Two New Brazilian Sennius (Coleoptera: Chrysomelidae: Bruchinae) Species Near the Guttifer Group

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TWO NEW BRAZILIAN *SENNIUS* (COLEOPTERA: CHRYSOMELIDAE: BRUCHINAE) SPECIES NEAR THE *GUTTIFER* GROUP

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ABSTRACT

Sennius Bridwell belongs to the richest tribe of Bruchinae, Bruchini, subtribe Acanthoscelidina, with more than 60 species distributed in the New World. The larval behavior of *Sennius* species stands out in being strongly associated with Cassiinae L. seeds (Fabaceae: Caesalpinioideae), especially *Senna* Miller. Eight species-groups were established for *Sennius*, but some of them are not well defined. The goal of this contribution is to describe 2 new species from Brazil, both closely related to species currently classified in the *guttifer* group. The new species are *Sennius albopygus* **sp. nov.** (Type locality: Brazil, Goiás, Goiânia) and *Sennius solum* **sp. nov.** (Type locality: Brazil, Goiás, Niquelândia). We have host records only for *Sennius albopygus*, as occurring on *Senna alata* (Linn.) Roxb. and *Senna aculeata* (Pohl ex Benth.) H. S. Irwin & Barneby. We also include illustrations and geographical distribution records for these species.

Key Words: Neotropical region, seed-beetles, seed predators, *Senna*

RESUMO

Sennius Bridwell pertence a tribo mais rica de Bruchinae, Bruchini, subtribo Acanthoscelidina, com mais de 60 espécies distribuídas no Novo Mundo. *Sennius* se destaca pelo hábito alimentar de suas larvas, fortemente associadas às sementes de Cassiinae L. (Fabaceae: Caesalpinioideae), especialmente *Senna* Miller. Oito grupos de espécies foram estabelecidos para o gênero, mas alguns desses grupos não possuem seus limites bem definidos. O objetivo desse trabalho foi descrever duas novas espécies do Brasil, ambas proximamente relacionadas com espécies do grupo *guttifer*. As duas espécies são: *Sennius albopygus* **sp. nov.** (Localidade do tipo: Brasil, Goiás, Goiânia) e *Sennius solum* **sp. nov.** (Localidade do tipo: Brasil, Goiás, Niquelândia), apenas a primeira possui dois registros de plantas hospedeira, *Senna alata* (Linn.) Roxb. e *Senna aculeata* (Pohl ex Benth.) H. S. Irwin & Barneby. Nesse trabalho também apresentamos ilustrações e registros de distribuição geográfica para essas espécies.

Palavras Chave: besouros predators de sementes, besouros de sementes, Neotropical region, *Senna*

Sennius Bridwell (Coleoptera: Chrysomelidae) is one of the 39 genera of Bruchinae, (known as seed-beetles) distributed in the New World (Ribeiro-Costa & Almeida 2012; Reid & Beatson 2013). It is placed in the most diverse tribe, Bruchini, which assembles more than half of all Bruchinae species, subtribe Acanthoscelidina, the richest among the currently 3 recognized subtribes (Bouchard et al. 2011). With more than 60 species, *Sennius* spp. have specialized feeding habits with their larvae feed on seeds of a restricted group of plant species classified in the subtribe Cassiinae (Fabaceae: Caesalpinioideae), which comprises *Cassia* Linnaeus, *Senna* Miller and *Chamaecrista* Moench (Johnson & Kingsolver 1973; Johnson 1984), with a clear preference for seeds of *Senna* (Viana & Ribeiro-Costa 2013a).

Bridwell (1946) defined this genus by the presence of a carina extending near the base of the inner margin of the hind femur, and a tooth posterior to this carina. Johnson & Kingsolver (1973) made the most relevant taxonomic contribution on the genus *Sennius* studying the North and Central American seed-beetle species. They revised and organized the included species into 7 groups, and made a key for the 27 species studied, 9 of which belong to 3 species groups that are also distributed in South America (*abbreviatus*, *guttifer* and *militaris* groups). Subsequently, a new species group was established for South America, the *terani* group, (L'Argentier & Kingsolver 1994); more recently the *abbreviatus* group was revised to include the South American fauna (Viana &

Ribeiro-Costa 2013c). Despite all these contributions, many South American species remain to be described and allocated into groups. However, the boundaries of some groups, for instance the *guttifer* group (Johnson & Kingsolver 1973), are not well defined.

In this contribution we endeavored to describe 2 new species of *Sennius* from Brazil. They both share morphological similarities with species of the *guttifer* group. However, we have not included them in this group because we believe that a broad, comprehensive study needs to be undertaken in order to clarify species-groups classifications. We also provide illustrations, host plants and geographical distribution records for the new species. Graphical materials are shown online in color in a supplementary document at http://purl.fcla.edu/fcla/entomologist/browse.

Materials and Methods

Acronyms of the collections are as follows: DZUP, Coleção Entomológica Pe. J. S. Moure, Brazil (C. S. Ribeiro-Costa); TAMU, Texas A & M University, United States of America (Edward Riley); USNM, National Museum of Natural History, United States of America (D. G. Furth).

Morphological investigations, terminology and imaging follow the latest contributions on *Sennius* (Viana & Ribeiro-Costa 2013c). We used the following abbreviations for the measurements: BL, body length (from the anterior margin of the pronotum to the posterior margin of the elytra), BW, body width (widest width of elytra).

Descriptions of the labels on the type material follow Viana & Ribeiro-Costa (2013c). They are arranged in sequence from top to bottom, with data from each label enclosed within quotes, and a vertical line dividing lines.

Sennius albopygus **sp. nov.** Viana & Ribeiro-Costa (Fig. 1)

Male

Dimension. BL: 2.58 mm. BW: 1.71 mm.

Integument (Fig. 1A-D, supplementary document). Body black, except antennomeres 1–4 red-orange. Fore legs, tibiae, tarsi and apical half of mid femur red-orange, hind tibiae and tarsi red-orange (Fig. 1B).

Vestiture (Fig. 1A-D). Head with white and gold setae, white setae denser at posterior region of postocular lobe (Fig. 1C). Pronotal setae gold, with white setae at base and lateral regions (Fig. 1A). Scutellum with white setae. Elytra with golden setae, except white setae on 1st interstriae, at submedian region of 2nd interstriae, at base of 5th and 6th interstriae and in horizontal strip on subbasal region from 5th to 10th interstriae (Fig. 1A). Pygidium forming 2 suboval areas with golden setae; white setae at laterobasal region, in a vertical strip at median region and apex (Fig. 1D). Ventral surface with white setae, denser at mesepimeral base, posterior region of metepisternum and at distal region of hind coxa (Fig. 1B).

Head (Fig. 1C). Head short and wide with fine and coarse punctation; frontal carina present with flattened area at apex; transversal sulcus absent; width of frons 0.83 times the width of eye; ocular sinus 0.53 the eye length; postocular lobe narrow; antennomeres 1, 3-4 filiform, 2 moniliform, 5-10 eccentric, 11 pointed apically; antennomeres 3-4 shorter than 2, 5-6 and 11 about as long as wide, 7-10 wider than long; antennae reaching humerus.

Prothorax (Fig. 1A). Disk of pronotum subconic, with fine and coarse punctation and with depression in laterobasal regions (Fig. 1A); lateral carina extending about half the distance from base toward coxal cavity; basal lobe without median line; prosternal process not visibly separating coxae for their entire length.

Mesothorax and metathorax (Fig. 1A,B,E). Scutellum width about 0.17 width of elytron; 1.5 wider than long; flat with large and not elevated tooth on each lateroposterior side; each elytron twice as long as wide, each with base of striae 3-4 closer than others, base of striae without denticles; striae with coarse punctations connected by shallow row; humerus rugose (Fig. 1A). Hind coxae with dense coarse rigose punctation at middle and remainder with fine punctation, except glabrous area near sulcus of anterior region (Fig. 1B). Ventral-inner surface of hind femur with serrate carina and subapical smooth tooth, 0.75 longer than the width of hind tibia base. Hind tibia without lateroventral carina, apex with emargination near mucro and with 3 denticles; mucro 0.28 longer than the width of tibia apex (Fig. 1E).

Abdomen (Fig. 1D). Pygidium with dense coarse punctuation (Fig. 1D).

Male Genitalia (Fig. 1F,G). Median lobe about 5.2 longer than the narrowest width, apex slightly expanded; ventral valve subtriangular with rounded apex and straight lateral margins. Internal sac with hinge sclerites longer than width of median lobe at apex, curved and expanded at the apex as inverted golf cleat; apical region with dense short spicules; subapical region with sparse short spicules and 2 large dense groups of long spicules; submedian region with sparse short spicules; laterobasal lobes with four groups of large spicules and sparse short spicules; basal region with dense short spicules (Fig. 1F). Tegmen with lateral lobes separated by emargination about 0.72 times their length (Fig. 1G).

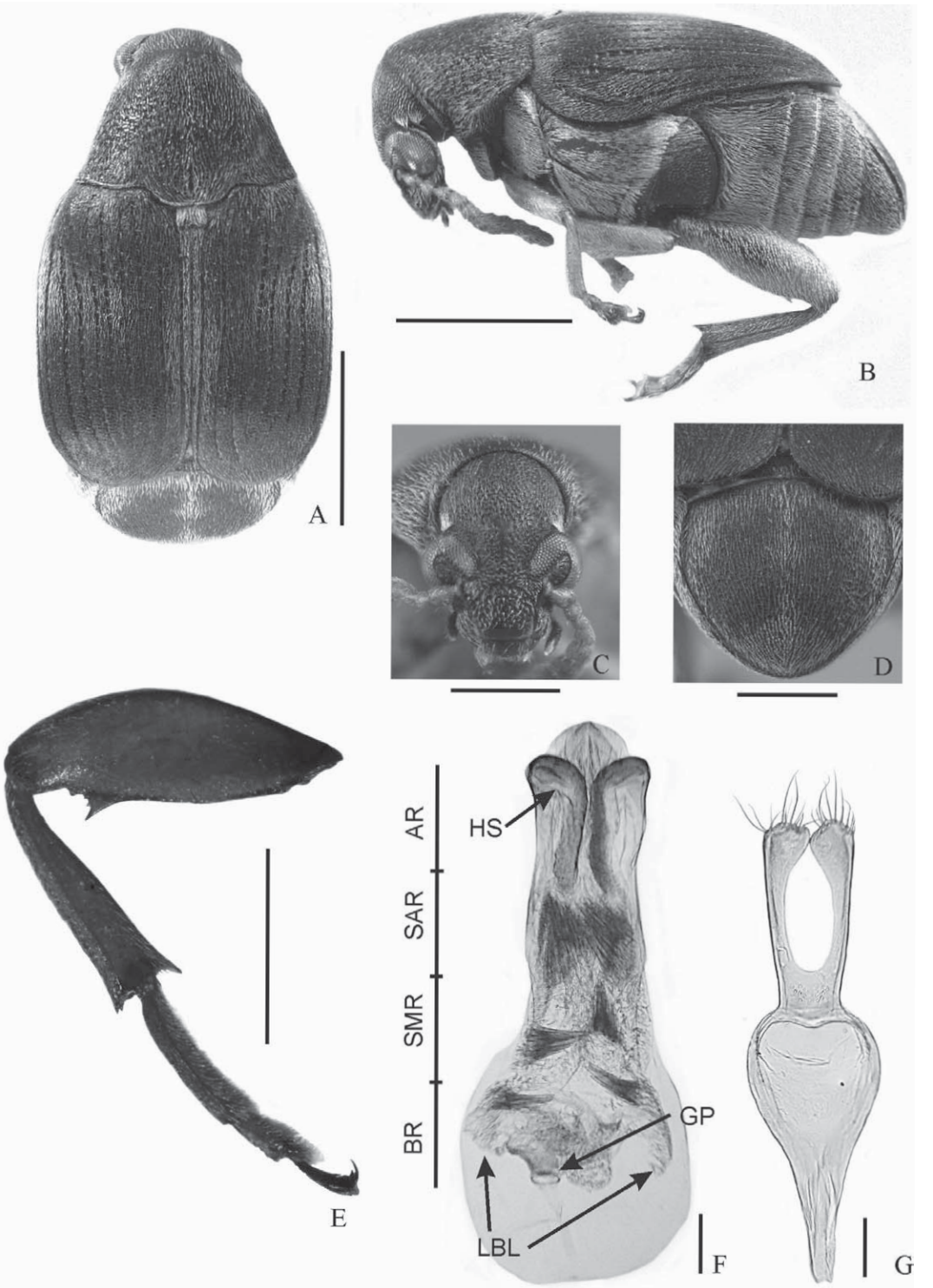

Fig. 1. *Sennius albopygus* **sp. nov.** A, dorsal view; B, lateral view; C, head, frontal view; D, pygidium; E, hind leg, internal view; F, G, male genitalia: F, median lobe, G, tegmen. AR – Apical region; SAR – Subapical region; SMR –Submedian region; BR – Basal region; HS – Hinge sclerite, LBL – Laterobasal lobes; GP – Gonopore. Scale bars = 0.5 mm for A-E; and 0.1 mm for F and G. These figures are shown in color in the supplementary document in Florida Entomologist 97(2) (2014) online at http://purl.fcla.edu/fcla/entomologist/browse .

Variation (9 Paratypes)

Dimension. BL: 2.28–2.5 mm. BW: 1.51–1.68 mm. Body with red-orange macula in submedian region from 2nd or 3rd to 10th interstriae or external margin of elytra; antennomeres 3-11 brown; hind tibia and tarsi brown. Elytra with horizontal strip of white setae from 3rd to 6th interstriae. Width of frons between 0.91-1.05 times the width of eye; scutellum width about 0.19-0.21 the width of each elytron, 1.4-1.7 wider than long. Hind femur with subbapical tooth of 0.71-0.78 longer than width of hind tibia base; lateroventral carina about half the length of tibia; hind tibia with mucro about 0.24-0.31 longer than width of tibia apex.

Female

Similar to male except apical margin of last abdominal ventrite not emarginate.

Type Material (9)

HOLOTYPE male deposited in DZUP with labels: "Brasil – Goiás, Goiânia | 16º 35' 33.78" S 49º 15' 14.78" W | 20-V-2012 Bergamini, L. | L. col." "Larva consumindo | sementes de *Senna* | *aculeata*" "HOLOTYPE | *Sennius albopygus* | Viana & Ribeiro-Costa | Desig. Viana & Ribeiro-Costa". Five paratypes deposited in DZUP (3), TAMU (1) and USNM (1) with same labels, except last one: "Pasto às margens de | córrego Encontrados | repousando no interior das | flores de *Senna aculeata* pela manhã". One paratype deposited in DZUP with labels: "Brasil Pará | Cachimbo | agosto 1979" "M. J. G. Hopkins | H. C. Hopkins" "ex *Cassia alata* L. | without voucher | Coll. 13-VIII-1979" "4429" "M. J. G. Hopkins | Collection" "PARATYPE | *Sennius albopygus* | Viana & Ribeiro-Costa | Desig. Viana & Ribeiro-Costa". One paratype deposited in DZUP with labels: "Brasil Pará | Cachimbo | VIII-1979" "M. J. G. Hopkins | H. C. Hopkins" "ex *Cassia alata* L. | without voucher | Coll. 13-VIII-1979" "4430" "M. J. G. Hopkins | Collection" "PARATYPE | *Sennius albopygus* | Viana & Ribeiro-Costa | Desig. Viana & Ribeiro-Costa". One paratype deposited in DZUP with labels: "Brazil: Roraima | Ilha de Maracá | 3.20° N 61.23° W | XII-1979 | M. J. G. Hopkins" | H. C. Hopkins" "ex *Cassia alata* L. | voucher: | H. C. Hopkins 349 | Coll. 13-VIII-1979" "5248" "M. J. G. Hopkins | Collection" "PARATYPE | *Sennius albopygus* | Viana & Ribeiro-Costa | Desig. Viana & Ribeiro-Costa".

Geographic Distribution

Brazil (Roraima, Pará, Goiás).

Host Plants

Fabaceae: Caesalpinioideae: *Senna alata* (Linn.) Roxb., *S. aculeata* (Pohl ex Benth.) H. S. Irwin & Barneby

Remarks

Sennius albopygus **sp. nov.** externally resembles some *Sennius* species with black dorsal integument color and pubescence pattern, with white setae forming a horizontal strip in the subbasal region of the elytra, similar to the condition found in *Sennius bondari* (Pic, 1929) (Fig. 3A, Viana & Ribeiro-Costa 2013a: p. 12) and *S. ensiculus* Johnson & Kingsolver 1973 (Fig. 58, Johnson & Kingsolver 1973: p. 120). However, it differs by the extension and uniformity of the horizontal strip at the subbasal region and by the absence of white setae at the base of the elytra, and also by the pubescence pattern of the pygidium. The male genitalia of *S. albopygus* **sp. nov.** resembles *S. guttifer* by having a median lobe more than 5 times longer than its narrowest width and with a similar spicules pattern of internal sac.

It differs from *S. guttifer* by having hinge sclerites expanded at the apex as an inverted golf cleat (*S. guttifer* not expanded), the short spicules denser at subapical region (*S. guttifer* in subapical region with less dense spicules) and by having 4 distinct groups of long spicules distributed as 2 subapical and 2 on each laterobasal lobe (*S. guttifer* with the submedian region bearing 2 distinct groups of long spicules).

The description of this species had already been presented in a congress (Viana & Ribeiro-Costa 2013b). We followed the recommendation of the International Commission on Zoological Nomenclature (ICZN 1999), that 'authors should not include new names and nomenclatural acts in abstracts of papers or posters to be presented at meetings' (Recommendation 9A of Article 9), and did not associate a name to the described taxa. The ICZN (1999) also does not consider such paper as a published work, because it is a material issued primarily to participants at meetings (e.g. symposia, colloquia, congresses, or workshops (Article 9.10). In this paper we are providing the valid description for *S. albopygus* **sp. nov.**

Etymology

From the Latin *albo* + *pygus* (meaning white pygidium), refers to white setae on the pygidium apex.

SENNIUS SOLUM **SP. NOV.**
VIANA & RIBEIRO-COSTA
(Fig. 2)

Male

Dimension. BL: 2.33 mm. BW: 1.54 mm.

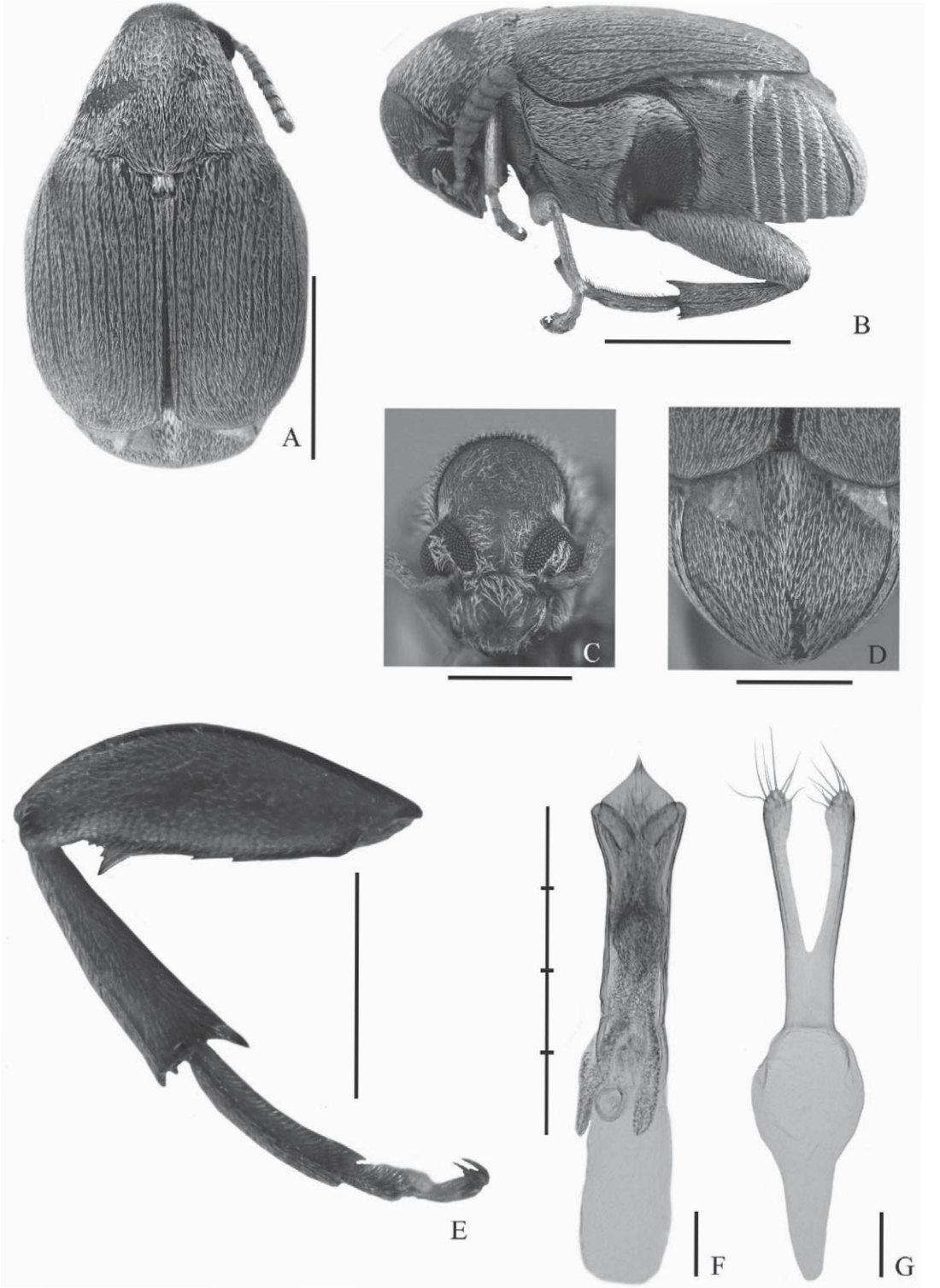

Fig. 2. *Sennius solum* **sp. nov.** A, dorsal view; B, lateral view; C, head, frontal view; D, pygidium; E, hind leg, internal view; F, G, male genitalia: F, median lobe, G, tegmen. Scale bars = 0.5 mm for A-E; and 0.1 mm for F and G. These figures are shown in color in the supplementary document in Florida Entomologist 97(2) (2014) online at http://purl.fcla.edu/fcla/entomologist/browse.

Integument (Fig. 2A-D, suplementary document). Light brown body, except antenna, elytra, fore and mid legs red-orange (Fig. 2A-D).

Vestiture (Fig. 2A-D). Head with yellow setae, denser at ocular sinus, postocular lobe and posterior region of postocular lobe (Fig. 2C). Pronotal setae yellow and denser laterally, except near scutellum with white setae (Fig. 2A). Scutellum with white setae. Elytra (Fig. 2A) and pygidium (Fig. 2D) with yellow setae, denser at median-apical region. Ventral surface with white setae, denser at mesepimeral base, posterior region of metepisternum and at distal region of hind coxa (Fig. 2B).

Head (Fig. 2C). Head short and wide with fine punctation, frontal carina present with midline rugouse and flattened area at apex, transversal sulcus absent; width of frons 1.05 times the width of eye; ocular sinus 0.75 the eye length; narrow postocular lobe; antennomeres 1, 3-4 filiform, 2 moniliform, 4 shorter than 2-3, 5-10 eccentric, 11 pointed apically; 5 and 11 about as long as wide, 6-10 wider than long; antennae reaching elytra.

Prothorax (Fig. 2A). Disk of pronotum conical (Fig. 2C) with fine and coarse punctation, coarse punctation denser at middle region, and laterobasal regions depressed and with lateral carina extending about half the distance from the base toward the coxal cavity; basal lobe without median line. Prosternum not visibly separating coxae for their entire length.

Mesothorax and metathorax (Fig. 2A, B, E). Scutellum width about 0.15 the width of each elytron; 1.5 wider than long; concave, with large and elevated tooth on each lateroposterior side; Each elytron twice as long as wide, each with base of striae 3-4 closer than others, base of 2nd stria with small denticle and base of striae 3-4 with larger denticles; striae with coarse punctations connected by deep row; humerus rugouse (Fig. 2A). Hind coxae with dense coarse punctation at the center and remainder with intermediary punctation, except glabrous area near sulcus of the anterior region (Fig. 2B). Ventral-inner surface of hind femur with carina serrate and sub-apical serrate tooth, 0.78 longer than width of hind tibia base. Hind tibia without lateroventral carina, apex without sinus near mucro and with three denticules and mucro 0.38 longer than the width of tibial apex (Fig. 2E).

Abdomen (Fig. 2D). Pygidium with dense thin punctuations (Fig. 2D).

Male Genitalia (Fig. 2F, G). Median lobe about 7.7 longer than narrowest width, apex expanded; ventral valve subtriangular with acute apex and concave lateral margins. Internal sac with hinge sclerites shorter than width of apex of middle lobe, straight and not expanded; apical and subapical regions with dense short spicules; submedian region and laterobasal lobes with sparse short spicules; basal region with dense spicules near gonopore (Fig. 2F). Tegmen with lateral lobes separated by emargination about 0.66 times their length (Fig. 2G).

Female

Unknown.

Type Material (1)

HOLOTYPE male deposited in DZUP with labels: "Brasil – GO Niquelândia | 14º 21' 47.1" S 48º 41' 17.9" W | IX-2009 M. Pimenta & L.L. | Bergamini cols. Malaise" "Chrysomelidae | Bruchinae sp. 2 – R706 | L.L. Bergamini det. 2010" "HOLOTYPE | *Sennius solum* | Viana & Ribeiro-Costa | Desig. Viana & Ribeiro-Costa".

Distribution

Brazil (Goiás).

Host Plant

Unknown.

Remarks

The specimen of *Sennius solum* **sp. nov.** externally resembles some *Sennius* species with specimens of red-orange dorsal integument and uniform pubescence pattern: for instance *Sennius atripectus* Johnson & Kingsolver 1973 (Fig. 16, Johnson & Kingsolver 1973: p. 112) and *Sennius margarete* Viana & Ribeiro-Costa, 2013 (Fig. 4A, Viana & Ribeiro-Costa 2013a: p. 17), but they differ in the male genitalia. *Sennius solum* **sp. nov.** resembles *Sennius russeolus* Johnson & Kingsolver 1973 (Fig. 123, Johnson & Kingsolver 1973: p. 132) by having the median lobe more than 5 times longer than its narrowest width and with a similar spicules pattern of the internal sac: but differs from it by the acute apex and the concave lateral margins of the ventral valve; by the hinge sclerites shorter and wider, the submedian region with sparse short spicules and basal region with dense short spicules near the gonopore. *S. russeolus* has a rounded apex and convex lateral margins of the ventral valve, hinge sclerites thinner and longer, and the submedian and basal regions with short spicules distributed in most of the submedian region and near the gonopore.

Etymology

From the Latin *solus*, meaning sole or unique. Used here to refer to the holotype as the only known specimen until this moment.

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