark brown; paraocular borders brown to dark brown, but always lighter than remainder of face and extending to concavity in ocular margin. Mesosoma dark brown to black except as noted: pronotal lobe yellow, sometimes with spot of brown; mesoscutum with thin stripes of pale yellow to yellow along lateral borders; axilla pale yellow to yellow; mesoscutellum with pale yellow to yellow apical margin; legs largely dark brown to black; wing membranes hyaline and faintly infumate, veins brown to dark brown.

Clypeus with minute punctures separated by 0.5–2× a puncture width, integument between faintly and weakly imbricate such that overall surface appears at lower magnifications more rough; supraclypeal area sculptured as on clypeus; lower and upper face with minute punctures separated by 1–4× a puncture width below, blending to 3–5× a puncture width above, integument between punctures smooth and shining; vertex and posterior of head with punctures similar to those of clypeus but integument a bit irregular; gena with punctures separated by 1–2× a puncture width. Mesoscutum smooth, shining, with minute punctures separated by 1–2× a puncture width, punctures more spaced posteriorly and outside of parapsidal lines and denser and fainter anteriorly; punctures of mesoscutellum similar but sparser, integument otherwise smooth and shining between punctures.

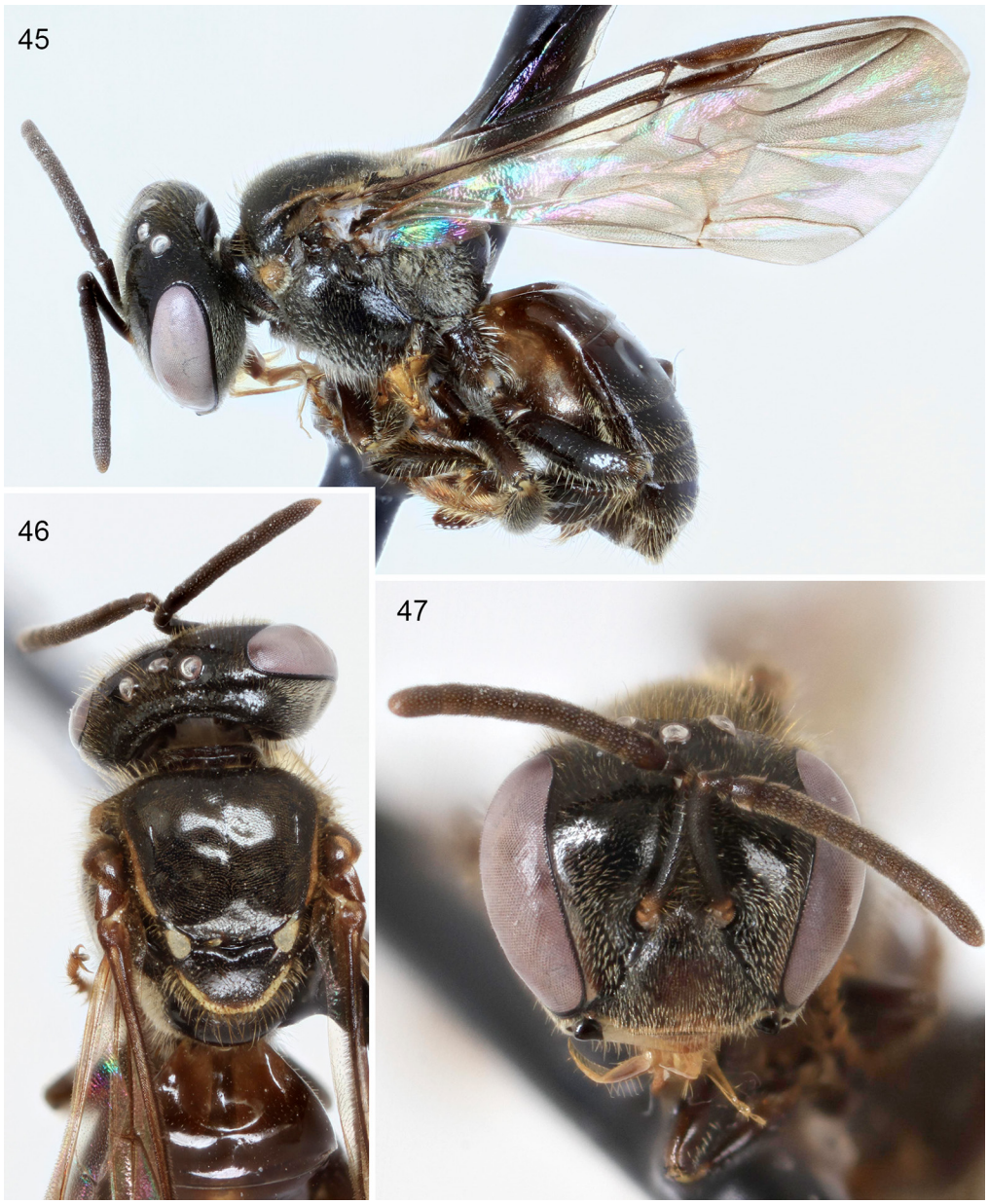
♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Peru: Pasco Dept., Yanachaga-Chemillen National Park, 1550 m, 10°16′24′′S, 75°36′48′′W, 20 Oct 1999, R. Brooks, ex: attracted to wet sand (SEMC).

PARATYPES (14♀♀): 14♀♀, Peru: Pasco Dept., Yanachaga-Chemillen National Park, 1550 m, 10°16′24′′S, 75°36′48′′W, 20 Oct 1999, R. Brooks, ex: attracted to wet sand (SEMC).

ETYMOLOGY: The specific epithet honors the late Fernando A. Silveira (1960–2022), one of the most affable melittologists, an influential teacher and researcher, and an excellent colleague of the last 29 years.



Figures 45–47. Worker of *Plebeia* (*Plebeia*) *silveirai*, new species. **45.** Lateral habitus. **46.** Dorsal view of head and mesosoma. **47.** Facial view.

Plebeia* (*Plebeia*) *vidali Engel, new species
ZooBank: urn:lsid:zoobank.org:act:EA89BF88-38C9-43D4-A909-BC260BA8A60E
(Figs. 48–50)

Diagnosis: The new species is most similar to *P. jatiformis* (Cockerell), a species that ranges from southern Mexico to Panama, but can be distinguished by the narrow-

er yellow markings of the lower paraocular area (Fig. 49), separated from the antennal torulus by approximately a torular diameter and well separated from the anterior tentorial pit, and by the uniformly brown postgena (Fig. 48).

DESCRIPTION: As described for *P. deceptrix* (*vide supra*), with the following modifications: ♀: Total body length approximately 3.58–3.92 mm, forewing length (to base of humeral sclerite) 3.42–3.50 mm. Head wider than long, width 1.53–1.67 mm, length 1.23–1.33 mm; compound eye length 1.00–1.12 mm; upper interorbital distance 0.93–0.97 mm, lower interorbital distance 0.77–0.78 mm. Scape length 0.53–0.60 mm. Malar area linear; clypeus broad, width 1.6–1.9× length. Preoccipital ridge rounded. Intertegular distance 1.07–1.13 mm. Hind wing with 5 distal hamuli.

Clypeus yellow medially and apically, otherwise brown, breadth of medial yellow area quite variable, sometimes encompassing majority of clypeus; supraclypeal area largely yellow with reddish brown along margins; scape largely dark brown except yellowish brown to orange over most of ventral surface, pedicel and flagellum brown to dark brown; lower paraocular area largely yellow in lateral half, otherwise reddish brown, yellow continues along ocular margin until level of concavity in ocular margin, remainder of head brown to reddish brown. Pronotum light reddish brown except yellow on dorsal collar and pronotal lobe; mesoscutum reddish brown with thin stripes of yellow along lateral borders; axilla yellow; mesoscutellum light brown mesally, otherwise yellow; metanotum reddish brown laterally, yellow mesally; pleura largely reddish brown except yellowish in lightest individuals; propodeum reddish brown except lighter, nearly yellow, in lightest individuals; legs largely yellow with light brown marks on femora, mesotibia, prolateral surface of mesobasitarsus, and prolateral surface of metabasitarsus, such areas of brown faint to absent in lightest individuals; wing membranes hyaline and weakly infumate, veins brown to dark brown; metasoma generally light reddish brown to yellow brown except typically darker on terga IV–VI, particularly in apical margins and more yellow on sterna proximal to segment V.

Clypeus with minute punctures separated by a puncture width or less, such punctures coarser and denser laterally; supraclypeal area sculptured as on medial disc of clypeus; lower and upper face with minute, punctures separated by 2–5× a puncture width, integument between punctures smooth and shining, such punctures become gradually sparser near ocelli and ocellocular space, small impunctate strip bordering lateral ocellus; vertex with punctures larger, shallower, more irregular. Mesoscutum smooth, shining, with minute, setiferous punctures separated by 1–3× a puncture width, punctures more spaced in posterior third; punctures of mesoscutellum slightly larger and sparser.

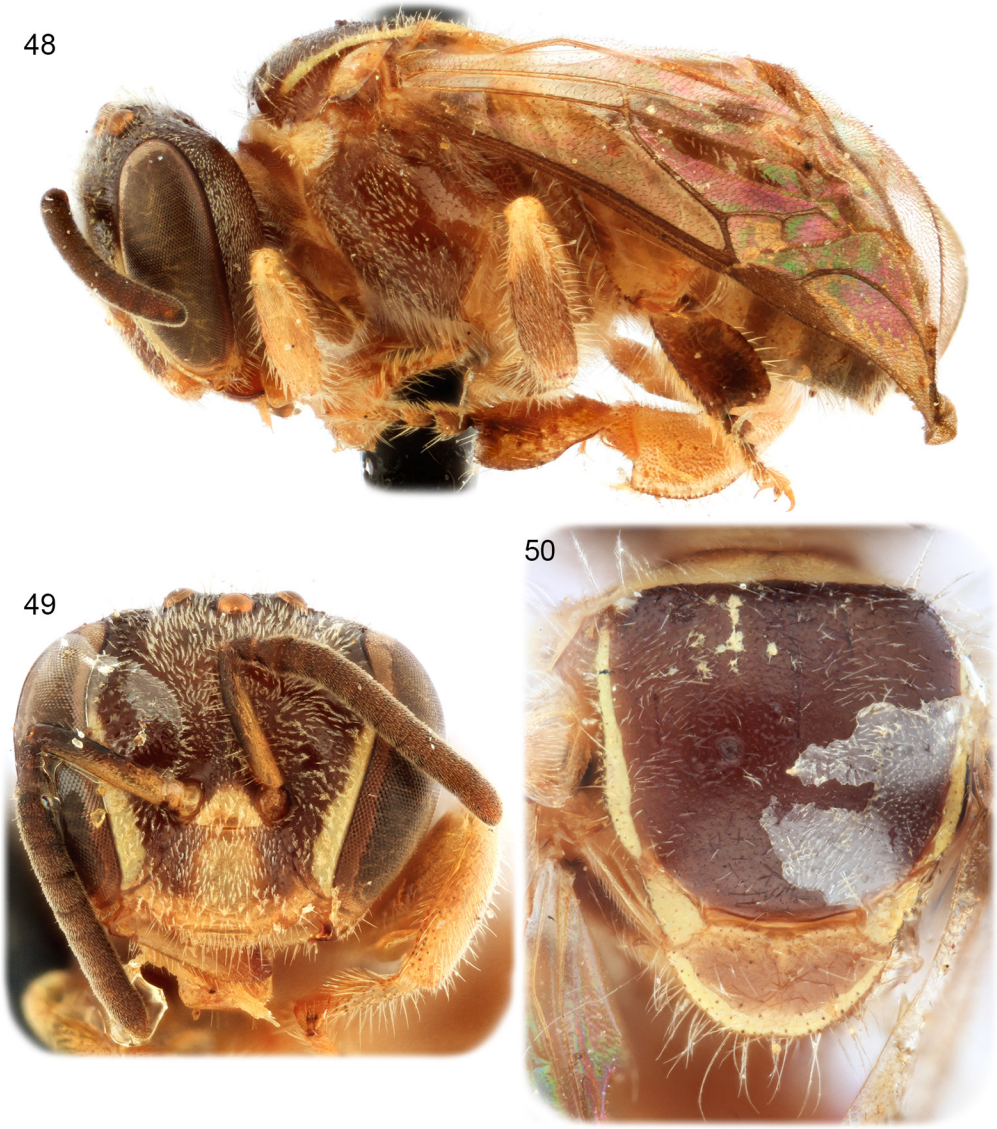
Scape with minute, appressed, simple setae, intermixed with scattered, erect simple setae, such erect setae at most as long as diameter of scape Hypoepimeral area with plumose setae numerous on anterior third to upper half.

♀: *Latet*.

♂: *Latet*.

HOLOTYPE: ♀, Costa Rica: San José Prov., Pozo Azul, junction Rios Parrita & Candelaria [presumably the conjunction of the Río Grande de Candelaria and Río Pirrís-Parrita, not far from the border with Puntarenas Province, at about 9.643104, -84.294199], 9 Dec 1961, 85 m, A. Wille (SEMC).

PARATYPES (4♀♀): 3♀♀, Costa Rica: San José Prov., Pozo Azul, junction Rios Parrita & Candelaria [presumably the conjunction of the Río Grande de Candelaria and Río Pirrís-Parrita, not far from the border with Puntarenas Province, at about 9.643104,



Figures 48–50. Holotype worker of *Plebeia* (*Plebeia*) *vidali*, new species. **48.** Lateral habitus. **49.** Facial view. **50.** Dorsal view of mesosoma.

-84.294199], 9 Dec 1961, 85 m, A. Wille (SEMC); 1♀, Costa Rica: San José Prov., Rio Damitas, 14.5 km N. Puerto Quepos, 200 m, 16 August 1962, A. Wille & C.D. Michener (SEMC).

Etymology: The specific epithet honors the writings and life of Gore Vidal (Eugene L.G. Vidal, 1925–2012).

Key to Costa Rican *Plebeia s.str.*
(worker caste)

Note that *Plebeia tica* (Wille) has recently been transferred to genus *Asperplebeia* Engel (Engel *et al*., 2021).

1. Mesoscutellum with yellow confined to posterior margin, remainder of surface black to reddish brown 2
—. Mesoscutellum completely yellow or yellowish brown (tawny) .... *P. pulchra* Ayala
2(1). Yellow of lower paraocular area extending from inner orbit to near antennal torulus, then above antennal torulus tapering upward toward compound eye; postgena with areas of yellow or yellowish brown ..... *P. jatiformis* (Cockerell)
—. Yellow of lower paraocular area narrow, somewhat linear along inner orbit, separated from antennal torulus by approximately torular diameter, well separated from anterior tentorial pit; postgena uniformly brown .... *P. vidali*, n. sp.

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