

New species of *Euglossa* IV. The *cordata* and *purpurea* species groups (Hymenoptera: Apidae)

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Abstract: Six new species of the *Euglossa cordata* species group and six of the *E. purpurea* species group are described. Each is compared with its closest allies.

Previous papers in this series have treated several species groups of *Euglossa*, some of these now well enough known to permit keys for the identification of all known species. The two, none too sharply differentiated, species groups to be treated here, in contrast, include many taxonomic problems. Each group includes some of the commonest *Euglossa* species of Tropical America, and names are clearly needed for some of these taxa. It is to be hoped that these descriptions and names will facilitate work with the euglossines of South America, as well as work on floral ecology in the area; but I do not attempt comprehensive keys, and I will continue to treat a number of bees in these groups as "close to species X" for the foreseeable future.

A. The *Euglossa cordata* species group. This group includes several very common species, *E. cordata*, of northern and eastern coastal South America, *E. tridentata* and *E. variabilis*, both ranging from northern South America to southern Mexico, and, among the species to be described here, *E. chlorina* and *E. gaianii* of northern South America, and *E. modestior* of the Amazon region. This group is characterized by having the anterior mid-tibial tuft deeply notched, with subequal lobes, or the lower lobe larger, and has the hind tibia rhomboid, but less strongly inflated than is usual in the *purpurea* group.

1. *Euglossa chlorina*, new sp.

Total length 10.3 mm; head width 4.8 mm; abdominal width 4 mm.

Color: Ivory paraocular markings narrow, incomplete below; forward side of antennal scape black; front of clypeus blue above, blue-green below and laterally, with black median keel; sides of clypeus and paraocular areas green with golden hues; upper frons dark green; episternum, scutum, scutellum and upper abdomen golden green; abdomen bronzy beneath; hind tibia blue-green with golden hues.

Vestiture: Plumose hairs of thorax short, tawny, denser behind, dusky above; hairs on scutum dense, dusky.

Punctuation: On front of clypeus small near keel and larger laterally; on episternum of medium size, interspaces smaller than punctures; on scutum varying in size, dense; on scutellum sparser, with some micropunctures; on terga II and III fine and very dense.

Tongue reaching sternum II; labrum subquadrate, with median keel; clypeus with strong median keel, irregular laterals; scutellum rounded subquadrate, less than half as long as wide, without median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, subcircular; anterior tuft about 3 times length of posterior, deeply notched, with subequal and symmetrical lobes; hind tibia rhombic.

Female: Similar to male, but front of clypeus golden green, punctuation of tergum II decreasing in size behind, scutellum more rounded; scutellar tuft about half scutellar length.

Holotype: Male, Caracas, Venezuela, 13 Sep. 1966. R.L. Dressler 563 (U.S.N.M.). Allotype female, Caracas, 5 Mar. 1967, Dressler 630 (U.S.N.M.). **Paratypes:** 3 males of type series, 12, 13 Sep. (Dressler coll.); 4 females of allotype series, 4, 5 Mar. (Dressler coll. and to be distributed); 5 females, Santa Elena, Bolívar, 20-23 Feb. 1967, Dressler 616 (Dressler coll. and to be distributed); 6 females, Rio Chicanán, 26 Sep. 1966, Dressler 567 (Dressler coll. and to be distributed); 2 males, Aripo Valley, Trinidad, 23 Aug. 1968, H.G. Hills (Dressler coll.); 1 male, Dawa, Tapakuma, Pomeroun, Guyana, 30 Mar. 1970, N.H. Williams (Dressler coll.); 3 males, Villavicencio, Colombia, 23 Jul. 1968, H.G. Hills (Dressler coll.); 2 males, Valparaiso, Caquetá, 7 June 1968, M.H. Robinson (Dressler coll.); 3 males, Rio Porce, Antioquia, 7 Apr. 1968, Dressler 915 (Dressler coll.); 4 males, Palotal, Córdoba, 12 Apr. 1968, G. Escobar (Dressler coll.).

This is another rather ordinary green *Euglossa*. The front of the clypeus is blue-green, so that it may easily be confused either with those species having green clypeus or with those having dark blue clypeus. The hind tibia is rather hatchet-shaped, and *E. chlorina*, is probably closest to *E. despecta*, which has blue-violet clypeus, markedly asymmetric anterior mid-tibial tuft, and much sparser punctation on tergum II. The epithet means yellow-green and refers to the golden hues typical of the species. *Euglossa chlorina* has been observed visiting flowers of *Cattleya mossiae* and brushing on the lip; it may be too small to be a pollinator of that orchid, even if it enters the flower. The bees have been found feeding on *Jacaranda mimosaeifolia* and *Stachytarpheta cayennensis*, and the females gather pollen of *Sauvagesia* and Melastomaceae. The males are attracted by cineole. Specimens of this species have been provisionally identified as "RD 492".

2. *Euglossa gaianii*, new sp.

Total length 10 mm; head width 4.5 mm; abdominal width 4.2 mm.

Color: Ivory paraocular markings narrow, incomplete below; forward side of antennal scape with small brown spot; front of clypeus dark green with brownish keel; sides of clypeus

and paraocular areas bottle green; upper frons dark green; episternum green with golden hues; scutum dark green with golden hues; scutellum golden green; abdomen green with golden hues above, bronzy green beneath; hind tibia dark green.

Vestiture: Plumose hairs of thorax short, sparse, tawny, dusky above; hairs on scutum short, dense, dusky.

Punctuation: Dense and irregular on front of clypeus, coarser laterally; on episternum of medium size, interspaces as large as punctures; on scutum small, variable in size, dense, sparser behind; on scutellum sparser, with micropunctures; on tergum II basally small and sparse, then fine and very dense, with prominent smooth marginal band; on III coarser and denser.

Tongue reaching sternum II; labrum subquadrate, wider than long, with median keel; clypeus with median keel; scutellum rounded subquadrate, margin straight behind, less than half as long as wide, with slight median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, subcircular; anterior tuft about 3 times length of posterior, deeply notched, with subequal lobes; hind tibia rhombic-oblong.

Female: Similar to male, but front of clypeus green, tergal punctation sparser; scutellar tuft about 2/5 scutellar length.

Holotype: Male, 12 km SW Kourou, French Guiana, 1 Dec. 1976, D. Roubik (U.S.N.M.). Allotype female, 12 km SW Kourou, 1 Mar. 1977, C.D. Michener (U.S.N.M.). **Paratypes:** 2 males collected with type (Dressler coll.); 1 female, collected with allotype (Dressler coll.); 7 males, 19 km SW Kourou, 22 Feb. 1977, C.D. Michener (Dressler coll. and to be distributed); 1 female, Kourou, 16 Oct. 1976, C.D. Michener (Dressler coll.); 1 male, Balandra, Trinidad, 7 Aug. 1972, F.D. Bennett (Dressler coll.); 8 males, Cuyaga, Aragua, Venezuela, 15 Nov. 1970, M. Gaiani (Dressler coll. and to be distributed); 5 males, P. Nacional Guatopo, Miranda, 700 m., 27 July 1968, M. Gaiani (Dressler coll. and to be distributed); 1 male, I.P.E.A.N., Belém, Pará, Brazil, 27 Oct. 1968,

Dressler 1203 (Dressler coll.); 2 males, Conceição da Barra, E.S., 15 Nov. 1968, Dressler 1280a (Dressler coll.); 16 males, Llullapichis, Rio Pachitea, Huánuco, Perú, 29 Jan.–15 Feb. 1975, Dressler 1612 (Dressler coll. and to be distributed).

This species is very similar to *E. liopoda*, but does not have the extremely shiny hind tibia of that species, and differs in the form of the anterior mid-tibial tuft. The name honors Marco Paulo Gaiani, who assisted me in the field in 1966 and 1967. After I left Venezuela, when perfume baits were discovered, Marco went to great effort to sample bees in different areas of Venezuela. His material of this species first showed me that it was distinct. *Euglossa gaianii* has been seen to brush on the spadix of *Spathiphyllum kochii* (cultivated), and has been collected with pollinaria of *Catasetum*, *Coryanthes*, *Cynoches*, *Gongora* and *Peristeria*. This species has been collected feeding in flowers of *Genipa americana*, and the females gather pollen from Melastomaceae. The males have been collected at methyl salicylate, and are not attracted to other known perfume baits. Specimens of this species have been provisionally identified as "RD 548".

3. *Euglossa liopoda*, new sp.

Total length 10 mm; head width 4.3 mm; abdominal width 4 mm.

Color: Ivory paraocular markings narrow, with small gap below; forward side of antennal scape 1/2 ivory; front of clypeus green, with brownish green keels; sides of clypeus and paraocular areas golden green; upper frons green; episternum golden green; scutum, scutellum and abdomen green with golden hues; hind tibia golden green, very shiny.

Vestiture: Plumose hairs of thorax short, sparse, tawny, dusky above; hairs on scutum short, dusky.

Punctuation: Coarse and irregular on front of clypeus; on episternum of medium size, interspaces smaller than punctures; on scutum of medium size, dense, sparser behind; on scutellum sparser, with micropunctures; on terga II and III fine and very dense, with narrow smooth marginal bands.

Tongue reaching sternum I; labrum subquadrate, wider than long, with median keel; clypeus tricarinate; scutellum rounded subquadrate, less than half as long as wide, with faint median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, subcircular; anterior tuft about three times length of posterior, deeply and obliquely notched, with the lower lobe much larger, and upper very narrow; hind tibia rhombic-oblong.

Female: Unknown.

Holotype: Male, Rio Chicanán, Bolívar, Venezuela, 26 Sep. 1966, R.L. Dressler 572 (U.S.N.M.). **Paratypes:** 5 males of type series, 26, 27 Sep. (Dressler coll. and to be distributed); 1 male, same locality, 26 Sep. 1966, Dressler 567 (Dressler coll.); 1 male, Valparaiso, Caquetá, Colombia, 7 Feb. 1964, M.H. Robinson (Dressler coll.); 1 male, Yarinacocha, Loreto, Peru, 28 Aug. 1972, E.W. Stiles (Dressler coll.); 1 male, Res. Ducke, Manaus, AM., Brazil, 18 Oct. 1968, Dressler 1152 (Dressler coll.); 3 males, I.P.E.A.N., Belém, Pará, 24-28 Oct. 1968, Dressler 1173 (Dressler coll.); 1 male, Belém, 14 Dec. 1965, Dressler 429 (Dressler coll.); 1 male, Utinga, Belém, 15 Dec. 1965, Dressler 431 (Dressler coll.).

The males of this species may be recognized by the very smooth, shiny hind tibia, to which the epithet, *liopoda*, or "smooth foot", refers. Males have been found brushing on spadices of *Anthurium* cf. *crystallinum* and *Spathiphyllum cannaefolium*, and one male from Belém bears a pollinarium of *Notylia*. The bees have been collected feeding on flowers of *Sabicea aspera* and *S. velutina*. The males have been collected at cineole, but never in large numbers. Specimens of this species have been provisionally identified as "RD 431".

4. *Euglossa modestior*, new sp.

Total length 11 mm; head width 4.7 mm; abdominal width 4.2 mm.

Color: Ivory paraocular markings narrow but complete; forward side of antennal scape half ivory; front of clypeus blue-green, with darker keels; sides of clypeus and paraocular areas

bottle green; upper frons dark green; episternum bottle green; scutum and scutellum dark green with golden hues; abdomen dark bottle green above, golden green beneath; hind tibia dark green with golden hues.

Vestiture: Plumose hairs of thorax short, tawny, denser behind, dusky above; hairs of scutum short, dense, dusky.

Punctuation: On front of clypeus of medium size near keel, coarser laterally; on episternum of medium size, interspaces about as large as punctures; on scutum variable in size, dense, sparser behind; on scutellum sparse, with micropunctures; on terga II and III fine and dense.

Tongue reaching sternum II; labrum subquadrate, wider than long, with median keel; clypeus with median keel and irregular laterals; scutellum rounded subquadrate, margin straight behind, less than half as long as wide, with slight median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, subcircular; anterior tuft very broadly notched, the mid-portion very narrow, each lobe about size of posterior tuft; hind tibia rhombic.

Female: Similar to male, but scutum and scutellum more densely punctate and tergal punctation finer behind; scutellar tuft about 2/5 scutellar length.

Holotype: Male, Iquitos, Loreto, Peru, 16 - 18 Oct. 1964, R.L. Dressler 130 (U.S.N.M.). Allotype female, from type series (U.S.N.M.). **Paratypes:** 1 male, 1 female, from type series (Dressler coll.); 3 males, Llullapichis, Rio Pachitea, Huánuco, 29 Jan. - 9 Feb. 1975, Dressler 1613 (Dressler coll.); 2 males, 25 km S Riberalta, Beni, Bolivia, 22 Sep. 1972, D.L. Pearson (Dressler coll.); 13 males, I.P.E.A.N., Belém, Pará, Brazil, 23-28 Oct. 1968, Dressler 1187 (Dressler coll. and to be distributed); 4 males, Res. Ducke, Manaus, AM., 18-20 Oct. 1968, Dressler 1158 (Dressler coll.); 2 males, Zandery, Surinam, 3 Apr. 1968, C.H. Dodson (Dressler coll.); 1 male, Puerto Ayacucho, Amazonas, Venezuela, 27 Apr. 1967, Dressler 650 (Dressler coll.); 4 females, Puerto Ayacucho, 27 Apr. 1967, Dressler 651 (Dressler coll.); 16 males, Leticia, Amazonas, Colombia,

6-7 June 1974, Dressler 1559 (Dressler coll. and to be distributed); 4 males, Villavicencio, Meta, 26 Nov. 1971, 1000 m, R.B. & M.G. Roberts (Dressler coll.).

This is a plain green bee without any outstanding features, and the epithet, *modestior*, refers to its plainness. The combination of its drab coloration, the clypeus being neither clear green nor dark blue, and the very narrow anterior mid-tibial tuft serve to distinguish this species from its allies. In the Orinoco and the upper Amazon, *E. modestior* seems to replace *E. cordata* as the common green *Euglossa*, and may be more common in urban habitats and degraded forests than in undisturbed, wet forest. Males have been collected brushing on spadices of *Spathiphyllum cannaefolium*, and have been collected with pollinaria of *Gongora* and *Mormodes* (near Belém). Males are attracted to cineole. Both sexes feed on *Thevetia peruviana*, and the females gather pollen from *Sauvagesia* and Melastomaceae. Specimens of this species have been provisionally identified as "RD 130".

5. *Euglossa platymera*, new sp.

Total length 10.3 mm; head width 4.5 mm; abdominal width 4.3 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape with small ivory spot; front of clypeus dark blue, with black median keel; sides of clypeus and paraocular areas golden green; upper frons dull green; episternum golden green; scutum dull bluish green, with golden hues behind; scutellum green with golden hues; abdomen bronzy green above, bronze beneath; hind tibia golden green.

Vestiture: Plumose hairs of thorax short, sparse, denser behind, tawny, dusky above; hairs on scutum of medium length, dusky, dense.

Punctuation: Coarse, sparse and irregular on front of clypeus; on episternum of medium size, the interspaces nearly as large as punctures; on scutum small and very dense; on scutellum sparser but still dense; on terga II and III fine and very dense, with narrow smooth marginal bands.

Tongue reaching sternum II; labrum subquadrate, wider than long, with median keel; clypeus with strong median keel, irregular laterals; scutellum rounded, somewhat 5-sided, with the postero-lateral edges straight, less than half as long as wide, with slight median depression, convex above, with the median part gibbous behind, the postero-lateral areas flattened above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, subcircular; anterior tuft about three times length of posterior, deeply notched, the lower lobe larger than posterior tuft, the upper lobe very narrow; hind tibia trapezoid- rhombic.

Female: Similar to male, but clypeus green, scutum and scutellum more densely punctate; scutellar tuft narrow, about 2/5 scutellar length.

Holotype: Male, Manaus, AM., Brazil, Mar. 1958, C. Elias (U.S.N.M.). Allotype female, collected with the type (U.S.N.M.). **Paratypes:** 2 males, 1 female, collected with type (Dressler coll.); 7 males, Mazaruni Potaro, Rockstone, Guyana, 9 Aug. 1970, N.H. Williams (Dressler coll. and to be distributed).

This species is very distinctive in the form of the scutellum, with both the rear margin and the upper surface flattened postero-laterally, so that it is five-sided in outline. The epithet, *platymera*, or "flat part", refers to this feature. Males have been attracted to eugenol. Specimens of this species have been provisionally identified as "BR 1".

6. *Euglossa securigera*, new sp.

Total length 11 mm; head width 4.9 mm; abdominal width 4.3 mm.

Color: Ivory paraocular markings complete, but narrow; forward side of antennal scape with very small ivory spot; front of clypeus blue-green; sides of clypeus and paraocular areas golden green; upper frons green; episternum green with some golden hues; scutum green; scutellum green with some golden hues; abdomen green with golden hues above, bronzy green beneath; hind tibia blue-green.

Vestiture: Plumose hairs of thorax short, tawny, denser behind, dusky above; hairs on scutum short, dusky.

Punctuation: On clypeus small near keel, larger laterally, very irregular; on episternum of medium size, interspaces as large as punctures; on scutum large and very dense; on scutellum large and dense; on terga II and III fine, basally sparse, denser behind, with narrow smooth marginal bands.

Tongue reaching sternum II; labrum subquadrate, wider than long, with median keel; clypeus with irregular median keel; scutellum rounded subquadrate, less than half as long as wide, without median depression, convex above; sternum II with small and widely separated tufts; mid tibia: posterior tuft small, subcircular, anterior tuft about 3 times length of posterior, deeply and obliquely notched, with subequal lobes; hind tibia trapezoid-rhomboid.

Female: Unknown.

Holotype: Male, Conceição da Barra, E.S., Brazil, 13 Nov. 1968, R.L. Dressler 1283 (U.S.N.M.). **Paratypes:** 4 males of type series, 10-15 Nov. (Dressler coll.); 1 male, Conceição da Barra, 14 Nov. 1968, Dressler 1302 (Dressler coll.); 1 male, Res. Monte Pascoal, Bahia, 8 Nov. 1968, Dressler 1264 (Dressler coll.); 2 males, Itabuna, 3 June 1971, H. Kennedy (Dressler coll.); 2 males, El Altar, Lara, Venezuela, 19 May 1968, S. Tillett (Dressler coll.); 1 male, El Altar, 16 Aug. 1968, H.G. Hills (Dressler coll.); 1 male, Santa Elena, Bolívar, 23 Feb. 1967, Dressler 623 (Dressler coll.); 1 male, Caracas, D.F., 13 Sep. 1966, Dressler 565 (Dressler coll.).

The distinctive feature of this species is the hatchet-shaped hind tibia; the epithet, *securigera*, or "axe-bearer", refers to this feature. The distribution, from the Bahian area and Venezuela, without, as far as I know, any material from the Amazon basin, is curious, but the material is quite uniform. Two of the specimens from Espirito Santo bear pollinaria of *Coryanthes*. The males have been attracted to cineole and eugenol.

B. The *Euglossa purpurea* species group: The very bronzy species of this group, with their greatest diversity in Costa Rica, are relatively well known, but the Amazonian complex of dark green bees has remained quite anonymous. The bees of this group are characterized by greatly inflated hind tibiae, by a tendency to gibbous scutellum and by the form of the anterior mid-tibial tuft, which is more easily sketched than described (see figure 1, G-L).

7. *Euglossa amazonica*, new sp.

Total length 11 mm; head width 4.5 mm; abdominal width 4.2 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape half ivory; front of clypeus blue-violet, with black keels; sides of clypeus, paraocular areas and episternum bottle green; upper frons dark green; scutum, scutellum and hind tibia dark green with golden hues; abdomen bottle green with golden hues above, golden green beneath.

Vestiture: Plumose hairs of thorax short, sparse, tawny, denser behind, dusky above; hairs on scutum short, dense, dusky.

Punctuation: Coarse on front of clypeus, sparser laterally; on episternum coarse, dense; on scutum coarse, variable in size, dense; on scutellum larger and sparser, with some micropunctures; on tergum II basally small and sparse, dense medially and behind, with very narrow smooth marginal band; coarser on III.

Tongue reaching sternum V; labrum subquadrate, wider than long, with median keel and weak laterals; clypeus tricarinate; scutellum subquadrate, margin straight behind, less than half as long as wide, with weak median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft oblong; upper lobe of anterior tuft dark, lower lobe shorter, pale, forming a broad angle with upper lobe; hind tibia oblong-rhomboid, inflated.

Female: Unknown.

Holotype: Male I.P.E.A.N., Belém, Pará, Brazil, 24 Oct. 1968, R.L. Dressler 1181 (U.S.N.M.). **Paratypes:** 68 males of type series,

23-28 Oct. (Dressler coll. and to be distributed); 3 males, Res. Ducke, Manaus, AM., 20 Oct. 1968, Dressler 1172 (Dressler coll.); 25 males, Lullapichis, Rio Pachitea, Huánuco, Peru, 27 Jan. - 11 Feb. 1975, Dressler 1594 (Dressler coll. and to be distributed); 6 males, Leticia, Amazonas, Colombia, 7 June 1974, Dressler 1558 (Dressler coll.); 7 males, Puerto Asis, Putumayo, 2 Feb. 1971, H. Kennedy (Dressler coll.).

This is perhaps the commonest small green *Euglossa* in the Amazon basin; thus the geographic epithet. *Euglossa amazonica* resembles both *E. magnipes* and *E. mourei* in the blue-violet clypeus and the greatly inflated hind tibia, but the tibia is distinctly smaller than in these species, and *E. amazonica* differs in the symmetrical anterior mid-tibial tuft with subequal lobes, and the tergal punctuation is not as dense as in *E. mourei* nor as sparse as in *E. magnipes*. Specimens from Belém bear pollinaria of *Coryanthes* and *Gongora*, while some of those from Peru bear pollinaria of *Chaubardiella* on the forelegs. The males are attracted in numbers to cineole, eugenol and skatole, and occasionally to beta ionone, methyl salicylate, 2-phenylethyl acetate and vanillin. Specimens of this species have been provisionally identified as "RD 1172".

8. *Euglossa avicula*, new sp.

Total length 10 mm; head width 4.8 mm; abdominal width 4.6 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape 2/5 ivory; front of clypeus blue-green, dark blue above, with dark blue median keel; sides of clypeus and paraocular areas golden green; upper frons dark green; episternum bronzy green; scutum dark green with golden hues; scutellum golden green; abdomen golden green above, bronzy green beneath; hind tibia bronzy green.

Vestiture: Plumose hairs of thorax short, tawny, denser behind, dusky above; hairs of scutum medium long, dense, dusky.

Punctuation: On front of clypeus coarse, irregular, coarser laterally; on episternum of medium size, dense; on scutum medium

large, dense; on scutellum larger, sparser, with some micropunctures; on tergum II medium fine, dense, smaller behind, with narrow smooth marginal band; denser on III.

Tongue reaching sternum III; labrum subquadrate, wider than long, with median keel; clypeus with strong median keel and irregular laterals; scutellum rounded subquadrate, less than half as long as wide, without median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft oblong, anterior tuft bilobed, the upper lobe large, hemicircular, lower lobe much smaller, pale; hind tibia rhomboid.

Female: Unknown.

Holotype: Male, Conceição da Barra, E.S., Brazil, 11 Nov. 1968, R.L. Dressler 1284 (U.S.N.M.). **Paratypes:** 5 males of type series, 13-15 Nov. (Dressler coll.); 1 male, Conceição da Barra, 14 Nov. 1968, Dressler 1306 (Dressler coll.); 1 male, No. Linhares, 12 Nov. 1968, Dressler 1290 (Dressler coll.).

This species is most closely allied to the widespread *E. townsendi*, and differs from that species in denser tergal punctation, squarer and flatter scutellum and in having the lower lobe of the anterior mid-tibial tuft more conspicuous. With a little imagination, one may see the anterior tuft as the silhouette of a bird, the lower lobe being the head. The epithet, *avicula*, refers to this outline. Males have been collected at cineole and vanillin.

9. *Euglossa gibbosa*, new sp.

Total length 9.8 mm; head width 4.8 mm; abdominal width 4.3 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape 1/2 ivory; front of clypeus green with bronzy brown median keel; sides of clypeus, paraocular areas, upper frons, episternum, scutum and scutellum golden green; abdomen dark green with golden hues above, golden green beneath; hind tibia bronzy green.

Vestiture: Plumose hairs of thorax medium long, denser behind, brown tawny; hairs of

scutum long, dense, mixed brown with some black.

Punctuation: On clypeus small near keel, coarser and irregular laterally; on episternum medium small, interspaces larger than punctures; on scutum medium small, rather dense, with some interspaces about as large as punctures; on scutellum larger, with some micropunctures; on tergum II very fine and dense, with narrow smooth marginal band; coarser on III.

Tongue reaching sternum II; labrum subquadrate, wider than long, with median keel and weak laterals; clypeus with median keel; scutellum rounded subquadrate, nearly half as long as wide, without median depression, gibbous above behind; sternum II with small, widely separated tufts; mid tibia: posterior tuft shortly oblong; anterior tuft large, hemicircular, weakly notched, paler in front; hind tibia triangular-rhomboid.

Female: Similar to male, terga II with wider smooth marginal band, scutellum more gibbous; scutellar tuft small, about 2/5 scutellar length.

Holotype: Male, Santo Domingo, Pichincha, Ecuador, 20 Aug. 1967, R.L. Dressler 711 (U.S.N.M.). Allotype female, of type series (U.S.N.M.). **Paratypes:** 24 males, 23 females, of type series (Dressler coll. and to be distributed); 1 male, Quevedo, Los Rios, 3 Apr. 1960, G. Frymire (Dressler coll.); 1 male, Quevedo, 4 Apr. 1960, C. Játiva (Dressler coll.).

This species is allied to *E. townsendi* and *E. heterosticta*, and differs from these species in the green male clypeus, in the finer scutal punctation, in the shaggier thorax and in the more symmetrical anterior mid-tibial tuft. In the field both males and females are easily recognized by the gibbous scutellum, to which the epithet refers. This is perhaps the commonest *Euglossa* on the Pacific slope of Ecuador. The type series, and many more, were collected feeding in flowers of *Ipomoea*. Some of the males bear pollinaria of *Gongora quinquenervis* and *Sievekingia rhonhofiae*. I believe that males of this species are attracted to cineole and perhaps other perfume baits,

though my material was collected before the perfume baits were in use. Specimens of this species have been provisionally identified as "RD 711".

10. *Euglossa magnipes*, new sp.

Total length 11.7 mm; head width 5 mm; abdominal width 4.4 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape black; front of clypeus blue-violet with darker keels; sides of clypeus and paraocular areas bottle green; upper frons blue-violet, episternum and scutellum golden green; scutum dark green with golden hues; abdomen dark green with golden hues above, golden green beneath; hind tibia golden green.

Vestiture: Plumose hairs of thorax sparse, tawny, denser behind, dusky above; hairs of scutum short, mostly black.

Punctuation: On clypeus small-medium next to keel, sparser and irregular laterally; on episternum medium-large, dense; on scutum large, dense; on scutellum sparser, with many micropunctures; on tergum II small and sparse, many interspaces larger than punctures, size of punctures decreasing behind; on II coarser and denser.

Tongue reaching sternum III; labrum subquadrate, wider than long, with median keel; clypeus with strong median keel and weaker laterals; scutellum subquadrate, shallowly convex behind, less than half as long as wide, with very faint median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, oblong; anterior tuft notched, lower lobe larger and forming broad angle with upper; hind tibia oblong-rhombic, inflated.

Female: Similar to male, but clypeus and frons green, scutum and scutellum more densely punctate, tergum II more finely punctate; scutellum without tuft.

Holotype: Male, Llullapichis, Rio Pachitea, Huánuco, Peru, 15 Feb. 1975, R.L. Dressler 1610 (U.S.N.M.). Allotype female, Iquitos, Loreto, emerged Feb. 1965, C.H. Dodson 104

(Dressler coll.). **Paratypes:** 7 males of type series, 29 Jan. - 16 Feb. (Dressler coll. and to be distributed); 1 male, from same nest as allotype (Dressler coll.); 1 male, Tarapoto, San Martin, H. Kennedy (Dressler coll.); 4 males, Museu Goeldi, Belém, Pará, Brazil, 4-5 June 1964, Dressler 500 (Dressler coll.); 4 males, Rio Chicanán, Bolívar, Venezuela, 26, 27 Sep. 1966, Dressler 571 (Dressler coll.); 1 male, Dawa, Tapakuma, Pomeroon, Guyana, 29 Mar. 1970, W. Evoy (Dressler coll.).

This species is closely allied to *E. mourei*, and differs from that species in the shorter tongue, in the coarser punctuation of the scutum, and in the larger lower lobe of the anterior mid-tibial tuft. The epithet, *magnipes*, refers to the greatly inflated hind tibia. One may find minor differences in punctuation between the different lots of bees assigned to this species. I consider these to represent geographical variation, but, of course, future study of more ample material may give greater importance to these differences. Males have been found brushing on spadices of *Anthurium magnificum* and *Spathiphyllum cannaefolium*; some males have been collected at vanillin and one at eugenol. Specimens of this species have been provisionally identified as "RD 500".

11. *Euglossa mourei*, new sp.

Total length 10.8 mm; head width 4.5 mm; abdominal width 4 mm.

Color: Ivory paraocular markings narrow, but complete; forward side of antennal scape black; front of clypeus blue-violet, with black median keel and dark blue laterals; sides of clypeus and paraocular areas bottle green; episternum and scutellum green with golden hues; scutum dark green with golden hues, bluish in front; abdomen dark green above, golden green beneath; hind tibia golden green.

Vestiture: Plumose hairs of thorax sparse, tawny, longer behind, dusky above; hairs on scutum short, mostly black.

Punctuation: Coarse and irregular on front of clypeus; on episternum medium large, some interspaces as large as punctures; on scutum variable in size, dense, with some interspaces as large as punctures; on scutellum sparser, with

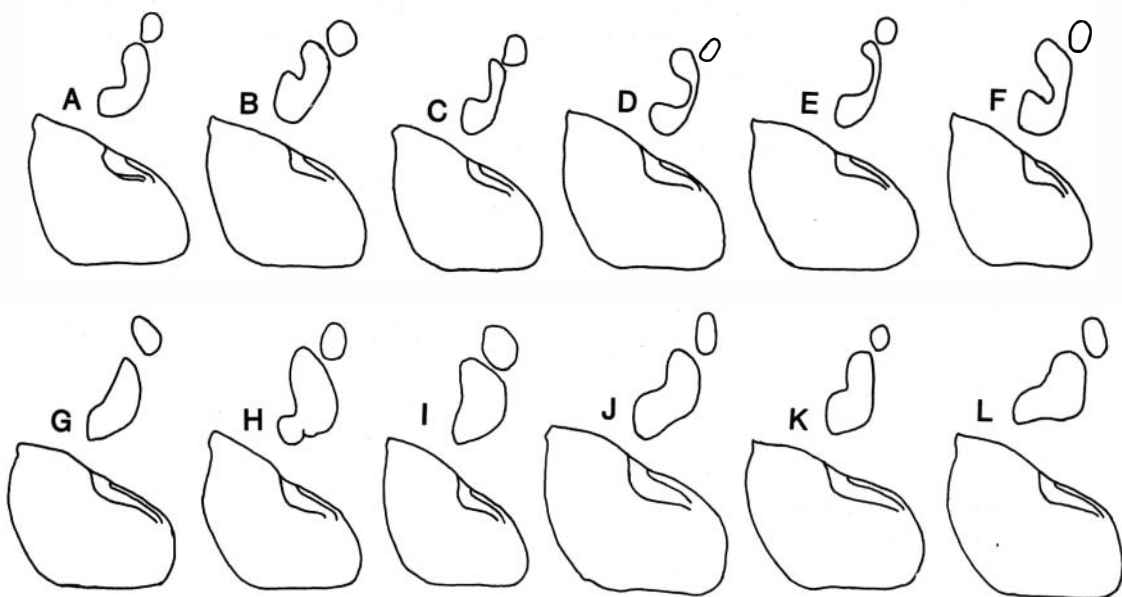


Fig. 1. Outlines of mid-tibial tufts (above) and hind tibiae (below). All drawn with camera lucida; tufts at greater magnification than tibiae. (A) *E. chlorina*. (B) *E. gairui*. (C) *E. liopoda*. (D) *E. modestior*. (E) *E. platymera*. (F) *E. securigera*. (G) *E. amazonica*. (H) *E. avicula*. (I) *E. gibbosa*. (J) *E. magnipes*. (K) *E. mourei*. (L) *E. pleosticta*.

many micropunctures; on tergum II basally fine, with a basal smooth area, medially of medium size and density, then decreasing in size to a wide smooth marginal band; denser on III.

Tongue subequal to body; labrum subquadrate, wider than long, with median keel; clypeus tricarinate, median keel strongest; scutellum subquadrate, shallowly convex behind, less than half as long as wide, with faint median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, oblong; anterior tuft with 2 lobes forming a broad angle, upper lobe narrow, dark, lower lobe pale; hind tibia oblong-rhomboid, inflated.

Female: Unknown.

Holotype: Male, Leticia, Amazonas, Colombia, 6 June 1974, R.L. Dressler 1557 (U.S.N.M.). **Paratypes:** 17 males of type series, 6, 7 June (Dressler coll. and to be distributed); 26 males, Puerto Asis, Putumayo, 2 Feb. 1971, H. Kennedy (Dressler coll. and to be distributed); 22 males, Macarena Field Sta., Meta, 12 Jan. 1971, H. Kennedy (Dressler coll.

and to be distributed); 3 males, Rio San Miguel, Napo, Ecuador, 4 Feb. 1971, H. Kennedy (Dressler coll.); 48 males, Lullapichis, Rio Pachitea, Huánuco, Peru, 27 Jan.-9 Feb. 1975, Dressler 1603 (Dressler coll. and to be distributed).

This is one of the most abundant small euglossas in the upper Amazon. It is closely allied to *E. magnipes*, as discussed under that species. When Father J.S. Moure first tried to sort out the Brazilian species of *Euglossa*, he recognized this as a distinct taxon, and provisionally treated it as "Moure no.2". The epithet, *mourei*, is given to this species in recognition of Father Moure's contribution to our understanding of these bees, and in gratitude for the very great deal of help that he has given me. I am sorry that other tasks have kept Father Moure away from the Euglossini during the last decade. While I dare not be positive in associating males and females in this difficult complex, I feel sure that the female of this species is a bee without scutellar tuft and with strong, recurved bristles on the galea, this last probably forming a device for extracting pollen from tubular flowers. Father Moure has assigned to these females a manuscript name

that alludes to the spiny galea. Some males of this species from Leticia bore pollinaria of *Catasetum*. The males have been collected especially with cineole and vanillin, with a few also attracted to skatole. As noted above, specimens of this species have been provisionally identified as "Moire no.2".

12. *Euglossa pleosticta*, new sp.

Total length 11 mm; head width 4.8 mm; abdominal width 4.2 mm.

Color: Ivory paraocular markings well developed; forward side of antennal scape 3/5 ivory; front of clypeus blue-green, with dark blue median keel; sides of clypeus and paraocular areas golden green; upper frons dark green; episternum golden green; scutum and scutellum green with golden hues; abdomen bronzy green above, bronze beneath; hind tibia bronzy green.

Vestiture: Plumose hairs of thorax short, tawny, denser behind, dusky above; hairs of scutum short, mixed brown and black.

Punctuation: On clypeus irregular, coarser laterally; on episternum medium large, dense; on scutum medium large, very dense; on scutellum sparser, with some micropunctures; on tergum II medium large, dense medially, punctures smaller both basally and distally, with wide smooth marginal band; denser on III.

Tongue reaching sternum II; labrum subquadrate, wider than long, tricarinate; clypeus with definite median keel, weak laterals; scutellum rounded subquadrate, shallowly convex behind, less than half as long as wide, with faint median depression, convex above; sternum II with small, widely separated tufts; mid tibia: posterior tuft small, oblong;

anterior tuft of two lobes, forming an angle of about 90°, upper lobe much larger and wider, lower lobe pale; hind tibia oblong-rhomboid, inflated.

Female: Similar to male, but front of clypeus green, and punctuation of tergum II decreasing more in size behind; scutellar tuft about 1/3 scutellar length.

Holotype: Male, No. Linhares, E.S., Brazil, 12 Nov. 1968, R.L. Dressler 1297 (U.S.N.M.). Allotype female, same locality and date, Dressler 1300 (U.S.N.M.). **Paratypes:** 1 male of type series (Dressler coll.); 1 female of allotype series (Dressler coll.); 8 males, Conceição da Barra, 10-15 Nov. 1968, Dressler 1278 (Dressler coll. and to be distributed); 3 males, Itabuna, Bahia, 3-6 Nov. 1968, Dressler 1226 (Dressler coll.); 2 males, 2 females, Represa Rio Grande, GB., Oct. 1960, F.M. Oliveira (Dressler coll.); 1 female, Represa Rio Grande, 23 Nov. 1968, Dressler (Dressler coll.).

In the form of the anterior mid-tibial tuft this species resembles *E. avicula* and *E. heterosticta*, but it is at once distinguished from these species by the greatly inflated hind tibia. The epithet *pleosticta*, or "many spots", refers to the very densely punctate scutum. Males, have been collected at cineole and vanillin, and the females were "examining the collector", indicating that this species behaves much like the Central American *E. igniventris* when it encounters an unfamiliar object in its habitat.

RESUMEN

Se describe seis especies nuevas en el grupo *Euglossa cordata* y seis en el de *E. purpurea*. Se compara cada una de ellas con sus aliados más cercanos.