

The Central American species of *Euglossa* subgenus *Glossura* Cockerell, 1917 (Hymenoptera, Apidae)*

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This is one of three papers on the Central American Euglossine bees belonging to the genus *Euglossa* Latreille, and deals with the species of the subgenus *Glossura*.

The subgenus *Glossura* was erected by Cockerell in 1917 to include the larger species of *Euglossa* with "mouth-parts extremely elongated, extending far beyond apex of abdomen; scutellum bigibbous". *Euglossa piliventris* Guérin, 1845, was indicated as the type species, and *E. ignitis* was also included. Five years later he described *E. imperialis* as a new subspecies of *piliventris*, from Rio Trinidad, Panamá. Four new species from this area are now added, raising the number of known Central American species to six.

All known species of this subgenus are restricted to tropical America, from Jamaica and Guatemala as known northern limit to Tarata in Bolivia, with one species reaching the wet tropical littoral forest of Santa Catarina State in southern Brasil. The total number of known species is thirteen, but the author believes that a careful and well oriented method of collecting, as has been employed by Dr. Robert L. Dressler, will increase this number.

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KEY TO THE CENTRAL AMERICAN SPECIES OF
EUGLOSSA (GLOSSURA):

1. Antennae thirteen segmented, metasoma with seven exposed segments; median tibia with a conspicuous velvety area on outer face; posterior tibia enormously developed, subtriangular, very thick, with a long hairy glandular slit near its posterior margin; a cream white stripe along inner orbits on lower parocular areas (Males) 2
- Antennae twelve segmented, metasoma with six exposed segments; median tibia without a velvety area; hind tibia broadly subtriangular, thin, its outer face largely concave, forming a corbicula; cream white marks reduced to lateroventral angles of clypeus, labrum, disc of outer face of mandibles and a small spot on malar area (Females) 7
2. Second metasomal sternum with two hairy ventral pockets on disc; velvety area on outer face of mid tibia with two pads of reverse hairs on its upper anterior portion 3
- Second metasomal sternum simple, its surface continuous; velvety area of mid tibia shortened above, lacking at least the upper pad of reverse hairs 5
3. Ventral hairy pockets of second metasomal sternum rather small, reduced to two oblique arches converging behind and broadly separated from each other by a level area as broad as the ocellorbital distance; the two pads of reverse hairs on upper part of velvety area clearly separated by a raised carina; cream white parocular stripe broadened below and most of the scape of the same color; tegument green shining with golden to carmine tinge on metasomal terga 1. *ignita*
- Ventral hairy pockets of second metasomal sternum rather large, in arches subparallel to gradulus and almost touching each other on mid line; the two pads of reverse hairs almost continuous; cream white parocular stripe narrow, scape entirely dark brown or with a small shortened whitish stripe; tegument all over bluish green or coppery red 4
4. Larger and more robust bees (head width 5.5 mm, anterior wing 11.2 mm), bluish to violet-green; scape with a short white stripe; punctures on disc of mesoscutum of two sizes (60 and 40 μ) the smaller ones more numerous and becoming of an intermediate size (50 μ) toward the borders, rather dense (interspaces about as large as the diameter of a puncture); punctures on disc of second metasomal tergum nearly as dense as on third tergum; marginal smooth depression on terga 3-5 rather broad (200:180:120 μ) 2. *imperialis*
- Smaller (head width 5.17 mm, anterior wing 10.6 mm), shining with a coppery red tinge; scape dark brown; punctures on disc of mesoscutum rather uniform, small (30 40 μ) and sparse (interspaces about two to four diameters of a puncture), punctures on disc of second metasomal tergum much sparser than on third tergum; marginal smooth depression of third to fifth tergum narrow (120:100:40 μ) 3. *flammea*
5. Cream white marks extensive (scape, parocular stripe widely broadened below reaching tentorial pits, translucent spots on labrum very small, about the size of median ocellus); a large black spot on lower frontal portion of mesepisterna; malar area conspicuously shorter than half diameter of fourth flagellomere; scutellum elongate, subparabolic (270:152); velvety area of mid tibia poorly developed; inner side of mid basitarsus distally with a small glabrous and swollen area with a thick tuft of ferruginous bristles behind; hind femur deeply concave beneath, hind tibia strongly convex anteriorly 4. *nigrosignata*.
- Cream white marks reduced (lacking or very reduced on scape; parocular stripe narrow, translucent spots of labrum larger); frontal portion of mesepisterna

- broadly green; malar area slightly shorter than diameter of fourth flagellomere; scutellum subtruncate slightly shorter or as long as half its width; velvety area fully developed; inner side of mid basitarsus more or less carinate, clothed with uniformly distributed black or fuscous bristles; hind femur nearly straight beneath, hind tibia moderately convex anteriorly 6.
6. Larger bees (head 5.42 mm, anterior wing 12.48 mm), tegument bluish-violet to purple, scape dark brown; postpalpal portion of galea remarkably long (longer than six times eye length); a laminate tooth on inner side of mid basitarsus, velvety area without upper pads of reverse hairs; punctures on mesoscutum rather small (about 40 μ), sparse (interspaces about twice the diameter of punctures), nearly uniform, on metasomal terga very shallow, on fifth and sixth terga larger and a little stronger 5. *asarophora*.
- Smaller (head 4.8 mm, anterior wing 9.7 mm), tegument light green with a faint golden brilliance, scape with a shortened white stripe; postpalpal portion of galea moderately long (shorter than five times eye length); a very obsolete median carina on inner side of mid basitarsus, velvety area ending above in a small pad of reverse hairs; punctures on mesoscutum minute (about 40 μ) with interspersed micropunctures, sparse on disc and near parapsidal sulci, denser in between and crowded around notauli areas, on metasomal terga well formed, rather strong and dense, a little larger and sparser on sixth tergum 6. *allosticta*.
7. Hind tibia rather narrow (narrower than half of maximum length), corbicular surface partially dull microreticulate; scutellum subparabolic (longer than half its width); scape with a conspicuous white stripe. Small (head 4.68 mm, anterior wing 9.03 mm), bluish green on head and thorax to violet on metasomal terga 4. *nigrosignata*.
- Hind tibia broad (broader than half of maximum length), corbicular surface micropunctured but shiny; scutellum subtruncate (as long as or slightly shorter than half its width); scape dark brown, sometimes with a very weak cream spot. Larger (head 4.84-5.45 mm, anterior wing 9.03-12.0 mm), without the above color combination 8.
8. Metasomal terga largely brassy to coppery red; corbicular bristles on anterior and posterior margins pale 9.
- Metasomal terga green, bluish or violet; corbicular bristles on anterior and posterior margins pale or mostly black 10.
9. Head and thorax mostly green, with a very weak golden tinge; mesoscutum densely punctate (interspaces nearly as large as small punctures) 1. *ignita*
- Head and thorax mostly coppery red as metasomal terga; mesoscutum sparsely punctate (interspaces twice to three times the size of small punctures) 3. *flammea*
10. Violet purple; marginal corbicular bristles mostly pale; punctures on mesoscutum sparse (interspaces larger than punctures), on metasomal terga sparse and shallow chiefly on fourth and fifth segments 5. *asarophora*
- Golden green or bluish green; marginal corbicular bristles mostly black; punctures on mesoscutum conspicuously of two sizes, dense, almost crowded on notauli areas, on metasomal terga rather dense and strong. 11.
11. Larger and more robust bees, bluish green with scape dark piceous; punctures on lower parocular areas much smaller toward orbits, on notauli areas dense but larger and smaller clearly distinguishable; marginal smooth depression on third and fourth metasomal terga wide (200: 180 μ) 2. *imperialis*.
- Smaller bees, golden green with scape marked by a faint cream spot; punctures on lower parocular areas nearly of uniform size, on notauli areas crowded and the two sizes almost indistinguishable; marginal smooth depression on third and fourth metasomal terga narrow (80: 80 μ) 6. *allosticta*.

1. *Euglossa (Glossura) ignita* Smith, 1874.

Euglossa ignita Smith, 1874, Ann. Mag. Nat. Hist., (4) 13: 444. 3.

Euglossa ignita var. *chlorosoma* Cockerell, 1918, Bull. Am. Mus. Nat. Hist., 38: 688.

TYPE: Male, N° 17B-950, in the British Museum of Natural History, from Jamaica.

The specimen described by Smith was the most highly colored one. Ordinary coloration was indicated by Smith as green with a faint coppery tinge towards the apex of abdomen.

FRIESE 1899) compares *ignita* with *piliventris* as the closest relative, but there is not so close a relationship between *piliventris* and *ignita*. The ventral pockets of *piliventris* are deeper, with short external hairs, the opening relatively small and directed laterad. The punctation, the pubescence and the oily gloss of the thorax are also very distinctive characteristics of *E. piliventris*, which is confined to the Amazonian area.

Cockerell described some specimens from British Guiana as *chlorosoma*, which he separates from the typical form by the color, as being "green without coppery tints, but variably suffused with purple". I have had the opportunity of studying some of those specimens at the U. S. National Museum, at the American Museum of Natural History and at the University of Michigan. There are two species confused, one very closely related to the *imperialis* group, which includes *chalybeata* Friese, 1925, and *flammea*, and the other indistinguishable from the not so brightly colored specimens of *ignita*. My notes on the holotype, a female labelled "Hym. 140" at the American Museum of Natural History, New York, are incomplete, but the male labelled with the same number and designated "cotype" by Cockerell is *ignita* proper. At the U. S. National Museum, one of the male cotypes also belongs to *ignita*, but the specimen from Bartica, B. G., V. 17. 1901, has the ventral hairy pockets of the second metasomal sternum connected together (as in *imperialis*!) At the Snow Entomological Museum (University of Kansas) there are also two male cotypes from Bartica, n° 190 Hym., which belong to *ignita*. The female from Kalacoon, classified as *ignita* by Cockerell, is at the Zoological Museum of the University of Michigan.

Euglossa ignita is the most common species of *Glossura* in the Amazonian area. Apparently the only record for JAMAICA is the one in the original description. Dr. R. L. Dressler found this species on the Caribbean slopes of Panamá and Costa Rica. The northernmost record is Cayuga, GUATEMALA, and the male specimen studied by Cockerell was seen by the author at the U. S. National Museum. The southwestern boundary of distribution is a male specimen captured in Bucay, 300 m, ECUADOR, and Dr. Carlos Alberto Campos Seabra has specimens from Parque Sooretama, near Linhares, in the state of Espírito Santo, BRASIL.

2. *Euglossa (Glossura) imperialis* Cockerell, 1922.

Euglossa (Glossura) piliventris imperialis Cockerell, 1922, Proc. U.S. Natl. Mus., 60 (18): 6.

TYPE: Female, n° 24822, in the U.S. National Museum, from Rio Trinidad, Panamá.

Cockerell's description is brief and refers only to color nuances. It is a close relative of *ignita* and belongs to the same complex, which also includes *chalybeata*, *flammea* and *stellfeldii*. There is some difficulty in distinguishing *ignita*, *chalybeata* and *imperialis* along the River Amazonas, but no intermediate or transitional forms have been found in Central America. Similar phenomena are found in other superspecies of *Euglossa*, *Euplusia* and *Eulaema*.

3. *Euglossa (Glossura) flammea* n. sp.

(Figs. 1-4)

This species is very similar in color to *Euglossa ignita*, with brilliant coppery tinge on mesonotum and metasomal terga. On the other hand, the structure of the hairy pockets of the second metasomal sternum resembles that of *E. imperialis*, differing principally in the distribution of punctures, width of the marginal depression on metasomal terga, white spots on face, general color and vestiture. In spite of these differences, the affinities of this species are closer to *E. imperialis* and *E. chalybeata*.

Male. Tegument green with golden reflections on face, genae, meso- and metepisterna, propodeum and legs, mostly coppery red on frons, mesonotum, posterior tibiae and metasomal terga. Cream white are: the mandibles (but the teeth black), labrum with two translucent elliptical spots, ventrolateral angles of clypeus, malar area and a narrow stripe on parocular areas reaching the level of alveolar centrum and leaving a narrow and elongate green triangle on the lower juxtaorbital portion; scape brownish dark. Tegulae golden green; wings subhyaline, veins honey dark.

Pubescence moderately developed, mostly whitish but predominantly black on upper part of clypeus, supraclypeal area, on upper frons transversely, on vertex, mesoscutum and scutellum; a few black hairs mixed on lower frons, pronotal lobes and upper mesepisterna just behind pronotal lobes; a small tuft of short black hairs on the anterior third of tegulae; short black hairs scattered on second and third metasomal terga, sparser on following ones. A row of about seventeen short black bristles on each gena near the orbit. Longest hairs on vertex about 1100 μ , on posterior margin of scutellum about 700 μ ; posterior fringe of front tibiae shorter than on front tarsi (600:1000 μ); velvety area of mid tibia fully developed, with the two pads of reverse hairs more or

less connected together in a cuneiform shape, anterior and posterior fringes simple, a few simple black bristles arising from tuberculate punctures of posterior outer area; mid basitarsus externally clothed with rather sparse white hairs, armed with three strong wavy laminate bristles, on inner side hairs mostly fuscous; on hind tibia externally sparse and pale with a few black hairs on upper third posteriorly, posterior fringe sparse, contour arcuate, longest hairs 1050 μ . On disc of second metasomal tergum moderately long (300 μ), much shorter medially apicad (100 μ) but surpassing the following puncture; on third tergum a trifle longer; on following terga slightly longer.

Punctures on upper frons (under transverse fascia of black hairs) of moderate size (40-60 μ), dense, becoming elongate and sparser towards the ocelli and larger towards the supralveolar arcades (80 μ) leaving small smooth areas in front of the ocelli and microshagreened ocellorbital areas; interocellar area with smaller elongate punctures connected with the frontal punctured areas; a little larger (80-90 μ) on the supralveolar arcades, becoming much smaller below leaving a smooth area around the alveoli and near the alveolorbital suture; on lower parocular areas larger, elongate, shallow and much sparser; on clypeus disc larger (120 μ) and forming irregular and somewhat arcuate rows on the upper five-eighths, on the lower three-eighths very irregular and directed apicad, outside of the lateral carinae more or less confluent on upper portion and obsolete below; on genae minute, shallow, elongate rather dense leaving a broad smooth area along the orbits with a row of about seventeen large punctures (140 μ). On mesoscutum rather small (30-40 μ) and uniform, interspaces very smooth and large (80-100 μ) all over mesoscutum without minute interspersed punctures; on scutellum slightly larger (40-60 μ), sparse on disc, with a few interspersed minute punctures, larger, inclined and denser marginad; on mesepisterna shallower, a little sparser and more uniform in size (about 40 μ) than on mesoscutum; on metepisterna very small and very sparse on disc and on flanks of propodeum minute and moderately dense in front of the spiracles very sparse behind. On tegulae small (20 μ), rather dense on disc, sparser apicad. On external face of anterior tibiae sparse; on mid-tibia behind the velvety area smooth with a very few tuberculate punctures posteriorly; on hind tibia very sparse (interspace 200-250 μ) below, still sparser towards the upper portion of the glandular slit, becoming a little denser basad, with a few minute punctures interspersed. On first metasomal tergum granulose and inclined, sparse, forming irregular arcuate rows on median basal portion, with a few minute punctures interspersed, becoming denser laterad, on median apical portion very minute and moderately dense, leaving a smooth margin of about 120 μ ; on second tergum stronger and more or less semilunar (50 μ transversely) forming irregular transverse rows, with a few interspersed minute punctures, distance between rows almost as long as transverse width of a puncture, becoming sparser laterad and smaller apicad; on third tergum dense, more uniform on disc, progressively smaller and sparser basad; on following terga slightly larger and denser; marginal smooth depression poorly indicated in second tergum, on third and fourth very distinct but narrow (100 μ), on fifth and sixth still

narrower; on seventh tergum punctures small and dense on apex, sparser basad.

Head slightly narrower than abdomen (517 : 533)*; eye about as long as twice its width (340 : 172), inner orbits converging rapidly on upper fourth, lower interorbital distance longer than upper one and maximum interorbital distance conspicuously shorter than eye length (340 : 205 : 529 : 236). Mandibles bidentate; distal portion of galea about 5.25 times as long as eye length (1785 : 340), almost entirely glabrous on basal fourth; labrum longer than broad (145 : 130), with median carina slightly shortened basally, lateral ones obsolete, translucent spots elliptical and rather large (40 : 70); malar area one-fifth of mandible width or about three-fifths of flagellar diameter (16 : 80 : 26); Clypeus strongly protuberant (slightly less than eye width in profile), a trifle longer than clypeocellar distance and seven-ninths of its width (176 × 228 : 170), with a moderately strong median carina continued over the supraclypeal area to the apex of the frontal sulcus, lateral carinae convergent above and there almost obsolete, subparallel to the epistomal suture below the tentorial pits. Inter-alveolar distance as long as three times the alveolorbital one or the alveolar diameter much shorter than alveolocellar distance (120 : 40 : 170 : Ø 40); supralveolar arcade gently arched, rounded. Interocellar distance shorter than transverse diameter of median ocellus and slightly more than half ocellorbital distance (30 : 56 : Ø 36); ocelloccipital distance much shorter than the diameter of median ocellus and about half orbitoccipital distance (24 : 50), with a median shallow sulcus between ocelli, without postocellar sulcus, but with a depression from the postocellar tubercle directed to the anterior part of orbit. Scape much shorter than clypeocellar distance and one-third of the length of pedicel and flagellum together (110 : 170 : 330), first to fourth flagellomeres as long as 48 : 24 : 24 : 26 and diameter of the fourth flagellomere 26. Lateral angles of pronotum slightly depressed before the angle which becomes a little more conspicuous; scutellum slightly longer than half width (148 : 292), subtruncate broadly rounded at each corner and depressed medially. Mid basitarsus shorter than tibia (225 : 260), its posterior border emarginate, upper part angulately prominent; hind femur straight below, hind tibia large (front, hind and distal sides 380 : 550 : 290), apical margin almost straight, posterior margin a little concave at upper part of glandular slit and very gently convex apicad, anterior margin broadly convex, ending in two very obsolete spines over tibial spurs, glandular slit starting at three-sevenths of posterior margin; hind basitarsus as long as apical margin of tibia, and almost three times as long as broad (290 : 105), its hind margin suprallel to the anterior one on the distal two-thirds projected in an acute angle. Ventral pockets of the second metasomal sternum very large, transverse, hairy and connected apically at the mid line.

Body length 14.0 mm, anterior wing measured from costal sclerite to wing tip 10.6 mm; head and abdomen widths 5.17 mm and 5.33 mm.

* Measurements are in hundredths of millimeters.

Female unknown.

TYPE AND TYPE LOCALITY: Holotype male, U. S. National Museum, Navy Reservation north of Gamboa, Canal Zone, PANAMA, September 16, 1964, R. L. Dressler n° 94, visiting flowers of *Stanbopea* sp. Paratypes sent to several collections are: 3 males of the same series as the holotype (one in Moure's collection); 3 males: Golfito, prov. Puntarenas, COSTA RICA, April 28, 1965, visiting flowers of *Gongora* sp., R. L. Dressler n° 258; 2 males, feeding on two species of *Ischnosiphon*, R. L. Dressler n° 257; 5 males from Las Cruces S. San Vito, Prov. Puntarenas, COSTA RICA, July 6, 1965, R. G. Wilson legit on *Anthurium*.

4. *Euglossa (Glossura) nigrosignata* n. sp.

This is a very distinctive small *Glossura*. Males have a large dark spot on the lower front portion of the mesepisterna, an obsolescent velvety area on mid tibia, narrow and deformed hind legs, sparse punctuation and simple second metasomal sternum. The narrow hind tibia, small size, sparse punctures in female are also very characteristic for that sex.

Male: Tegument mostly green with a faint golden reflection, more conspicuously so on ventral side of thorax, turning to a dilute bluish in some light on depressed margin of metasomal terga. Cream white are: mandibles (but teeth black), labrum with two very small spots of translucent brown, ventrolateral angles of clypeus, malar area, a broad stripe on parocular area starting at the upper alveolar tangent and widening progressively down to fill entirely the lower part above lateral portion of epistomal suture, most of the scape except a black stripe behind. A very large dark-brown spot on lower front part of mesepisterna. Tegulae green; wing moderately fuscous, free apical portion a little darker; veins dark fuscous.

Pubescence moderately developed, with some long black hairs on vertex (to 1200 μ) and mesoscutum (700 μ), densely and softly plumose on episterna and lateral sides of propodeum. Pale on labrum and below frontal band of very sparse and long black hairs, on genae, thorax (with sparse and stronger black hairs mixed on mesoscutum and a very few on the upper part of the pronotal lobes, legs, propodeum, first metasomal tergum, ventral side of metasoma and last terga. Mostly black on the vertex and forming a row of few (9-10) strong short black hairs on genae arising from the large punctures along the orbits. Posterior fringe of front tibiae shorter than on front tarsi; velvety area of mid tibia rather small, obsolescent and incomplete, more or less dagger-shaped, truncate and much shortened above, without pads of reverse hairs and lacking the row of reverse eyelash-shaped bristles, without short spinous bristles on posterior external concave area, anterior fringe pale, weak; mid basitarsus externally clothed with sparse pale hairs and armed with three long wavy laminate bristles, hairs on inner side basally pale and forming apically and posteriorly a dense tuft of ferruginous bristles leaving a small glabrous area anteriorly. Pubescence on hind tibia sparse and pale, with a few black hairs on upper third, posterior fringe sparse without definite contour (longest hairs about 900 μ). On disc of second metasomal tergum rather long and pale basad shorter and black apicad (clearly surpassing the two or three following punctures); on disc of third

tergum black sparser and a trifle longer becoming pale on sides with some strong erect black hairs mixed; on fourth, fifth and sixth terga hairs longer and black erect hairs very conspicuous but fewer.

Punctures on upper frons of moderate size (50-60 μ), dense, becoming elongate and diverging from frontal line laterad, leaving a very large smooth and impunctate area continuous in front of ocelli and extending over most of the ocellorbital area limited behind by a micro-shagreened area broadened towards the upper portion of the orbits; slightly larger (70-90 μ) on supra-alveolar arcades and becoming rapidly smaller below; very sparse and shallow on lower parocular areas almost disappearing on the white portion; on clypeus disc very flat and large, semicircular, becoming more normal basad and apicad, behind lateral carinae a little elongate; on genae minute sparse and shallow, leaving a smooth area along orbits with a simple row of large punctures scattered below and closer to each other above. On mesoscutum rather small (20-30 μ) and uniform, interspaces much larger (2-3 diameters of a puncture); on scutellum of various sizes, starting as very minute ones near base, large (40-50 μ) on disc with some minute punctures scattered and becoming larger and elongated on posterior margin, very crowded and minute on median depression posteriorly; on mesepisterna shallower and sparser than on mesoscutum; on metepisterna still smaller and on flanks of propodeum very minute. On tegulae small and moderately dense, sparser anteriorly and posteriorly, evanescent inward. On external face of front tibiae rather sparse; on mid tibia behind velvety area strongly pyramidal and rather numerous, posteriorly minute, very sparse and shallow; on hind tibia paraboloid-elongate, rather large and shallow, moderately dense with more numerous fine punctures interspersed, and micro-canaliculi connecting points of origin of hairs in series of inclined lines, punctures becoming very sparse apicad and toward the glandular slit leaving a broad area free of large punctures (minute ones evanescent) around, above and behind glandular scar. On first metasomal tergum granulate on base in irregular transverse rows, more normal and crowded laterad, on depressed margin minute and dense, a trifle transverse and simulating arched rows; on second tergum shallow, transversely arched and sparse on base with interspersed minute punctures, becoming denser and smaller on depressed area medially, more regular and greater (50-60 μ) and a little sparser on sides; on the following terga punctures progressively greater, more or less elongate, on third still keeping the distributional pattern of the second tergum and less so on the last segments; marginal smooth depressions poorly marked on second tergum, clearly on sides of third and conspicuous all over entire margin on fourth, fifth and sixth terga (width from third to sixth measured in lateral third 160 : 140 : 100 : 60), on fourth almost uniformly developed, on fifth and sixth slightly broadened medially.

Head slightly narrower than abdomen (426 : 480); eye 2.28 times as long as broad (320 \times 140), inner orbits converging rapidly on upper fourth, lower interorbital distance equal to upper one, maximum interorbital distance conspicuously shorter than eye length (320: 210: 280: 210). Mandibles biden-

tate; distal portion of galea about 3.6 times as long as eye length (1150: 320), almost entirely glabrous on basal fourth; labrum longer than broad (130 × 120) with median carina shortened basally, lateral ones obsolete, translucent spots rather small (28 × 20) ending in a short brown line; malar area one-eighth of mandible width or two-fifths of the diameter of the fourth flagellomere (10: 80: Ø 25). Clypeus strongly protuberant (a little less than eye width in profile), as long as clypeocellar distance and three-fourths of its width (150 × 200: 150), with a moderately strong median carina continued to the apex of frontal sulcus, lateral carinae weak subparallel to epistomal suture, curved inward below, a little swollen on upper portion and ending two-ninths before upper portion of epistomal suture. Interaveolar distance more than three times the alveolorbital distance or alveolar diameter, much shorter than alveolocellar distance (115 : 36 : 145 : Ø 36); supralveolar arcade gently marked, mostly rounded. Interocellar distance shorter than transverse diameter of median ocellus, two-fifths of ocellorbital distance (26 : 64 : Ø 30); ocelloccipital distance shorter than diameter of the ocellus, about half orbitoccipital distance (22 : 42) without post-ocellar sulci. Scape much shorter than clypeocellar distance, slightly shorter than two-sevenths of flagellum and pedicel together (87 : 150 : 312), first to fourth flagellomere as long as 42 : 20 : 24 : 27 and the diameter of the fourth 25. Lateral angles of pronotum almost right angled; scutellum strongly arched, subparabolic, longer than half its width (152 : 270), conspicuously depressed medially. Mid basitarsus longer than tibia (228 : 220), its posterior border emarginate, upper part rounded, armed with three wavy laminate bristles; hind femur excavate beneath, hind tibia rather small (front, hind and distal sides as long as 272 : 375 : 215), apical and posterior margins almost straight, front margin concave-convex-straight ending in two small spines over tibial spurs, glandular slit starting a little above mid posterior margin; hind basitarsus relatively long, longer than apical margin of hind tibia or twice its own width (240 × 93). Hairy ventral pockets on second metasomal sternum lacking.

Body length 11.9 mm, anterior wing 9.03 mm; head and abdomen widths 4.62 mm and 4.80 mm.

Female: Body bluish green, more bluish purple on scutellum and metasomal terga. Cream white colored: labrum, margined with dark fuscous and with two irregularly oval brownish translucent spots of moderate size (52 × 34), mandibles with dark fuscous margins and teeth, a small spot on malar area, ventrolateral angles of clypeus and an obsolete stripe on scape. Lacking the dark brown spot on front part of mesepisterna. Tegulae green; wings moderately fuscous, veins dark fuscous.

Pubescence moderately developed, with some long black hairs on vertex (1200 μ), mesoscutum (700-800 μ) and scutellum (1000 μ). Pale, dense and softly plumose on episterna and propodeal flanks with a few black hairs near wing bases and on pronotal lobes. Pale on genae, ventral side of thorax, posterior margin of scutellum beneath; on femora, fringes of front and mid tibiae, front tarsi, external face of mid basitarsus, long (1120 μ on posterior margin and 700-620 on anterior margin) on hind tibia with a few black corbicular bristles

more numerous on external face of hind basitarsus; on inner side of hind basitarsus black. On frons, clypeus and labrum mostly black, on lower parocular areas pale. Navicular tuft of scutellum black, rather small (65×36). Pale on first and two last metasomal terga (some hairs on sixth reaching 1000μ), pale and black mixed on second to fourth, hairs on apical disc of second tergum surpassing two to three consecutive punctures; on sterna rather long (on third some hairs 700μ long), pale with a few black hairs mixed on sixth sternum.

Punctures on upper frons of moderate size ($40-60 \mu$), dense, becoming elongate on upper part and on sides, leaving a large smooth area at side of each lateral ocellus limited behind by a micro-shagreened area broadened laterad and occupying most of the ocellorbital area, smooth area in front of median ocellus moderate and separated from lateral ones by a few scattered punctures; among and behind ocelli irregular and more or less elongate and evanescent; on supra-veolar arcades slightly larger ($70-80 \mu$) diminishing gradually in size toward antennal socket; smaller, very sparse and shallow on lower parocular areas; on clypeus disc a little obsolete and flat, semicircular, more normal basad, apical and behind lateral carinae; on genae very small and scattered leaving a narrow smooth area along orbits with a row of large punctures (9-11 punctures of about $80-100 \mu$) with a short black hair in each of them. On mesoscutum rather small ($20-30 \mu$) and uniformly scattered, smooth interspaces larger than punctures (two to three diameters); on scutellum of various sizes ($10-90 \mu$), starting very small on base and becoming larger denser and elongate on posterior margin converging mesad, minute and crowded around navicular tuft; on mesepisterna shallower, a little larger and sparser than on mesoscutum; on metepisterna very small and sparse, on flanks of propodeum minute but interspaces micro-shagreened; on outer face of front tibiae moderately dense; on second tibia of two sizes, granulate, posteriorly bearing a few (6-8) spinelike thick black bristles; on basitarsus of two sizes, sparser basad; on hind tibia with fine and shallow and irregular punctures on the upper third, corbicular concavity microtessellate and with scattered micropunctures leaving smooth the front swollen portion; on hind basitarsi granular and sparse with interspaces microtessellate. On tegulae smaller than on mesoscutum, rather dense on disc becoming sparser anteriorly and posteriorly. On first metasomal tergum granular and irregularly transverse on base, more crowded laterally, on depressed margin minute, transverse and moderately sparse forming arched rows; on second tergum transverse and simulating arched rows more evidently on posterior third, sparser basad, larger ($50-60 \mu$) more rounded and sparser laterad; on third and fourth terga much as on second but punctures progressively larger and sparser, on fifth larger and elongate, on sixth minute granular and sparse; depressed smooth margin on second and third terga conspicuously marked laterally ($120 : 140 \mu$) obsolescent mesad, on fourth and fifth broader ($180 : 140$) and widening mesad; on sterna rather dense and granulose, becoming smaller and sparser mesad.

Head slightly narrower than abdomen ($468 : 492$); eye 2.25 times as long as broad ($315 : 140$), inner orbits converging rapidly on upper fourth, lower interorbital distance slightly shorter than upper one, maximum interorbital

distance a little shorter than eye length (315 : 255 : 295 : 235). Mandibles with their lower border moderately angulose on distal third; distal portion of galea about 4 times as long as eye length (1270 : 315), with sparse short and thin upcurved hairs on its basal fourth; labrum a trifle longer than broad (128 : 124), with a strong basally abbreviated median carina; malar area slightly longer than one sixth of mandible basal width or about half diameter of fourth flagellomere (14 : 82 : 26). Clypeus strongly protuberant (a little less than eye width in profile), slightly shorter than five-sevenths of its width or slightly shorter than clypeocellar distance (150 × 216 : 164), lower clypeorbital distance as long as 1.25 times the diameter of fourth flagellomere (32 : 26); median carina moderately strong on lower two-thirds and above on supraclypeal area, obsolescent on upper third of clypeus, lateral carinae strong on lower fourth, obsolete on second and third fourths and evanescent above. Inter-alveolar distance more than twice alveolorbital distance, but conspicuously shorter than alveolocellar distance (116 : 48 : 155 : Ø 42); supralveolar arcades gently marked, rounded. Interocellar distance shorter than transverse diameter of median ocellus and about one-third of ocellorbital distance (26 : 76 : Ø 34); ocelloccipital distance shorter than ocellar diameter and a little longer than half orbitoccipital distance (32 : 55), postocellar tubercle very minute, without postocellar sulci. Scape as long as three-fifths of clypeocellar distance and slightly longer than one-third of flagellum and pedicel together (100 : 164 : 288); first four flagellomeres as long as 38 : 22 : 24 : 25 and diameter of the fourth 26. Lateral angles of pronotum almost right-angled; scutellum almost semicircular, longer than half its width (155 : 280), moderately depressed medially. Mid basitarsus rather narrow (as wide as one fourth of its length) and slightly shorter than tibia (250 : 210); hind femur a trifle flattened ventrally, hind tibia rather narrow, posteriorly almost straight, almost as long as twice its maximum width (348 : 172), rounded distally and moderately emarginate, its anterior margin concave and medially convex; hind basitarsus conspicuously longer than twice its width (220 : 90), tapering gradually from its base.

Body length 11.7 mm; anterior wing 9.03 mm; head and abdomen widths 4.68 mm and 4.92 mm.

TYPE AND TYPE LOCALITY: Holotype male, "Hills north of El Valle de Antón, Prov. Coclé, PANAMA, November 21, 1964, visiting flowers of *Gongora* and scratching on sepals; possibly not pollinator," R. L. Dressler N° 151. Allotype female, Cerro Campana, Prov. Panamá, PANAMA, July 12, 1965, R. L. Dressler N° 298, collected in flower of Gesneriad, 10:15 AM. The bee entered the flower even though the flower was held in my hand and the flower shaking when the bee arrived." Holotype in U. S. National Museum, Allotype in Dressler's collection. Two males, paratypes, Cerro Campana, prov. Panamá, PANAMA, January 2, 1965, R. L. Dressler N° 172, visiting flowers of *Gongora* (El Valle). "These behaved very much as potential pollinators." One male in my collection, the other in the Snow Entomological collection, the University of Kansas.

5. *Euglossa (Glossura) asarophora* Moure & Sakagami, n. sp.

This species is the largest of the group of species lacking the ventral hairy pockets on second metasomal sternum in males. It may be distinguished from all others by the very shallow punctures on metasomal terga, and a laminate tooth on inner side of middle basitarsus just before distal articulation.

Male: Tegument bluish violet to purple, with parts of a green tinge in some light, ventral side more greenish than dorsal. Cream white are: mandibles (but teeth brownish black), labrum with two rather small translucent spots, ventrolateral angles of clypeus, two spots on malar area and a narrow juxtaorbital stripe slightly broadened below on lower parocular areas; scape dark brown without white stripe. Tegulae violet to purple green; wings faintly fuscous, veins honey dark.

Pubescence moderately developed, mostly whitish; black on frons, predominantly black on vertex and mesonotum, with a few black hairs on upper part of clypeus, supraclypeal area, pronotal lobes, on mesepisterna behind pronotal lobes and scattered on distal terga, short on proximal terga. A row of about fourteen stout and short black bristles on each gena near the orbit. Longest hairs on vertex 1000 μ , on posterior margin of scutellum about 700 μ ; posterior fringe of front tibiae about as long as on basitarsus (980 : 1000 μ) velvety area of mid tibia almost fully developed, shortened basally, lacking the pads of reverse hairs, anterior and posterior fringes simple, black bristles on conical punctured tubercles of medium size; mid basitarsus externally clothed with pale hairs and with three wavy laminate bristles on upper part of emarginate portion of posterior margin, on inner side thick bristles dark brown; on outer face of hind tibia whitish anteriorly and forming an arcuate posterior fringe (longest hairs 1100 μ), hairs on disc and apically short (200 μ), black, very sparse, on basal third posteriorly a little more numerous. On disc of second metasomal tergum suberect black bristles short (220 μ), appressed hairs near median portion of apical margin much shorter (about 80 μ); on third tergum a little longer (100-120 μ), on fifth and sixth lateral pale hairs rather long (700 μ).

Punctures on upper frons dense and elongate, of moderate size (50-60 μ), very sparse above leaving a smooth area in front of ocelli and anterior half of ocellorbital areas, on vertex very small and sparse and on sides granulose; round and moderately large (80 μ) on supralveolar arcades, a little smaller and elongate towards the alveoli leaving a small smooth area above and lateral, this reaching the orbits above the alveolorbital sulcus; on lower parocular areas smaller, sparser and very shallow; on clypeus between lateral carinae shallow, irregular, of moderate size, somewhat transverse above and longitudinal below, on lateral portions stronger and rounded basally, longitudinally elongate medially and very shallow and obsolete below; on genae minute and dense, weakly granulose, leaving a moderately broad smooth band with about fourteen large punctures near the orbits. On mesoscutum small (about 40 μ), rather uniform in size and distribution all over the surface, a little closer on anterior corners, interspaces

smooth and about two diameters of a puncture; on scutellum sparse, very shallow anteriorly, conspicuously of two sizes (45 and 20) on disc, larger, elongate and denser on borders, median depression smooth; on mesepisterna punctures about of the same size as on mesoscutum, a little elongate, sparser on disc and denser toward the metepisterna; on metepisterna minute, sparser below; on propodeal flanks minute and moderately dense near and in front of spiracles, much sparser posteriorly, propodeal triangle microtessellate and sparsely granulate-punctate. Tegulae minutely (20 μ) and densely punctate on disc, very shallowly and sparsely posteriorly, shallowly and sparsely and very finely anteriorly. On outer face of front tibiae sparse, behind velvety area of second tibia with a few irregular conical punctate tubercles on posterior margin, glabrous upper portion of velvety area very smooth and shiny; on hind tibia larger punctures (60 μ) very sparse on disc, a little closer on posterior upper third, minute punctures interspersed among larger ones, sparser below and reaching the glandular slit. First metasomal tergum very shallowly punctate, larger punctures sublunular in shape, sparse on disc basally, closer laterad and with micropunctures interspersed, micropunctures on apical margin obsolete and leaving a broad smooth unpunctured apical band; on second and third terga punctures larger, shallow and closer side by side, sparse longitudinally, closer and stronger laterad, much smaller and shallow medially apicad; on fourth, fifth and sixth terga punctures sparse but becoming progressively larger and stronger; on seventh tergum dense and minute apically, larger basad; marginal smooth depression on second, third and following terga as broad as 200 : 200 : 200 : 120 : 100, measured about on the lateral third.

Head narrower than abdomen (542 : 565); eye nearly 2.06 times as long as broad (372 : 180), inner orbits rapidly and more converging above than below, maximum interorbital distance shorter than eye length 372 : 215 : 300 : 268). Mandibles bidentate; distal portion of galea a little longer than six times the eye length (2,285 : 372), almost entirely glabrous on basal fourth; labrum longer than broad (160 : 144), with three laminate carinae, lateral ones lower apicad, subparallel, translucent elliptical spots rather small (60 : 40); malar area nearly two-sevenths as long as mandible basal width, and slightly shorter than diameter of fourth flagellomere (25 : 90 : 27). Clypeus strongly protuberant (in profile nearly as long as eye width), longer than clypeocellar distance and about three-fourths of its width (190 \times 250 : 183); median carina conspicuous only on disc, lateral carinae converging in a parabola on upper one fifth. Inter-alveolar distance three times as long as alveolar diameter, which is slightly shorter than alveolorbital distance (120 : 44 : 172 : \varnothing 40); supra-alveolar arcades rounded. Interocellar distance shorter than transverse diameter of median ocellus and half ocellorbital distance (30 : 60 : \varnothing 36); ocelloroccipital distance shorter than ocellar diameter and nearly half orbitoccipital distance (32 : 60); median interocellar sulcus connected with posterior one and forming a shallow Y with curved upper arms, almost continuous with oblique depression behind small postocellar tubercle. Scape much shorter than clypeocellar distance and nearly three times shorter than pedicel and flagellum together (112 : 183 :

360); first to fourth flagellomeres as long as 52 : 22 : 24 : 27, the fourth as long as broad. Lateral angles of pronotum broadly rounded; scutellum nearly half as long as broad (312 : 165), subtruncate, deeply depressed medially, posterior angles broadly rounded. Mid basitarsus comparatively short, conspicuously shorter than tibia (200 : 280), its posterior margin deeply emarginated on upper three-fifths, basal part in an almost perfect right angle, inner side elevated in a rounded tooth before apical articulation. Hind femur almost straight below; hind tibia large (front, hind and distal sides 360 : 575 : 280), apical margin slightly convex before basitarsal articulation, posterior margin gently convex (contour a little depressed near upper part of glandular slit), anterior margin moderately convex, ending in a short rim above outer spur; glandular slit starting at upper three-sevenths on posterior margin; hind basitarsus longer than tibia apical width, 2.67 times its own width (300 : 112), anterior and posterior margins gently convex, ending in an acute angle. Hairy ventral pockets of second sternum lacking.

Body length 14.95 mm; anterior wing 12.48 mm; head and abdomen width 5.42 mm and 5.65 mm.

Female: Similar to male, except for the usual sexual characters, in color, pubescence and punctures. Cream white color reduced to the basal discal three-fifths of mandibles, a spot on malar area anteriorly and lateroventral angles of clypeus. The labrum white with two translucent elliptical spots larger than in male (80 × 40) reaching the basal articulation. Black hairs a little more numerous on clypeus, supraclypeal area and on tibiae of first and second pairs of legs, on inner face of basitarsi, a little mixed on borders of mid basitarsus, but almost all the marginal bristles of hind tibia pale; navicular tuft of black hairs on scutellum of moderate size (80 × 45).

Head as broad as abdomen (525 : 525), eye nearly 2.1 times as long as broad (369 : 175); inner orbits strongly more convergent above, maximum interorbital distance conspicuously shorter than eye length (369 : 215 : 305 : 280). Mandible tridentate, lower outer border concave basally and convex apically; distal portion of galea 6.45 times as long as eye length (2380 : 369), its basal fourth unarmed and with a few short recurved hairs; labrum longer than broad (160 : 150), with a median carina, malar area a little longer than two-ninths of mandibular width, and shorter than diameter of fourth flagellomere (24 : 90 : Ø 27). Clypeus strongly protuberant, about as long a three-fourths of its width and shorter than clypeoocellar distance (185 × 250 : 195), lower clypeorbital distance nearly as long as diameter of fourth flagellomere (28 : 27), median carina conspicuous in its upper three fourths, lateral carinae converging in a parabola before clypeus base but a little obsolete above. Inter-alveolar distance about three times as long as alveolar diameter, but much shorter than alveolocellar distance (128 : 40 : 185 : Ø 44); supralveolar arcades rounded. Interocellar distance slightly shorter than transverse diameter of median ocellus and about half ocellorbital distance (34 : 62 : Ø 36); ocelloccipital distance slightly longer than ocellar diameter but much shorter than orbitocipital distance (40 : 65);

interocellar sulcus obsolete, postocellar tubercle minute followed by an oblique depression toward anterior margin of orbit. Scape conspicuously shorter than clypeocellar distance and slightly longer than three-eighths of flagellum and pedicel together (130 : 195 : 360); first four flagellomeres as long as 52 : 22 : 26 : 28 and diameter of the fourth 27. Lateral angles of pronotum obtusely angled; scutellum nearly twice as broad as long (312 : 160) with posterior angles very broadly rounded. Mid basitarsus shorter than tibia (252 : 280); hind tibia almost twice as long as its maximum width (480 : 245), anterior margin concave basally and broadly convex, posterior margin conspicuously convex apically and distal border deeply notched near the basitarsus articulation; hind basitarsus almost three times as long as broad (260 : 95) tapering apicad, posterior margin straight.

Body length 13.94 mm; anterior wing 10.30 mm; head and abdomen width 5.25 mm and 5.25 mm.

TYPE AND TYPE LOCALITY: Holotype male, V. de Chiriquí, 2500 - 4000 ft, Champion, PANAMA, in the British Museum. Allotype female, Piña Area, Canal Zone, PANAMA, July 18, 1965, R. L. Dressler N° 312, together with two other female paratypes, "feeding on *Costus villosissimus*". One male paratype, Cerro Campana, Prov. Panama, PANAMA, January 2, 1965, R. L. Dressler N° 173, "visiting flowers of *Gongora*". Three males, near Chitaria (Turrialba - Siquirres Rd.), prov. Cartago, COSTA RICA, March 10-11, 1965, R. L. Dressler N° 228, "on flowers of *Mormodes colossus*". One male Puerto Viejo, Prov. Heredia, COSTA RICA, August 6, 1965, R. L. Dressler, N° 371, "on *Paphinia clausula*". One male San Carlos, COSTA RICA, 1902, dt. by Friese as "*Euglossa piliventris*" at Snow Entomological Museum, University of Kansas.

6. *Euglossa (Glossura) allosticta* n. sp.

Euglossa allosticta belongs to the group of *asarophora* and *nigrosignata*. The males of this group are readily distinguishable by the lack of ventral hairy pockets on the second metasomal sternum. The anterior micropunctate portion of the mesepisterna is uniformly green, the velvety area fully developed and the scutellum subtruncate as in *asarophora*. *E. allosticta* differs from *asarophora* in size, punctuation and color, and is separable at once by the presence of a thick tuft of fuscous hairs on the upper half of the metepisterna. In *asarophora* and *nigrosignata* that tuft is pale or whitish.

Male: Tegument uniformly metallic green with very faint golden tinge on abdomen and legs, in some light turning to bluish. Cream white colored are: mandibles but teeth black, labrum with two translucent elliptical spots, ventrolateral angles of clypeus, malar area and an uniformly narrow stripe on lower parocular areas extending to the level of the lower alveolar tangent and separate below from the orbits and malar area spot by a small green triangle; scape dark brown with a shortened white stripe on its outer side. Tegulae metallic green; wings subhyaline, veins brownish dark.

Pubescence moderately developed, mostly whitish pale, predominantly black on upper portion of clypeus, supraclypeal area, vertex and mesonotum;

entirely black on frons forming a transverse band above supralveolar arcades, and a dense tuft on the upper half of metepisterna; a few mixed black hairs on pronotum, pronotal lobes and on upper portion of mesepisterna behind pronotal lobes. Short black hairs scattered on second and third metasomal terga, scarcer on following ones. A row of about twelve stout and short black bristles on each gena near the orbit. Longest hairs on vertex about 950 μ , on posterior margin of scutellum 700 μ ; posterior fringe of front tibiae shorter than in basitarsus (800 : 1100); velvety area of mid tibia fully developed, shortened basally, with only the frontal pad of reverse hairs, anterior and posterior fringes simple, black bristles of conical tubercles poorly developed; mid basitarsus clothed with pale hairs and with three wavy laminate bristles on emarginate portion of posterior margin, on inner side bristles dark fuscous; on outer face of hind tibia very sparse and extremely short (about as long as the diameter of the puncture) on disc, short toward anterior and posterior margin, darker on upper fourth, posterior fringe poorly developed, longest hairs about 600 μ . On disc of second metasomal tergum suberect black bristles short (200 μ), appressed hairs near median portion of apical margin shorter (100 μ); on third tergum a little longer, on fourth and following ones the pale hairs much longer (500 μ).

Punctures on upper frons crowded, minute (20 μ), slightly elongate and in rows diverging below, more elongate and sparser toward ocelli, connected with dense and minute interocellar punctures leaving small smooth areas in front of the ocelli and shagreened ocellorbital areas; larger (60 μ), rounded and dense on supralveolar arcades, becoming very dense laterad on upper parocular areas above, sparser below, and leaving a broad smooth area on outer side of alveoli, much sparser and elongate above alveoli, denser and minute on interalveolar area, larger and crowded on supraclypeal area; on lower parocular areas very sparse above near white stripe and denser toward epistomal suture, larger, sparser and elongate below; on clypeus between lateral carinae dense, larger (80 μ above to 100 μ below) and somewhat hexagonal, irregular on the border, sparser and smaller outside the lateral carinae; on genae minute and dense leaving a moderately broad smooth area with a row of 12-13 large punctures near the orbits. On mesoscutum minute and of almost uniform size (35-45 μ) with a very few interspersed micropunctures, sparse on disc and near parapsidal and median lines (interspaces three to four diameters of a puncture), anteriorly in between denser (interspaces about one diameter) and almost crowded on notauli areas; on scutellum minute and sparse anteriorly, denser on median depression, larger (40-50 μ) and much sparser (interspaces three to five diameters) on elevated areas, denser and a little larger near posterior margin, with micropunctures interspersed; on mesepisterna about of the same size as on mesoscutum, moderately dense above, sparse on disc (interspaces about two to three diameters) and sparser below; on metepisterna minute, dense above and very sparse below; on propodeal flanks minute, dense in front of spiracles, sparser behind, propodeal area microreticulate and with a few tuberculate minute punctures scattered. Tegulae densely punctured, punctures a little smaller than on mesoscutum (35 μ), sparser on anterior and posterior portions. On outer face of front tibiae sparse, behind

velvety area of second tibia with a few irregular conical punctured tubercles on posterior margin of the concave and smooth area; on hind tibia extremely sparse on distal third and near the glandular slit, very sparse (interspaces two to four diameters) and inclined on upper disc with minute punctures interspersed, a little denser on upper third and very dense near anterior margin. First metasomal tergum granulose on narrow basal part, expanded laterad and with micropunctures more numerous, on apical portion densely and minutely punctured; on second tergum rather dense and uniform on disc, smaller and sparse apicad, very sparse on the lateral premarginal elevations and leaving a broad smooth marginal area near the inner side of the elevations; on third, fourth and fifth terga very dense, crowded laterobasally, sparser and minute on median apical portion, larger, a little elongate and sparser on lateral elevations; on sixth tergum sparser and elongate medially, a little denser laterad; on seventh smaller, rounded and sparse basally, denser apicad.

Head slightly broader than abdomen (488 : 482); eye about as long as 1.88 times its width (324 : 172); inner orbits rapidly and more converging above, maximum interorbital distance conspicuously shorter than eye length (324 : 200 : 272 : 224). Mandibles bidentate; distal portion of galea 4.72 times as long as eye length (1530 : 324), almost entirely glabrous on its basal fourth; labrum a trifle longer than broad (126 : 124), with three carinae high and laminate, ending a little before basal articulation and reaching apical border, subparallel, lateral ones closer together than to lateral margin, translucent spots elliptical, rather short (55 : 38); malar area a little longer than one-fourth of mandibular basal width and slightly shorter than diameter of fourth flagellomere (22 : 82 : \emptyset 24). Clypeus strongly protuberant (less than eye width on profile), slightly longer than clypeocellar distance and about seven-ninths of its width (160 \times 210 : 155), with a moderately strong median carina shortened before apical border and continued weakly on upper clypeal tenth and reaching the apex of frontal sulcus, lateral carinae rather conspicuous converging in an ogive before clypeus base. Interveolar distance longer than three times the alveolorbital distance, much shorter than alveolocellar distance (110 : 33 : 160 : \emptyset 36); supralveolar arcades moderately built, rounded. Interocellar distance almost as long as transverse diameter of median ocellus, about two-thirds of ocellorbital distance (34 : 50 : \emptyset 36); ocelloccipital distance much shorter than diameter of ocellus and about half orbitoccipital distance (24 : 46) with a median shallow interocellar sulcus connected with two shallow short postocellar sulci forming a Y, depression from postocellar tubercle obliquely directed to anterior margin very shallow. Scape much shorter than clypeocellar distance and a little shorter than one-third of the length of flagellum and pedicel together (90 : 155 : 292); first to fourth flagellomeres as long as 42 : 17 : 20 : 21 and diameter of the fourth 24. Lateral angles of pronotum in an obtuse angle; scutellum about twice as broad as long (292 : 145), subtruncate, depressed medially, posterior angles rounded. Mid basitarsus a little shorter than tibia (215 : 220), its posterior border moderately widened basally in rounded angle and very shallowly emarginate, inner face raised in a very shallow median carina.

Hind femur straight beneath; hind tibia large (front, hind and distal sides 340 : 517 : 260), apical margin slightly angled before basitarsal articulation, posterior margin moderately biarched, anterior margin convex on basal third ending in a short rim above spurs, not projected in spine; glandular slit starting at upper three sevenths of posterior margin; hind basitarsus as long as tibia apical width and as broad as two-fifths of its length (260 : 104), posterior margin subparallel on distal two-thirds and ending in an acute angle. Hairy ventral pockets of second metasomal sternum entirely lacking.

Body length 13.09 mm, anterior wing 9.68 mm; head and abdomen width 4.88 mm and 4.82 mm.

Female: Exactly resembles the male in color, pubescence, puncture distribution and general shape. Cream white spots are reduced to mandibular disc (margins and teeth black), labrum (margins black, apical one broadly so), a small spot on malar area and ventrolateral angles of clypeus, a very obsolete spot on scape. Pubescence with more black hairs on clypeus and legs, particularly on inner side of mid and posterior tibiae and tarsi, a little mixed on borders of mid basitarsus and posterior margin of mid tibia, on lower side of hind femora and most of the anterior and posterior marginal bristles of hind tibia; tuft of black hairs on upper third of metepisterna very conspicuous, navicular tuft of black hairs on scutellum of a rather small size (65 × 45).

Head slightly narrower than abdomen (484 : 492); eye 2.05 times as long as broad (328 : 160), inner orbits strongly converging above in upper fourth, lower interorbital distance larger than upper one, maximum interorbital distance shorter than eye length (328 : 212 : 288 : 244). Mandible tridentate, lower outer border almost straight, slightly bent after its middle; distal portion of galea 4.56 times as long as eye length (1496 : 328), its basal portion unarmed and almost entirely glabrous; labrum shorter than broad (120 : 126), tricarinate, lateral carinae extending very little out of the translucent and regularly elliptical spots (60: 44); malar area a little longer than three-tenths of mandible basal width or as long as the diameter of the fourth flagellomere (25 : 80 : Ø 25). Clypeus strongly protuberant, about as long as two-thirds of its width and slightly shorter than clypeocellar distance (150 × 225 : 160), lower clypeorbital distance longer than diameter of the flagellum (30 : 25); median carina moderately strong shortened before apical border, lateral carinae converging in an ogive a little before clypeus base. Interveolar distance more than twice as long as alveolorbital distance, but shorter than alveolocellar distance (110 : 44 : 165 : Ø 36); supralveolar arcades rounded. Interocellar distance slightly longer than transverse diameter of median ocellus but shorter than ocellorbital distance (42 : 55 : Ø 36); ocelloccipital distance as long as ocellar diameter, shorter than orbitoccipital distance (36 : 55), postocellar tubercle minute, interocellar sulcus obsolete. Scape conspicuously shorter than clypeocellar distance and about three eighths of pedicel and flagellum together (110 : 160 : 288); first four flagellomeres as long as 52 : 18 : 20 : 22 and diameter of fourth flagellomere 36. Lateral angles of pronotum slightly obtuse; scutellum twice as broad as

long (290 : 145), subtruncate, depressed medially, posterior angles rounded. Mid basitarsus slightly shorter than tibia; hind tibia broadly triangular, its maximum width a little more than half its maximum length (420 : 220), anterior margin gently convex, posterior one conspicuously so on distal third, apical margin moderately concave; hind basitarsus longer than twice its width (220 : 92), posterior margin straight, anterior one slightly convex tapering apicad.

Body length 12.87 mm, anterior wing 9.03 mm; head and abdomen width 4.84 mm and 4.92 mm.

TYPE AND TYPE LOCALITY: Holotype male, allotype female and two paratypes (male and female) from Navy Reservation, North of Gamboa, Canal Zone, PANAMA, July 17, 1964, R. L. Dressler N° 48, "visiting flowers of *Costus friedrichsenii*". The same place, one female, July 8, 1964, R. L. Dressler N° 34, visiting the same plant. Same place one male and one female "visiting *Costus villosissimus*" July 11, 1964, R. L. Dressler N° 40; three males "visiting *C. friedrichsenii*" N° 41; one female, N° 52 "visiting *Costus* sp.". Four males, Cerro Campana, Prov. Panama, PANAMA, July 14, 1965, R. L. Dressler N° 303, "attracted by *Stanhopea ecornuta*; entering the flower, but too small to be pollinator". One male, Piña Area, Canal Zone, PANAMA, July 22, 1965, R. L. Dressler N° 324, on *Costus villosissimus*. One male, Cerro Campana, Prov. Panama, PANAMA, July 26-27, 1965, R. L. Dressler N° 342, "on *Calathea insignis*". Two males and one female, Barro Colorado Island, Canal Zone PANAMA, May 12 and 23, 1926 the males, and April 14, 1926 the female, C.T. Greene collector. The last three specimens from the U. S. National Museum.

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RESUMEN

Se presenta una revisión de las especies centroamericanas de *Euglossa*, subgénero *Glossura*, con una clave para la identificación de ejemplares de uno y otro sexo. Con la descripción de cuatro especies nuevas, la representación del subgénero en Centro América llega a seis.

Fig. 1. *Euglossa (Glossura) imperialis* Cockerell, 1922. Female. Dorsal view of head, thorax and abdomen. Front and ventral view of head.

