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Research article

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Revision of Neotropical *Scelolabes* Philippi (Diptera, Hybotidae, Ocydromiinae): two new species and a proposal of delimitation

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Abstract. *Scelolabes*, historically is a monotypic genus of Ocydromiinae (Hybotidae) that for a long time was not studied due to the absence of the type of the type species (*Scelolabes bivittatus* Philippi), which is probably lost or destroyed. In this context, we propose an updated diagnosis and redescription of the genus, based on specimens identified by experts and in agreement with the original description of Philippi (1865), as well as illustrating male and female terminalia for the first time. This serves as an aid to discuss and corroborate the status of *Scelolabes* in the Neotropical region as a genus distinct from *Hoplopeza*. In addition, two new species are described, and an identification key and a distribution map are provided to all the Neotropical species of the genus.

Keywords. Empidoidea, predatory flies, dance flies, taxonomy, Neotropical Region.

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Introduction

Scelolabes Philippi, 1865 was considered, for a long time, to be a monotypic genus of Ocydromiinae Schiner, 1862, with its Neotropical distribution restricted to the Pacific Coast and Andean region of Southern South America (Chile and Argentina). Sinclair & Cumming (2000) indicated that undescribed species of the genus also occurred in Australia. During the more than one and a half centuries since its description, there is a gap regarding the knowledge about species composition, Neotropical and

world distribution, morphological diversity and cladistic positioning of the genus, given that important morphological characters, such as male and female terminalia, have not been described or illustrated.

Based on the original description and illustration of *Scelolabes bivittatus* by Philippi (1865), and the redescription made by Collin (1933), who did not examine the type, researchers have been able to identify the single specimen of the genus based on the following very broad diagnostic characters: all femora strongly dilated, particularly the hind one, and the presence of one ventral row of small spine-like setae inserted on micro-tubercles on the hind femur.

The task of identifying *S. bivitattus* with few characters has been made easier by the absence of further species in the genus. Alternately, these almost all-inclusive diagnostic characters, allied with the absence of up-to-date diagnoses, description and refined morphological studies of features such as the male terminalia, led researchers to a problematic distinction between *Scelolabes* and *Hoplopeza* Bezzi, 1909, making necessary a revision of both genera (Sinclair & Cumming 2000). However, as the holotype of the single described species, *S. bivittatus*, is apparently lost or destroyed, a formal redescription has not been completed. Consequently, the description of additional new species has also been compromised.

In this context, motivated by the insufficiency of diagnostic characters of *Scelolabes* that distinguish it from *Hoplopeza* and to facilitate the description of new species, we studied specimens of *S. bivittatus* identified by experts and in agreement with the original description, from different regions of Chile and Argentina in order to provide an updated diagnosis and redescription of this species and genus, providing the first illustration of the male and female terminalia of the genus. The description of two new species also helps to improve the understanding of the diagnostic morphological characters of the genus and its cladistic position in the subfamily. In addition, we provide an identification key to all Neotropical species of the genus and an updated distribution map.

Material and methods

The material studied in this work is housed in the institutions cited below.

CAS = The California Academy of Sciences, California, USA
CNC = The Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada
INPA = Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil
MNHN = Museo Nacional de Historia Natural, Santiago, Chile
MNRJ = Museu Nacional do Rio de Janeiro, Rio de Janeiro, Brazil
MZUSP = Coleção Entomológica do Museu de Zoologia da Universidade de São Paulo, Brazil

Terms used for adult structures and abbreviations follow Cumming & Wood (2017). We describe the hybotid male terminalia based on their unrotated position, considering the cerci positioned dorsally. In description and figures, male terminalia and their parts are presented oriented with their basal (anterior) parts at the bottom and the apical (posterior) parts at the top of the figure. Female terminalia are shown in the figures with the posterior parts demarcated by the presence of the cerci.

Terminalia were removed from the abdomen, treated with hot 85% lactic acid, and kept in a microvial with glycerine. Wings were photographed after being removed from the body, mounted between cover slides with Canada balsam and glued on one side to a small piece of carton. Microvials and cover slides were pinned together with their respective specimens.

The specimens were photographed with a Leica MC170 HD camera, attached on a Leica M165C stereo microscope. Posteriorly, photographs were stacked and combined using Leica Application Suite ver. 4.11.

Distribution maps were created with QGIS Software (ver. 3.24), using localities from specimen labels and the published works of Philippi (1865) and Collin (1933).

Results

Taxonomic account

Classe Insecta Linnaeus, 1758
Order Diptera Linnaeus, 1758
Superfamily Empidoidea Brauer, 1883
Family Hybotidae Meigen, 1820
Subfamily Ocydromiinae Schiner, 1862

Genus ***Scelolabes*** Philippi, 1865

Scelolabes Philippi, 1865: 751, pl. 28 fig. 45

Scelolabes – Gerstaecker 1867: 415 (diagnosis). — Schiner 1868: 200 (citation). — Bigot 1889: 116 (in key). — Bezzi 1905: 458 (catalogue). — Kertész 1909: 104 (catalogue). — Melander 1928: 49 (citation), 51 (in key), 71 (catalogue). — Edwards & Shannon 1927: 655 (citation). — Collin 1928: 13 (citation); 1933: 3–4 (citation), 9 (key), 47 (citation), 49 (remark). — Hardy 1930: 238 (citation), 239 (table), 248 (in key). — Smith 1967: 16 (catalogue). — Chvála 1983: 111, 226 (citation). — Plant 1989: 231 (citation). — Sinclair & Cumming 2000: 179 (citation), 182 (in key, world distribution); 2006: 78 (citation); 2007: 37 (citation). — Camousseight 2005: 90 (list). — Ale-Rocha 2007: 410 (citation and in key). — Yang *et al*. 2007: 335 (catalogue). — Ale-Rocha & Freitas-Silva 2014a: 442 (in key); 2014b: 502 (citation). — Barros *et al*. 2019: 399 (citation); 2022: 516 (citation). — González *et al*. 2021a: 163 (list), 166 (catalogue).
Scelobates (sic) – Reed 1888: 301 (catalogue). — Bezzi 1905: 458 (correction). — Melander 1902: 250 (citation). — Becker 1915: 155 (citation).
Scelolates (sic) – González & Llanos 2019: 121 (list).

Type species

Scelolabes bivittatus Philippi, 1865, by monotypy.

Revised diagnosis

Antenna inserted above mid height of head (Fig. 3A). Prosternum narrow, acrostichal multiserial (Fig. 3F), 1 notopleural seta. Hind tibia without apical strong process, usually with outstanding short setae (Fig. 5E). Discal cell short (shorter than length of bm cell) (Fig. 3G), CuA vein complete or incomplete. Hypandrium with a short projection on right distal margin with a tuft of long and slender setae (Fig. 4A); right surstylus with bifid apex, chela-like (Figs 2F, 4F, 6F); female tergite 10 absent, sternite 10 subtriangular, divided medially (Fig. 4G).

Redescription

Male

Colour. Predominantly yellow species.

Head. Eyes bare. All ocellar facets uniformly sized. Frons shining, except lower half with pruinosity, narrower than width of anterior ocellus; very close eyes near face. Antenna inserted above mid height of head (Fig. 3A), postpedicel lanceolate, about twice length of scape and pedicel combined, covered with dense microtrichia (Fig. 5C); two pairs of ocellar setae proclinate, anterior pair strong and long, posterior pair very short and thin. Proboscis oriented downwards, short; palpus covered with setae.

Occiput covered with pruinosity (Figs 1E, 3E), postocular setae elongated, scattered, upper setae stronger (Fig. 3E).

Thorax. Prosternum narrow (not forming precoxal bridge). Acrostichal setulae multiserial, dorsocentrals uniserial, short, slender and sparse on scutum. Notopleuron with 1 seta; lacking postpronotal seta; 1 anterior long and strong as well as 1 posterior short and slender postalar setae. Scutellum with 1 pair of lateral setae and 1 pair apical of bristles.

Wing (Fig. 1G). Narrow, not enlarged at apex. Membrane pale brown; pterostigma present, elongate and narrow, situated at apex of c cell; basal costal seta present, strong; Rs short, arising near apex of br cell; R_1 vein long, ending at apical ⅓ of wing; dm cell shorter than basal cells; CuA vein complete or incomplete, reaching or not reaching CuP vein; CuA+CuP not reaching wing margin; M_{1+2} and M_4 veins reaching wing margin; anal lobe not developed. Halter with a row of spine-like setulae on stem (Fig. 1C).

Legs. Fore and mid legs slender; hind femur slightly to strongly swollen, banded near apex. Chaetotaxy of legs: hind tibia without apical strong process, only a slender dorsal outstanding seta at apex. Tarsi lacking outstanding bristles.

Abdomen (Fig. 1A, H). Shining. Syntergite 1+2 partly fused. All tergites weakly sclerotized anteriorly. Sternite weakly sclerotized. All tergites covered with short to long and slender setae on apical margin.

Male terminalia (Fig. 4A–F). Hypandrium with slender setae, and a short projection on right distal margin with a tuft of long and slender setae (Fig. 4A). Phallus elongate, phallic shaft gradually arched, cylindrical, without protuberances (Fig. 4C–D); phallus articulation as long as phallic shaft, sclerotized. Left epandrial lamella slightly shorter than right lamella (Fig. 4C); right epandrial lamella with a dorsal projection near base (Figs 2B, 4B, 6B); dorsal connection between epandrial lamellae wide and narrow (Fig. 4B). Surstyli setulose, setae inserted on tiny tubercles (Fig. 4F); left surstylus usually sinuous at apex (Fig. 4E); right surstylus shorter than left, with bifid apex, chela-like (Fig. 4F). Cerci symmetrical, short, subtriangular, weakly sclerotized, flattened, covered with short and slender setae (Fig. 4B); subepandrial sclerite short and broad, with basal margin truncate and distal margin with slight medial concavity; hypoproct with short marginal apical projections (Fig. 4B); bacilliform sclerite setulose.

Female (Fig. 3B)

Similar to male, except by the shorter length.

Female terminalia (Fig. 4G). Tergite and sternite 8 fused laterally, broad; sternite 8 with slight constriction in posterior margin making a bifid and sharpened projection. Tergite 10 absent. Sternite 10 slightly sclerotized, small, sub triangular, divided medially. Cerci symmetrical, slightly sclerotized, flattened, short, covered by several short and slender setae.

Distribution

Scelolabes is known from southern Argentina and Chile. Sinclair & Cumming (2000) also list the genus from Australia.

Remarks

Scelolabes is similar to *Hoplopeza* by the antenna inserted above the mid-height of the head, wing with anal lobe not developed and Rs vein very short, arising near the apex of bm cell. Both genera are different by apical strong setae in hind tibia present in *Hoplopeza*, vs weak or absent in *Scelolabes*, right surstylus with bifid apex, chela-like in *Scelolabes*, vs simple in *Hoplopeza*, and tergite 10 absent in

females of *Scelolabes*, while it is present in *Hoplopeza.* Additionally, in *Scelolabes* the acrostichal setae are always multiserial, while in *Hoplopeza* they may be either uniserial or multiserial.

Scelolabes amorimi sp. nov.
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Figs 1–2, 7A

Diagnosis

Scape and pedicel yellow, postpedicel brown (Fig. 1D). Scutum extensively black, except for narrow yellow triangular marks on anterior and posterior acrostichal region (Fig. 1F). Pleura (Fig. 1A) yellow, except entire anepisternum and brown spots on upper margin of katepisternum, on anterior margin of anepimeron and on upper margin of meron. Legs (Fig. 1A) whitish yellow, except apical half of hind femur light brown.

Etymology

The epithet *amorimi* is named after the dipterologist Dalton Amorim, for having collected the holotype and part of the paratype series.

Type material

Holotype

CHILE • ♂ (good condition, except by the right hind leg lost); "Osorno, Pq. Nac. [Parque Nacional] Puyehue, Termas Aguas Calientes, 40°44′S / 72°19′W, 440 m, 14–31. i. 2017, sweeping, V. C. Silva & D. S. Amorim [white label]", "HOLOTYPE, *Scelolabes amorimi* Barros, Freitas-Silva & Ale-Rocha" [red label]; MNHN.

Paratypes

CHILE • 1 ♂, 10 ♀♀; same collection data as for holotype; INPA • 1 ♂, 10 ♀♀; same collection data as for holotype; MNHN • 10 ♀♀; same collection data as for holotype; MNRJ • 8 ♀♀; same collection data as for holotype; MZUSP • 5 ♀♀; same collection data as for holotype except "464 m, 40°44′16″ S, 72°18′24″W, 14.i–3.ii.2017, Shannon Trap, D.S. Amorim & V.C. Silva cols"; MNHN • 1 ♂, 14 ♀♀; same collection data as for holotype; INPA • 1 ♂, 10 ♀♀; same collection data as for holotype; MNHN • 14 ♀♀; same collection data as for holotype; MZUSP • 5 ♀♀; same collection data as for holotype except "464 m, 40°44′16″ S, 72°18′24″W, 14.i–3.ii.2017, Shannon Trap, D.S. Amorim & V.C. Silva cols"; MNHN • 1 ♀; "10 km E of Puyehue, 26.i.1951, leg. Ross & Michelbacher"; CAS • 1 ♀; "Puerto Fuy, Valdivia, 4.iii.1955, L.E. Peña"; CNC • 1 ♂; "R.[Region] IX, PN [Parque Nacional] Nahuelbuta, 37°48′58″S, 73°00′36″W, 9–10.ii.2005, YPT [Yellow Pan Trap], mature Nothofagus for., L. Masner, UCR A tol"; CNC.

Description

Male (Fig. 1A, C–D, F, H).

Measurements. Body length: 4.5 mm. Wing length: 4.3 mm.

Head. Dichoptic, frons shining brown, narrow, about same width of anterior ocellus. Face narrower than frons, about 1.8× length of frons. Antenna (Fig. 1D) yellow, except postpedicel brown, scape as long as pedicel, postpedicel lanceolate, about 2× length of scape and pedicel combined, with dense brown microtrichia; stylus about 1.7× length of antenna. Proboscis whitish yellow and short; palpus whitish yellow, short, oval, covered with dense yellow pruinosity and 1 long slender seta. Two pairs of proclinate ocellar setae, anterior pair longer and stronger, posterior very short and slender. Occiput (Fig. 1E) black covered with dense grey pruinosity, postocular setae elongated, scattered, upper postocular setae stronger.

Thorax. Shining. Pronotum brown with grey pruinosity. Scutum (Fig. 1F) longer than wide, black, except for orange yellow subtriangular acrostichal area on anterior fourth and triangular spot on the prescutelar region, middle of acrostichal region paler, postpronotal lobe and postalar callus yellow. Pleura (Fig. 1A) whitish yellow, except anepisternum, brown spots on upper margin of katepisternum, on anterior margin of anepimeron and on upper margin of meron. Scutellum brown, paler on apical margin, short lateral scutellar seta thin and short, apical scutellar bristle yellow, long and strong; mediotergite brown with grey pruinosity. Acrostichal setae 4-serial, dorsocentral setulae uniserial, short, slender and sparse on scutum, posterior dorsocentral seta longer; several short and slender setae in the prescutelar

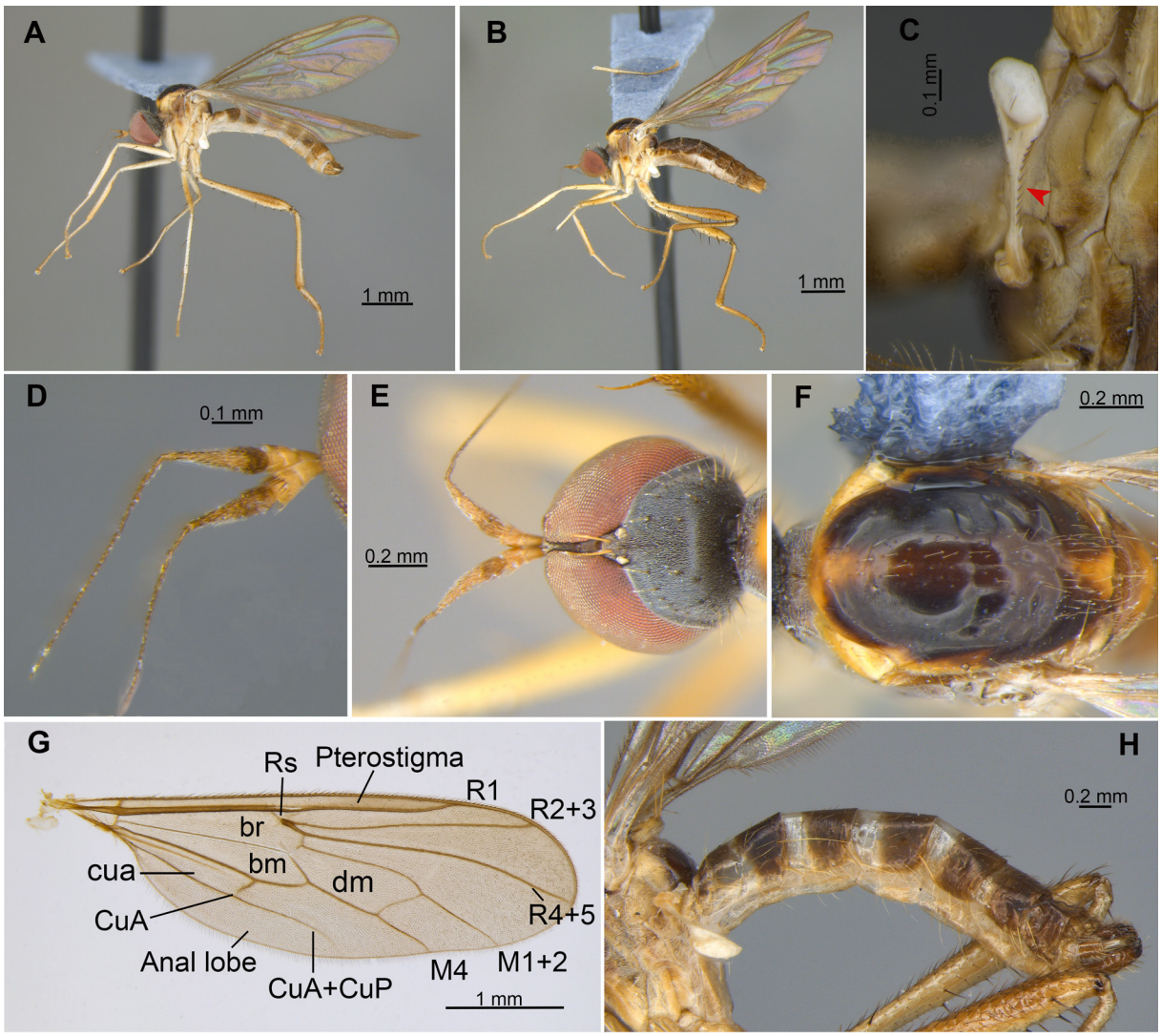

Fig. 1. *Scelolabes amorimi* sp. nov. **A**. Holotype, ♂ (MNHN). **B**. Paratype, ♀ (MNHN). **C–H**. Paratypes (MNHN). **A–B**. Lateral habitus. **C**. Halter, row of spine-like setulae in evidence (arrow). **D**. Antenna in lateral view. **E**. Occiput of male in dorsal view. **F**. Scutum in dorsal view. **G**. Wing of male paratype. **H**. Abdomen in lateral view. Abbreviations: bm = basal medial cell; br = basal radial cell; CuA = anterior branch of cubital vein; cua = anterior cubital cell; CuA+CuP = anterior branch of cubital vein + posterior branch of cubital vein; dm = discal medial cell; M_{1+2} = first branch of media; M_4 = fourth branch of media; R_1 = anterior branch of radius; R_{2+3} = second branch of radius; R_{4+5} = third branch of radius; R_s = radial sector.

region; several short and slender postpronotal setae; notopleuron with light grey pruinosity, 1 long and strong bristle and several shorter, thin setae; 2 postalar setae, 1 anterior long and strong, 1 posterior short and thin.

Wing (Fig. 1G). Membrane pale brown; pterostigma brown, elongate and narrow; dm cell shorter than basal cells, approximately 3 × as long as wide; bm cell 1.3 × length of cell cua; CuA vein incomplete, not reaching CuP vein. Halter (Fig. 1C) whitish yellow, stem with a row of spine-like setulae.

Legs (Fig. 1A). Whitish yellow, except apical half of hind femur light brown. All coxae subequally long. Legs long and slender, except apex of hind femur and hind tibia slightly swollen. Chaetotaxy: fore femur with 1 long and slender anterodorsal sub-basal seta, 1 anterodorsal and 1 posterodorsal setae at apical ⅓; mid femur with 1 strong anterodorsal seta at basal ⅓, 2 strong posterodorsal on apical half and 1 strong anterodorsal subapical setae; hind femur with 1 strong anterodorsal sub-basal, 1 strong posterodorsal sub-basal, 1 strong anterodorsal subapical, 1 anteroventral row of strong setae on apical half and a posteroventral row of long setae, last strong, both inserted on short tubercles. Fore tibia without outstanding setae; mid tibia with 2 slender basal setae, 1 anterodorsal and 1 posterodorsal, 1 strong anterodorsal seta at mid-length, 1 strong anterodorsal seta at apex, 1 strong anteroventral and 1 strong posteroventral apical setae; hind tibia with 1 slender dorsal basal seta, 2 posterodorsal apical setae, 1 slender and 1 strong, 1 strong anteroventral apical seta. Tarsi without outstanding bristles.

Abdomen (Fig. 1H). All tergites brown, whitish and weakly sclerotized anteriorly. Sternites 1–4 weakly sclerotized, hyaline; sternites 5–8 pale brown, weakly sclerotized anteriorly. All tergites with long and slender setae on apical margin.

Male terminalia (Fig. 2A–F). Hypandrium (Fig. 2A) short, sub-quadrangular, as long as wide, with a short projection with an apical tuft of long and slender setae on right side. Epandrial lamellae covered with several short and slender setae. Left epandrial lamella (Fig. 2C) subtriangular, shorter than right, as wide as long; right epandrial lamella (Fig. 2D) broad, sub-quadrangular, as wide as long, dorsobasal pointed projection short and wide. Left surstylus (Fig. 2E) long, slightly sharpened, curved at apex, turned direct to dorsal margin, with 1 row of long and slender setae close together on dorsal surface, 1 row of long, slender and scattered setae on ventral surface, all setae inserted on tiny tubercles; right surstylus (Fig. 2F) shorter, about ⅔ length of left surstylus, left lobe thin, sharpened and claw-like, longer than right, right lobe rounded with short and slender setae, dorsal surface near base with a row of long, slender and scattered setae, inserted on tiny tubercles. Cerci (Fig. 2B) symmetrical, short, subtriangular, weakly sclerotized, covered with short and slender setae. Subepandrial sclerite (Fig. 2B) with basal and apical margins truncate. Hypoproct (Fig. 2B) sub-quadrangular, with a small triangular projection in left margin, behind left cercus. Bacilliform sclerite asymmetrical with short and slender setae.

Female (Fig. 1B)

Similar to male, except by abdominal tergites entirely sclerotized.

Female terminalia (Fig. 2G). Tergite and sternite 8 laterally fused, broad. Sternite 8 with slight and short constriction in posterior margin shaping a bifid and sharpened projection, covered by several short and slender setae. Tergite 10 absent. Sternite 10 slightly sclerotised, small, sub-triangular, with a narrow mediobasal division until ⅓ of length, covered with several short and slender setae. Cerci slightly sclerotised, flattened, short, about ⅔ of sternite 10, covered with several short and slender setae.

Variation

Some specimens may have the scutum with full yellow acrostichal stripe, probably due to preservation in alcohol.

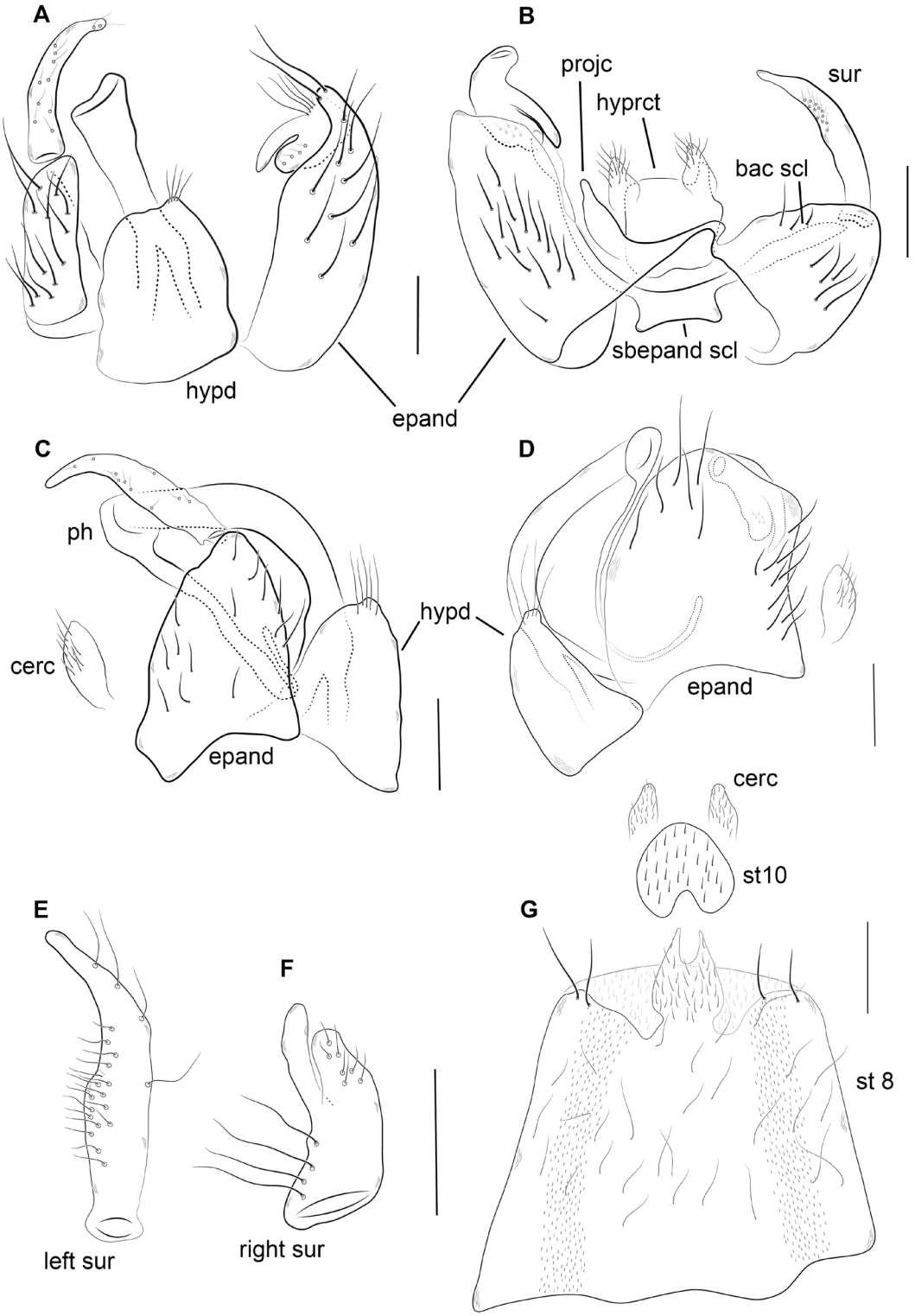

Fig. 2. *Scelolabes amorimi* sp. nov. **A–F**. Male terminalia. **A**. Ventral view. **B**. Dorsal view. **C**. Left lateral view. **D**. Right lateral view. **E–F**. Surstyli in frontal view. **E**. Left. **F**. Right. **G**. Female terminalia in ventral view. Abbreviations: bac scl = bacilliform sclerite; cerc = cercus; epand = epandrium; hypd = hypandrium; hyprct = hypoproct; ph = phallus; projc = projection; sbepand scl = subepandrial sclerite; st = sternite; sur = surstylus. Scale bars = 0.1 mm.

Remarks

The female terminalia of *S. amorimi* sp. nov. are different from those of *S. bivittatus* by the sternite 10 narrowly divided mediobasally until ⅓ of length, whereas those of *S. bivittatus* are divided medially until half the length of sternite 10. The scutum of *S. amorimi* is clearly darker than in the other two species of the genus, with only narrow triangular yellow marks on the anterior and posterior part of the acrostichal area. The brown mark on the pleura is also more extensive in *S. amorimi* than in *S. bivittatus* and *S. verasilvae* sp. nov.

Distribution

This species is known only from Chile (Osorno; Fig. 7A).

Scelolabes bivittatus Phillipi, 1865
Figs 3–4, 7B

Scelolabes bivittatus Phillipi, 1865: 751, pl. 28 fig. 45.

Scelolabes bivittatus – Gerstaecker 1867: 415 (citation). — Bezzi 1905: 458 (catalogue). — Kertész 1909: 104 (catalogue). — Melander 1928: 71 (catalogue). — Collin 1933: 49–51 (redescription). — Smith 1967: 16 (catalogue). — Camousseight 2005: 90 (list). — Yang *et al*. 2007: 336 (catalogue). — Ale-Rocha & Freitas-Silva 2014a: 441 (citation), 446 (list). — González *et al*. 2021a: 162 (list), 166 (catalogue).

Diagnosis

Scape and pedicel yellow, postpedicel brown (Fig. 3D). Scutum (Fig. 3F) orange yellow, except for narrow intra-alar black stripe reaching posterior margin and not extending laterally to notopleural region. Legs (Fig. 3A) with long, slender and waved setae, hind femur strongly swollen with 2 rows of spine-like setae, 1 anteroventral and 1 posteroventral.

Material examined

ARGENTINA • 1 ♂; "Río Negro: Bariloche, Llao-Llao Lane, i.1962, Coscaron, & Capri, 254, *Scelolabes bivittatus* Phil., N. Papavero det. [19]62"; MNRJ • 1 ♂; "Chubut: Lago Futalaufquen Lane, i.1962, Coscaron & Capri, *Scelolabes bivittatus* Phil., N. Papavero det. [19]62"; MNRJ.

CHILE • 1 ♀; "Chile, E.P. Reed, E.P. Reed Collection"; CAS • 1 ♂, 1 ♀; "[Valparaíso:] Acon. Zapallar, 15.xii.1950, Ross and Michelbacher coll., Scelolabes sp. D. Wilder 1977 det"; CAS • 2 ♀♀; "Curicó: 3 km SE. of Los Queñes, 1100 m, 9.iv.1966, Mike E. Irwin & Luciano E. Campos coll."; CAS • 1 ♂; "Concepcíon: Pinares, 9–13.xi.1970, T. Cekalovic coll."; MZUSP • 1 ♀; "Cautín: 20 km E. of Temuco, 1–8–52 [08.i.1952] Ross & Michelbacher leg."; CAS • 1 ♀; "Malleco: 18 km W. Angol, Nahuelbuta Ca. Pk [National Park]. 37°48′S, 72°43′W, 620 m, 10.ii.1967, E.I. Schlinger, *Scelolabes* B.J. Sinclair, 1993 det"; CAS • 1 ♂, 4 ♀♀; "Osorno: Pq. Nac. [National Park] Puyehue, Termas Aguas Calientes, 40°44′S, 72°19′W, 440 m, 14–31.i.2017, sweeping, V.C. Silva & D.S. Amorim col."; MNHM • ·2 ♀♀; same collection data as for preceding; MZUSP • 1 ♀; same collection data as for preceding except "14.i–3.ii.2017"; MZUSP • 1 ♂, 3 ♀♀; same collection data as for preceding except "14.i–3.ii.2017, 464 m, Shannon trap"; INPA • 1 ♂; same collection data as for preceding except "40°44′09″S, 72°18′19″W, 481 m, pan trap"; MZUSP • 1 ♀; same collection data as for preceding except "Sendero Los Rápidos, 40°44′05″S, 72°18′47″W, 528 m, 14–31.i.2017, Malaise"; MZUSP • 1 ♂; "Antillanca, límite de la vegetación, 40°46′28″S, 72°12′41″W, 1054 m, 14.i–3.ii.2017, Malaise trap"; INPA • 1 ♀; "Anticura, Sendero Repucura, 40°39′53″S, 72°10′02″W, 447 m, 17.ii.2005, SS *Nothofagus*/*Chusquea* for. UCR AtoL C05-022"; CNC • 1 ♀; "Pucatrihue, ii.1967, L.E. Peña col."; MZUSP • 1 ♂, 4 ♀♀; "Chiloé:

Isla Chiloé, Dalcahue, iv.1968, L.E. Peña col."; MZUSP • 2 ♀♀; same collection data as for preceding except "i.1962"; MZUSP • 1 ♂; same collection data as for preceding except "17–22.i.[19]62, *Scelolabes bivittatus* det. B.J. Sinclair, 2014"; CNC • 8 ♂♂, 15 ♀♀; "Ahoni Alto, ix.1988, L.E. Pena, *Scelolabes bivittatus* Phil., J.A. Rafael 1994 det."; INPA.

Redescription

Male (Fig. 3A, C–F)

Measurements. Body length: 9.7 mm. Wing length: 8.0 mm.

Head. Frons black, shining, except lower half with pruinosity, dichoptic, slightly narrower than width of anterior ocellus. Very close eyes on face, Face 1.9 × height of frons. Antenna (Fig. 3D) yellow, except postpedicel brown. Scape 1.5 × as long as pedicel, postpedicel lanceolate, about 1.5 × length of scape and pedicel combined, with dense brown microtrichia; stylus about 1.8 × length of antenna. Proboscis pale yellow, short; palpus pale yellow, short, oval, covered with dense yellow pruinosity and 1 long and slender setae. Two pairs of slender proclinate ocellar setae, anterior pair long, posterior pair very short. Occiput (Fig. 3E) black covered with dense grey pruinosity, postocular setae elongated, scattered, upper postoculars short; row of occipital setae elongated and strong.

Thorax. Shining. Pronotum (Fig. 3E) brown, except lateral margin yellow. Scutum (Fig. 3F) longer than wide, orange yellow, except by narrow dorsocentral stripe reaching posterior margin and not extend to postpronotal lobe, postalar callus brown, except spot on anterior margin yellow. Pleura (Fig. 3A) pale yellow. Scutellum (Fig. 3F) yellow with yellow pruinosity, with 1 pair of thin and short lateral yellow setae and 1 long and strong apical pair of black bristles. Mediotergite (Fig. 3H) yellow, except narrow black spot on lateral margin with yellow pruinosity. Acrostichal setulae multiserial (rows undefined), dorsocentrals uniserial, short, slender and sparse; several short and slender setae (acrostichals and dorsocentrals) on prescutelar region; notopleuron with slight grey pruinosity, 1 long and strong black notopleural bristle and several shorter, slender yellow setae; postpronotal lobe with several short and slender setae; 2 postalar setae, 1 long and strong anterior and 1 short and slender posterior.

Wing (Fig. 3G). Membrane pale brown; pterostigma brown, elongate and narrow; dm cell shorter than basal cells, approximately 2.5 × as long as wide, bm cell 1.3 × length of cua cell; CuA vein incomplete, not reaching CuP vein. Halter (Fig. 3C) yellow, except spot slightly darker on knob; stem with a row of spine-like setulae.

Legs (Fig. 3A). Yellow, except hind coxa, dorsal surface of mid and hind femora brown, apex of hind femur and base of hind tibia dark brown. Coxae subequal in length. Fore femur slightly swollen, hind femur strongly swollen. Chaetotaxy: legs with several long, slender and waved setae. Fore femur with 2 long and slender anterodorsal setae at apical half, 2 long and strong posterodorsal setae at apical half; mid femur with 1 row of anterodorsal, 1 row of posterodorsal and 1 row anteroventral of long and strong setae at apical half; hind femur with 1 row anterodorsal of long and strong setae on apical half, 1 posterodorsal of long and strong setae, two rows of spine-like setae, 1 anteroventral and 1 posteroventral, both inserted on small tubercles. Fore tibia with 1 short and slender dorsal basal setae; mid tibia with 2 long and strong posterodorsal setae, 1 basal and 1 at mid-length, 2 long and strong anterodorsal setae, 1 basal and 1 at mid-length, and 1 row of long and strong ventral setae at apex; hind tibia with 1 strong dorsal basal seta, 1 short and slender anterodorsal apical seta. Tarsi without outstanding bristles.

Abdomen. All tergites (Fig. 3H) brown, paler and weakly sclerotized anteriorly. Sternites weakly sclerotized, 1 and 2 hyalines, 3–8 pale brown. All tergites with long and slender setae on apical margin.

Male terminalia (Fig. 4A–F). Hypandrium (Fig. 4A) short, about 1.5 × as long as wide, sub-quadrangular, covered with several long and slender setae, with a distal short projection on right margin

with a group of long and slender setae. Epandrial lamellae (Fig. 4A–D) covered with several short and slender setae. Left epandrial lamella (Fig. 4C) slightly shorter, sub-rectangular, as long as wide; right epandrial lamella (Fig. 4B) broad, sub-ovate, as long as wide (Fig. 4D); presence of a long and slender dorsobasal projection behind right cercus, inserted close to bridge that links right to left epandrial lamella (Fig. 4B). Left surstylus (Fig. 4E) long, narrowing towards apex, with a row of long and slender setae on dorsal surface, setae inserted on tiny tubercles; right surstylus (Fig. 4F) subequal in length to

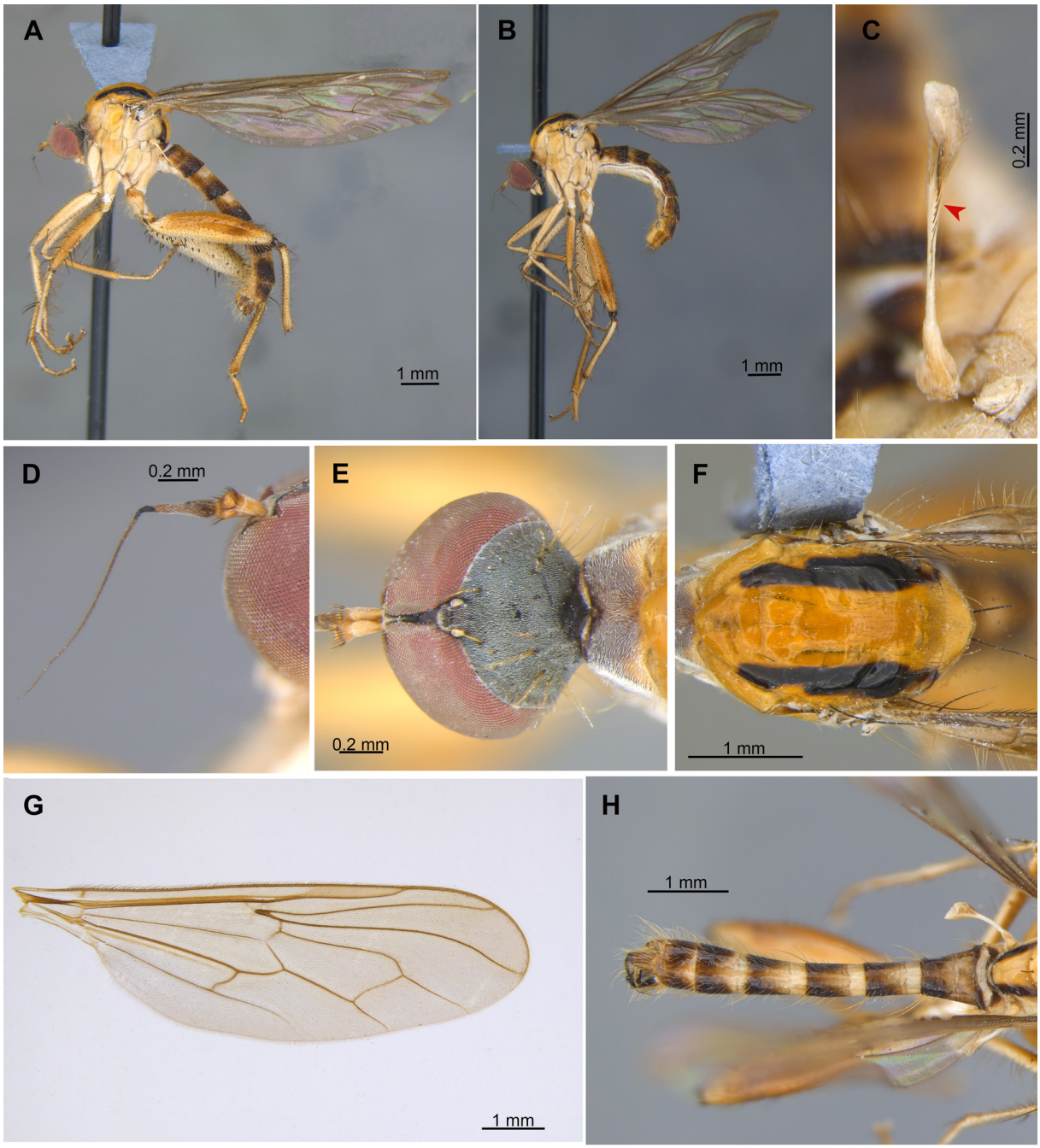

Fig. 3. *Scelolabes bivittatus* Philippi, 1865 (INPA). **A–B**. Lateral habitus **A**. Male. **B**. Female. **C**. Halter, row of spine-like setulae in evidence. **D**. Antenna of male in lateral view. **E**. Occiput of male in dorsal view. **F**. Scutum of male in dorsal view. **G**. Wing of male. **H**. Abdomen of male in dorsal view.

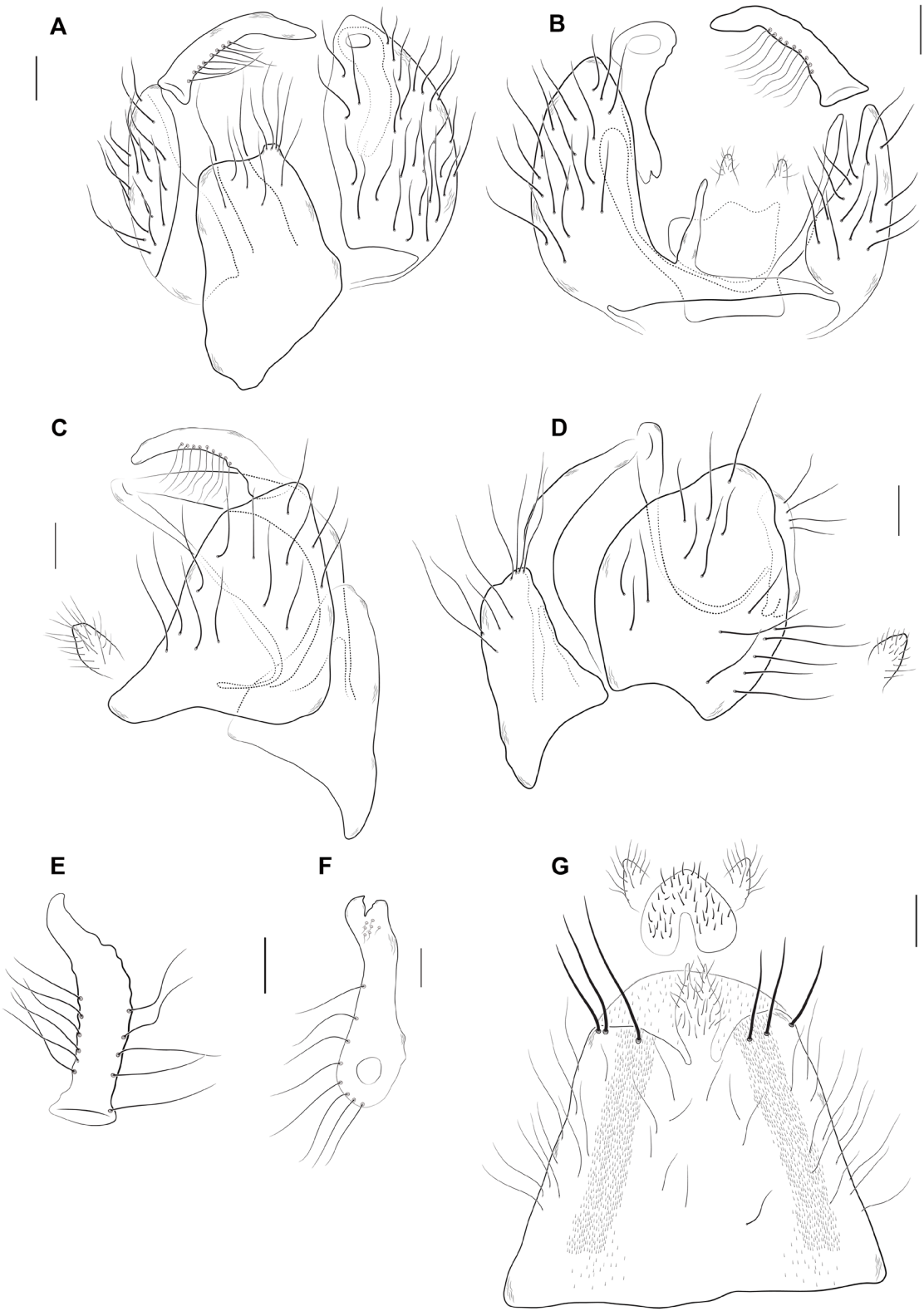

Fig. 4. *Scelolabes bivittatus* Philippi, 1865. **A–F**. Male terminalia. **A**. Ventral view. **B**. Dorsal view. **C**. Left lateral view. **D**. Right lateral view. **E–F**. Surstyli in frontal view. **E**. Left. **F**. Right. **G**. Female terminalia in ventral view. Scale bars = 0.1 mm.

left surstylus, clavated on base, both lobes with same length, short, with row of long and slender setae on ventral surface, setulae inserted on tiny tubercles near apex. Cerci symmetrical, short, subtriangular, weakly sclerotized, covered with short and slender setae (Fig. 4B). Subepandrial sclerite wider than long, with basal margin truncate and distal margin with slight middle concavity (Fig. 4B). Hypoproct sub-rectangular with two short projections, one at middle and one on left margin. Bacilliform sclerite asymmetrical with long and slender setae at distal half.

Female (Fig. 3B)

Similar to male, except by absence of rows of short spine-like setae on hind femur. In female's hind femur, the rows of anteroventral and posteroventral setae are long and strong. Moreover, the body of the female is smaller. Abdomen (Figs 3B, 4G) with tergite and sternite 8 fused. Sternite 8 covered with several short and slender setae, with slight constriction on posterior margin forming a bifid and sharpened projection, slenderer than in *S. amorimi* sp. nov. Tergite 10 absent. Sternite 10 sub-triangular, narrowly divided medially until ⅔ of length, covered with several short and slender setae. Cerci short, about ⅔ of sternite 10, covered with several short and slender setae.

Variation

Specimens of *Scelolabes bivittatus* show a wide variation in size, with the smallest specimens of the series measuring 6.5 mm and the biggest measuring 10 mm.

Remarks

Scelolabes bivittatus is similar to *S. verasilvae* sp. nov. by the scutum with a black intra-alar stripe and the abdominal tergites weakly sclerotized anteriorly. In addition, *S. bivittatus* has the scape and pedicel yellow and the black stripes on the scutum are restricted to intra-alar region, whereas in *S. verasilvae* the scape and pedicel are brown and the darker marks on the scutum are broader and occupy the dorsocentral region. Also, in *S. bivittatus* the hind femur is strongly swollen, whereas in *S. verasilvae* the hind femur is only slightly swollen.

Distribution

This species is known from southern Argentina and Chile (Fig. 7B).

Scelolabes verasilvae sp. nov.

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Figs 5–6, 7A

Diagnosis

Scutum (Fig. 5D) yellow, except for a broad black stripe occupying dorsocentral and intra-alar regions, slightly narrower anteriorly. Pleura (Fig. 5A) yellow, except spot on upper margin of anepisternum pale brown. Mediotergite yellow, except spot on lateral margin brown. Hind femur (Fig. 5E) swollen at apex, hind tibia slightly arched and swollen at apex.

Etymology

The epithet '*verasilvae*' is named in honor of dipterologist Vera Cristina Silva, who collected a number of the specimens studied in the manuscript.

Type material

Holotype

CHILE • ♂ (good condition, terminalia dissected); "CHILE. [Cautín:], R.[egion] IX, PN [National Parkl] Nahuelbuta, 37°48′10″S / 73°01′27″ W, 1327 m, 8–10.ii.2005, YPT [Yellow Pan Trap], *Araucaria*/

Chusquea forest [sic. Araucania], UCR A Tol C05-004" [white label]. "HOLOTYPE, *Scelolabes verasilvae* Barros, Freitas-Silva & Ale-Rocha" [red label]; CNC.

Paratypes

CHILE • 1 ♀; same collection data as for holotype except "37º49′42″S 73º00′39″W, 1138 m, 8–9.ii.2005, meadow & along stream, UCR AToL C05-002"; CNC • 1 ♂; "Conguillio NP, 1150 m, *Araucaria*/*Nothofagus*, 5.ii.1988, L. Masner"; CNC • 1 ♂, 2 ♀♀; same collection data as for holotype except "4.ii.1988"; CNC • 2 ♂♂; "14 km E Malalcahuello, 1570 m, 3–31.xii.1982, A. Newton & M. Thayer"; CNC • 1 ♂; "Cautin Prov., Volcan, Villarrica, 15-19.xii.1982, 1250 m, A. Newton & M. Thayer"; MNHN • 1 ♀; "Valdivia, 30kmW La Union, Las Trancas, *Nothofagus*, 25.ii.1988, L. Masner"; MNHN • 1 ♀; "Region IX, PN Nahuelbuta, 8.ii.2005, sweep *Araucaria* forest (CH-01), L. Masner"; CNC • 1 ♂, 1 ♀; "Region IX, PN Conguillio, 3.9 km S north entrance 38°39′01″S 71°39′45″W, 1239 m, 20-24.ii.2006, YPT, *Nothofagus*/*Chusquea* for"; CNC • 6 ♂♂, 4 ♀♀; "Parque Nacional Conguillío, Auracania, -38.648216, -71.669870, 21–22.I.2023, A. Gonçalves col."; INPA.

Description

Male (Fig. 5A, C–G)

Measurements. Body length: 4.5 mm. Wing length: 3.5 mm.

Head. Frons brown, shining, dichoptic, narrow, about same width of anterior ocellus. Very close eyes on face. Face 1.2 × length of frons. Antenna (Fig. 5C) pale brown; scape as long as pedicel; postpedicel lanceolate, about 1.2 × length of scape and pedicel combined, with dense brown microtrichia; stylus about 2 × length of antenna. Proboscis pale brown and short; palpus (Fig. 5C) pale yellow, short, oval, covered with dense yellow pruinosity and 1 long and slender seta. Two pairs of slender proclinate ocellar setae, 1 anterior long and 1 posterior very short. Occiput black (Fig. 5D), covered with dense grey pruinosity; postocular setae elongated, scattered, upper setae stronger.

Thorax. Shining. Pronotum dark brown, except lateral margin yellow. Scutum (Fig. 5D) longer than wide, yellow, except for a broad black stripe occupying dorsocentral and intra-alar regions, not including postpronotal lobe, slightly narrower anteriorly; median acrostichal area and postalar callus pale brown. Pleura (Fig. 5A) yellow, except spot on upper margin of anepisternum pale brown, with slightly grey pruinosity. Scutellum (Fig. 5D) pale brown on base and yellow on apex, with slightly grey pruinosity; 1 thin short lateral scutellar pair of setae and 1 long, strong and black apical scutellar bristle of setae. Mediotergite yellow, except brown spot on lateral margin, with slightly grey pruinosity. Acrostichal setae with 4 rows, dorsocentral uniserial, short, slender and sparse on scutum; several short and slender setae (acrostichal and dorsocentral) on prescutelar region; notopleuron with slightly grey pruinosity, 1 long and strong notopleural bristle and several shorter, slender bristles; several postpronotal setae short and slender; 2 postalar setae, 1 anterior long and strong and 1 posterior short and slender.

Wing (Fig. 5G). Membrane pale brown: pterostigma brown, elongate and narrow; dm cell shorter than basal cells, approximately 2.5 × as long as wide; bm cell 1.3 × length of cua cell; CuA vein complete, reaching CuP vein. Halter whitish yellow, stem with some setulae.

Legs. Long and slender (Fig. 5A, E). All coxae whitish yellow, except hind coxa slightly darker; femora whitish yellow, except dorsal surface of hind femur pale brown; tibiae pale brown, hind tibia darker; tarsi light brown. Coxae subequal in length. Hind femur slightly swollen near apex. Hind tibia (Fig. 5E) arched and slightly swollen at apex. Chaetotaxy: fore femur without outstanding setae; mid femur with 1 long and strong anterodorsal subapical seta, 1 long and slender ventral seta at basal ⅓, 1 long and slender anteroventral seta at mid-length and 1 long and slender anteroventral seta at ⅓ of apical; hind femur with 1 long and slender anterodorsal subapical seta, a row of long and strong anteroventral setae,

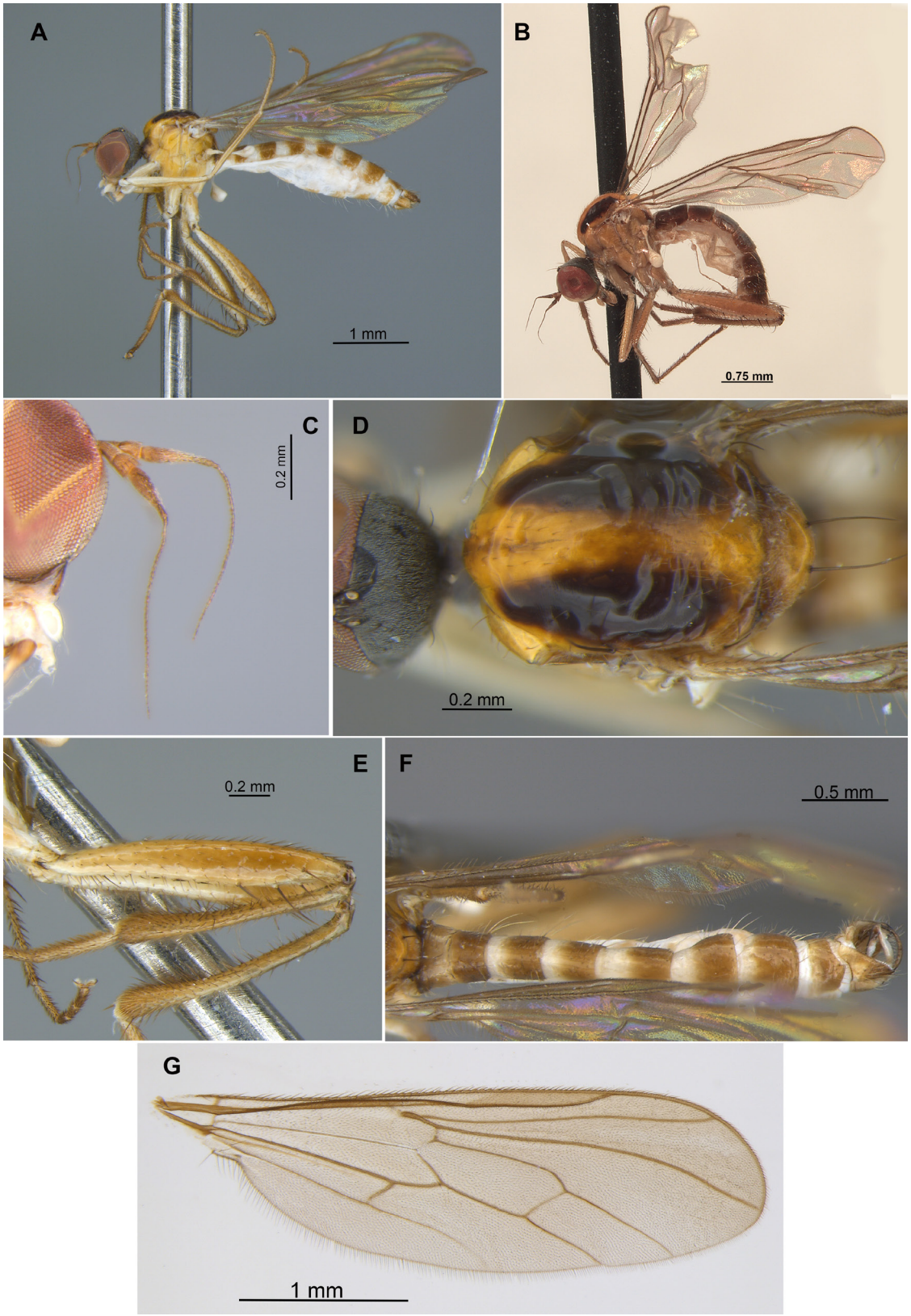

Fig. 5. *Scelolabes verasilvae* sp. nov. **A, C–G**. Holotype, ♂ (CNC). **B**. Paratype, ♀ (CNC). **A**. Lateral habitus. **B**. Lateral habitus of female. **C**. Antenna in lateral view. **D**. Scutum in dorsal view. **E**. Hind legs. **F**. Abdomen in dorsal view. **G**. Wing. Fig. 5B provided by Bradley Sinclair.

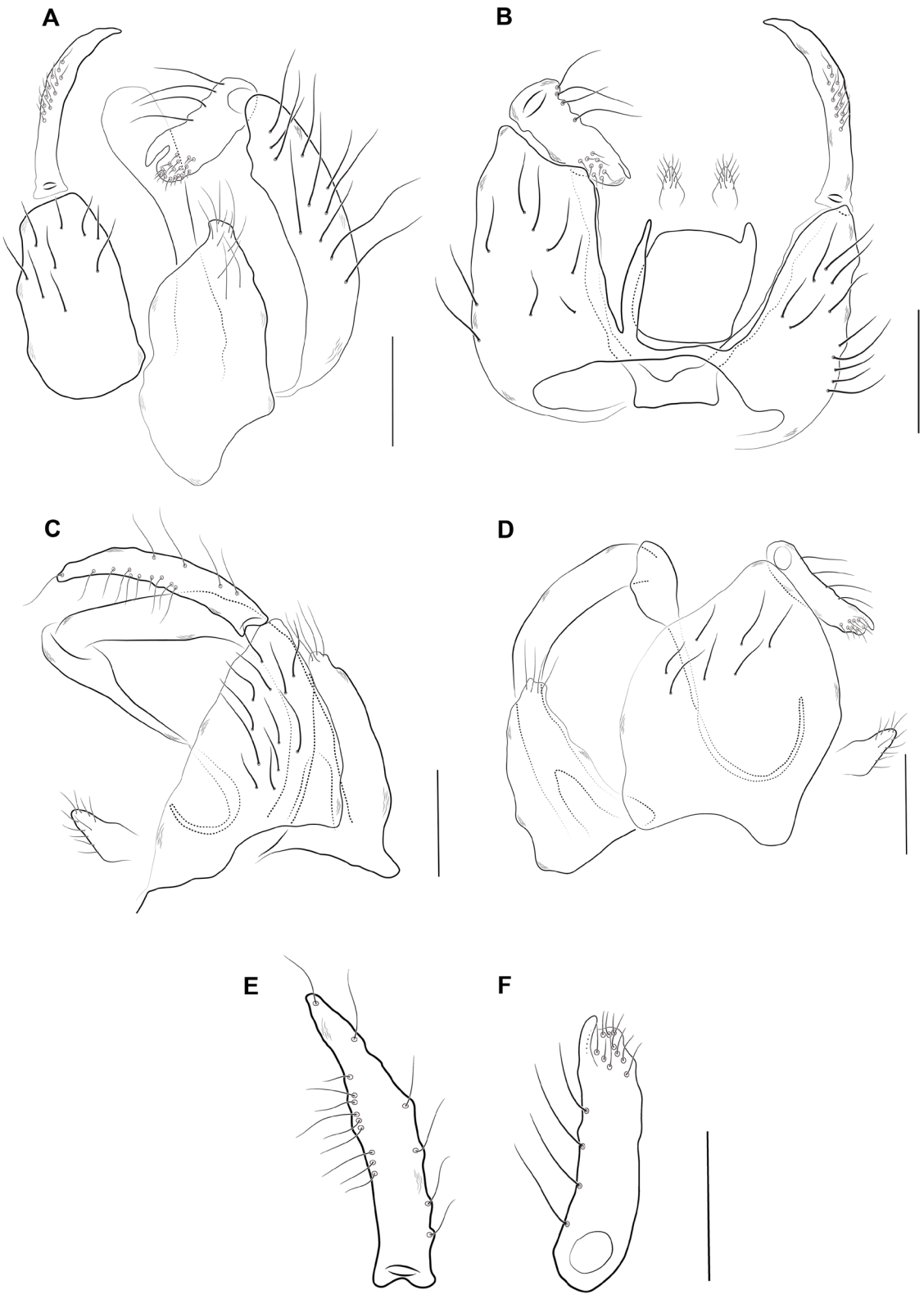

Fig. 6. *Scelolabes verasilvae* sp. nov., male terminalia. **A**. Ventral view. **B**. Dorsal view. **C**. Left lateral view. **D**. Right lateral view. **E–F**. Surstyli in frontal view. **E**. Left. **F**. Right. Scale bars = 0.1 mm.

both inserted on short tubercles. Fore tibia without outstanding setae; mid tibia with 1 long and stronger anterodorsal seta at mid-length, 1 anteroventral and 1 posteroventral long and strong apical setae. Tarsi without outstanding bristles.

Abdomen (Fig. 5F). Shining. All tergites brown, whitish and weakly sclerotized anteriorly. Sternite 1–3 weakly sclerotized, hyaline; sternites 4–8 pale brown, weakly sclerotized anteriorly. All tergites with long and slender setae on apical margin.

Male terminalia (Fig. 6A–F). Hypandrium (Fig. 6A) short, 2 × as long as wide, sub-quadrangular, with a short projection with an apical tuft of long and slender setae on the right side (Fig. 6A). Epandrial lamellae covered with several short and slender setae. Left epandrial lamella (Fig. 6C) subtriangular, shorter than right, 1.5 × as wide as long; right epandrial lamella (Fig. 6D) broad, sub-quadrangular, as wide as long; presence of a long and slender dorsobasal projection behind right cercus, inserted close to bridge that links right to left epandrial lamellae (Fig. 6B). Left surstylus (Fig. 6E) long, slightly sharpened, with 1 row of long, slender setae close together on dorsal surface, 1 row of long, slender and scattered setae on ventral surface, all setae inserted on tiny tubercles; right surstylus (Fig. 6F) shorter, about ⅔ of left, right lobe thin and sharpened, left lobe rounded with short and slender setae, dorsal surface with a row of long, slender and scattered setae, inserted on tiny tubercles, ventral surface bare. Cerci symmetrical, short, subtriangular, weakly sclerotized, covered with short and slender setae (Fig. 6B). Subepandrial sclerite (Fig. 6B) with basal margin truncate, distal margin with slight concavity

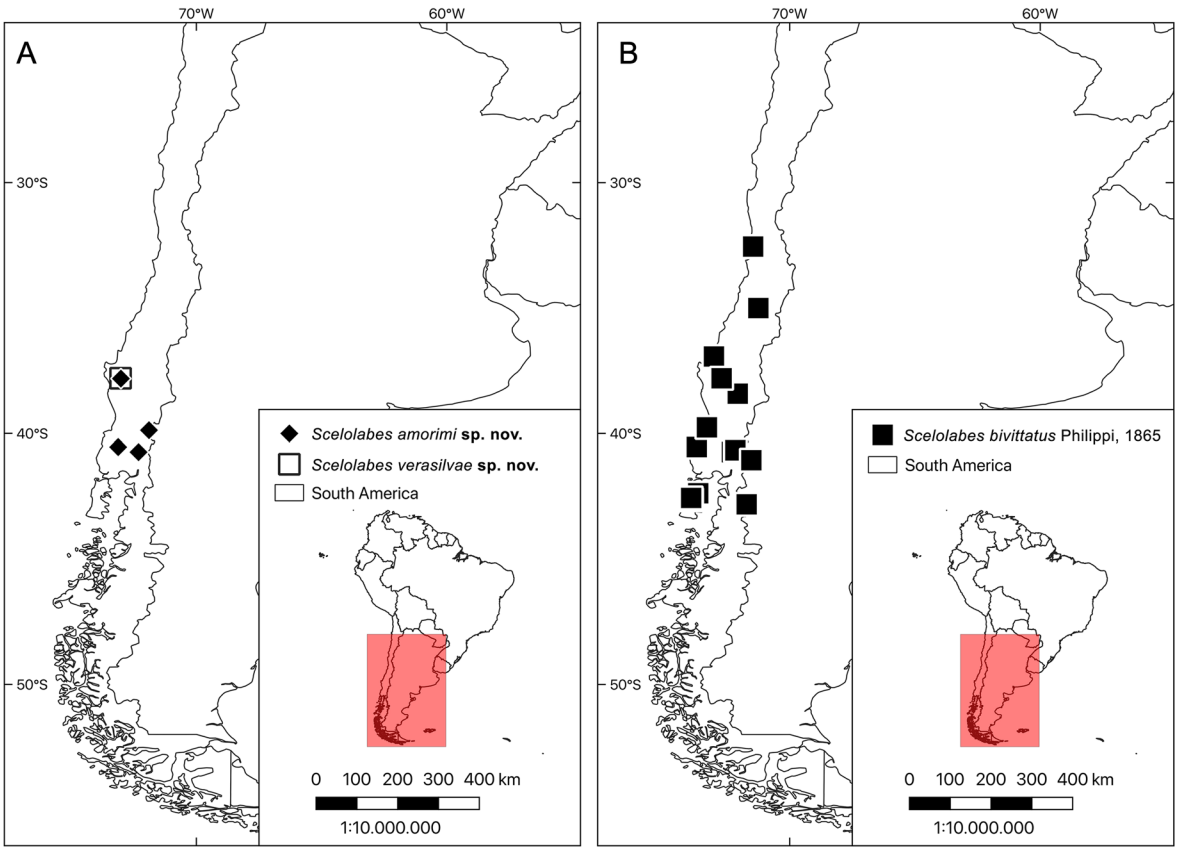

Fig. 7. Geographical records of *Scelolabes* Philippi, 1865. **A**. *S. amorimi* sp. nov. and *S. verasilvae* sp. nov. **B**. *S. bivittatus* Philippi, 1865.

in the middle. Hypoproct (Fig. 6B) sub-quadrangular, with a short triangular projection in left margin. Bacilliform sclerite asymmetrical with short and slender setae.

Female (Fig. 5B)
Similar to male.

Variation

Some specimens of *S. verasilvae* sp. nov. have a completely yellow acrostichal region.

Remarks

Scelolabes verasilvae sp. nov. resembles *S. amorimi* sp. nov. in the slender legs and coloration of the scutum, but the species differ in the coloration of the pleura. In *S. verasilvae*. the pleuron is yellow with a brown spot on the upper margin of the anepisternum, while in *S. amorimi*. the pleuron is mostly yellow, except for the brown anepisternum, and the presence of a brown spot on the katepisternum, anepimeron and meron.

Distribution

This species is known from Chile (Fig. 7A).

Identification key for Neotropical species of Scelolabes Philippi, 1865

1. Scutum with narrow black stripe restricted to intra-alar region (Fig. 3F); legs (males) covered by long, slender, and waved setae; hind femur with 2 rows of spine-like setae on ventral surface (Fig. 3A); left surstylus with long setae, as long as half-length of left surstylus (Fig. 4E) ..... ***Scelolabes bivittatus*** Philippi, 1865
– Scutum widely darkened, black stripe covering at least intra-alar and dorsocentral regions (Figs 1F, 5D); legs (males and females) covered by short and slender setae; hind femur without rows of spine-like setae on ventral surface, only long and strong ordinary setae (Fig. 1A); left surstylus with short setae, shorter than half-length of left surstylus (Fig. 2E) 2

2. Hind tibia arched (Fig. 5E); mediotergite yellow with two black stripes on lateral margins; antenna with scape and pedicel brown (Fig. 5C); hypandrium 2× as long as wide (Fig. 6A); dorsobasal process of right lamellae longer and slender (Fig. 6B) ..... ***Scelolabes verasilvae*** sp. nov.
– Hind tibia straight, not arched (Fig. 1A); mediotergite brown; antenna with scape and pedicel yellow (Fig. 1D); hypandrium as longer as wide (Fig. 2A); dorsobasal process of right lamellae shorter and wider (Fig. 2B) .....***Scelolabes amorimi*** sp. nov.

Discussion

The issue of a revision of *Scelolabes* and *Hoplopeza* has already been raised as a requirement to shed some light on the confused delimitation between the genera (Sinclair & Cumming 2000). They compose a putative monophyletic group in Ocydromiinae based on the following characters: vein Rs short (arising from R_1 near the apex of the cell br), weaker and thinner than the junction between R_{2+3} and R_{4+5}, and vein CuA evanescent near CuP and not reaching the wing margin (reverted to complete in *S. verasilvae* sp. nov.). However, the revision of *Scelolabes* involves the difficulty of locating Philippi's type material.

Rudolph A. Philippi's type material has a complex history, as pointed out by González *et al*. (2021b). Part of the Diptera specimens described by Philippi were housed at the National Museum of Natural History in Santiago, Chile, where he worked between 1853–1897 (Kabat & Coan 2017). However, after consulting the curator, no specimen of *Scelolabes* was located at that institution (Francisco Urra Lagos pers. com.). We also inquired, with no success, with several other major collections for Philippi's

specimens of *Scelolabes* (Oxford University Museum of Natural History [OUMNH], The Natural History Museum [NHM], Museo Nacional de Historia Natural Chile [MNHN], Museu de Historia Natural de Concepción [MHNC], California Academy of Sciences [CAS], Canadian National Collection of Insects, Arachnids and Nematods [CNC], Museo Entomológico Luis Peña [MELP], Museu de Zoologia da Universidade de São Paulo [MZSP], Museo Argentino de Ciencias Naturales Bernardino Rivadavia [MACN], Senckenberg Naturhistorische Sammlungen, Dresden [SNSD] and National Museum of Natural History, Smithsonian Institution [USNM]). It is known that some zoological and botanical specimens described by Philippi were destroyed in a fire at the Universidad Austral de Chile in 2007 (Kabat & Coan 2017) and, although it is uncertain whether the holotype of *S. bivittatus* was held there, it is possible that the specimens were included among the lost material, making Philippi, as far as we can ascertain the only one who has studied the species based on the type-specimen.

Collin (1933) redescribed *S. bivittatus* based upon two males and eleven females from Argentina (Puerto Blest) and Chile (Chiloé Island, Casa Pangue and Peulla, the last two localities near the border with Argentina), not examing the holotype. Despite the lengthened morphological redescription, with little detail of male and female terminalia as expected for his time, Collin's study remained for a long time the only study of the morphology of *Scelolabes*, but it had little use addressing the upcoming debate about its status in relation of *Hoplopeza*.

Comparing male and female specimens from Chilean provinces surrounding Valdivia (type-locality) with the original description and habitus illustration of *S. bivitattus*, at least three characters (not observed in *S. amorimi* sp. nov. nor in *S. verasilvae* sp. nov.) exclusively associated with the type-species of the genus are worth mentioning: 1) the paler coloration of the scutum with lateral darker longitudinal stripes, 2) the relatively short hind tibia, described by Philippi as measuring only ⅔ of the length of the hind femur, and 3) the color patter of the abdomen, with tergites with a specific yellow and dark brown banded pattern, all with little variation among the specimens, in that the posterior darker bands extend anteriorly laterally and reach the immediate anterior segment. Thus, in our opinion, these specimens may be reliably associated with *S. bivitattus*, providing good support for the study of external morphology and of male and female terminalia of the genus.

The diagnostic morphological characters of Neotropical *Scelolabes* resulting from the study of male and female specimens, hitherto not mentioned in the literature, tend to support the validation of Neotropical *Scelolabes* as a distinct genus from *Hoplopeza*. On the external morphology, *Scelolabes* lacks strong setae (or spurs) at the apex of the hind tibiae, being found only as short and slightly highlighted setae, while in *Hoplopeza* the hind tibiae bear one or more strong, prominent setae (or spurs) at the apex. On the male terminalia of *Scelolabes*, the right surstylus is bifid and chela-like at the apex (Figs 2F, 4F, 6F), a unique feature within Ocydromiinae and possibly synapomorphic for the species of the genus. In females of *Scelolabes*, tergite 10 is completely absent, with no sclerite corresponding dorsally with the sternite 10, while in *Hoplopeza* tergite 10 is present as a distinct dorsal sclerite proximal to the cerci.

Besides this, a row of short spine-like setulae located on the stem of the halter was observed in Neotropical *Scelolabes*, absent in the holotype of *S. verasilvae* sp. nov., but present in the paratypes. Probably these setulae were lost in the holotype due to manipulation or storage, but it is potentially an additional character to distinguish *Scelolabes* from *Hoplopeza*, given that no species of *Hoplopeza* is known to bear these setae.

*Scelolabes bivittatu*s has been identified over the years using the external morphology, favored by the monotypic status and with the help of the morphological study of Collin (1933); notwithstanding we hope our study contributes to clarify the situation of the characterization of *S. bivittatus* and provides the association of characters of external morphology and male and female terminalia as an aid in

the identification of Neotropical *Scelolabes*. This association allowed us to propose characters that differentiate the Neotropical *Scelolabes* and *Hoplopeza*. However, the delimitation of these genera will eventually be tested with the analysis of the Australian *Scelolabes* mentioned by Sinclair & Cumming (2000).

Acknowledgments

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Authors contribution

LMB performed the morphological description, photographed the species, illustrated the terminalias, and drafted the manuscript. RFS and RAR wrote the discussion and drafted the manuscript; both authors read and approved the final manuscript.

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Conflict of interests

The authors declare no competing interests

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