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## Five new species of *Geocoris* Fallén, 1814 from Peru: synonym, new records, and key to species (Hemiptera: Heteroptera: Lygaeoidea: Geocoridae)

### Cinco especies nuevas de *Geocoris* Fallén, 1814 de Perú: sinonimias, nuevos registros y clave para las especies (Hemiptera: Heteroptera: Lygaeoidea: Geocoridae)

Harry Brailovsky<sup>1,2</sup> and Ernesto Barrera<sup>1,3</sup>

Instituto de Biología, Universidad Nacional Autónoma de México, apdo, postal 70153, México, Ciudad de México, 04510.

<sup>1,2</sup>coreidae@ib.unam.mx; <https://orcid.org/0000-0001-7456-5678>

<sup>1,3</sup>ernesto.barrera@ib.unam.mx; <https://orcid.org/0000-0001-8276-2553>

#### ABSTRACT

The genus *Geocoris* Fallén, 1814 is recorded for the first time from Peru. Five new species are described: *G. castanoae*, *G. flatus*, *G. genuinus*, *G. infrequens*, and *G. navus*. *Geocoris sobrinus* (Blanchard, 1852) is recorded for the first time from Peru. *Geocoris barrosi* Porter, 1917 is considered a synonym of the nominal species *Geocoris sobrinus* (Blanchard, 1852). A key to the six species known from Peru is included, with photographs of the dorsal habitus, and parameres of some species.

**Key words:** Heteroptera, *Geocoris*, Peru, taxonomy, new species, synonyms, distribution, key.

#### RESUMEN

*Geocoris* Fallén, 1814 es citado por primera vez para el Perú y cinco nuevas especies son descritas: *G. castanoae*, *G. flatus*, *G. genuinus*, *G. infrequens*, y *G. navus*. *Geocoris sobrinus* (Blanchard, 1852) es citado por primera vez para el Perú. *Geocoris barrosi* Porter, 1917, es considerado como un sinónimo de la especie nominal *G. sobrinus* (Blanchard, 1852). Clave para las seis especies peruanas a la fecha conocidas son incluidas, así como fotografías en vista dorsal y parameros de algunas especies.

**Palabras clave:** Heteroptera, *Geocoris*, Perú, taxonomía, nuevas especies, sinonimia, distribución, clave.

The genus *Geocoris* Fallén, 1814 is currently classified in the family Geocoridae, superfamily Lygaeoidea (Henry, 1997). Members of this genus are small to medium-sized (2.70–3.97 male; 2.87–4.97 female), body relatively stout and ovoid; head broader than long, eyes are semistylate, sometimes close to or in contact with the anterior angles of pronotum, prominent, projecting backward and frequently overlapping anterior angles of pronotum; ocellus usually closer to inner margin of eye than to medial line of vertex; rostral segment II is distinctly shorter than III; claval commissure absent or very short; hemelytra in macropterous forms covering the abdomen, and hemelytral membrane large and extending beyond its tip or reduced to small flaps in braquipterous forms; abdominal stures between segments IV-V and V-VI, posteriorly curved (Readio & Sweet, 1982, Brailovsky, 2016).

*Geocoris* is the largest and most widespread geocorine genus with around 138 species distributed in all the major zoogeographic regions with emphasis in the Eastern Hemisphere. The species are very variable and much of the variation is related to the color pattern of pronotal disk, scutellar disk, hemelytra and abdominal sterna. These insects are unusual in the Lygaeoidea in being chiefly predaceous on other small arthropods. They are commonly known as “big-eyed bugs” due to the characteristic large, prominent, widely separated eyes, and have been studied intensively in

recent year as possible biocontrol agents against several destructive insects (Malipatil, 1994, Schuh and Slater, 1995, Slater and Henry, 1999, Cassis and Gross, 2002, Henry 2009, Malipatil, 2012, Henry *et al.*, 2015, Brailovsky, 2016, Kóbor, 2018, Kóbor *et al.*, 2018). A summary of the feeding habits of these partially predatory insects is given in detail by Readio and Sweet (1982).

*Geocoris* currently contains 40 described species in the Western Hemisphere and only 10 have been reported from South America: *G. callosulus* Berg, 1879 (Argentina, Uruguay), *G. flavilineus* Stål, 1874 (Colombia, Guatemala, Mexico, Panama), *G. ochraceus* (Fieber, 1861) (Colombia), *G. pallidiceps* Stål, 1858 (Brazil), *G. pallipes* Stål, 1859 (Argentina, Uruguay), *G. punctipes* (Say, 1832) (Bahamas Is., Cayman Brac, Colombia, Dominican Republic, Grand Cayman, Guatemala, Hawaii Is., Inagua, Jamaica, Johnson Is., Mexico, Panama, Puerto Rico, USA), *G. sobrinus* (Blanchard, 1852) (Chile), *G. striola* (Fieber, 1861) (Venezuela), *G. thoracicus* (Fieber, 1861) (Mexico, Guatemala, Puerto Rico, Mona Is., Venezuela), and *G. ventralis* (Fieber, 1861) (Argentina, Brazil, Chile, Paraguay) (Slater, 1964, Slater and O’Donell, 1995, Lygaeoidea Species File, 2023).

In this contribution, *Geocoris* is recorded for the first time from Peru, and five new species are described. *Geocoris sobrinus* is a new country record cited here from Peru. *Geocoris barrosi* Porter, 1917, described from Chile, is

synonymized with *G. sobrinus* (Blanchad, 1852).

**MATERIALS AND METHODS**

Specimens examined for this study are deposited in following institutions: Natural History Museum, London, England (BMNH); Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires, Argentina (MABR); University of Kansas, Snow Entomological Museum, Lawrence, Kansas, USA (UKS); University of California, Davis, Bohart Museum of Entomology, Davis, California, USA (UCDC); Universidad Nacional Agraria, La Molina, Lima, Peru (UNALM); Instituto de Biología, Universidad Nacional Autónoma de México (UNAM); Smithsonian Institution, National Museum of Natural History, Washington, D. C., USA (USNM).

The measurements were obtained using an eyepiece micrometer. All measurements are in millimeters (mm). External and internal morphology were studied with a Zeiss Stereo Discovery 8 stereoscopic microscope. Pictures were taken with a Nikon D200 camera. To remove soft tissues, genitalia were macerated in a hot solution of 10 % KOH for 5 minutes, rinsed in distilled water, and dissected under stereoscopic microscopic Leica MX8.

**RESULTS AND DISCUSSION**

**TAXONOMY**

**Key to the species of *Geocoris* from Peru\***

1. Head dorsally granulose or rugulose, dull-black (Fig. 1); tylus sulcus not extending onto vertex; transverse arcuate suture around base of tylus absent; inner face of eye without yellowish white tubercle; small species, shorter than 2.90 mm; hemelytral membrane reaching middle third of last abdominal segment; maximum width of abdomen 1.17–1.20 mm (male), 1.30–1.32 (female) (Figs. 14, 22) ..... *G. castanoae* **n. sp.**
- Head dorsally smooth, shiny-black to yellowish (Fig. 2); transverse arcuate suture around base of tylus clearly defined; tylus sulcus extending onto vertex inner face of eye with yellowish white tubercle ..... 2
2. Head dorsal and ventrally mostly pale yellow to dark yellowish orange; pronotal disk yellow to yellowish white, punctures pale castaneous to reddish brown; scutellar disk pale yellow to yellowish white, punctures pale castaneous to reddish brown and eventually with pale brown longitudinal stripe extending from base to apex; subbasal angles of scutellum with yellowish white callosity; endocorium with an elongate translucent window ..... 3
- Head dorsally mostly shiny black, with anterior 1/3 shiny yellow with one to three black longitudinal stripes, two at each side of sulcus and one running across midline of sulcus; head ventrally mostly black, with tubercle behind eyes and two short irregular stripes close to midline yellowish white ..... 4

3. Inner face of eyes shiny brownish black; posterior half of head close to anterior border of pronotal disk shiny brownish black; total body length in males 3.70–4.10 in females 4.30–4.80; width of posterior pronotal lobe in males 1.42–1.46 in females 1.57–1.62; length of antennal segment IV in males 0.45 in females 0.47 (Figs. 5–6, 23) ..... *G. punctipes* (Say)
- Inner face of eyes yellowish white; posterior half of head close to anterior border of pronotal disk yellowish white; smaller species, total body length in males 3.10–3.49 in females 3.47–3.60; width of posterior pronotal lobe in males 1.12–1.15 in females 1.20–1.25; length of antennal segment IV in males 0.40 in females 0.38 (Figs. 3–4, 24) ..... *G. infrequens* **n. sp.**
4. Scutellar disk dark shiny black to shiny reddish brown with each subbasal angle with yellowish white discoidal callosity ..... 5
- Scutellar disk entirely shiny black to shiny reddish brown or dark brownish castaneous ..... 6
5. Head ventrally mostly shiny black with only the tubercle behind eyes and irregular elongate spot lateral to midline yellowish white; abdominal sterna III–VII shiny black; pleural abdominal margins III–VII with anterior third reddish brown and posterior third yellowish white or sternite III–IV entirely yellow (Figs. 11–12, 18) ..... *G. flatus* **n. sp.**
- Head ventrally yellow with or without narrow brown longitudinal stripe at midline; middle third of abdominal sternite III–VII entirely yellowish white, or broken into quadrate yellowish white spots along each side of the sternite; laterally shiny reddish brown to dark castaneous orange; pleural abdominal margins with anterior third reddish brown and posterior third yellowish white (Figs. 9–10, 17) ..... *G. ventralis* (Fieber)
6. Endocorium with an elongate dark castaneous window, covering large portion of them (Figs. 15–16, 19) ..... *G. genuinus* **n. sp.**
- Endocorium with an elongate translucent window .... 7
7. Posterior lobe of pronotal disk yellow, punctures reddish brown and humeral angles with pale castaneous discoidal spot; anterior lobe of pronotal disk shiny black with anterior margin broadly yellow, punctures reddish brown (Figs. 13, 20) ..... *G. navus* **n. sp.**
- Posterior lobe of pronotal disk shiny black with humeral angles yellow; anterior lobe of pronotal disk shiny black with or without narrow yellow stripe along the anterior margin (Figs. 7–8, 21) ..... *G. sobrinus* (Blanchard)

\**Geocoris punctipes* (Say) widely distributed throughout Bahamas Is., Canada, Cayman Islands, Colombia, Dominican Republic, Guatemala, Hawaiian Islands (introduced), Jamaica, Mexico, Puerto Rico, Panama and United States, and *G. ventralis* (Fieber) cited from Argentina, Brazil, Chile and Paraguay are included in the key for the similarity with some other South American species here described.

***Geocoris flatus* Brailovsky and Barrera n. sp.**

(Figures 11-12, 18)

<http://zoobank.org/DDE1A344-83E2-435B-AC11-717423982EFF>

Holotype male: PERU, Amazonas Department, Chachapoyas, vic. Gocta Lodge, 1815 m, 06°03'22.5"S, 077°53'42.6"W; 21-24/X/2012, J. E. Eger (UNAM). Paratypes: 2 males, 3 females, same data as male holotype (UNAM, USNM); Cusco Department, Pícol, 3700 m, 13°29'S, 71°52'W, 1/IV/2005, L. S. Kimsey (UCDC), 1 female.

Holotype male. Dorsal coloration. Head shiny, smooth; almost entirely shiny black, including the space behind eyes with only anterior 1/3 yellow with three longitudinal stripes, two run at each border of sulcus and one across the sulcus; eye and ocelli pale pink; antennal segments I–III dark brown, IV dark castaneous; pronotum shiny black, with anterior margin, anterolateral margins and middle of posterior margin pale yellow; punctures reddish brown; humeral angles yellow with dark castaneous discoidal spots; scutellar disk shiny black, with a small sub-basal callosity yellowish white; clavus and corium pale yellowish white with pale castaneous punctures; endocorium with elongate translucent window near midline; hemelytral membrane translucent; connexival segments III–IV yellow, V–VII yellow, with anterior half dark reddish; dorsal abdominal segments shiny reddish brown. Ventral coloration. Head shiny black, with inner tubercle behind eyes, two short longitudinal stripes lateral to midline and located anteriorly; buccula yellowish white; rostral segment I yellow, with basal and apical joint brown; II–IV yellow (apex of IV brown); prosternum, collar, acetabulae, metathoracic peritreme, and legs yellow; femora yellow sprinkled with pale brown spots; pro-, meso-, and metapleuron, abdominal sterna III–VII, and genital capsule shiny reddish brown; pleural margins of abdominal sterna III–IV yellow, and V–VII with anterior third reddish and posterior third yellow. Structure. Head broad, glabrous, smooth; inner face of eye with yellowish white tubercle; rostrum reaching posterior border of metasternum; scutellum triangular, wider than long or subequal; macropterous, hemelytra extending beyond apex of last abdominal segment; parameres as in figures 11–12.

Female. Color and habitus similar to male holotype. Dorsal abdominal segments VIII–IX, abdominal sternite VIII–IX and genital plates shiny reddish brown.

Variation. Head dorsally almost entirely shiny black with apical third yellow. Space near eyes and above ocelli yellow. Posterior border of pronotal disk entirely dark brownish castaneous. Posterior angles of metasternon yellow. Femora pale castaneous orange with darker spots.

Measurements. Holotype male. Body length 3.80; head length 0.47; width across eyes 1.50; interocular distance 0.82; interocellar distance 0.37; maximum length of eye 0.52; antennal segments: I - 0.25, II - 0.47, III - 0.37, IV - 0.52; rostral segments: I - 0.45, II - 0.32, III - 0.45, IV - 0.40; pronotum: length 0.75, maximum width of anterior pronotal lobe 1.20, maximum width of posterior pronotal

lobe 1.40; scutellum: length 0.77, width 0.80; maximum width of abdomen 1.62.

Measurements. Paratype female. Body length 3.86; head length 0.50; width across eyes 1.58; interocular distance 0.82; interocellar distance 0.43; maximum length of eye 0.57; antennal segments: I - 0.26, II - 0.50, III - 0.41, IV - 0.52; rostral segments: I - 0.46, II - 0.30, III - 0.42, IV - 0.42; pronotum: length 0.87, maximum width of anterior pronotal lobe 1.40, maximum width of posterior pronotal lobe 1.52; scutellum: length 0.81, width 0.82; maximum width of abdomen 1.85.

**Etymology.** From the Latin word “*flatus*”, meaning breath, breeze, wind.

**Discussion.** This species is closely related to *G. sobrinus* (Blanchard, 1852) (Fig. 21) both species have the head ventrally almost entirely shiny black, the space behind eyes shiny black, and abdominal sterna III–VII and male genital capsule entirely shiny black. In *G. flatus* n. sp., (Fig. 18) described from Peru, the scutellar disk is shiny black, with small subbasal yellowish white callosity, the middle third of posterior margin of pronotum yellow, and humeral angles with dark to pale castaneous discoidal spot. In *G. sobrinus* reported from Argentina and Chile, the scutellar disk is entirely shiny black, the posterior margin of pronotum shiny black, and humeral angles yellow without pale castaneous discoidal spot.

***Geocoris genuinus* Brailovsky and Barrera n. sp.**

(Figures 15-16, 19)

<http://zoobank.org/FE0F41C8-7A92-4B8B-8C6D-0971DDB287B9>

Holotype male: PERU: Piura, Sullana (algodon), 200 m, 28/VII/1974, C. Bordon (UNAM). Paratypes: PERU: Ica Department, Nazca, 2/VI/1974 (without collector) (UNAM), 2 males. Lima Department, Sta. Rosa de Quives, 1250 m, 11°33'44.1"S, 76°43'21.3"W, 22/III/2006, C. Carrera Lujan (UNALM); La Molina, 6/X/1996, C. Maihuay (UNAM), 1 male; Distrito La Molina, 12°04'40"S, 71°54'40"W, 17/II/2023, 10/XII/2019, 15/VIII/2020, L. Cruces (UNALM), 3 males, 4 females. Chancay, 24/IV/1969, K. Raven (UNALM), 1 male. Huaura, 10/VI/1964, K. Raven (UNALM), 1 male. Cañete, 17/II/1987, G. Sanchez (UNALM), 1 male, 1 female.

Holotype male. Dorsal coloration. Head shiny, smooth; almost entirely shiny black, including the space behind eyes, with only anterior 1/3 yellow with three longitudinal stripes two run at each border of sulcus and one across the sulcus; eye and ocelli pink; antennal segments I–III reddish brown, IV dark castaneous with apex paler; anterior lobe of pronotum dark castaneous, punctures reddish brown, anterior margin yellow and calli shiny black; posterior lobe of pronotum dark castaneous, punctures reddish brown, and posterior margin dark yellow; scutellum entirely shiny reddish brown; clavus pale yellowish white with pale castaneous punctures; corium bicolored, pale yellowish white, punctures castaneous and endocorium with distinct dark castaneous elongate window, running from apical margin

and extending almost to middle third of exocorium; hemelytral membrane translucent; connexivum dark brownish castaneous with upper border dark yellow; dorsal abdominal segments dark brownish castaneous. Ventral coloration. Head shiny black, with short stripe lateral to midline and small yellowish white tubercle at inner face of eyes; buccula with anterior half yellowish white and posterior half brownish castaneous; rostral segment I with anterior half brown and posterior half yellow; II–IV yellow (apex of IV brown); collar, prosternon, acetabulae, metathoracic peritreme, and legs yellow; pro-, and mesopleuron shiny black; metapleuron shiny black with posterior margin yellow; abdominal sterna and genital capsule shiny reddish brown; pleural margins of abdomen yellow with anterior third reddish to pale brown. Structure. Head broad, glabrous, smooth; inner face of eye with yellowish white tubercle; rostrum reaching posterior border of metasternon; scutellum triangular, wider than long or as long as wide; hemelytra extending beyond the apex of last abdominal segment; parameres as in figures 15-16.

Female. Color and habitus similar to male holotype. Connexival segments VIII-IX, dorsal abdominal segments VIII-IX, and genital plates shiny black. Coxae dark castaneous, with inner third yellow; trochanters pale castaneous; femora pale castaneous with apical joint yellow; tibiae and tarsi yellow.

Variation. Posterior lobe of pronotum dark castaneous, reddish brown punctures, and two dark yellow discoidal spots at each side of midline. Humeral angles yellow to pale castaneous. Corium pale yellowish white, punctures castaneous to reddish brown, and endocorium with distinct quadrate pale to dark castaneous spot, running from apical margin to almost middle third of corium. Femora yellow sprinkled with pale brown spots.

Measurements. Holotype male. Body length 3.72; head length 0.57; width across eyes 1.50; interocular distance 0.70; interocellar distance 0.39; maximum length of eye 0.57; antennal segments: I - 0.20, II - 0.42, II-I 0.32, IV - 0.47; rostral segments: I - 0.47, II - 0.23, III - 0.50, IV - 0.26; pronotum: length 0.98, maximum width of anterior pronotal lobe 1.16, maximum width of posterior pronotal lobe 1.38; scutellum: length 0.80, width 0.80; maximum width of abdomen 1.57.

Measurements. Paratype female. Body length 4.52; head length 0.60; width across eyes 1.65; interocular distance 0.85; interocellar distance 0.41; maximum length of eye 0.59; antennal segments: I - 0.22, II - 0.50, III - 0.37, IV - 0.50; rostral segments: I - 0.45, II - 0.25, III - 0.47, IV - 0.27; pronotum: length 1.02, maximum width of anterior pronotal lobe 1.32, maximum width of posterior pronotal lobe 1.62; scutellum: length 0.87, width 0.96; maximum width of abdomen 1.90.

**Etymology.** From the Latin word “*genuinus*”, meaning native, natural, authentic.

**Discussion.** Related to *G. sobrinus* (Blanchard, 1852) and *G. flatus* here described by having the head dorsal and

ventrally almost entirely shiny black; inner face of eyes with yellowish white tubercle, and pro-, meso-, and metapleuron, male genital capsule and female genital plates shiny black. In *G. sobrinus* and *G. flatus* the corium is pale yellowish white, punctures pale castaneous, and endocorium with elongate translucent window near midline. In *G. genuinus* n. sp., the corium is pale yellowish white, punctures pale castaneous, and endocorium provided with an elongate dark castaneous window covering large portion of them. In *G. sobrinus* and *G. genuinus* the scutellar disk is entirely shiny black; in contrast in *G. flatus* it is shiny black with two subbasal yellowish white callosities (Figures 18-19, 21).

***Geocoris infrequens* Brailovsky and Barrera n. sp.**  
(Figures 3-4, 24)

<http://zoobank.org/77FD1138-38D6-4D6C-919A-47C0CA77F71F>

Holotype male: PERU: Trujillo, La Libertad, Huaca, La Luna, 28/III/2018, H. Brailovsky (UNAM). Paratypes: 5 males, 8 females, same data as holotype (UNAM). PERU: Maca District, Maca Mirador, Peña Blanca, 23/III/2018, H. Brailovsky (UNAM), 2 females.

Holotype male. Dorsal coloration. Head shiny, smooth, yellowish, with sulcus, inner face of eyes, and small spot anterior to ocelli shiny black; eyes and ocelli pale pink; antennal segment I pale brown, with inner face yellowish white, II-III pale brown, IV yellow; pronotal disk pale yellow, with reddish brown punctures; calli pale yellowish orange; scutellum pale yellow, punctures reddish brown, and basal margin paler; clavus yellowish white, punctures pale castaneous; corium yellowish white, punctures pale castaneous, and endocorium near clavus with an elongate, translucent window; hemelytral membrane translucent; connexival segments yellowish white, with anterior border pale reddish; dorsal abdominal segments III-VI pale brown, VII yellowish white. Ventral coloration. Head yellowish orange; rostral segment I yellow, with basal and apical joints brown, II-IV yellow (apex of IV darker); prosternon including the collar yellowish white; meso-, and metasternon black; pro-, meso-, and metapleuron yellowish white, heavily punctate with reddish brown punctures; coxae, trochanters, tarsi, acetabulae, and metathoracic peritreme yellow; femora yellow sprinkle with pale brown or darker dots; abdominal sternite III yellowish white, with dark brown quadrate spot at midline; abdominal sterna IV-VII pale yellowish white; spiracles pale pink; pleural abdominal margins yellowish white, with anterior border of V-VII pale pink; genital capsule yellowish white with basal margin and two circular dots at each side of midline dark brown. Structure. Head broad, glabrous, smooth; tylus longitudinally sulcate; sulcus continued through the vertex ending near basal third; ocular sulcus complete; transverse usually black to reddish brown arcuate curving around base of tylus, with 2 distinct reddish brown pits at ends of suture; inner face of eye with yellowish white tubercle; rostrum reaching posterior third

of metasternon; pronotum trapezoidal; posterior lobe wider than anterior lobe; scutellum triangular longer than wide; hemelytra extending beyond the apex of last abdominal segment; parameres as in figures 3-4.

Female. Color and habitus similar to male holotype. Dorsal abdominal segments VIII-IX, abdominal sterna IV-VII, and genital plates yellowish white; abdominal sternite III yellowish white with brown spot at midline and close to metasternum.

Variation. Antennal segment IV pale castaneous orange. Calli with pale pink transversal stripe. Apex of scutellum pale brown. Dorsal abdominal segments III-V dark brown, VI-VII dark yellow, with black quadrate spot at midline. Abdominal sternite III-VII lateral to midline sprinkle with dark brown spots. Abdominal spiracles brown.

Measurements Holotype male. Body length 3.49; head length 0.50; width across eyes 1.16; interocular distance 0.62; interocellar distance 0.30; maximum length of eye 0.45; antennal segments: I - 0.17, II - 0.42, III - 0.30, IV - 0.40; rostral segments: I - 0.40, II - 0.26, III - 0.37, IV - 0.26; pronotum: length 0.72, maximum width of anterior pronotal lobe 1.00, maximum width of posterior pronotal lobe 1.15; scutellum: length 0.65, width 0.62; maximum width of abdomen 1.36.

Measurements. Paratype female. Body length 3.47; head length 0.51; width across eyes 1.20; interocular distance 0.63; interocellar distance 0.33; maximum length of eye 0.43; antennal segments: I - 0.21, II - 0.42, III - 0.32, IV - 0.37; rostral segments: I - 0.40, II - 0.25, III - 0.40, IV - 0.30; pronotum: length 0.70, maximum width of anterior pronotal lobe 1.05, maximum width of posterior pronotal lobe 1.25; scutellum: length 0.67, width 0.65; maximum width of abdomen 1.50.

**Etymology.** From the Latin word "*infrequens*", meaning seldom, rare.

**Discussion.** Closely related to *G. punctipes* (Say, 1831) (Figures 23-24) as they share a mostly yellow coloration, with pale castaneous punctures on the head (dorsal and ventral surfaces), and pronotal and scutellar disks mostly yellow with pale castaneous punctures. In the rest of species included in this study the head and the pronotal and scutellar disks are mostly shiny black.

*Geocoris infrequens* n. sp., is a tiny species, with body length 3.49 in male, 3.47, in female; width across eyes 1.16 in male, 1.20 in female; maximum length of antennal segment IV in male 0.40, in female 0.37; pronotal length 0.72 in male, 0.70 in female. In *G. punctipes* the total body length 3.84 in male, 4.40 in female; width across eyes 1.50 in male, 1.66 in female; maximum length of antennal segment IV in male 0.45, in female 0.47; pronotal length 0.85 in male, 0.97 in female. In addition, the inner face of the eyes in *G. infrequens* is yellowish white, and the posterior half of head in dorsal view and close to the anterior border of pronotum is yellowish white. In *G. punctipes* it is shiny brownish black.

***Geocoris navus* Brailovsky and Barrera n. sp.**

(Figure 2, 13, 20)

<http://zoobank.org/6B9D1738-351A-451C-8CB2-725AD-FEE57D6>

Holotype male: PERU: Tingo Maria, Huanuco, IV/1974, C. Bordon (UNAM). PARATYPES: 1 male, 3 females, same data as male holotype (UNAM); Ica, Hacienda Arrabales (in Giramolanda), 25/II/1971, Lainez (UKS), 2 males; Ica, Hacienda Castellana (in V. santa), 19/II/1971, Lainez (UKS), 1 male; Vitarte, 13/V/2004, Y. Velarde (UNALM), 1 male.

Holotype male. Dorsal coloration. Head shiny, smooth, almost entirely shiny black, including the space behind eyes, with only anterior 1/3 yellow with three longitudinal stripes two run at each border of sulcus and one across the sulcus; eyes pale reddish; ocelli pale pink; antennal segments I-III dark castaneous, IV pale yellowish castaneous; anterior lobe of pronotal disk with wide transversal stripe shiny black, which covers the calli and anterior angles; middle third of anterior lobe yellow, with reddish brown punctures; posterior lobe yellow, punctures reddish brown, and humeral angles with pale castaneous discoidal spot; scutellum entirely shiny reddish brown; clavus and corium pale yellowish white, with pale castaneous punctures, and endocorium with distinct translucent elongate window; hemelytral membrane translucent; connexivum yellow with anterior third pale brown; dorsal abdominal segments dark brownish castaneous. Ventral coloration. Head shiny black, with short yellowish white stripe lateral to midline; inner face of eye with yellowish white tubercle; buccula yellowish white, with apical third shiny black; rostral segment I yellow, with anterior third brown, II-IV yellow; collar, prosternum, acetabulae, metathoracic peritreme, and legs yellow; pro-, and mesopleuron shiny black; metapleuron shiny black with posterior margin yellow; abdominal sterna and genital capsule shiny reddish brown; pleural abdominal margins yellow with anterior third reddish to pale brown. Structure. Head broad, glabrous, smooth; inner face of eye with yellowish white tubercle; rostrum reaching posterior border of metasternon; scutellum triangular, wider than long or as long as wide; hemelytra extending beyond the apex of last abdominal segment; paramere as in figure 13.

Female. Color and habitus similar to male holotype. Dorsal abdominal segments VIII-IX, connexival segments VIII-IX, and genital plates shiny reddish brown; coxae, trochanters, tibiae, and tarsi yellow; femora dark castaneous; pleural abdominal margins dark castaneous.

Variation. Antennal segment I dark castaneous. Middle third of abdominal sterna III-VI orange, laterally shiny reddish brown, and pleural abdominal margins yellow.

Measurements. Holotype male. Body length 3.97; head length 0.55; width across eyes 1.50; interocular distance 0.75; interocellar distance 0.36; maximum length of eye 0.60; antennal segments: I - 0.17, II - 0.45, III - 0.35, IV - 0.47; rostral segments: I - 0.45, II - 0.27, III - 0.40, IV - 0.45; pronotum: length 0.90, maximum width of anterior pronotal lobe 1.25, maximum width of posterior pronotal

lobe 1.42; scutellum: length 0.90, width 0.90; maximum width of abdomen 1.67.

**Measurements.** Paratype female. Body length 4.18; head length 0.52; width across eyes 1.62; interocular distance 0.81; interocellar distance 0.34; maximum length of eye 0.60; antennal segments: I - 0.20, II - 0.52, III - 0.37, IV - 0.50; rostral segments: I - 0.46, II - 0.32, III - 0.45, IV - 0.47; pronotum: length 0.96, maximum width of anterior pronotal lobe 1.25, maximum width of posterior pronotal lobe 1.57; scutellum: length 0.87, width 0.92; maximum width of abdomen 2.00.

**Etymology.** From the Latin word “*navus*”, meaning busy, active.

**Discussion.** This species is related to *G. sobrinus* (Blanchard, 1852) (Fig. 21), *G. flatus* (Fig. 18) and *G. genuinus* (Fig. 19) as they share the head (dorsal and ventral surfaces) almost entirely shiny black; also, the inner face of eyes with a yellowish white tubercle. Additionally, the pro-, meso-, and metapleuron, as well as the male genitalia and female genital plates shiny black to shiny reddish brown. In *G. genuinus* the endocorium has an elongate dark castaneous window covering large portion of them in the other species the window of the endocorium is translucent. The scutellar disk of *G. flatus* is shiny black with two subbasal yellowish white callosities, which are absent in *G. navus* n. sp., (Fig. 20) and *G. sobrinus*. In *G. navus* n. sp., the posterior lobe of pronotal disk is yellow with reddish brown punctures, and humeral angles with pale castaneous discoidal spot; the anterior lobe of pronotal disk shiny black except the anterior margin with broad yellowish transversal stripe. In *G. sobrinus* the posterior lobe of pronotal disk is shiny black with or whitout humeral angles yellow; and the anterior lobe shiny black with narrow yellow transversal stripe along the anterior margin.

### *Geocoris sobrinus* (Blanchard)

(Figures 7-8, 21)

*Salda sobrina* Blanchard 1852: 155.

*Ophthalmicus (Geocoris) sobrina* Signoret 1863, 3: 565.

*Geocoris sobrinus* Mayr 1868, 2: 128.

*Geocoris barrosi* Porter 1917: 193–194. new synonym.

**General distribution.** Previously known from only Chile. Blanchard (1852) describe the species from Chingola and Cordilleras Ovalle, in Chile. South America published records. CHILE: Region Coquimbo: Provincia de Elqui, Junta de Chingoles; Region Coquimbo: Provincia de Limari, Ovalle; Nilahue (Blanchard 1852, Porter 1917). Material examined. New records. ARGENTINA: Chubut, Los Alerces, 1100 m, 11/III/1974, C. Bordon (UNAM), 1 male; Manantiales Sarmiento, 7/III/1974, C. Bordon (UNAM), 1 hembra; Catamarca, Capillitas, 3500 m, I/1984, D. Carpintero (MABR), 1 hembra. CHILE: Provincia Concepcion, Curiñan, 14/XII/1996, 9/I/1999, T. Cekalovic (UNAM), 1 male, 3 females; Hualqui, 17/I/1992, T. Cekalovic (UNAM), 2 males, 4 females; Cabrero, 10/I/1988, T. Cekalovic (UNAM), 1 male, 2 females; Man-

zano, 4/I/1988, T. Cekalovic (UNAM), 1 female; Tomeco, 10/I/1988, T. Cekalovic (UNAM), 5 males, 3 females; Estero Nonguen, 5/X/1996, T. Cekalovic (UNAM), 1 female; Puente Batuco, 10/I/1988, T. Cekalovic (UNAM), 1 male, 1 female; Palo Grande, camino a Sta. Juana, 29/XII/1996, T. Cekalovic (UNAM), 1 female; Escuadron, 10/IV/1988, T. Cekalovic (UNAM), 1 female; Periquillo, 1/V/1977, 19/XII/2000, T. Cekalovic (UNAM), 2 females. Provincia Osorno, Huillinco, km 24 from Osorno, 7/III/2001, T. Cekalovic (UNAM) 2 females. Provincia Santiago, XII/1953, L. E. Peña (USNM), 1 female; San Juan Maipo, XII/1979, L. E. Peña (USNM), 2 females; 1 km W La Obra, 2/XII/1967, C. W. & L. B. O'Brien (UKS), 1 female; La Obra, IX/1978, L. E. Peña (USNM), 1 male. Provincia Mallico, Fondo El Almendro, km 15 W de Ercilla, 20/II/1988, T. Cekalovic (UNAM), 1 male, 1 female. Provincia Bio-Bio, Velluda, 1100 m, I/1991, L. E. Peña (USNM), 1 male, 2 females. Provincia Valparaiso, Lago Zapallar, 11-14/II/1982, N. Zambrano (USNM), 1 female. Las Trancas, Chillau, III/1984, D. Veas (USNM), 1 female. Cauquemes, Maule, 9/XII/1990, L. E. Peña (USNM), 1 female. Vicuña, Elqui, XII/1988, col. Castillo (USNM), 1 male, 1 female. Municipio de Paihuano, 6 km E Monte Grande, 1250 m, 30°06'938"S, 70°27'269"W, 26/X/1994, E. Barrera Vargas (UNAM), 2 females.

**Redescription.** Based on a male specimen from Chile. Dorsal coloration. Head shiny, smooth; including the space behind eyes shiny black, with anterior 1/3 yellow; antennal segment I ventrally reddish brown and dorsally dark castaneous, II reddish brown, III yellow with basal third brown, IV yellow; antenniferous tubercle dark brown; preocellar space yellow; pronotum shiny black, with anterior, anterolateral, and posterolateral margins and humeral angles yellowish white; anterior angles shiny black; scutellum entirely shiny black; clavus and corium pale yellowish white, with pale castaneous punctures; endocorium with elongate translucent window near midline; hemelytral membrane translucent; connexival segments yellowish orange, with or whitout anterior third brown; dorsal abdominal segments shiny reddish brown. Ventral coloration. Head shiny pale castaneous orange, anteriorly yellow; midline with dark reddish brown longitudinal stripe; buccula yellow with dark spots at base; inner surface of head behind eyes with yellowish white tubercle; rostral segments I–IV yellow (apex of IV darker); prosternum including the collar yellowish white; meso-, and metasternum shiny black; propleura shiny black, with posterior margin yellow; mesopleura shiny black; metapleura shiny black, posterior margin yellow, with black punctures; legs, acetabulae, and metathoracic peritreme yellow; abdominal sterna and genital capsule shiny black; pleural abdominal margins yellowish orange with anterior third reddish brown. **Structure.** Head broad, glabrous, smooth; inner face of eye with yellowish white tubercle; rostrum reaching anterior border of metasternum; rostral segment II the shortest, I, III–IV subequal. Scutellum triangular, longer than wide or as long as wide; hemel-

etra extending beyond the apex of last abdominal segment; parameres as in figures 7-8.

Female. Color and habitus similar to male. Abdominal segment VII and genital plates shiny black.

Variation. Antennal segments I–II reddish brown, III pale castaneous with apical joint yellowish orange, IV yellowish orange, or antennal segments I–IV entirely pale castaneous brown. Head ventrally shiny black with tubercle behind eyes yellowish white. Tylus yellow with sulcus and laterally to midline black to dark reddish brown. Rostral segments I–IV yellow with basal and apical joint brown. Pronotum shiny black with humeral angles pale castaneous. Femora yellow sprinkle with pale castaneous spots. Pleural abdominal margins and connexival segments entirely shiny black.

Measurements. Male. Body length 3.24; head length 0.52; width across eyes 1.32; interocular distance 0.70; interocellar distance 0.36; maximum length of eye 0.48; antennal segments: I - 0.20, II - 0.37, III - 0.32, IV - 0.45; rostral segments: I - 0.34, II - 0.27, III - 0.35, IV - 0.37; pronotum: length 0.75, maximum width of anterior pronotal lobe 1.05, maximum width of posterior pronotal lobe 1.25; scutellum: length 0.67, width 0.75; maximum width of abdomen 1.40.

Measurements. Female. Body length 3.50; head length 0.53; width across eyes 1.37; interocular distance 0.73; interocellar distance 0.37; maximum length of eye 0.55; antennal segments: I - 0.22, II - 0.40, III - 0.31, IV - 0.45; rostral segments: I - 0.35, II - 0.32, III - 0.40, IV - 0.38; pronotum: length 0.80, maximum width of anterior pronotal lobe 1.16, maximum width of posterior pronotal lobe 1.37; scutellum: length 0.80, width 0.80; maximum width of abdomen 1.42.

**Discussion.** Recognized by having the head dorsally shiny, smooth, black, with anterior 1/3 yellow; inner face of eye, close to midline with yellowish white tubercle; scutellum entirely shiny black; pronotal disk shiny black with anterior margin, anterolateral margins (anterior angles shiny black), posterolateral margins and humeral angles yellowish white; clavus and corium yellowish white with pale castaneous punctures; legs yellow with femora sprinkled with pale brown spots; pro-, meso-, and metapleuron, abdominal sterna III–VII, male genital capsule, and female genital plates shiny black to shiny reddish brown.

Porter (1917) describe *G. barrosi* from Chile (Nilahue) using only one specimen and mention the close relation with *G. sobrinus* (Blanchard, 1852) (Fig. 21) also described from Chile. On his discussion Porter cited that *G. barrosi* is recognized by having the coxae pale brown and corium with one row of punctures running from posterior margin to anterior third. In the extensive series of *G. sobrinus* examined we found the coxae pale brown to yellow and the corial punctuation truncated or not at the anterior third near midline.

*Geocoris barrosi* is here considered a synonym of *G. sobrinus*.

***Geocoris castanoae* Brailovsky and Barrera n. sp.**

(Figures 1, 14, 22)

<http://zoobank.org/3192F841-6771-49A8-9B78-00F2110B7941>

Holotype male: PERU. Lago Titicaca, Isla Taquile, 3956 m, 15°46'22"S, 69°41'00"W, 7/I/2013, L. Cervantes (UNAM). PARATYPES: 2 males, same data as holotype (UNAM), PERU: Valle del Colca, Chivay, 22/II/2018, H. Brailovsky (UNAM), 1 male.

Holotype male. Dorsal coloration. Head finely granulose-rugulose; dull-black, with anterior third and space near eye yellowish; tylus yellow, with basal third black; antennal segment I dark brown, with apex yellow, II–III with outer face dark brown and inner face yellow, IV dark brown; ocellus and eyes pale pink; pronotum shiny reddish brown with humeral angles, anterolateral margins and short longitudinal stripe at midline of anterior margin yellow; scutellum shiny reddish brown; clavus pale yellow; corium pale yellow, with two distinct brown spots, one small, quadrate, near middle third of apical margin, and second elongate and running at endocorium; punctures pale castaneous; hemelytral membrane hyaline with ambarine reflections; connexivum yellow; dorsal abdominal segments III–VII reddish brown. Ventral coloration. Head dark brown; rostral segments I–IV yellow (apex of IV brown); collar yellowish white; prosternum yellow; meso-, and metasternum dark brown; pro-, meso-, and metapleuron dark brown with, acetabulae, metathoracic peritreme and outer third of propleura and metapleura yellowish white; legs yellow; abdominal sterna III–VII and male genital capsule shiny reddish brown; pleural margin of abdominal sterna III–VII yellow. Structure. Head broad, finely granulose-rugulose; dorsum and venter with fine appressed setae; width of head across eyes greater than width of pronotum; space between eye and tylus convex; preocellar pit deep; tubercle anterior to ocellus absent; inner face of eye without yellowish white tubercle; antennal segment I the shortest, IV the longest or subequal to II, and II longer than III; rostrum reaching posterior third of metasternum; rostral segment I the longest, II the shortest, and III subequal or shorter than IV. Thorax. Pronotum nearly quadrate, wider than long; anterolateral margins slightly sinuate, clearly separating on anterior and posterior lobes; anterior and posterior margins of each lobe slightly convex; humeral angles rounded; hemelytra reaching middle third of last abdominal segment; apical margin straight; paramere as in figure 14.

Variation. Midline of pronotal disk with or without slender, yellowish longitudinal stripe. Calli reddish brown, with pale yellowish orange discoidal spot at each side of midline. Scutellum entirely reddish brown or with lateral margins yellow. Femora yellow sparkled with brown spots. Femora pale yellow to pale castaneous orange. Upper margin of pro-, meso-, and metapleuron yellow.

Measurements. Holotype male. Body length 2.70; head length 0.40; width across eyes 1.12; interocular distance 0.57; interocellar distance 0.35; maximum length of eye 0.42; antennal segments: I - 0.14, II - 0.30, III - 0.22,



IV - 0.40; rostral segments: I - 0.32, II - 0.24, III - 0.27, IV - 0.25; pronotum: length 0.60, maximum width of anterior pronotal lobe 0.96, maximum width of posterior pronotal lobe 1.02; scutellum: length 0.52, width 0.50; maximum width of abdomen 1.17.

**Female.** Unknown.

**Etymology.** This species is named in honor of Dra. Gabriela Castaño Meneses distinguished Mexican entomologist specialized in Collembola and Formicidae and friend for many years.

**Discussion.** Characterized by having the head dorsally finely granulose-rugulose. This tiny species is related to *G. lividipennis* Stål, 1862 by having the corium yellowish white without dark brown elongate stripe present in *G. thoracicus* (Fieber, 1861). *Geocoris lividipennis* is a large species longer than 3.30 mm; the hemelytral membrane extending beyond the apex of last abdominal segments; and the maximum width of abdomen fluctuate between 1.30–1.32 mm (male) and 1.68–1.70 mm (female). This species is known from Canada, Cayman Is., Dominican Republic, Guatemala, Jamaica, Martinique, Mexico, Panama, St. Vincent Is., and United States. *Geocoris castanoae* n. sp., (Fig. 22) is a smaller species, shorter than 2.90 mm., the hemelytral membrane reaching middle third of last abdominal segment; and the maximum width of abdomen fluctuate between 1.17–1.20 mm (male) and 1.30–1.32 mm (female). This new species is known from Peru.

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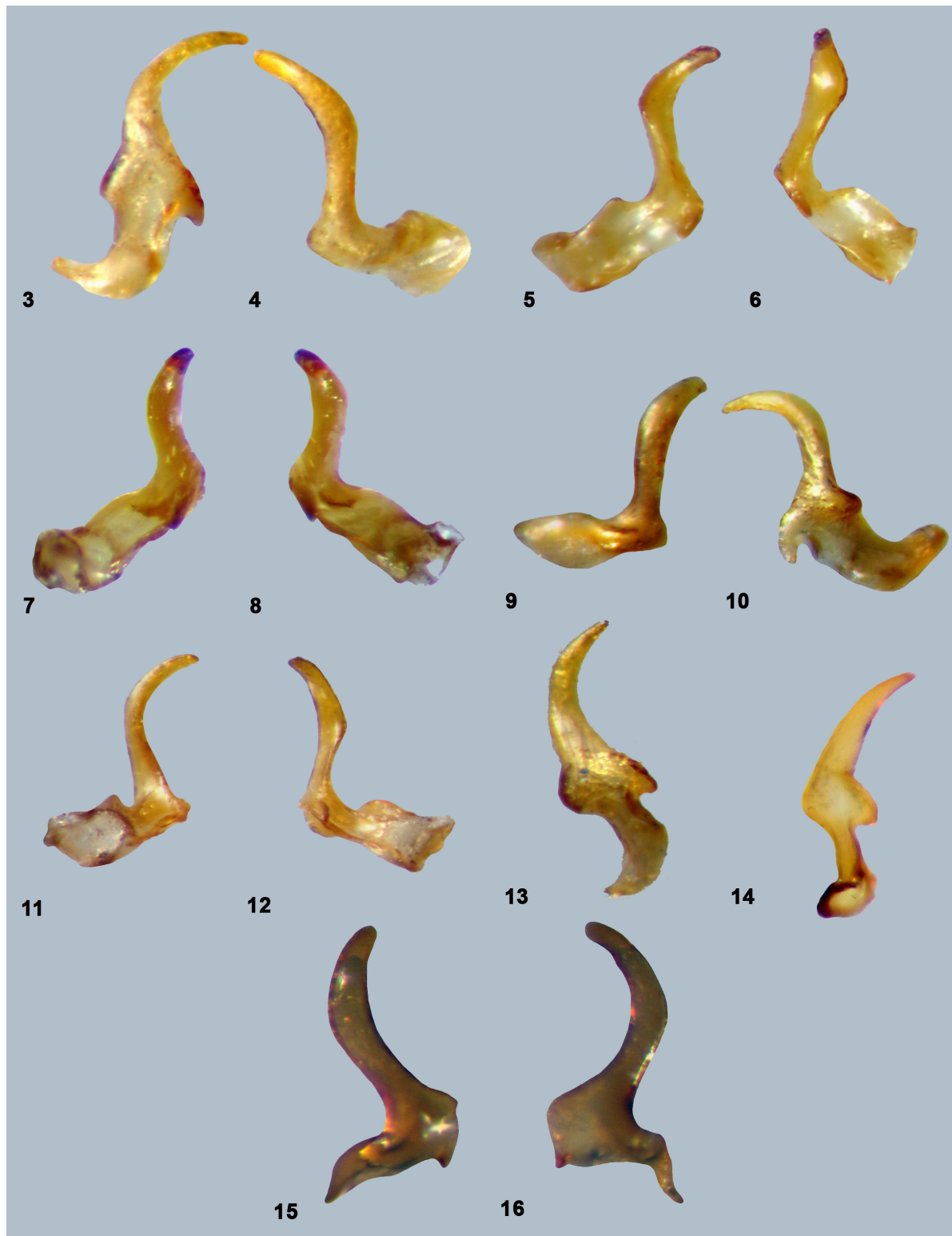
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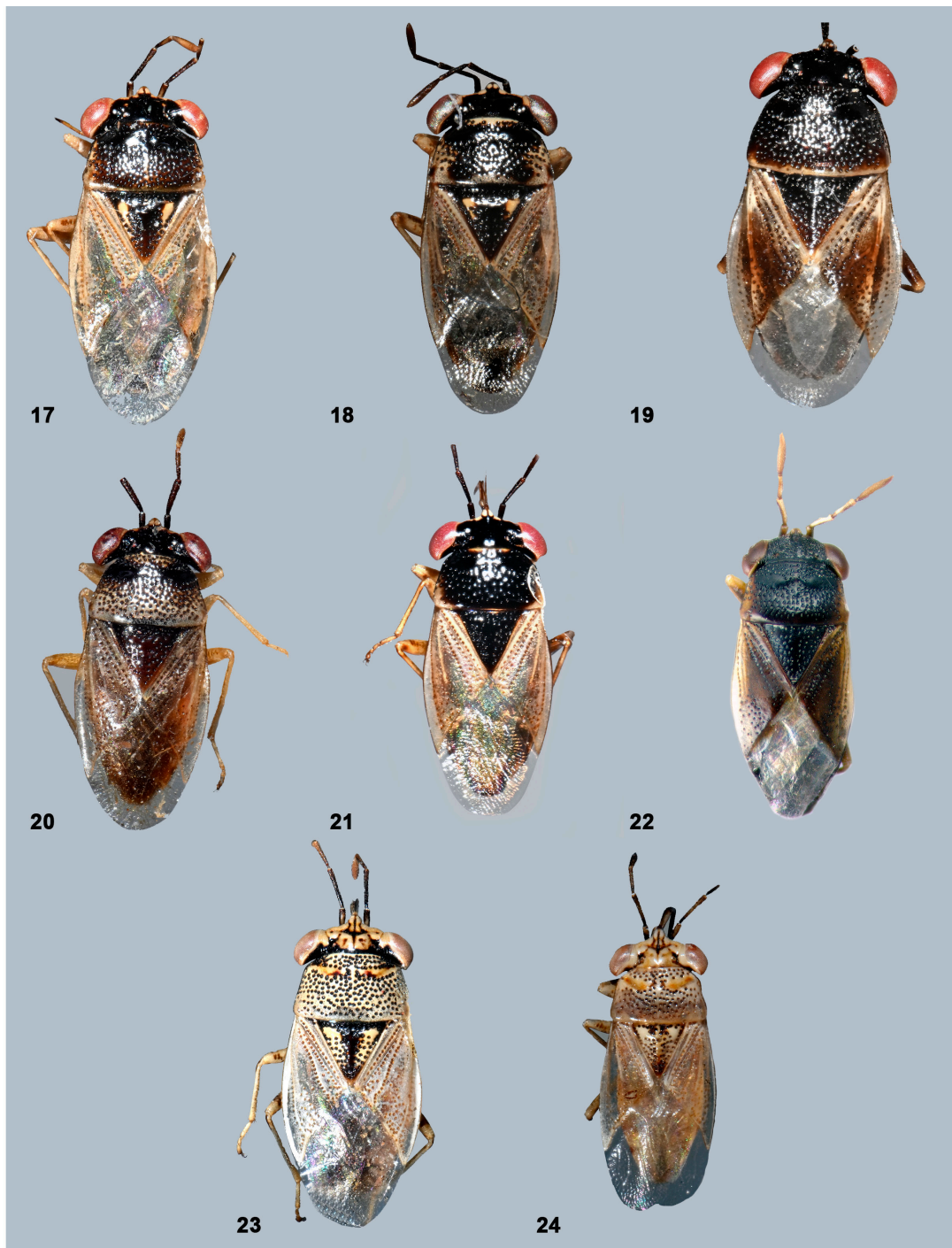
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Figures 1–2. *Geocoris* spp. Head and pronotum in dorsal view. 1. *G. castanoae* n. sp. 2. *G. navus* sp.



Figures 3-16. Parameres of *Geocoris* spp. 3-4. *G. infrequens* n. sp. 5-6. *G. punctipes* (Say). 7-8. *G. sobrinus* (Blanchard). 9-10. *G. ventralis* (Fieber). 11-12. *G. flatus* n. sp. 13. *G. navus* n. sp. 14. *G. castanoae* n. sp. 15-16. *G. genuinus* n. sp.



Figures 17–24. Dorsal view of *Geocoris* spp. 17. *G. ventralis* (Fieber). 18. *G. flatus* n. sp. 19. *G. genuinus* n. sp. 20. *G. navus* n. sp. 21. *G. sobrinus* (Blanchard). 22. *G. castanae* n. sp. 23. *G. punctipes* (Say). 24. *G. infrequens* n. sp.