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Monograph

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A revision of *Scipopus* Enderlein including the subgenera *Scipopus* s. str., *Phaeopterina* Frey and *Parascipopus* subgen. nov. (Diptera, Micropezidae, Taeniapterinae)

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Abstract. The genus *Scipopus* (Diptera, Micropezidae, Taeniapterinae) is redefined and revised to include the genera previously treated as the “*Scipopus* group” which included *Scipopus* Enderlein, *Pseudeurybata* Hennig, and *Phaeopterina* Frey. *Pseudeurybata* is treated as a junior synonym of *Phaeopterina* and the genus *Scipopus* is redefined to include three subgenera: *Scipopus* s. str., *Phaeopterina* and *Parascipopus* subgen. nov.. Redescriptions are given of 18 previously described species, and descriptions of 25 new species are provided as follows: *S. (Parascipopus) alturas* sp. nov., *S. (Parascipopus) fenestratus* sp. nov., *S. (Parascipopus) kubus* sp. nov., *S. (Parascipopus) monteverde* sp. nov., *S. (Parascipopus) nigriscapus* sp. nov., *S. (Parascipopus) otisi* sp. nov., *S. (Parascipopus) savegre* sp. nov., *S. (Parascipopus) tico* sp. nov., *S. (Phaeopterina) argentum* sp. nov., *S. (Phaeopterina) brunneus* sp. nov., *S. (Phaeopterina) lineatus* sp. nov., *S. (Phaeopterina) musculosus* sp. nov., *S. (Phaeopterina) narupa* sp. nov., *S. (Phaeopterina) noturgidus* sp. nov., *S. (Phaeopterina) turgidus* sp. nov., *S. (Phaeopterina) vee* sp. nov., *S. (Phaeopterina) fraudator* sp. nov., *S. (Phaeopterina) metallicus* sp. nov., *S. (Phaeopterina) quetzal* sp. nov., *S. (Phaeopterina) uniformis* sp. nov., *S. (Scipopus) brikelos* sp. nov., *S. (Scipopus) convexus* sp. nov., *S. (Scipopus) nitidus* sp. nov., *S. (Scipopus) planus* sp. nov., and *S. (Scipopus) wokomung* sp. nov. *Scipopus (Scipopus) limbativertex* Enderlein is a new junior synonym of *S. (Scipopus) nigripennis* (Hendel), *S. (Scipopus) bolivianus* Hennig is a new junior synonym of *S. (Scipopus) belzebul* (Schiner), *S. (Scipopus) frit* Cresson is a new junior synonym of *S. (Scipopus) calocephalus* (Bigot) and *S. (Scipopus) alvarengai* Albuquerque is a new junior synonym of *S. (Scipopus) erythrocephalus* (Fabricius). The phylogeny of *Scipopus* s. lat. and its presumed outgroup (a clade containing *Rainieriella* Aczel) is considered using morphological and molecular data and supported with a maximum likelihood tree for the genes 12S, 28S and COI.

Keywords. New species, new subgenus, South America, Central America, Mexico.

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Introduction

The ‘*Scipopus* group’ was defined by Marshall (2016) to include *Scipopus* Enderlein, 1922, *Phaeopterina* Frey, 1927, *Pseudeurybata* (Hennig, 1934) and a clade here described as *Parascipopus* subgen. nov. We here treat all previous members of the *Scipopus* group as a single genus, *Scipopus* s. lat., with three subgenera: *Scipopus* s. str., *Phaeopterina* (including *Pseudeurybata*) and *Parascipopus*. The *Scipopus* group is treated as a single genus with multiple subgenera, rather than as multiple genera, because high levels of homoplasy render it difficult to distinguish the former genera in a morphological key without resorting to species identification. Although the former genera and the group as a whole are both supported as monophyletic on a molecular phylogeny (Figs 2–3), *Scipopus* s. lat. is more practically diagnosable using a combination of morphological characters than the former genera (now treated as subgenera).

Scipopus is currently classified in the tribe Rainieriini, sensu Cresson (1938) (widely referred to as Grallipezini, sensu Aczél 1951), a paraphyletic group characterized by a short anal cell (*cua*). The genus

Scipopus is part of a clade characterized by uniformly short setae on the scape and costagium, within which the genus is further diagnosed by the combination of a short third costal sector (C3) that is no more than half the length of *M* (Fig. 14A), a well-defined posterodorsal sulcus on at least the basal 1/3 to 1/2 of the hind tibia, and a long distance (>2.5 times as long as ocellar triangle) between the posterior apex of the frontal vitta and the ocellar triangle (Figs 4CB, 66A).

The subgenus *Scipopus* s. str. is easily recognized by an anteriorly white microtrichose anepisternum but the other subgenera are less easily diagnosed. *Scipopus* (*Parascipopus*) is recognized by a combination of traits (a shiny, clearly delineated orbital plate, a strongly tapered anterior frontal vitta, a single spermathecal duct arising from common or paired spermathecal duct and absent apical scutellar setae in half of the species), but similar characters appear convergently in *S.* (*Phaeopterina*). *Phaeopterina*, here redefined to include *Pseudeurybata*, is clearly circumscribed by molecular characters but is diagnosed morphologically only by the combination of an entirely or mostly dull orbital plate, a pair of apical scutellar seta, an elongate thorax and postpronotal lobe, and a smooth or absent common spermathecal duct (rugose in Caribbean species). *Pseudeurybata* was previously diagnosed by a tall and deflexed clypeus (Marshall 2016) (Fig. 15A), but *Pseudeurybata zeta* Marshall, 2016, a species with that character state, is here shown to belong in *S.* (*Phaeopterina*) on the basis of molecular data. A tall and deflexed clypeus also shows up as a homoplasy in two species of *Scipopus* s. str. (Fig. 5). The former genus *Phaeopterina* was previously diagnosed by the lack of ocellar setae, a character state now recognized in only a quarter of the species now included in the subgenus.

Defining and diagnosing *Scipopus* has been challenging due to high apparent homoplasy across the genus, and the formal description of the new subgenus *S.* (*Parascipopus*) was delayed by about a decade pending the necessary context provided by a revision of the largest and oldest subgenus in the group, *Scipopus* s. str. We here redefine and revise *Scipopus* and reconsider the monophyly of, and the relationships between, its included subgenera. The revision of *Scipopus* s. str. is based on an unpublished MSc thesis by the senior author (Lindsay 2021).

Biology

Scipopus occurs from Mexico south to Argentina at elevations of 0–2700 m. Little was previously known about the biology of the genus, although *S.* (*Scipopus*) *convexus* sp. nov. has been reared from larva to adult in rotting bananas and feces (Albuquerque 1972c, as *S. belzebul* (Schiner, 1868)). Females of *Scipopus* (*Phaeopterina*) *alces* (Marshall, 2016) (as *Pseudeurybata alces*), *S.* (*S.*) *nigripennis* (Hendel, 1922) (as *S. limbativertex* Enderlein, 1922), *S.* (*S.*) *erythrocephalus* (Fabricius, 1805), and *S.* (*S.*) *cartaboensis* Cresson, 1926 have been observed ovipositing in rotting wood (Marshall 2010, 2012, 2016, and new observations reported here). Some females of *Scipopus* s. str. (including *S.* (*S.*) *souzalopesi* Albuquerque, 1972) have been observed and photographed inserting their heads into multiple beetle burrows before laying eggs in a chosen burrow (Marshall 2012). Females of *Scipopus* (*Phaeopterina*) *narupa* sp. nov. have been observed feeding at the same dung baits as males and females of *S.* (*S.*) *chalybeus* Hennig, 1934 in Ecuador; while feeding, both species slowly outstretched their mid and hind legs towards other insects attracted to the dung, presumably to keep space between them. Females of *Scipopus* (*Phaeopterina*) *stigmatica* (Hennig, 1935) have been repeatedly observed and photographed feeding with the abdomen pointed upwards (Marshall 2016) (Fig. 68); similar behavior is noted here for *S.* (*Ph.*) *narupa* (Fig. 63B). Males of at least some species perform courtship displays for females; during copulation, males stroke females and provide regurgitated oral fluids which likely serve as a nuptial gift (Marshall 2010, 2012). The male pleural sac (a swelling on abdominal P2 presumably used to disperse pheromones) is often inflated in living males and appears to be conspicuously swollen in photographs of a new species of *Scipopus* (*Phaeopterina*) (Fig. 73). The specimens of *Scipopus* s. str. studied here were mostly taken on or around fallen or cut trees, at dung baits, or in Malaise traps; fewer were collected on standing trees or on leaves 0.6–1.2 meters off the ground.

Adults of *Scipopus* are often associated with phoretic pseudoscorpions, more so than in other genera of micropezids (unpublished data). The large size of *Scipopus* species and the frequency at which they visit fallen trees (a shared habitat with pseudoscorpions) likely facilitate this relationship. Martinez *et al.* (2020) record one species of pseudoscorpion, *Americhernes oblongus* (Say, 1821), from a female identified here as *S. (S.) nigripennis* from Panama. *Scipopus (Parascipopus) manifestus* (Wulp, 1897) (Fig. 40), *S. (Pa.) monteverde* subgen. et sp. nov. (Fig. 41F) and *S. (Ph.) narupa* sp. nov. (<https://www.inaturalist.org/observations/31649795>) have been photographed with a pseudoscorpion attached to the left hind coxa and *S. (S.) cartaboensis* was photographed with a pseudoscorpion attached to the wing or hind leg (Fig. 12B). *Scipopus (S.) diversus* (Schiner, 1868) has been photographed with pseudoscorpions on the mid and hind left coxae (<https://www.inaturalist.org/observations/39262837>). *Scipopus (Ph.) browni* (Marshall, 2016) was observed with an associated pseudoscorpion, and we have examined pinned specimens of *S. (S.) brikelos* sp. nov., *S. (S.) calocephalus* (Bigot, 1886), and *S. (S.) diversus* with attached pseudoscorpions. *Scipopus (Ph.) narupa* and *S. (Ph.) gorgonae* Hennig, 1935 were photographed with mites attached between T6 and the oviscapae and directly behind the head, respectively (Figs 62G, 54G).

Collection records suggest a strong female-biased sex ratio, but this may be a reflection of collecting techniques rather than the actual sex ratio.

Material and methods

Material examined

Institutions from which specimens or photos of type specimens were examined, and institutions where material will be deposited, are as follows:

AMNH	=	American Museum of Natural History, New York, New York, USA
ANSP	=	The Academy of Natural Sciences of Drexel University, Philadelphia, Pennsylvania, USA
BIOUG	=	Centre for Biodiversity Genomics, University of Guelph, Ontario, Canada
BMNH	=	Natural History Museum, London, UK
CBFC	=	Colección Boliviana de Fauna, La Paz, Bolivia
CMNH	=	Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
CNC	=	Canadian National Collection of Insects, Arachnids & Nematodes, Ottawa, Ontario, Canada
DEBU	=	University of Guelph Insect Collection, Guelph, Ontario, Canada
IAVH	=	Instituto Alexander von Humboldt, Villa de Leyva, Colombia
IEXA	=	Instituto de Ecología, Xalápa, Veracruz, Mexico
INPA	=	Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil
IOC	=	Oswaldo Cruz Institute, Manguinhos, Rio de Janeiro, Brazil
MHNJP	=	Museo de Historia Natural Javier Prado, Univ. San Marcos, Lima, Peru
MLUH	=	Martin-Luther-Universität, Zentralmagazin Naturwissenschaftlicher Sammlungen, Zoologische Sammlung, Halle (Saale), Germany
MNBG	=	Museum für Naturkunde, Berlin, Germany
MNCR	=	Museo Nacional de Costa Rica, San José, Costa Rica (includes previous INBIO collection)
MNHN	=	Muséum national d'histoire naturelle, Paris, France
MUSM	=	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
NHMW	=	Naturhistorisches Museum, Vienna, Austria
NMBE	=	Naturhistorisches Museum, Bern, Switzerland
OUM	=	Oxford University Museum of Natural History, Zoology, Oxford University, Oxford, UK
QCAZ	=	Departamento de Biología, Pontífica, Universidad Católica del Ecuador, Quito, Ecuador
ROM	=	Royal Ontario Museum, Toronto, Canada

SDEI	=	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
SEMC	=	Snow Entomological Museum Collection, Lawrence, KS, USA
SMTD	=	Staatliches Museum für Tierkunde, Dresden, Germany
TAUI	=	Zoological Museum of Tel Aviv University, Tel Aviv, Israel
USNM	=	United States National Museum (National Museum of Natural History), Washington DC, USA
UVG	=	Universidad del Valle de Guatemala, Guatemala, Guatemala
ZMUC	=	Zoological Museum, University of Copenhagen, Copenhagen, Denmark
ZMUH	=	Zoological Museum, University of Helsinki, Helsinki, Finland

Terminology

Morphological terms and procedures follow Marshall (2011, 2019), including the use of T, P, and S for tergite, pleuron and sternite, respectively. T1+2 refers to the fused first and second tergites. Patterns of microtrichosity (unsocketed microtrichia) can manifest themselves as tomentosity (with microtrichia visible as fine pile) or pollinosity (an apparent fine dusting or pruinosity); the more general term microtrichosity is used to refer to either type. Complete head chaetotaxy includes two lower fronto-orbital seta, one upper fronto-orbital seta, one inner and one outer vertical seta and one postocellar seta (Fig. 66A–B); many species lack one or more of these setae.

The female spermathecal complex normally includes two spermathecal ducts, with one branching into two terminal stems leading to large spermathecae and the other leading to a single, generally much smaller, spermatheca (Fig. 10D). We follow previous papers in calling these ducts the “single” (alternatively called the secondary) and “paired” (alternatively called the primary) ducts although in some species the normally “single” spermatheca is duplicated, giving a total of four spermathecae. In many species the single and paired ducts are fused for some distance beyond the bursa copulatrix to form a single duct here referred to as the common duct. The common duct is either rugose and clearly delineated from the paired duct (Fig. 7B), smooth and not clearly delineated (Fig. 61C), or absent (Fig. 47E).

Colour and apparent microtrichosity can differ widely between living and preserved specimens. Living specimens are often darker and usually have very clear patterns of microtrichosity, but preserved specimens (air dried, critical point dried or preserved in ethanol) are often lighter and the patterns of microtrichosity (including the vittae on the scutum and microtrichosity of the thoracic pleuron) are often only visible at certain angles. The blue sheen on the scutum of many species is only visible at some angles on dry specimens. The areas of dark grey or black pigmentation visible on the abdominal pleuron of living or fresh specimens is sometimes faded to light grey in preserved specimens and often fades entirely in some older specimens. Where visible, pleural pigmentation patterns are sometimes reliably diagnostic for species or groups of species.

Photographs

Photographs of living flies were taken by the second author using Nikon DSLRs, hand-held flash and either 60 mm or 105 mm macro lenses, unless otherwise specified. Whole specimen photos were taken using a Canon DSLR mounted on a Stackshot rail using Helicon Remote software (Helicon Soft 2020), and images were stacked using Helicon Focus software. Photographs of terminalia were taken manually using a Nikon Coolpix 4500 mounted on a Zeiss compound microscope and stacked with Helicon Focus.

Molecular sequencing

Specimens were sequenced for the ‘barcode region’ of cytochrome oxidase I (CO1–5′) when possible. DNA was extracted, amplified and sequenced as in Hebert *et al.* (2013). In addition to the material

sequenced from the University of Guelph Insect Collection, five CO1 barcodes of *Scipopus* s. str. and 11 CO1 barcodes of *Scipopus* (*Phaeopterina*) were obtained from the BOLD database (Ratnasingham & Hebert 2007) and added to our dataset. This dataset (<https://doi.org/10.5883/DS-SCIPOPUS>) for *Scipopus* had the following barcode compliant sequences at the time of our analyses: 64 sequences for *Scipopus* s. str. representing 13 species and 31 BINs (Barcode Index Numbers) (Ratnasingham & Hebert 2013), 16 sequences for *S.* (*Parascipopus*) representing five species and six BINs and 32 sequences for *S.* (*Phaeopterina*) representing 21 species and 22 BINs (nine of those specimen barcodes were previously treated as *Pseudeurybata*) (Appendix 1). New records are periodically added to the BOLD dataset.

Fourteen specimens of *Scipopus* s. str., fourteen of *S.* (*Phaeopterina*), nine of *S.* (*Parascipopus*) and 37 specimens from the presumed outgroups of *Scipopus*, including *Rainieriella* Aczel, 1949, *Ptilosphen* Enderlein, 1922, *Grallipeza* Rondani, 1850, *Calosphen* Hennig, 1934, *Systellapha* Enderlein, 1922, *Amapeza* Marshall, 2022, *Parasphen* Enderlein, 1922, *Mesoconius* Enderlein, 1922, and two undescribed genera (one with ms name “*Nudopeza*”) were also sequenced by BOLD for markers other than CO1 including: 12S, three segments of the gene 28S referred to as 28S–2, 28S–3 and 28S–5, and CO1–3’ (Appendix 2). These gene regions were chosen based on previous success rates for sequenced Taeniapterinae Cresson, 1930 (Jackson *et al.* 2015; Ferro *et al.* 2021). Although Ferro *et al.* (2021) noted that Jackson *et al.*’s (2015) analysis of 12S had weak backbone support and we corroborate this finding, adding it to the multi-gene analysis increased overall node support. Sequencing of markers was conducted at the Centre for Biodiversity and Genomics using material from specimens previously barcoded for CO1–5’. Primers used for sequencing were referenced from Jackson *et al.* (2015) and Ferro *et al.* (2021) and are listed in Table 1.

Molecular analysis

Barcode tree

One representative from each BIN from *Scipopus* and the selected outgroups (restricted to those with at least 500 base pairs of the barcode region of CO1–5’) was selected for analysis from the DS-SCIPOPUS dataset on BOLD. Barcodes were downloaded from BOLD using BOLD Aligner and uploaded to CIPRES (Cyberinfrastructure for Phylogenetic Research) ver. 3.3 and ran under IQ-tree ver. 2.1.1 on XSEDE (Minh *et al.* 2020). Support values were calculated using IQ-tree’s Ultrafast Bootstrap algorithm (Hoang 2018) with 1000 bootstraps. Analysis resulted in a maximum likelihood tree, which was opened using FigTree ver. 1.4.4 (Rambaut 2007) and later modified using Photoshop 2018 (Fig. 1).

Multi-gene tree

Sequenced specimens with a minimum of three gene regions from the DS-SCIP2020 dataset on BOLD were chosen for the analysis. Sequences of all lengths were downloaded from BOLD with the MUSCLE aligner (Edgar 2004). If necessary, these sequences were aligned further using AliView ver. 1.26 (Larsson 2014). Sequences were concatenated using the python script AMAS.py (Borowiec 2016). The concatenated data and partition data were uploaded to CIPRES (Cyberinfrastructure for Phylogenetic Research) ver. 3.3. (Miller *et al.* 2010) and ran under IQ-tree ver. 2.1.1. on XSEDE (Minh *et al.* 2020) using six partition models as listed in Table 2. (Chernomor *et al.* 2016; Kalyaanamoorthy *et al.* 2017). Support values were calculated using IQ-tree’s Ultrafast Bootstrap algorithm (Hoang 2018) with 1000 bootstraps. Analysis resulted in a maximum likelihood tree, which was opened using FigTree ver. 1.4.4 (Rambaut 2007) and later modified using Photoshop 2018 (Figs 2–3).

Combined analysis

A matrix of 27 characters (Table 3) for 41 taxa including *Scipopus* and its outgroups (Table 4) was assembled using Mesquite ver. 3.61 (Maddison & Maddison 2019). Although morphological trees from matrices on their own rarely resolve the phylogeny of a group with high confidence, the morphological

Table 1. Primers used for PCR amplification.

Gene locus	Primer name	Sequence (5'→3')	Fragment length (bp)	Reference
12S rRNA	12Sh	GACCAAATTGGTGCCAGCAGT	463	Simon <i>et al.</i> 1994
	12Sbi	AAGAGCGACGGGCGATGTGT		Simon <i>et al.</i> 1994
COI-3'	COI PAT	TCCAATGCACTAATCTGCCATATTA	746	Simon <i>et al.</i> 1994
	COI JERRY	CAACATTTATTTTGATTTTTTGG		Simon <i>et al.</i> 1994
28S-2	28S 1345-F (28S-Dipt-4534F)	CCTATTCTCAAACCTTTAAATGGG	490	Gibson <i>et al.</i> 2011
	28S 2073-R	GGAACCGTATTCCTTTTCG		SK-unpublished
28S-3	28-S 1835-F (aka 28S-Dipt-4997F)	GGAGGACTGAAGTGGAGAAGG	481	Gibson <i>et al.</i> 2011
	28S 2456-R	CTCAATCTTCAGAGCCAATCC		SK-unpublished
28S-5	28S-3631-F	CTCGGCCTATCGATCCTTTTGG	395	SK-unpublished
	28S 4277-R (aka 28S-Dipt-7176R)	CCACTTACAACACCTTGCC		Gibson <i>et al.</i> 2011

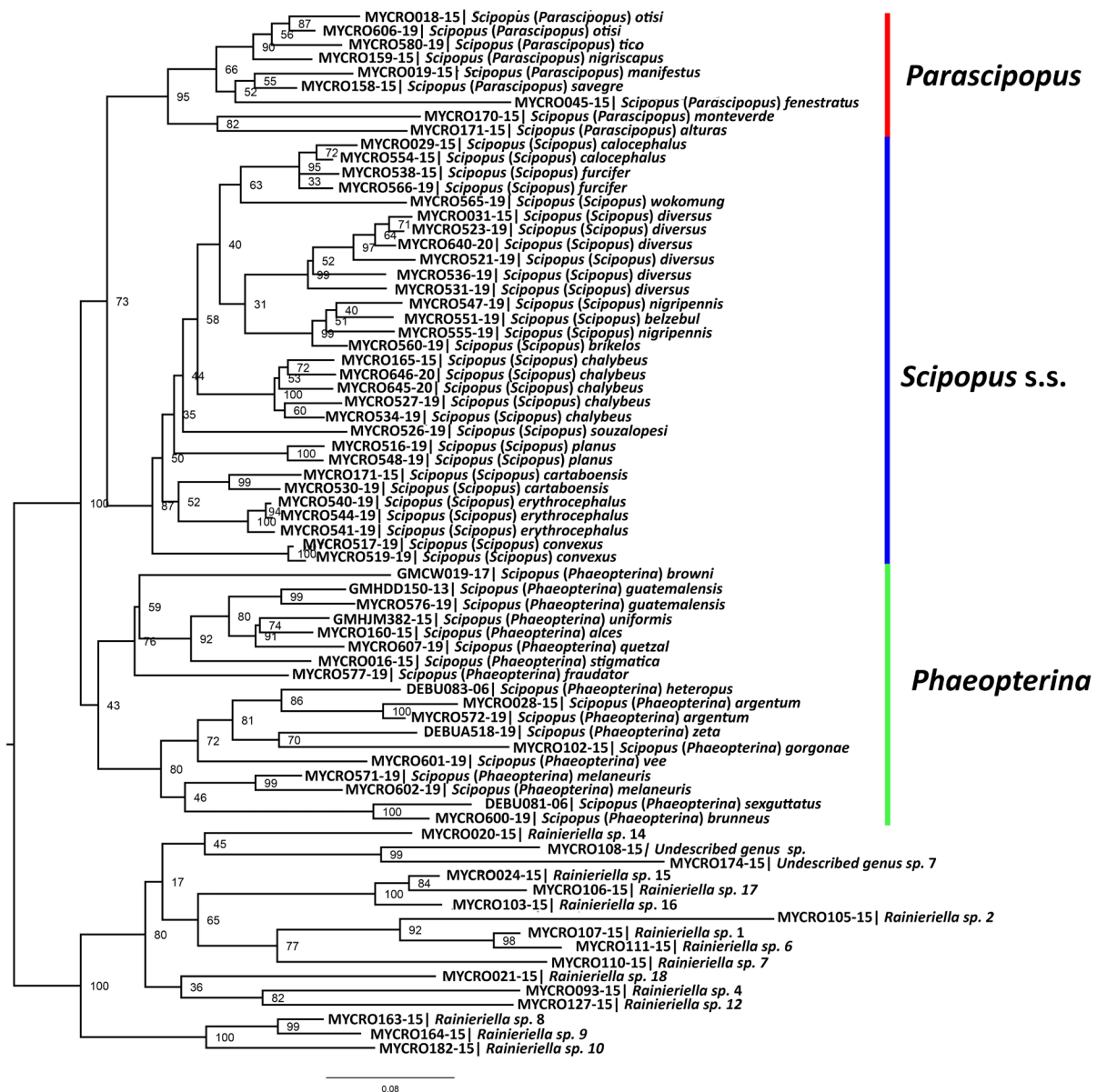


Fig. 1. Barcode tree (COI-5') for *Scipopus* Enderlein, 1922, and selected outgroups. Generated using one representative from each BIN and with over 500 base pairs from the DS-SCIPOPUS dataset on BOLD.

Table 2. Evolutionary model used for each partition in a maximum likelihood analysis. Degree of missing data is 0.198.

Gene region	Sequences	Parsimony informative sites	Model
12S	76	200	TVM+F+R3
28S-2	66	30	TIM2+F+I+G4
28S-3	84	47	TVM+F+R3
28S-5	84	72	GTR+F+I+G4
CO1-5'	85	250	GTR+F+I+G4
CO1-3'	29	269	TVM+F+I+G4



Fig. 2. Maximum likelihood tree using CO1-5', CO1-3', 12S and 28S-2, 28S-3 and 28S-5 for 27 members of *Scipopus* Enderlein, 1922, 16 members of *Rainieriella* Aczél, 1949, and 37 members belonging to *Grallipeza* Rondani, 1850, *Amapeza* Marshall, 2022, undescribed genus (ms name “*Nudopeza*”), *Systellapha* Enderlein, 1922, *Calosphen* Hennig, 1934, *Parasphen* Enderlein, 1922, *Ptilosphen* Enderlein, 1922, *Mesoconius* Enderlein, 1922 and an undescribed genus. Numbers represent bootstrap values. *Pseudeurybata* (Hennig, 1934) (dark green) is now treated as *Scipopus* (*Phaeopterina*) (light green) as indicated by the species names.

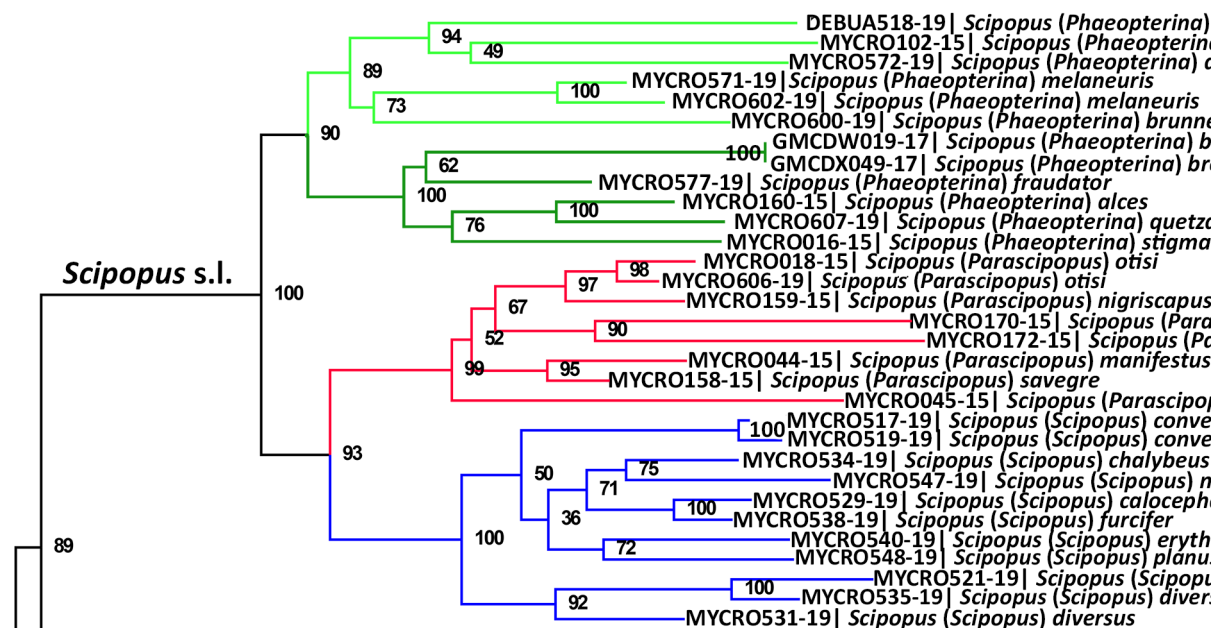


Fig. 3. Detail of *Scipopus* Enderlein, 1922 from the maximum likelihood tree in Fig. 2.

phylogeny for *Scipopus* generated using the matrix in Table 4, was especially difficult to interpret due to the high levels of homoplasy in *Scipopus* and close relatives. Due to the difficulty in interpreting the morphological matrix alone, we combined the matrix with concatenated molecular data from taxa with high-quality sequences for at least four of the six gene regions sequenced for the molecular phylogeny (Appendix 2).

The concatenated data were uploaded to CIPRES (Cyberinfrastructure for Phylogenetic Research) ver. 3.3. (Miller *et al.* 2010) and a Bayesian analysis was run under MrBayes ver. 3.2.7a on XSEDE (Ronquist & Huelsenbeck 2003) using the MrBayesblock in Appendix 3. The resulting tree was opened using FigTree ver. 1.4.4 (Rambaut 2007) and later modified using Photoshop 2018 (Fig. 4). The matrix from Table 3 and tree topology from Fig. 4 were combined into a Mesquite nexus file, which was uploaded to WinClada ver. 1.61 (Nixon 1999–2002) to map characters on the tree, using the optimization of unambiguous characters only (Fig. 5).

Taxonomic value of male and female terminalia

As indicated by the character state distribution in Fig. 5, most external characters used in the taxonomy of *Scipopus* are highly homoplastic. Unexpectedly, the same seems to be true of complex characters of the male and female terminalia. For example, female spermathecal ducts in the Taeniapterinae usually have the paired and single ducts arising independently from the bursa copulatrix, but in both *Scipopus* s. str. and *S. (Parascipopus)* the single duct arises from the base of the paired duct, or from the common duct. This was initially considered as a unique synapomorphy linking these subgenera but was later discovered in the Caribbean clade of *S. (Phaeopterina)* and, in a less pronounced form, in several other species of Central and South American *S. (Phaeopterina)*. A similar duct arrangement is also present in some species of *Mesoconius* (not illustrated in Fig. 5).

Length of the spermathecal ducts generally corresponds to the length of the distal distiphallus throughout the Taeniapterinae, and both character states (distal distiphallus length, spermathecal duct length) vary widely in *Scipopus* in a pattern that suggests that striking elongation of the distal distiphallus (and

Table 3. Characters used for morphological analysis of *Scipopus* Enderlein, 1922. ‘(0)’ indicates plesiomorphic states, ‘(1)’–‘(3)’ indicate apomorphic states.

1. Palpus: (0) nearly parallel-sided, narrow (length ≥ 3.3 width); (1) dorsal margin straight, ventral margin convex, apex pointed, narrow (length ≥ 3.3 width); (2) dorsal margin straight, ventral margin convex, apex pointed, wide (length ≤ 3 width).
2. Epicephalon: (0) shiny, wide, meeting frontal vitta in a V shape (Fig. 39C); (1) shiny, wide, meeting frontal vitta in a U shape (Fig. 26F); (2) dull, microtrichose, not clearly delineated from upper frontal vitta (Fig. 31C).
3. Orbital plate: (0) fully shiny; (1) at least partially dull, microtrichose.
4. Outer vertical seta: (0) present; (1) absent.
5. Postocellar seta: (0) present; (1) absent.
6. Upper fronto-orbital: (0) present; (1) absent.
7. Clypeus shape: (0) short (length $\geq 1.8 \times$ height), not normally deflexed; (1) tall (length $\leq 1.6 \times$ height), normally deflexed.
8. Clypeus microtrichosity: (0) microtrichose medially; (1) bare medially.
9. Postpronotal lobe: (0) broad (length/width = 2.1–2.6); (1) elongate (length/width > 2.7).
10. Thorax shape: (0) robust (length/height ≤ 0.94); (1) elongate (length/height ≥ 0.96).
11. Anepisternum: (0) entirely white microtrichose; (1) partially bare; (2) white microtrichose anteriorly.
12. Length of C3: (0) long ($> 3/4$ length of *M*); (1) short ($< 1/2$ length of *M*).
13. Wing membrane: (0) patterned; (1) evenly infuscate/clear.
14. Apical scutellar seta: (0) present; (1) absent.
15. Distal distiphallus: (0) present, long ($1.5\text{--}2.5 \times$ length of epandrium); (1) present, short (\approx length to epandrium); (2) absent.
16. Basal distiphallus: (0) long (equal length to epandrium); (1) short (less than half length of epandrium).
17. Phallic bulb: (0) spherical, small, length and height nearly subequal (Fig. 20D); (1) greatly enlarged, ovoid or irregularly shaped (Fig. 52D).
18. Inner basal process of genital fork: (0) present; (1) absent.
19. Single spermathecal duct: (0) originating at bursa; (1) originating in basal half of combined duct; (2) originating in distal half of combined duct; (3) single spermathecal duct absent.
20. Comb-like row of anterior dorsocentral setae: (0) absent; (1); present.
21. Female postpronotal lobe: (0) flat; (1) anterior nipple-like bump.
22. Anterior half of scutum: (0) entirely densely white microtrichose; (1) variable; partially densely microtrichose at most.
23. Distance between ocellar triangle and posterior margin of frontal vitta: (0) short ($\leq 2 \times$ length of ocellar triangle); (1) long ($\geq 2.5 \times$ length of ocellar triangle) (Fig. 63A).
24. Arista: (0) bare; (1) plumose.
25. Anal cell (*cup* or *cua*): (0) short (A_1 half or less the length of $A_1 + CuA_2$) (Fig. 14A); (1) long ($A_1 + CuA_2$ as long or longer than CuA_2).
26. Sulcus on posterodorsal hind tibia: (0) absent or poorly defined; (1) well-defined on at least basal $1/3$.
27. Male genital fork: (0) present (1) absent.

corresponding elongation of the spermathecal ducts) developed and reversed multiple times. Other characters in the male and female terminalia (including the ejaculatory apodeme, phallic bulb, and spermathecal shape) seem similarly unstable, apparently contradicting the common assumption that complex genitalic characters in Acalypterae are mostly stable and relatively free of homoplasy.

Etymology

New species names, unless otherwise specified, are to be treated as arbitrary combinations of letters and are given as nouns in apposition in keeping with ICZN Code article 31.2.2.

Table 4 (continued on next page). Character matrix for *Scipopus* Enderlein, 1922 and outgroup taxa. ‘0’ represents plesiomorphic state, ‘1–3’ represent apomorphic states, ‘?’ indicates an unknown character state.

Taxon	Characters																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
<i>Calosphen</i> sp. 11A	0	1	0	0	0	0	0	1	0	0	1	0	0	0	?	?	?	?	0	0	0	0	0	0	0	0	0	0
<i>Grallipeza bilineata</i> ms name	0	0	0	0	0	0	1	1	0	0	1	0	0	0	?	?	?	?	?	0	0	0	0	0	1	0	0	0
<i>Grallipeza nigrinotata</i> group	2	0	0	0	0	0	0	0	0	0	1	0	1	0	?	?	?	1	?	0	0	0	1	1	0	0	0	0
<i>Mesoconius bipleuron</i>	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	0	?	0	0	0	0	1	0	0	0	1	0
<i>Mesoconius garyi</i>	0	0	0	0	0	0	0	1	0	0	0	1	1	1	2	0	1	?	0	0	0	0	1	0	0	0	1	0
<i>S. (Parascipopus) alturas</i>	0	0	0	0	0	0	0	0	1	1	0	1	0	0	2	0	1	0	1	0	0	0	0	0	0	0	1	0
<i>S. (Parascipopus) fenestratus</i>	0	0	1	1	0	1	0	0	1	1	0	1	0	1	0	1	0	0	2	0	0	0	0	0	0	0	1	0
<i>S. (Parascipopus) manifestus</i>	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0
<i>S. (Parascipopus) nigriscapus</i>	0	0	0	1	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0
<i>S. (Parascipopus) otisi</i>	0	0	0	1	0	0	0	0	1	1	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0
<i>S. (Parascipopus) savegre</i>	0	0	0	1	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0
<i>Parasphen amazonicus</i>	0	1	1	0	1	1	0	1	0	0	0	1	0	0	2	0	1	1	3	0	0	0	0	0	1	1	1	0
<i>S. (Phaeoptera) alces</i>	0	1	1	0	0	0	1	0	1	1	0	1	1	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) argentum</i>	0	1	1	0	1	0	0	0	1	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) browni</i>	0	1	1	0	0	0	1	1	1	1	0	1	1	0	2	0	1	1	0	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) brunneus</i>	0	1	1	0	1	0	0	0	1	1	0	1	0	0	?	?	?	?	?	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) fraudator</i>	0	0	0	0	0	0	0	1	1	1	0	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) gorgonae</i>	0	1	1	0	0	1	0	0	1	1	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) melaneuris</i>	0	2	1	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) quetzal</i>	0	1	1	0	0	0	1	0	1	1	0	1	1	0	?	?	?	?	?	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) stigmatica</i>	0	1	1	1	0	0	1	1	1	1	0	1	1	0	2	0	1	1	1	0	0	0	0	0	0	0	1	0
<i>S. (Phaeoptera) zeta</i>	0	1	1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0
<i>Ptilosphen albibasis</i>	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0
<i>Rainiertiella</i> sp. 2	2	0	0	0	0	0	0	0	1	1	0	0	0	0	?	?	?	?	?	0	?	0	1	0	0	0	1	0
<i>Rainiertiella</i> sp. 4	0	0	0	0	0	1	0	1	1	1	0	1	0	0	2	1	1	1	0	?	?	0	0	1	0	0	1	0
<i>Rainiertiella</i> sp. 8	1	0	1	0	0	0	0	0	1	1	0	0	0	0	?	?	?	?	?	0	0	1	1	0	0	1	0	0
<i>Rainiertiella</i> sp. 10	1	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0	0	?	0	1	1	0	0	1	0	0
<i>Rainiertiella</i> sp. 11	0	0	1	0	0	0	0	0	1	1	0	0	0	0	?	?	?	?	?	?	0	0	1	1	0	0	1	0
<i>Rainiertiella</i> sp. 12	0	0	0	0	0	0	0	0	1	1	0	1	0	0	?	?	?	?	?	?	0	?	0	1	0	0	1	0

Table 4 (continued). Character matrix for *Scipopus* Enderlein, 1922 and outgroup taxa. '0' represents plesiomorphic state, '1–3' represent apomorphic states, '?' indicates an unknown character state.

Taxon	Characters																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
<i>Rainieriella</i> sp. 14	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0	0	0	1	1	0	1	0	0	1	0
<i>Rainieriella</i> sp. 15	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	1	1	0	0	1	0
<i>Rainieriella</i> sp. 16	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	1	1	0	0	1	0
<i>Rainieriella</i> sp. 18	0	1	0	0	0	0	0	0	1	1	0	0	0	?	?	?	?	?	?	0	0	0	0	0	0	1	0
<i>S. (Scipopus) calcephalus</i>	0	1	1	0	0	0	0	1	0	0	2	1	1	0	0	1	0	0	1	0	0	0	0	0	0	1	0
<i>S. (Scipopus) chalybeus</i>	0	1	1	1	0	0	0	0	0	0	2	1	1	0	0	1	0	0	2	0	0	0	0	0	0	1	0
<i>S. (Scipopus) convexus</i>	0	2	1	0	0	0	1	1	0	0	2	1	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0
<i>S. (Scipopus) diversus</i>	0	2	1	0	0	0	0	1	0	0	2	1	1	0	1	1	0	0	1	0	0	0	0	0	0	1	0
<i>S. (Scipopus) erythrocephalus</i>	0	2	1	0	0	0	0	1	0	0	2	1	1	0	0	1	0	0	2	0	0	0	0	0	0	1	0
<i>S. (Scipopus) furcifer</i>	0	1	1	0	0	0	0	1	0	0	2	1	1	0	0	1	0	0	1	0	0	0	0	0	0	1	0
<i>S. (Scipopus) nigripennis</i>	0	1	1	0	0	0	1	1	0	0	2	1	1	0	0	1	0	0	2	0	0	0	0	0	0	1	0
Undescribed genus sp. 7	0	1	0	0	0	0	0	0	0	0	0	0	1	0	?	?	?	?	?	0	0	0	0	0	0	1	0

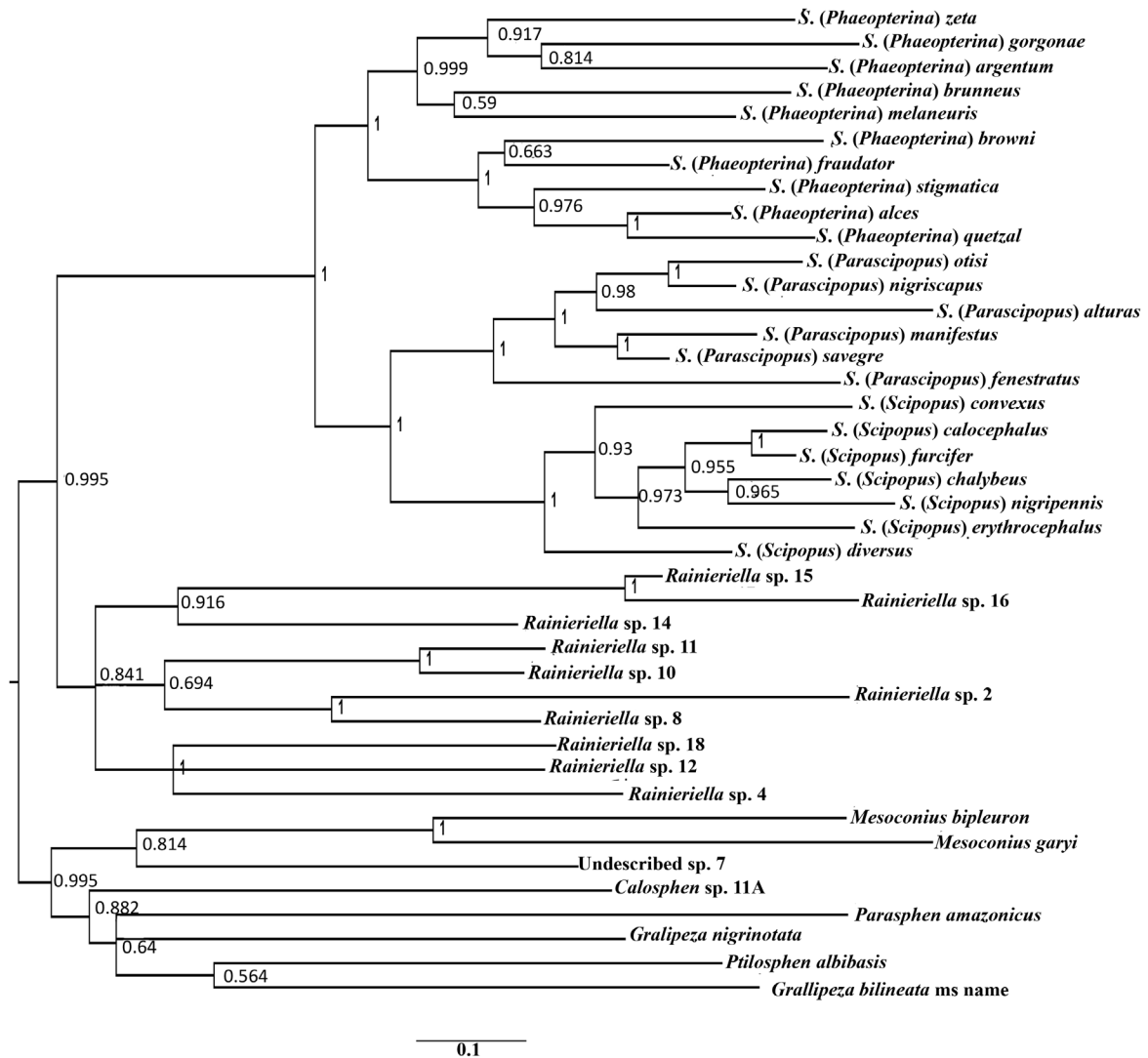


Fig. 4. Combined morphological and molecular phylogeny generated using MrBayes on CIPRES with the MrBayes block in Appendix 3. Node numbers represent posterior probabilities.

Measurements

Body length was measured with a ruler from the head, not including the arista, to the apex of the abdomen, not including wings.

The following measurements were made at $3.0\times$ magnification on a Leica compound microscope using a graticule:

Thorax ratio: thorax length (anterior mesonotum to anterior edge of scutellum) / thorax height (top of scutum at transverse suture to most ventral point of katepisternum).

Postpronotal lobe ratio: maximum length (anterior tip to posterior tip) / maximum height (ventral margin to dorsal margin).

Clypeus ratio: width (widest part of anterior clypeus) / height (highest part of anterior clypeus).

Common duct (measurements conducted using the freehand tool on ImageJ): common duct length / total duct length.

Results

Relationships and generic classification

Scipopus is recognized as monophyletic based on a molecular phylogeny (Fig. 2) and is diagnosed by a combination of characters as listed below in the diagnosis. Although the three subgenera that make up *Scipopus* s. lat. are each supported as monophyletic by molecular characters (Fig. 2), only *Scipopus* s. str. can be recognized on the basis of a single morphological character (an anteriorly white microtrichose anepisternum). Characters used to define the other three subgenera are either reversed in one or more species or appear as homoplasies elsewhere in *Scipopus*. *Scipopus* (*Parascipopus*), the sister group to

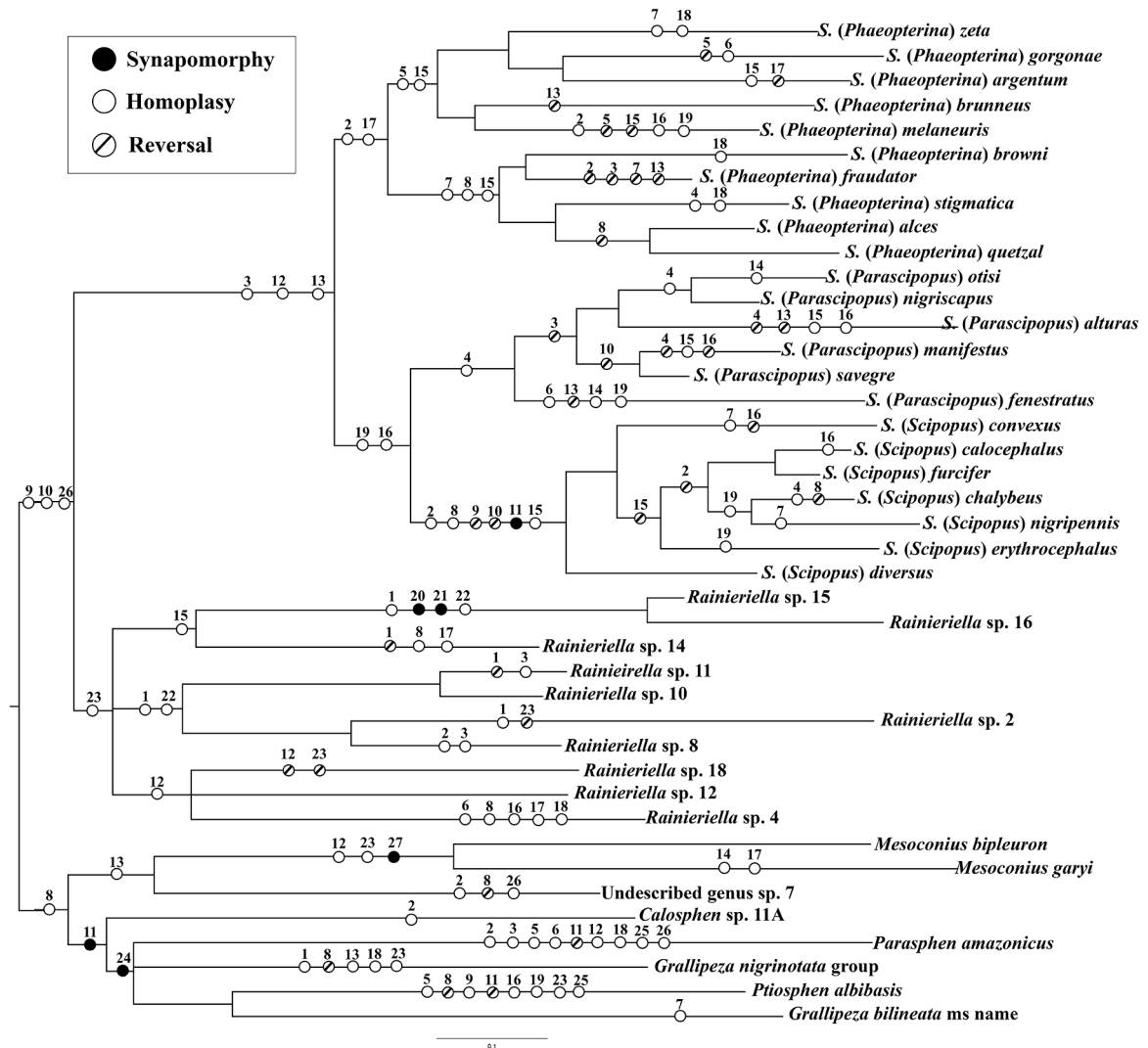


Fig. 5. Combined tree from Fig. 4 with mapped morphological characters. Numbers above branches represent characters from Table 3. Mapped using WinClada ver. 1.61 (Nixon 1999–2002) with unambiguous characters only.

Scipopus s. str., is generally recognizable by shiny orbital plates and a strongly tapered, pointed posterior frontal vitta, but these states also occur in other subgenera in *Scipopus*, leaving the subgenus diagnosed by a combination of traits. *Scipopus* (*Phaeopterina*) and *S. (Pseudeurybata)* were more difficult to distinguish on the basis of morphological characters; treating *Pseudeurybata* as a junior synonym of *S. (Phaeopterina)* makes them more easily diagnosable, and the treatment of a single combined subgenus is supported on the molecular tree (Fig. 2). *Phaeopterina* (including *Pseudeurybata*) is most easily recognized by the absence of the diagnostic features of *Scipopus* s. str. and *S. (Parascipopus)* but can also be diagnosed by the combination of an elongate postpronotal lobe and elongate thorax, and a dull orbital plate (except in *S. (Ph.) fraudator* sp. nov.).

The subgenera of *Scipopus* each form strongly supported clades on a molecular tree (Fig. 2), so each could be legitimately recognized as a genus separate from *Scipopus* s. str. This approach, however, results in genera that are difficult or impossible to identify using a morphological key without keying them through to the species level. Treating the whole group as a single genus (*Scipopus* s. lat.) renders the genus readily identifiable, and still allows for clades within the genus to be treated as monophyletic (albeit often difficult to diagnose) named subgenera.

Rainieriella is treated as the sister group to the *Scipopus* s. lat. group based on several shared morphological character states as well as molecular data (Fig. 5). *Rainieriella*, formerly treated as a subgenus of *Rainieria* Rondani, 1843, is treated as a genus since it is not closely related to ‘typical’ *Rainieria*, which do not occur in the Neotropics.

Diagnosing the *Scipopus* group

Scipopus s. lat. is distinguished from other New World Taeniapterinae with a short anal cell by the full combination of the following characters: all setae on the scape and costagium short, arista bare, third costal sector $\leq \frac{1}{2}$ length of *M* (Fig. 14A), hind tibia with a well-defined sulcus on at least the basal $\frac{1}{3}$ to $\frac{1}{2}$, and ocellar triangle widely separated from posterior margin of frontal vitta (distance $\geq 2.5 \times$ ocellar triangle length) (Fig. 66A). *Scipopus* s. lat. comes out at couplet 20 in the *Manual of Central American Diptera* key to genera of neotropical Micropezidae Loew, 1861 (Marshall 2010).

Scipopus s. str., the most recognizable subgenus, is further diagnosed by the combination of a mostly orange head, an entirely or partially dull orbital plate, a dark brown or black body, uniformly dark brown or black legs and wings, and an anteriorly white microtrichose anepisternum. The remaining subgenera of the *Scipopus* group have an entirely white microtrichose anepisternum, with at most a small bare patch anteriorly (Fig. 47A); sometimes this microtrichosity is only visible at certain angles and may give the impression of a bare or only partially microtrichose anepisternum; therefore, careful examination is required. Many species of *S. (Phaeopterina)* (including *Pseudeurybata*) are similar in coloration to *Scipopus* s. str., with a mostly orange head and a dark brown or black body. Most *S. (Phaeopterina)* also have entirely or mostly dull orbital plates (shiny in *S. (Ph.) fraudator* sp. nov.), an elongate thorax and postpronotal lobe, and most species have a wide, median silvery or blue vitta on the scutum (Fig. 61B). A quarter of the species in *S. (Phaeopterina)* lack a postocellar seta and most species previously treated as *Pseudeurybata* have a tall and deflexed clypeus (as in Fig. 15A) (width $\leq 1.6 \times$ height). *Scipopus (Parascipopus)* differs from the remainder of *Scipopus* s. lat. in having entirely shiny orbital plates (Fig. 43A), a strongly tapered, pointed posterior frontal vitta (Fig. 43D) (except in *S. (Pa.) fenestratus* subgen. et sp. nov.) and a single spermathecal duct arising from the common or paired spermathecal duct (Fig. 39E).

Members of *Scipopus* s. lat. are superficially similar to several closely related genera of Rainieiriini (Grallipezini) that, like *Scipopus*, have a bare arista and short setae on the scape and costagium. Species of *Mesoconius* are similar to *Scipopus* s. lat. in having a very short third costal sector, and females of

several species have both spermathecal ducts arising from a common duct (as in Fig. 61C). *Mesoconius* differs in that the male genital fork is absent, the tibial sulcus is weak and the ocellar triangle is closer to the vertex than in *Scipopus* s. lat.; furthermore, a major subgroup of *Mesoconius* is easily recognized by a protuberant katatergite. Some species of *Cliobata* Enderlein, 1923 and some species in the *Rainieriella* clade resemble *Scipopus* s. lat. in the generally dark brown or black body colour, the short third costal sector and the hind tibial sulcus, but differ from *Scipopus* in having a short distance between the ocellar triangle and the posterior apex of the frontal vitta. Most *Cliobata* also have a distinctive pattern of microtrichia on the scutum. *Cliobata* is restricted to the Andean countries, and all species are mostly or entirely black with red eyes. Species of *Rainieriella* also have a distinctive pattern of microtrichia on the thorax where the anterior half is entirely white microtrichose.

Description of *Scipopus* s. lat.

HEAD. Colour varying from mostly orange to brown or black. Arista bare, microtrichose near base. Pedicel only with short seta. Gena silvery microtrichose, with 2–5 ventral setae. Palpus approximately parallel-sided, rounded or pointed apically, $3.3\text{--}6.0\times$ as long as wide, setulose.

THORAX. Variable in colour, orange or brown to black, often with blue sheen. Proepisternum setulose on ventral margin, with 1–5 rows of ventral setae. Two notopleural setae, one dorsocentral seta, one prealar seta, one postalar seta. Acrostichal setulae forming several scattered rows. Katepisternum with two posterior vertical rows of orange, brown or black setae. Tibiae with sulcus on at least basal $\frac{1}{3}$ of posterodorsal surface. Tarsomere 1 on all legs longer than tarsomeres 2–5 combined. Fore and mid coxae with an anteroventral tuft of black setae, hind coxae with scattered black anteroventral setae.

WING. Variable in colour. Anal cell (*cua*) short (length of A_1 \sim half the length of $A_1 + CuA_2$), triangular, bare, A_1 with basal half with a slight darkened longitudinal fold or false vein (*CuP*) (Fig. 26D). Third costal sector very short, at most $\frac{1}{2}$ the length of *M*. Costagium with several short setae.

ABDOMEN. Variable in colour. Male pleural sac large, occupying most or all of P2. T1 with fine, long setae. T2–6 with medium length or short setulae. T1–6 dark brown or black with white microtrichosity: connection between T1–2, posterior corners of T2 and anterior margin of T3 usually densely microtrichose, T4–6 usually with indistinct, sparse microtrichosity. Male genital fork and epandrium dark brown or black with white or pale microtrichosity. Basiphallus usually small, crescent-shaped (wider posterodorsally, narrower anteroventrally) or frame-like (Fig. 71B). Basal distiphallus variable; usually very short ($1\text{--}2\times$ length of phallic bulb) or short ($>$ half epandrial length) in *Scipopus* s. str., short or long (= epandrial length) in *S. (Parascipopus)* and long in *S. (Phaeopterina)*. Distal distiphallus variable; often long and whip-like in *Scipopus* s. str., and long, short or absent in *S. (Parascipopus)* and *S. (Phaeopterina)*. Phallic bulb ranging from very short and approximately spherical (as in many species of *Scipopus* s. str.) (Fig. 20D), to enlarged, irregular and elongate (as in many species of *S. (Phaeopterina)*) (Fig. 47D). Epandrium usually elongate (length $2.0\times$ height) in *Scipopus* s. str. (Fig. 20D), elongate or stout in *S. (Parascipopus)* and usually stout (length \approx height) in *S. (Phaeopterina)* (Fig. 62E). Ejaculatory apodeme highly variable (small or large) within each genus. Bursa copulatrix broad and rugose with a small, claw-like ventral receptacle (Fig. 24E). Spermathecal duct arrangement variable; single duct arises from paired duct in *Scipopus* s. str. (Fig. 7B), from common or paired duct in *S. (Parascipopus)* (Fig. 45C), and independently from bursa (Fig. 47E) or from paired or smooth common duct in *S. (Phaeopterina)* (Fig. 61C). Duct width and length highly variable. Spermathecae (usually 2+1, occasionally 2+2) with shape and size highly variable; spherical, ovoid, elongate, cup-like or sinuate, with or without tubercles.

Key to species of *Scipopus* Enderlein, 1922

1. Anepisternum mostly white microtrichose on anterior $\frac{1}{4}$ to $\frac{3}{4}$, ventral corner sometimes brown microtrichose; at minimum, posterior $\frac{1}{4}$ mostly brown microtrichose (Figs 7E, 16) 2 (*Scipopus (Scipopus)* Enderlein, 1922)
 - Anepisternum entirely white microtrichose (at most with small bare spot on anterior margin) (Fig. 47A) 17
2. Clypeus entirely white microtrichose (Fig. 13A). Female cervical sclerite strongly convex on anterior half (Fig. 13C). Fore tarsomere 1 white. Epicephalon shiny, clearly delineated (Fig. 13C) *Scipopus (Scipopus) chalybeus* Hennig, 1934 (Bolivia, Peru, Colombia, Ecuador)
 - Clypeus bare medially, white microtrichose posterolaterally (Fig. 15A). Female cervical sclerite flat or weakly convex. Fore tarsomere 1 white or dark brown or black. Epicephalon dull or shiny, clearly or poorly delineated 3
3. Posterolateral portions of paracephalon with strongly convex projections (Fig. 29C) 4
 - Posterolateral portions of paracephalon with at most indistinct bumps (Fig. 22H) 5
4. Fore and hind tarsomere 1 at least partially white. Epicephalon dull, orange, microtrichose (Fig. 29C). Fine setae on T1 entirely white *Scipopus (Scipopus) planus* sp. nov. (Bolivia, Brazil, Peru)
 - Fore and hind tarsomere 1 dark brown or black. Epicephalon dull, microtrichose, brown and/or orange (Fig. 15C). Fine setae on T1 mostly dark brown or black *Scipopus (Scipopus) convexus* sp. nov. (Northwest South America)
5. Fore and hind tarsomere 1 dark brown or black dorsally; ventrally dark brown or with whitish or golden fringe (Fig. 32) 6
 - Fore and hind tarsomere 1 at least partially white or pale yellow dorsally; ventrally white, dark brown or black (Fig. 9A) 10
6. Orbital plate entirely dull, microtrichose, without anterior shiny patch (Fig. 8A). Scutum with anteromedian pale brown vitta flanked by blue sheen (Fig. 10E) *Scipopus (Scipopus) calocephalus* (Bigot, 1886) (Costa Rica to Colombia)
 - Orbital plate dull, microtrichose posteriorly, with anterior shiny patch (Fig. 11C). Scutum with indistinct silvery or pale brown, or blue median vittae or entirety of scutum with blue sheen (Figs 11C, 20C, 28B) 7
7. Epicephalon dull, orange, microtrichose (Fig. 20C) 8
 - Epicephalon shiny, orange or brown, bare or white microtrichose (Fig. 26F) 9
8. Scutum black-brown with an indistinct pale brown anteromedian vitta flanked by median blue sheen (Fig. 31C), with pale brown microtrichose anterolateral patches (Fig. 31C) and pale brown spots anterior to and on transverse suture (Fig. 31C). Oviscape 3.0–4.0 × length of T6 (Fig. 31 E). Genital fork small (2.3 × length of T6) *Scipopus (Scipopus) souzalopesi* Albuquerque, 1972 (Ecuador to Brazil)
 - Scutum black, at most with indistinct silvery anteromedian vittae (Fig. 20C). Oviscape 1.5–3.0 × length of T6. Genital fork large (3.0 × length of T6) (Fig. 20E) *Scipopus (Scipopus) erythrocephalus* (Fabricius, 1805) (Ecuador to French Guiana)
9. Scutum uniformly blue-black (Fig. 28B). Postpronotal lobe pale brown anteriorly (Fig. 28C). Notopleuron uniformly dark brown or black or with small pale spot (Fig. 28D). Clypeus dark brown (Fig. 28A) *Scipopus (Scipopus) nitidus* sp. nov. (Colombia)

- Scutum black with median blue sheen (Fig. 11C). Postpronotal lobe uniformly dark brown or black (Fig. 11F). Notopleuron with pale microtrichia outlining notopleural seta and lining ventral margin (Fig. 11F). Clypeus light brown or orange (Fig. 11A)
 *Scipopus (Scipopus) cartaboensis* Cresson, 1926 (Brazil, Guyana, French Guiana)
10. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta (Fig. 17B) 11
 – Epicephalon shiny, bare, orange, brown or black, clearly delineated from upper frontal vitta (Fig. 7C) 12
11. Scutum uniformly black (Fig. 17B)
 *Scipopus (Scipopus) diversus* (Schiner, 1868) (Brazil, Bolivia, French Guiana, Colombia, Argentina)
 – Scutum dark brown or black with wide, median, well-defined pale silvery-brown vitta (Fig. 33A) and pale brown anterolateral microtrichose area (Fig. 33A)
 *Scipopus (Scipopus) striatithorax* Hennig, 1934 (Brazil)
12. Clypeus orange or light brown, with median dark brown patch (Fig. 8A). Fine, long setae on T1 at least partially black. Anepisternum white microtrichose on anterior $\frac{1}{2}$ or less (Fig. 8F). Katepisternum mostly brown microtrichose, white microtrichose anteriorly (Fig. 9B)
 *Scipopus (Scipopus) brikelos* sp. nov. (Costa Rica)
 – Clypeus orange, light brown or dark brown, uniform in colour (Fig. 24A). Fine long setae on T1 entirely white. Anepisternum white microtrichose on anterior $\frac{1}{4}$ or more (Fig. 14D). Katepisternum variable, entirely white microtrichose (Fig. 14D) to almost entirely brown microtrichose with white patches or spots (Fig. 16A) 13
13. Anepisternum with anterior white microtrichosity forming straight line, ventral corner white microtrichose (Fig. 24H). Ventral part of notopleuron and dorsal part of postpronotal lobe with dense, wide lines of pale microtrichia (Fig. 24H) ... *Scipopus (Scipopus) lateralis* Hennig, 1934 (Ecuador)
 – Anepisternum with anterior white microtrichosity forming a jagged or irregular line, ventral corner dark brown microtrichose (Fig. 27). Ventral part of notopleuron and dorsal part of postpronotal lobe either dark brown or black, or with narrow lines or spots of pale microtrichia. (Fig. 27) 14
14. Outer vertical seta absent. Scutum with wide blue median sheen (Fig. 34E). Notopleuron with pale brown microtrichia forming depressed Z shape (Fig. 34G)
 *Scipopus (Scipopus) wokomung* sp. nov. (Brazil, Guyana)
 – Outer vertical seta present. Scutum with narrow median pale brown vitta(e), sometimes flanked by blue vittae (Fig. 26F). Notopleuron with narrow sweeping line or spot of pale microtrichia (Fig. 27B) 15
15. Scutum with three pale anteromedian vittae sometimes overlaid by blue sheen (Fig. 22D). Ventral corner of katepisternum brown microtrichose (Fig. 22G)
 *Scipopus (Scipopus) furcifer* Hennig, 1934 (Mexico, Guatemala)
 – Scutum with single median pale brown vitta flanked by blue sheen (Fig. 26F) or with uniform blue sheen (Fig. 7C). Ventral corner of katepisternum white microtrichose (Fig. 27) 16
16. Epicephalon narrow (width less than $\frac{2}{3}$ of upper frontal vitta width at inner verticals) (Fig. 26F). Scutum with pale anteromedian brown vitta flanked by blue sheen (Fig. 26F)
 *Scipopus (Scipopus) nigripennis* (Hendel, 1922) (Honduras, Ecuador to Brazil)
 – Epicephalon wide (width $\frac{2}{3}$ or more of frontal vitta width at inner vertical seta) (Fig. 7C). Scutum black with blue sheen (Fig. 7C)
 *Scipopus (Scipopus) belzebul* (Schiner, 1868) (Panama south to Bolivia and Brazil)

17. Epicephalon shiny, wide (width $\frac{2}{3}$ or more of frontal vitta width at inner vertical seta). Frontal vitta strongly tapered posteriorly, posterior apex forming a sharp or narrowly rounded point (Fig. 39C). Orbital plate shiny, bare, clearly delineated from frontal vitta (Fig. 43A) 18
 – Epicephalon dull or shiny, wide or narrow. Posterior frontal vitta tapered or subequal in width to anterior frontal vitta, apex U-shaped (Fig. 47B). Orbital plate entirely dull or with slight lateral shine (Fig. 50B) 26
18. Scutum dark brown or black with well-defined median silvery-blue vitta (Fig. 53C). Wing dark brown infuscate with distomedian hyaline spot (Fig. 53F). Female single spermathecal duct arising from bursa copulatrix (Fig. 53E) *Scipopus (Phaeopterina) fraudator* sp. nov. (Mexico)
 – Scutum brown, black or orange, may have a blue uniform blue sheen (Fig. 38) but never forming a well-defined median vitta. Wing either uniformly infuscate (Fig. 38D), dark with 3 subapical hyaline spots (Fig. 37A) or mostly clear with distal (Fig. 45D) and/or discal infuscation (Fig. 35E). Female single spermathecal duct arising from paired or common duct (Fig. 36A)
19 (*Scipopus (Parascipopus)* subgen. nov. in part)
19. Thorax orange or pale reddish brown in colour, with indistinct pale microtrichosity (Fig. 37B)
*Scipopus (Parascipopus) nigriscapus* subgen. et sp. nov. (Costa Rica)
 – Thorax dark brown or black in ground colour, with conspicuous pale microtrichosity (Fig. 39F) 20
20. Wing predominantly clear, with distal and/or discal infuscation (Fig. 35E). Legs dark brown, gradually fading to pale brown basally (Fig. 35E) 21
 – Wing either entirely light to dark infuscate (Fig. 38D), or predominantly infuscate with subapical hyaline spots (Fig. 37A). Legs uniformly dark brown or black (Fig. 40), or dark brown or black with highly-contrasting yellow basal portion (Fig. 43F) 22
21. Wing apex dark infuscate anterior to *M*, relatively small dark infuscate discal patch divided into anterior and posterior parts by a clear band (Fig. 35E). Outer vertical seta and apical scutellar seta (Fig. 35E) *Scipopus (Parascipopus) alturas* subgen. et sp. nov. (Costa Rica)
 – Wing slightly darker at apex, clear discally (Fig. 45D). Outer vertical seta and apical scutellar seta absent*Scipopus (Parascipopus) tico* subgen. et sp. nov. (Costa Rica)
22. Mid and hind femur black distally, bright yellow on basal $\frac{1}{2}$ – $\frac{3}{4}$, highly contrasting (Fig. 43F)
*Scipopus (Parascipopus) otisi* subgen. et sp. nov. (Costa Rica)
 – Mid and hind femur uniformly black or dark brown (Fig. 44F) 23
23. Wing brown infuscate with three well-defined subapical hyaline spots (Fig. 39F). Hind tarsomere 1 white or yellow on inner basolateral $\frac{1}{2}$
*Scipopus (Parascipopus) manifestus* (Wulp, 1897) subgen. et comb. nov. (Costa Rica)
 – Wing uniformly brown infuscate or with three poorly defined, subapical hyaline spots (Fig. 44F). Hind tarsomere dark brown or black, sometimes with conspicuous ventral golden fringe (Fig. 41F) ... 24
24. Epicephalon and clypeus light brown or orange (Fig. 38A–B)
*Scipopus (Parascipopus) kubus* subgen. et sp. nov. (Costa Rica)
 – Epicephalon and clypeus dark brown or black (Fig. 44A) 25
25. Anterior frontal vitta orange (Fig. 41A). Long, fine setae on T1 white
*Scipopus (Parascipopus) monteverde* subgen. et sp. nov. (Costa Rica)
 – Anterior frontal vitta black (Fig. 44A). Long, fine setae on T1 black
*Scipopus (Parascipopus) savegre* subgen. et sp. nov. (Costa Rica)

26. Thorax orange and wing with three subapical hyaline spots (Fig. 37A). Apical scutellar seta absent *Scipopus (Parascipopus) fenestratus* subgen. et sp. nov. (Costa Rica)
 – Thorax orange and wing evenly infusate or clear with discal infuscation (Fig. 46), or thorax dark brown or black and wing either evenly infusate (Fig. 47F), infusate with discal hyaline band (Fig. 58F), or infusate with three subapical hyaline spots (Fig. 61D). Apical scutellar seta present 27 (*Scipopus (Phaeopterina)* in part)
27. Epicephalon dull, orange, microtrichose, not clearly delineated from frontal vitta (Fig. 59C) 28 (Caribbean *Scipopus (Phaeopterina)*)
 – Epicephalon shiny, orange, brown or black, bare or microtrichose, clearly delineated from frontal vitta (Fig. 50A) 29 (Central and South American *Scipopus (Phaeopterina)* in part)
28. Mid and hind femora almost entirely yellow (Fig. 58F). Wing mostly hyaline, infusate apically and discally, forming subapical hyaline stripe (Fig. 58F) *Scipopus (Phaeopterina) lineatus* sp. nov. (Saint Lucia)
 – Mid and hind femora entirely dark brown or black (Fig. 59G). Wing brown infusate (Fig. 59G) ... *Scipopus (Phaeopterina) melaneuris* Cresson, 1926 (Dominica, Martinique)
29. Thorax orange, with indistinct or conspicuous pale microtrichia (Fig. 68) 30
 – Thorax dark brown (Fig. 48C), black (Fig. 57C) or dark reddish-brown (Fig. 50D), with conspicuous pale microtrichia 32
30. Wing clear except for dark apex (Fig. 68). Dorsal surface of scutum with a prominent dip (Fig. 68) *Scipopus (Phaeopterina) stigmatica* (Hennig, 1935) (Costa Rica)
 – Wing uniformly infusate (Fig. 46). Dorsal surface of scutum relatively flat (Fig. 46) 31
31. Hind femur mostly black with basal and preapical orange bands (Fig. 46). Male genital fork large, with very long inner basal processes and arms (Fig. 46) *Scipopus (Phaeopterina) alces* (Marshall, 2016) (Costa Rica)
 – Hind femur uniformly dark brown or black on distal $\frac{2}{3}$, yellow on basal $\frac{1}{3}$ (Fig. 49). Male genital fork small, inner basal processes small and indistinct *Scipopus (Phaeopterina) browni* (Marshall, 2016) (Costa Rica)
32. First fore tarsomere at least partially white dorsally (Fig. 50B) 33
 – First fore tarsomere dark brown or black dorsally (Fig. 63A) 40
33. Wing brown infusate with three subapical hyaline spots (Figs 61D, 67D) 34
 – Wing uniformly brown infusate (Fig. 55) 36
34. Clypeus and antenna dark brown (Fig. 50B). Facial groove dark brown with white microtrichosity, only appearing brown at some angles, otherwise appearing silvery-white (Fig. 50B) *Scipopus (Phaeopterina) brunneus* sp. nov. (Colombia)
 – Clypeus and antenna light brown or orange (67A). Facial groove orange with white microtrichosity, only appearing orange at some angles, otherwise appearing silvery-white (Fig. 67A) 35
35. Fine, long, setae on T1 white. First fore and hind tarsomere at least partially white *Scipopus (Phaeopterina) sexguttatus* Enderlein, 1922 (Venezuela)
 – Fine, long, setae on T1 black. First fore tarsomere white, first hind tarsomere dark brown or black *Scipopus (Phaeopterina) musculosus* sp. nov. (Venezuela)

36. Mid and hind femora brown or black and basally yellow or with preapical orange band (Figs 65D, 71F)	37
– Mid and hind femora uniformly brown or black (Fig. 60E)	39
37. Mid and hind femora yellow on at least basal ½ (Fig. 71F)	
..... <i>Scipopus (Phaeopterina) vee</i> sp. nov. (Peru)	
– Mid and hind femora with preapical orange band (Fig. 65D)	38
38. Clypeus entirely white microtrichose. Female cervical sclerite strongly convex (Fig. 13C). Paired spermathecal stems very short; paired spermathecae teardrop-shaped with bumps and striae (Fig. 65C)	<i>Phaeopterina quetzal</i> sp. nov. (Guatemala)
– Clypeus bare. Female cervical sclerite relatively flat. Paired spermathecal stems long, with spike-like projections; paired spermathecae ovoid	
..... <i>Phaeopterina guatemalensis</i> (Marshall, 2016) (Mexico to Honduras)	
39. Clypeus entirely white microtrichose. Genital fork with inner basal process (Fig. 60B). Anterior part of hypandrium with very broad fan-like extensions (length 1.5 × height) (Fig. 60D)	<i>Scipopus (Phaeopterina) metallicus</i> sp. nov. (Mexico)
– Clypeus bare. Genital fork without inner basal process (Marshall 2016: fig. 31). Anterior part of hypandrium with narrow extensions (length 5.0 × height) (Marshall 2016: fig. 28)	
..... <i>Scipopus (Phaeopterina) dasypogon</i> (Marshall, 2016) (Mexico)	
40. Epicephalon wide (width ⅔ or more of frontal vitta width at inner vertical seta) and black (Fig. 57E)	41
– Epicephalon wide or narrow, brown or orange (Fig. 47B)	42
41. Hind femur black, yellow on basal ½ (Fig. 57C)	
..... <i>Scipopus (Phaeopterina) heteropus</i> (Frey, 1927) (Bolivia)	
– Hind femur entirely dark brown or black (Fig. 62G)	
..... <i>Scipopus (Phaeopterina) narupa</i> sp. nov. (Ecuador)	
42. Mid and hind femur with preapical orange band (Fig. 51). Thoracic pleuron dark reddish-brown (Fig. 50)	<i>Scipopus (Phaeopterina) compeditus</i> Hennig, 1934 (Mexico)
– Mid and hind femur uniformly black or brown on apical third (Fig. 72). Thoracic pleuron blackish-brown, often with median blue sheen (Fig. 69D)	43
43. Postocellar seta absent	44
– Postocellar seta present (Fig. 66A)	46
44. Clypeus tall (width ≤ 1.4 × height) (Fig. 15A). Hind tarsomere 1 at least partially white dorsally	<i>Scipopus (Phaeopterina) zeta</i> (Marshall, 2016) (Brazil, Colombia, Ecuador)
– Clypeus short (width > 1.9 × height) (Fig. 64A). Hind tarsomere 1 entirely dark brown or black, with or without ventral golden fringe (70C)	45
45. Scutum dark brown or black with median blue sheen and pale silvery-blue microtrichose spot anterior to transverse suture (Fig. 47B). Hind femur dark brown, pale brown or yellow on basal ¼, gradually fading into brown distally (Fig. 47F)	<i>Phaeopterina argentum</i> sp. nov. (Bolivia, Peru, Ecuador)
– Scutum dark brown or black with, at most, median blue sheen (Fig. 64A). Hind femur dark brown, at most slightly pale brown basally (Fig. 64D)	
..... <i>Scipopus (Phaeopterina) noturgidus</i> sp. nov. (Colombia)	

46. Postpronotal lobe bare or with sparse setulae on outer margin. T2 flat (Fig. 70D) 47
 – Postpronotal lobe densely setulose anteriorly. T2 swollen (Fig. 69D)
 *Scipopus (Phaeopterina) turgidus* sp. nov. (Colombia)
47. Epicephalon dark brown (Fig. 48B)
 *Scipopus (Phaeopterina) brevifurca* Enderlein, 1922 (Ecuador)
 – Epicephalon light brown or orange (Fig. 70B) 48
48. Clypeus orange with median brown stripe (Fig. 70A). Epicephalon wide (width $\frac{2}{3}$ or more of frontal vitta width at inner vertical seta) (Fig. 70B)
 *Scipopus (Phaeopterina) uniformis* sp. nov. (Mexico, Honduras)
 – Clypeus uniformly brown or orange (Fig. 66B). Epicephalon narrow (width less than $\frac{2}{3}$ of frontal vitta width at inner vertical seta (Fig. 66A) 49
49. Upper fronto-orbital seta absent. Notopleuron black-brown, with pale brown microtrichia lining ventral margin (Fig. 54B). Female cervical sclerite strongly convex on anterior half (Fig. 13C)
 *Scipopus (Phaeopterina) gorgonae* Hennig, 1935 (Costa Rica, Colombia)
 – Upper fronto-orbital seta present. Notopleuron evenly black-brown (Fig. 66F). Female cervical sclerite relatively flat *Scipopus (Phaeopterina) rufilabris* Enderlein, 1922 (Mexico)

Species accounts

Class Insecta Linnaeus, 1758
 Order Diptera Linnaeus, 1758
 Superfamily Neriioidea Hendel, 1916
 Family Micropezidae Loew, 1861
 Subfamily Taeniapterinae Cresson, 1930
 Genus *Scipopus* Enderlein, 1922

Scipopus (Scipopus) s. str. Enderlein, 1922

Scipopus Enderlein, 1922: 208 (type species: *Scipopus erythrocephalus* (Fabricius, 1805)).

Scipopus – Enderlein 1922: 165 (key), 208 (diagnosis, key). — Frey 1927: 68 (keyed), 74 (list). — Cresson 1930: 324 (diagnosis). — Curran 1934a: 450 (keyed), 451 (key); 1934b: 305 (key). — Hennig 1934: 72 (keyed), 321 (diagnosis, key). — Aczél 1949: 339 (catalog); 1951: 534, 538 (key). — Steyskal 1968: 48.15 (catalog). — Albuquerque 1971: 89 (diagnosis). — Schumann 1988: 115 (list). — Marshall 2010: 810 (key), 812 (notes). — Ferro & de Carvalho 2014: 53 (key), 59 (diagnosis, list). — Martinez-Alava & Serna 2015: 345 (distribution). — Marshall *et al.* 2016: 543 (catalog). — Martinez *et al.* 2020: 180 (phoretic relationships).

Diagnosis

Frontal vitta orange. Thorax, abdominal tergites, wings and legs dark brown or black. Thoracic pleuron with varying patterns of white and brown microtrichosity; anepisternum always white microtrichose on majority of anteroventral $\frac{1}{3}$ and anteroventral margin, primarily brown microtrichose on at least posterior $\frac{1}{3}$. Thorax stout, height greater than length (thorax ratio ≤ 0.93). Common spermathecal duct rugose, clearly delineated from smooth paired duct; single spermathecal duct arising from basal portion of paired duct.

Remarks

Scipopus was originally diagnosed by the bare arista, short anal cell (*cua*) and very short third costal sector, but all of these character states also occur in combination in other species outside of *Scipopus*.

Most relatively large black or dark brown micropezids with a contrasting orange or red head belong to *Scipopus* s. lat., and all species of *Scipopus* s. str. have this characteristic colour combination. The characteristic pattern of white microtrichosity on the mesopleuron provides a new, reliably diagnostic character for the subgenus.

Description

LENGTH. 9–16 mm.

HEAD. Antenna orange. Frontal vitta dull, orange, microtrichose. Orbital plate dull, orange, microtrichose (Fig. 10A), or with shiny, bare anterior patches (Fig. 11C). Anterior frontal vitta with scattered black setulae. Epicephalon orange to black, either shiny and clearly delineated from upper frontal vitta (Fig. 7C) or dull and not clearly delineated (Fig. 17B). Paracephalon orange to black, shiny, slightly convex (Fig. 22H) to strongly convex with upturned bumps (Fig. 29C). Head chaetotaxy always including inner vertical, postocellar, upper fronto-orbital seta, and 1–2 lower fronto-orbital seta; outer vertical seta usually present (absent in *S. (S.) wokomung* sp. nov. and sometimes absent in *S. (S.) chalybeus*). Palpus narrow (length 3.6–6.0 × width), nearly parallel-sided, rounded and tapered apically, pale microtrichose and black setulose. Clypeus orange to black, usually twice as wide as high, sometimes much higher than wide (as in *S. (S.) convexus* sp. nov. and *S. (S.) nigripennis*) (Fig. 15A), usually bare medially and microtrichose posterolaterally (entirely white microtrichose in *S. (S.) chalybeus*) (Fig. 13A).

THORAX. Cervical sclerite dark brown or black, white microtrichose, subquadrate, usually relatively flat or slightly convex, but anterior part swollen in females of *S. (S.) chalybeus* (Fig. 13C). Mesothorax robust, only slightly tapered anteriorly. Thorax ratio (length/height) always less than 0.93. Anterior edge of mesonotum elevated (most clearly seen laterally), with surface becoming anteriorly humped (Fig. 13G), convex (Fig. 7D) or relatively flat (Fig. 33B). Postpronotal lobe distinct, dark brown or black, raised, slightly tapered anteriorly, length ~2.0–2.5 × height (Fig. 30A). Notopleuron brown or black, often with interspecifically varying patterns of silvery or pale brown microtrichia (Figs 27, 34G). Pleuron dark brown or black with variable patterns of white and brown microtrichosity; anepisternum always white on most of anteroventral 1/3 and anteroventral margin, brown on majority of posterior 1/3 (Fig. 7E). Legs dark brown or black, fore and hind tarsomere 1 partially or entirely white, or entirely black or brown dorsally, often with ventral golden fringe. Scutellum with two long, strong apical setae (2.0 × length of scutellum), and 1–3 pairs of short, lateral or dorsolateral discal setulae.

WING. Uniformly brown infusate.

ABDOMEN. Tergites dark brown or black. T1 with fine white, and/or black or dark brown setae, remainder of abdomen with short black or dark brown setulae. T1 (especially posterior margin), posterior margin or corners of T2, anterior margin of T3, entirety or lateral edges of T4, and entirety of T5–6 usually very indistinctly white microtrichose, more obvious in some species (as in *S. (S.) planus* sp. nov. and *S. (S.) convexus* sp. nov.). Pleuron with P1, upper half of P2 and sometimes upper half of P3–6 either almost entirely black, pale grey, or off-white and dark brown (Fig. 13G).

FEMALE ABDOMEN. T1+2 1.1–2.8 × length of T3. Oviscape dark brown or black, variable in dimension but tapered distally and sparsely covered in short black setulae, anterior 1/3 usually entirely or partially white microtrichose (Fig. 6A–B). Common spermathecal duct arising from bursa, roughly textured and ranging from very short (almost absent) (Fig. 11B) to very long (3/4 of entire combined duct length) (Fig. 8C), clearly delineated from paired duct. Paired spermathecal duct smooth, ranging from short and wide (Fig. 17E) to long and narrow (Fig. 20B). Paired spermathecal stems bare (Fig. 17E) or with spiked or finger-like projections (Fig. 11B); paired spermatheca striate, usually spherical or ovoid (Fig. 20B), sometimes elongate (Fig. 15B). Single spermathecal duct arising from basal portion of paired

duct, smooth and narrow, swollen distally, ending in usually one but sometimes two finger- or bulb-like spermathecae (Fig. 14B).

MALE ABDOMEN. T1+2 1.4–2.9 × length of T3. Genital fork dark brown or black, white microtrichose, arms with inner basal process (Fig. 24B), length and shape of arms and processes variable. Epandrium dark brown or black, white microtrichose and setulose, stout (length ≈ height) to elongate (length ≥ 2.0 × height). Basiphallus usually small, crescent-shaped when viewed ventrally (Fig. 22F). Basal distiphallus usually very short and wide (1.0–2.0 × length of phallic bulb), ending or partially enclosing phallic bulb (Fig. 10C). Phallic bulb usually short, somewhat spherical, with multiple chambers, sometimes with posterior projections (Fig. 22F). Distal distiphallus short (shorter than epandrium) to long (> 2.0 × length of epandrium), usually narrow (Fig. 10C). Phallapodeme slender or broad, may or may not be expanded apically. Ejaculatory apodeme varying in size, usually with a fan-like apodeme attached to a bulbous sperm pump (Fig. 15D).

Scipopus (Scipopus) belzebul (Schiner, 1868)

Figs 6B, 7

Calobata belzebul Schiner, 1868: 251.

Scipopus bolivianus Hennig, 1934: 328. **Syn. nov.**

Scipopus belzebul – Enderlein 1922: 210 (key). — Frey 1927: 74 (listed). — Curran 1934a: 451 (key). — Aczél 1949: 339 (catalog); 1951: 538 (key). — Steyskal 1968: 48.15 (catalog). — Ferro & de Carvalho 2014: 59 (listed). — Marshall *et al.* 2016: 544 (catalog).

Scipopus bolivianus – Aczél 1949: 340 (catalog); 1951: 539 (key). — Steyskal 1968: 48.15 (catalog).

Non *Scipopus belzebul* – Cresson 1930: 327 (*S. (S.) planus* sp. nov.). — Hendel 1933: 61 (*S. (S.) convexus* sp. nov.). — Hennig 1934: 322 (key), 324 (diagnosis) (*S. (S.) convexus*). — Albuquerque 1972a: 92, figs 1–9 (re-description) (*S. (S.) convexus*).

Differential diagnosis

Scipopus (Scipopus) belzebul resembles other species of *Scipopus* s. str. with a white first fore tarsomere and a shiny epicephalon clearly delineated from the upper frontal vitta (*S. (S.) brikelos* sp. nov., *S. (S.) chalybeus*, *S. (S.) nigripennis*, *S. (S.) furcifer*, *S. (S.) lateralis*). It differs in the wide, dark brown or black epicephalon, the blue sheen on the scutum and the dark brown or black clypeus.

Type material examined

Lectotype (*Calobata belzebul*) (photos provided by Peter Sehnal, Vienna, 2020)
VENEZUELA • 1 ♀; Lindig; 1864; Alte Sammlung; *belzebul* det. Schiner; NHMW.

Holotype (*Scipopus bolivianus*) (borrowed and photographed in 2002)
BOLIVIA • 1 ♀; Yungas [La Paz] v. Coroico; 1000 m a.s.l.; 18 Jun. 1906; SMTD.

Paratypes (*Scipopus bolivianus*)
BOLIVIA • 1 ♀; same collection data as for holotype; 8 Jun. 1906; SMTD (not examined) • 2 ♂♂; Yungas de La Paz; 1000 m a.s.l.; BMNH (examined by photo only) • 1 ♀; ohne Loc. [without location]; MLUH (not examined).

Other material examined

COLOMBIA • 1 ♀; Cauca PNN Gorgona Alto el Mirador; 2°58' N, 78°11' W; 130 m a.s.l.; 20 Feb.– 6 Mar. 2001; H. Torres leg.; Malaise; M.1475; IAVH • 1 ♀; same collection data as for preceding; 6–23

Oct. 2000; R. Duque leg.; M.900; DEBU • 1 ♀; same collection data as for preceding; Antigua Laguna; 70 m a.s.l.; 5–20 Sep. 2000; M.912; debu01088997/MYCRO551-19 sequenced for CO1–5'; IAVH • 2 ♀♀; same collection data as for preceding; El Saman; 5 m a.s.l.; 9–27 Aug. 2001; H. Torres leg.; M.2120; IAVH (photographed, Fig. 7A, C–E) • 1 ♀; same collection data as for preceding; Mancora; 60 m a.s.l.; 23 Oct.–8 Nov. 2000; M.906; IAVH (dissected and photographed, Fig. 7B) • 1 ♀; same collection data as for preceding; El Helechal; 30 m a.s.l.; 13 Apr.–7 May 2001; M.1651; debu01088988/MYCRO528-19 sequenced for CO1–5'; IAVH • 1 ♀; same collection data as for preceding; El Roble; 130 m a.s.l.; 20 Feb.–6 Mar. 2001; M.1475; IAVH.

Description

LENGTH. 12–14 mm.

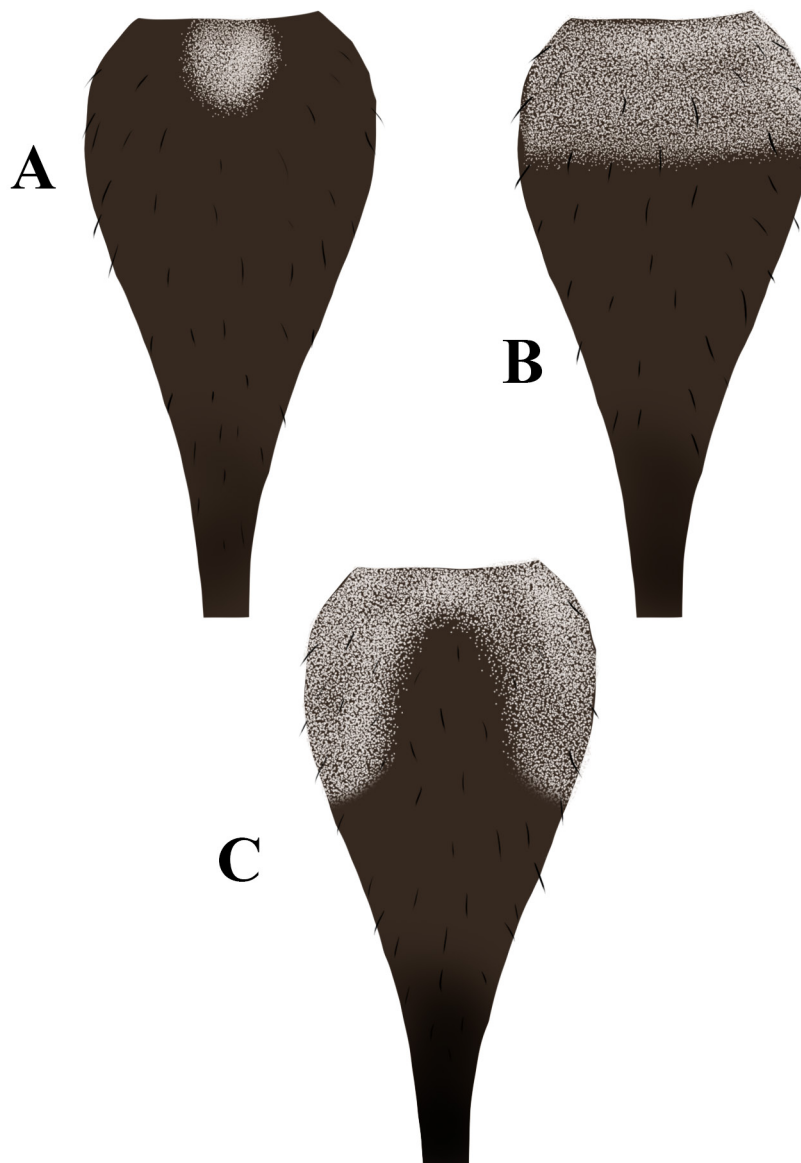


Fig. 6. Variation in oviscape white microtrichosity. **A.** *Scipopus (Scipopus) planus* sp. nov. **B.** *Scipopus (Scipopus) belzebul* (Schiner, 1868). **C.** *Scipopus (Parascipopus) nigriscapus* subgen. et sp. nov.

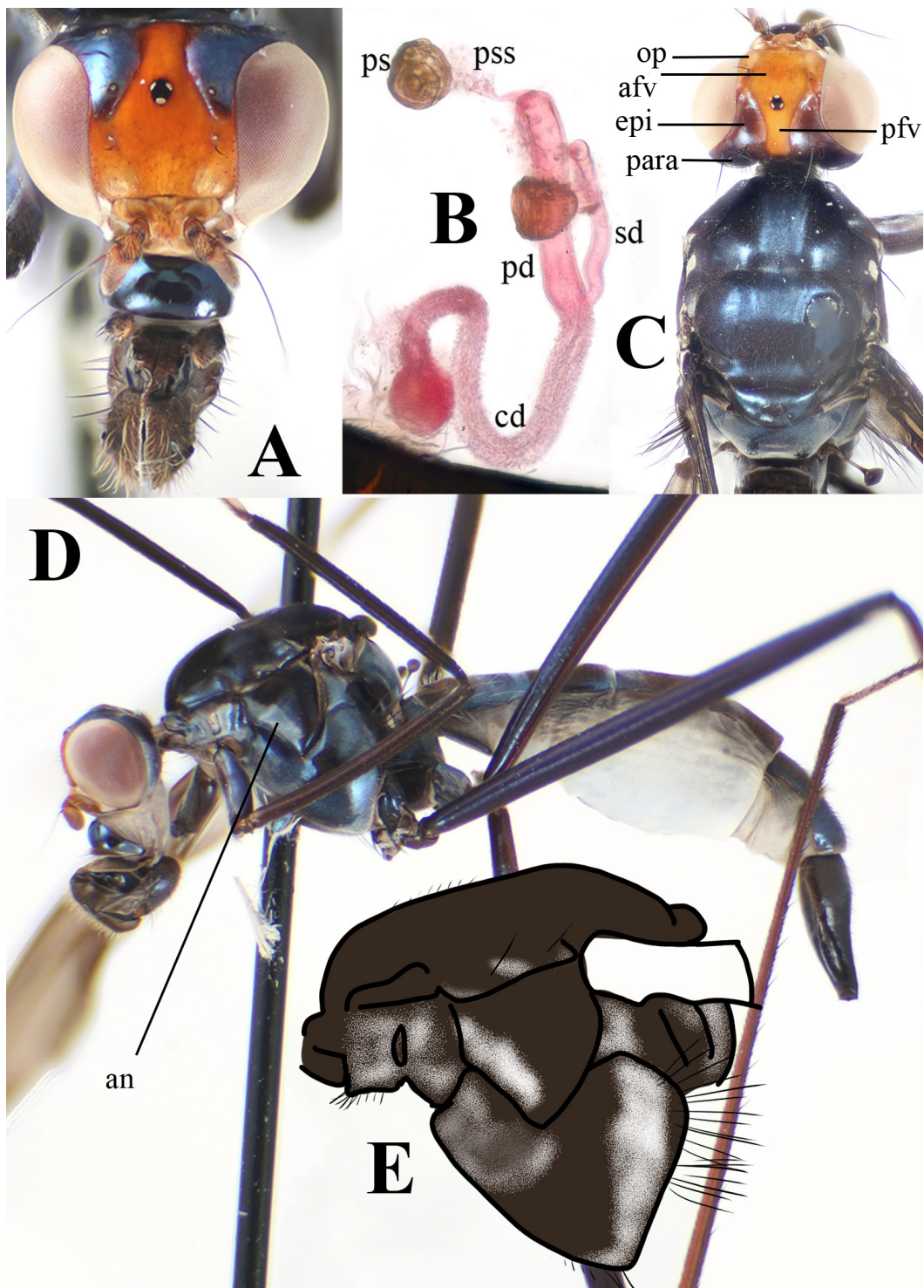


Fig. 7. *Scipopus (Scipopus) belzebul* (Schiner, 1868) (IAVH). **A.** Head, ♀, anterior view, Colombia, non-type. **B.** Female spermathecae and associated structures, Colombia, non-type. **C.** Head and thorax, ♀, dorsal view, Colombia, non-type. **D.** Habitus, ♀, Colombia, non-type. **E.** Thorax, ♀, left lateral view, illustrating white microtrichosity, Colombia, non-type. Abbreviations: afv = anterior frontal vitta; an = anepisternum; cd = common duct; epi = epicephalon; op = fronto-orbital plate; para = paracephalon; pd = paired spermathecal duct; pfv = posterior frontal vitta; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct.

HEAD. Palpus dark brown, lighter apically, pale brown microtrichose and setulose on entire surface, narrow (length $4.6 \times$ height). Clypeus dark brown or black, width $\sim 2.1 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull orange, microtrichose. Orbital plate orange, bare and shiny anteriorly. Epicephalon dark brown or black, shiny, mostly bare (white microtrichose near upper fronto-orbitals), wide (width over $\frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon dark brown or black, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

THORAX. Scutum black-brown, microtrichose, with even blue sheen (Fig. 7C). Female cervical sclerite with slight anterior bump. Postpronotal lobe black-brown, outer margin with several setulae. Notopleuron black-brown, with anterior, median and posterior white microtrichose spots. Pleuron black-brown with the following microtrichosity: entirely white on proepisternum, entirely white except brown posterodorsally on proepimeron, white on anteroventral $\frac{1}{3}$ of anepisternum, with remainder in ventral corner and elsewhere on anepisternum brown, white anterior patch on katepisternum and posterior stripe extending onto anterior katatergite. Legs black-brown; first and second fore tarsomere white dorsally, hind tarsomere 1 almost entirely white dorsally.

FEMALE ABDOMEN. Tergites black-brown. T1 with fine, long, white setae. Abdominal pleuron pale grey, microtrichose, with P1 and upper half of P2–6 dark brown. T1+2 $\sim 2.0 \times$ length of T3. Oviscape $1.5\text{--}2.0 \times$ length of T6, black-brown, silvery-microtrichose on anterior $\frac{1}{3}$. Combined spermathecal ducts short; common duct $\frac{2}{3}$ of entire duct length. Paired spermathecal duct short ($\sim 4.0 \times$ length of paired spermathecae), parallel-sided. Paired spermathecal stem slightly longer than spermatheca, relatively inornate. Paired spermathecae spherical. Single spermathecal duct narrow, arising from base of paired duct, $\frac{1}{2}$ the diameter and $\frac{3}{4}$ the length of paired duct. Single spermatheca small, bulb-like (not visible in Fig. 7B).

MALE ABDOMEN. Not observed.

Remarks

NHMW holds two syntypes of *Scipopus (Scipopus) belzebul*. The specimen that matches the original description of Schiner (1868) is here designated as lectotype; the other specimen is *S. (S.) erythrocephalus*. Cresson (1930), Hendel (1933), Hennig (1934) and Albuquerque (1972a) all described *Scipopus belzebul* as having convex bumps on the paracephalon, meaning these authors likely did not examine the type(s) of Schiner and were mistaken in their identification; the species those authors refer to is *S. (S.) convexus* sp. nov., a new species described here. The type of *Scipopus bolivianus* is identical to *Scipopus (S.) belzebul* and is therefore treated here as a new junior synonym.

Distribution

Steyskal (1968) lists the distribution from Panama south to Brazil and Bolivia, but all of the specimens we have confirmed as this species are from South America.

Scipopus (Scipopus) brikelos sp. nov.

[urn:lsid:zoobank.org:act:CF3F3C29-C339-437A-B7B2-97E52F12EEAA](https://zoobank.org/urn:lsid:zoobank.org:act:CF3F3C29-C339-437A-B7B2-97E52F12EEAA)

Figs 8–9

Differential diagnosis

Scipopus (Scipopus) brikelos sp. nov. resembles *S. (S.) nigripennis* in having a white first fore tarsomere, a shiny epicephalon that is clearly delineated from the upper frontal vitta, an elongate spermathecal duct, and nearly spherical paired spermathecae. It differs in the orange clypeus that is dark and bare on the middle third, and in the fine, black setae on T1.

Etymology

The name, a Greek word translating to ‘tragic mask’, refers to the median dark part of the clypeus. This dark central area resembles a facial mask used in the COVID-19 pandemic, during which time this manuscript was written.

Type material examined

Holotype

COSTA RICA • 1 ♀; Alajuela, San Ramon Biol. Res.; 900 m a.s.l.; Apr.–May 2000; P. Hanson leg.; MNCR.

Paratypes

COSTA RICA • 1 ♀; same collection data as for holotype; debu00206321/MYCRO560-19 sequenced for CO1–5'; DEBU (dissected, photographed, Figs 8A–C, F, 9B) • 1 ♀; same collection data as for preceding; MNCR • 1 ♀; Puntarenas Province, Monteverde; 22 May 2000; F. Joyce leg.; debu01088988/MYCRO528-19 sequenced for CO1–5'; pseudoscorpion associated with specimen; DEBU • 1 ♀; Guanacaste, Area de Conservacion Guanacaste, Sector Cacao, Derrumbe; 10.9292' N, 85.4643' W; 1220 m a.s.l.; 14 May 2015; D.H. Janzen and W. Hallwachs leg.; Malaise, forest; BIOUG-D09/GMCCE108-17 sequenced for CO1–5'; BIOUG • 1 ♂; Puntarenas, Monteverde, San Luis Ecolodge; 1–7 Apr. 2005; P.D. Careless leg.; MNCR (dissected and photographed, Fig. 8D–E).

Other material examined

COSTA RICA • 1 ♀; Monteverde; 17 Aug. 2010; S.A. Marshall leg.; MNCR (photographed, Fig. 9A).

Description

LENGTH. 14–17 mm.

HEAD. Palpus light brown, pale brown microtrichose and setulose on entire surface, narrow (length $6.0 \times$ height). Clypeus orange laterally, brown medially, width $\sim 2.0 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta and orbital plate dull, orange, microtrichose. Epicephalon light brown, shiny, bare, narrow (width less than $\frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown and/or orange, slightly convex on posterolateral portions. Anterior lower fronto-orbital seta absent or present, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with narrow, pale brown anteromedian vitta flanked by dark brown vittae and blue sheen, and with indistinct pale spot anterior to transverse suture. Female cervical sclerite convex. Postpronotal lobe black-brown with blue sheen with very few setulae on outer margin, notopleuron black-brown. Pleuron black-brown with the following microtrichosity: entirely white except dorsally on proepisternum, denser on outer margins, entirely white except dorsally on proepimeron, white on anteroventral $\frac{1}{4}$ of anepisternum, with ventral corner and remainder brown, white anterior patch on katapisternum, otherwise brown, white dorsally and ventrally on katatergite. Legs black-brown with blue sheen; first and second fore tarsomere white dorsally, hind tarsomere 1 almost entirely white dorsally. Wing uniformly black-brown infuscate.

ABDOMEN (σ^+ + ω). T1 with fine, long dark brown or black setae.

FEMALE ABDOMEN. T1+2 $\sim 2.1 \times$ length of T3. Pleuron almost entirely dark brown or black, grey on ventral $\frac{1}{4}$ of P2–6. Oviscape $\sim 3.0 \times$ length of T6, black-brown, white microtrichose on anterior $\frac{1}{3}$. Combined spermathecal ducts long; common duct making up $\frac{2}{3}$ of entire duct length. Paired spermathecal duct short ($\sim 5.0 \times$ length of paired spermathecae), curved basally, mostly parallel-sided, slightly tapered basally and swollen apically. Paired spermathecal stem equal to or slightly longer than paired

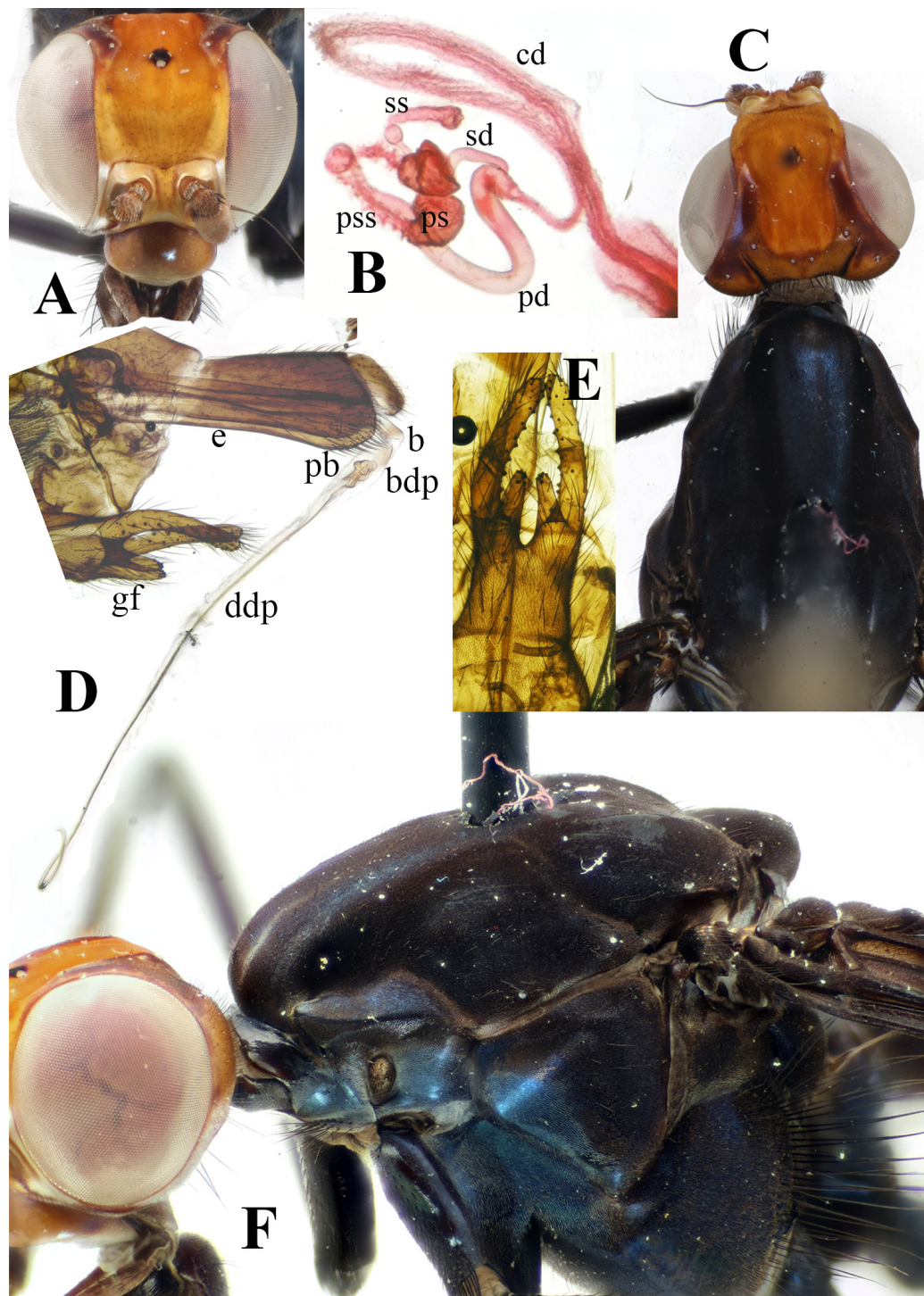


Fig. 8. *Scipopus (Scipopus) brikelos* sp. nov. **A.** Head, ♀, anterior view, Costa Rica, paratype (DEBU). **B.** Female spermathecae and associated structures, Costa Rica, paratype (DEBU). **C.** Head and thorax, ♀, dorsal view, Costa Rica, paratype (DEBU). **D.** Male terminalia, lateral view, Costa Rica, paratype (MNCR). **E.** Male genital fork, ventral view, Costa Rica, paratype (MNCR). **F.** Thorax, ♀, left lateral view, Costa Rica, paratype (DEBU). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; gf = genital fork; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermathecae; pss = paired spermathecal stems; sd = single spermathecal duct; ss = single spermatheca.

spermathecae, with numerous tubercles. Paired spermathecae approximately spherical, bent and tapered basally (collapsed in Fig. 8B). Single spermathecal duct arising from base of paired duct, narrow, $\sim\frac{1}{2}$ the diameter and length of paired duct, swollen apically. Single spermatheca small, elongate, swollen apically.

MALE ABDOMEN. T1+2 $\sim 2.4 \times$ length of T3. Pleuron off-white, P1 and pleural sac dark brown or black, P3–6 black on dorsal half. Genital fork with arms converging, $3.0 \times$ length of T6, inner basal process $\frac{1}{3}$ length of arm. Epandrium length $\sim 2.0 \times$ height, rounded and taller posteriorly, short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus very short ($\sim 1.0 \times$ phallic bulb), ending in phallic bulb. Phallic bulb short and small, length $\sim 1.2 \times$ height, bulbous on posterior half, nearly subquadrate on anterior half. Distal distiphallus long ($> 2.0 \times$ length of epandrium). Phallapodeme not observed.

Remarks

A specimen of *S. (S.) brikelos* sp. nov. from Monteverde, Costa Rica, is pinned with a pseudoscorpion that was previously attached to the specimen.

Distribution

Costa Rica.

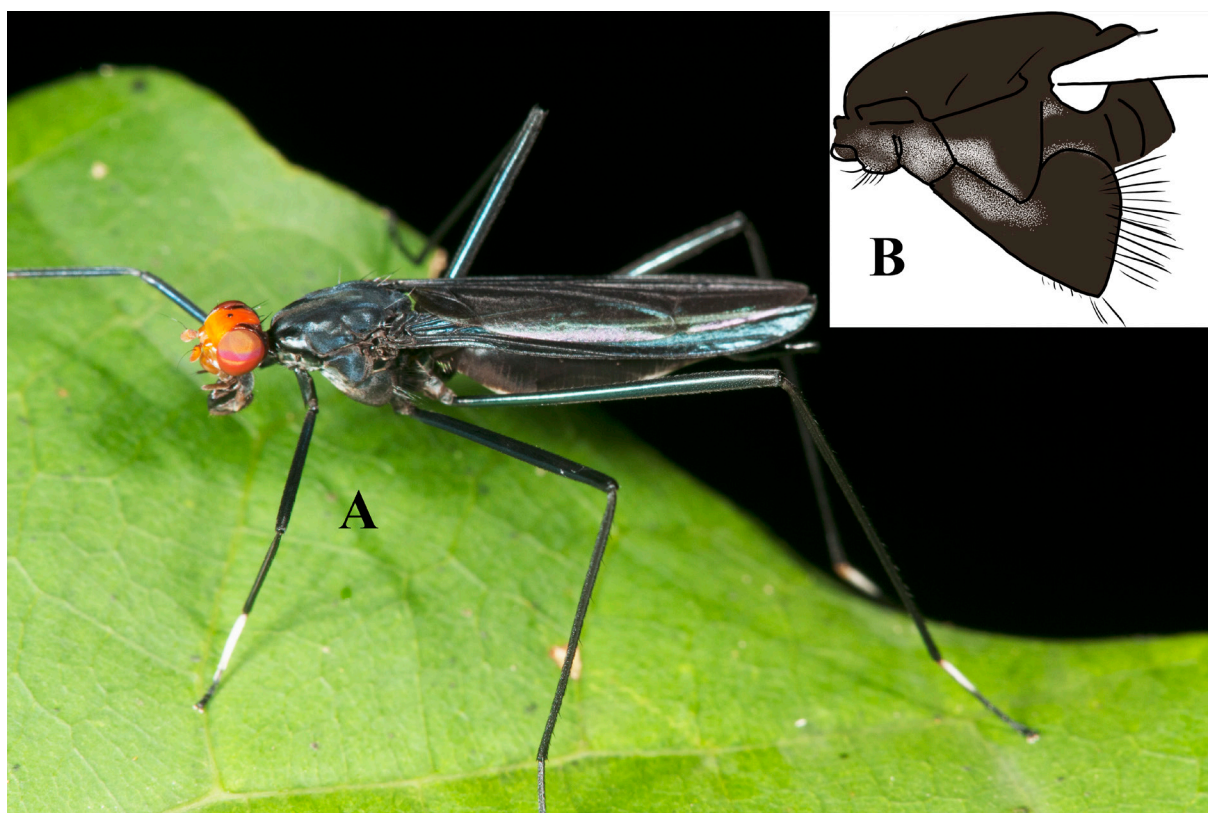


Fig. 9. *Scipopus (Scipopus) brikelos* sp. nov. **A.** ♀, Costa Rica, non-type (MNCR). **B.** Thorax, left lateral view, ♀, illustrating white microtrichosity, Costa Rica, paratype (DEBU).

Scipopus (Scipopus) calocephalus (Bigot, 1886)

Fig. 10

Calobata calocephala Bigot, 1886: 375.

Scipopus opacus Enderlein, 1922: 212.

Scipopus frit Cresson, 1926: 270. **Syn. nov.**

Scipopus opacus – Frey 1927: 74 (listed). — Cresson 1930: 328. — Hennig 1934: 327. — Schumann 1988: 104 (catalog).

Scipopus frit – Cresson 1930: 328. — Hennig 1934: 325 (listed). — Aczél 1949: 342 (catalog). — Steyskal 1968: 48.16 (catalog). — Roback 1969: 538 (listed). — Ferro & de Carvalho 2014: 60 (listed). — Marshall *et al.* 2016: 544 (catalog).

Scipopus calocephalus – Hennig 1934: 322 (key), 327 (diagnosis).

Scipopus calocephala – Aczél 1949: 340 (catalog). — Steyskal 1968: 48.15 (catalog). — Ferro & de Carvalho 2014: 59 (listed).

Differential diagnosis

Scipopus (Scipopus) calocephalus resembles *S. (S.) cartaboensis* in having a dark first fore tarsomere, a shiny epicephalon that is clearly delineated from the upper frontal vitta, and similar median vitta on the scutum, but differs in the entirely dull, microtrichose orbital plate.

Type material examined

Syntypes (*Calobata calocephala*) (photos provided by Robyn Crowther, Oct. 2020, OUM)
MEXICO • 2 ♂♂, 1 ♀; OUM.

Syntypes (*Scipopus opacus*) (not examined)
GUATEMALA • 1 ♂; Tumbador; May 1912; Riedel leg.; MNBG.

PERU • 1 ♀; Callanga, “in the valley of Pinipini”; 1900; O. Garlepp leg.; MNBG.

Holotype (*Scipopus frit*) (photos provided by Jason Weintraub, Oct. 2020, ANSP)
HONDURAS • 1 ♂; Sangrelaya; 13 Apr. 1924; A.N.S.P., No. 6309; ANSP.

Paratypes (*Scipopus frit*) (not examined)
HONDURAS • 3 ♂♂, 2 ♀♀; same locality as holotype; ANSP • 1 ♂, 3 ♀♀; Corocito; 3 Apr. 1924; A.N.S.P and Bequaert leg.; ANSP.

Other material examined

COLOMBIA • 1 ♀; Cauca PNN Gorgona El Helechal; 2°58' N, 78°11' W; 2130 m a.s.l.; 23 Jun.–15 Jul. 2001; H. Torres leg.; Malaise; M.1995; debu01088989/MYCRO529-19 sequenced for CO1–5', CO1–3', 12S, 28S; IAVH • 1 ♀; Cauca PNN Gorgona Alto el Mirador; 2°58' N, 78°11' W; 180 m a.s.l.; 8–30 Nov. 2001; H. Torres leg.; Malaise; M.1084; debu01088998/MYCRO552-19 sequenced for CO1–5'; IAVH • 1 ♂; same collection data as for preceding; 10–26 Jun. 2000; M.494; IAVH • 1 ♀; same collection data as for preceding; Alto El Mirador; 26 May–10 Jun. 2000; IAVH • 1 ♀; same collection data as for preceding; 3–18 Jan. 2001; M.1231; IAVH • 1 ♀; same collection data as for preceding; 18 Jul.–3 Aug. 2000; M.585; IAVH • 1 ♀; same collection data as for preceding; Antigua Laguna; 70 m a.s.l.; 18 Jul.–16 Aug. 2000; M.588; IAVH • 1 ♂; same collection data as for preceding; 4 Apr. 2000; R. Duque leg.; IAVH • 2 ♀♀; same collection data as for preceding; 8–30 Nov. 2000; H. Torres leg.; M.1088; IAVH • 1 ♀; same collection data as for preceding; 4–24 Mar. 2000; R. Duque leg.; IAVH • 1 ♀; same collection data as for preceding; Mancora; 60 m a.s.l.; 6–23 Oct. 2000; M.899; IAVH • 1 ♂; same collection data

as for preceding; 24 Apr.–9 May 2000; IAVH • 1 ♀; same collection data as for preceding; 8–30 Nov. 2000; H. Torres leg.; M.1085; IAVH • 1 ♀; same collection data as for preceding; 3–18 Jan. 2001; M.1235; IAVH • 1 ♀; same collection data as for preceding; 13 Apr.–7 May 2001; M.1651; IAVH • 1 ♀; same collection data as for preceding; El Saman; 9–27 Aug. 2001; M.2120; IAVH • 1 ♀; same collection data as for preceding; 5 m a.s.l.; 12–27 Jun. 2001; M.1997; IAVH • 1 ♀; same collection data as for preceding; 22 Mar.–13 Apr. 2001; R. Duque leg.; M. 1650; IAVH • 1 ♀; Chocó PNN Utria Cocalito Dosel; 6°1' N, 77°20' W; 20 m a.s.l.; 16 Aug.–7 Sep. 2000; J. Perez leg.; M.814; IAVH • 1 ♀; Choco Queb. Salero Las Animas; 19 Feb. 1983; O.S. Flint Jr. leg.; USNM • 1 ♀; Cacagualito, Santa Marta; Apr.; H.H. Smith leg.; Acc. No. 1740; CMNH.

COSTA RICA • 1 ♀; Alajuela, Volcán Tenorio, N slope, trail to laguna; 800–900 m a.s.l.; 16–20 Jun. 2000; S.A. Marshall leg.; rain forest; MNCR • 1 ♀; same locality as for preceding; nr Bijagua Biol. Stn; 700 m a.s.l.; 19 Jun. 2000; Buck and Marshall leg.; debu00138137/MYCRO513-19 sequenced for CO1–5'; DEBU • 1 ♂; San José, San Carlos, Riosparaiso Res., Pecari Stn, 16 km NNE of Quepos, 9°33'53" N, 84°7'3" W; 400 m a.s.l.; 22–27 Feb. 2006; S.A. Marshall leg.; 1° forest; TAE112/TAE044-14 sequenced for CO1, 12S, Wnt1, CAD; DEBU • 1 ♀; same collection data as for preceding; 12–15 Apr. 2006; MNCR • 1 ♂; same collection data as for preceding; 26 Feb. 2006; S.M. Paiero leg.; MNCR (dissected and photographed, Fig. 10B–C) • 1 ♀; Guanacaste, Guanacaste National Park, trail betw. Maritza and Cacao Field Stns.; 600–900 m a.s.l.; 1–9 Sep. 1996; B. Viklund leg.; MNCR • 1 ♀; San Juan de Peñas Blancas, Soltis Research Centre; 17 Aug. 2013; S.A. Marshall leg.; MNCR • 1 ♀; Guanacaste, Est. Maritza; 600–800 m a.s.l.; 17 Feb. 1996; S. Marshall leg.; L_N_327000_373600_#6919; MNCR • 2 ♀♀; Heredia, Estac. Biol. La Selva; 2 Apr. 1993; ALAS, Malaise trap; M/11/058; MNCR • 2 ♀♀; same collection data as for preceding; 1 Mar. 1994; M/01/360; MNCR (photographed, Fig. 10A) • 1 ♀; same locality as for preceding; 18–21 Apr. 2000; E.M. and C.F. Fisher leg.; MNCR • 1 ♀; Prov. Limón, Sector Cerro Cocori, 30 km N of Cariari; 100 m a.s.l.; 10 Feb.–11 Mar. 1991; F. Rojas leg.; Malaise; L_N_286000-567500#2876; MNCR • 1 ♀; Prov. Puntarenas, 2 km N of Hacienda Barú de Dominical Reserve; 22–25 Feb. 2008; S.A. Marshall leg.; MNCR • 1 ♂; Prov. Puntarenas, Est. Agujas, Río Agujas; 300 m a.s.l.; 19–24 Mar. 1997; M. Lobo leg.; UGIC128-15/MYCRO029-15 sequenced for CO1–5'; MNCR • 1 ♀; Alajuela, San Ramón Biol. Res.; 900 m a.s.l.; May 2000; P. Hanson leg.; MNCR • 1 ♀; Alajuela, San Gerardo Biol. Stn; 10°52'51" N, 85°23'20" W; ~590 m a.s.l.; 15 Aug. 2010; M.D. Jackson leg.; debu00332183/MYCRO554-19 sequenced for CO1; DEBU (photographed, Fig. 10E) • 3 ♀♀, 1 ♂; same collection data as for preceding; MNCR • 1 ♀; Limón, Siquerres, Pacuarito, Los Brisas, trail betw. Est. El Palenque and Rio Dantas; 275–500 m a.s.l.; 26 Aug. 1996; B. Viklund leg.; MNCR • 1 ♀; Puntaneras, Osa Pen., Corcovado Nat. Pk Est. Agujas above Dos Brazos; 500–600 m a.s.l.; 29–30 Aug. 1996; Gustafsson *et al.* leg.; MNCR • 1 ♀; Turriabla; 15 Jul. 1965; P.J. Spangler leg.; USNM • 1 ♀; Osa Peninsula, 3 mi. S of Rincon; 7–20 Feb 1967; H.R. Roberts *et al.* leg.; arboreal habitat, Insecticide sta. 34.; MNCR • 1 ♀; San Pedrillo Corcovado; 5 Mar. 2000; F. Joyce leg.; pseudoscorpion with Micropezidae; MNCR • 1 ♀; Puntarenas Province; Monteverde, Peñas Blancas; 26 May 2000; F. Joyce leg.; MNCR • 1 ♀; Puntarenas, Monteverde, San Luis Ecolodge; Dec. 2006; P.D. Careless leg.; MNCR • 1 ♀; Puntarenas; Proyecto Campanario de Osa, N of San Pedrillo; Feb. 2005; P.D. Careless; debu00380052/MYCRO814-20 sequenced for CO1–5'; DEBU.

HONDURAS • 1 ♂; Gracias a Dios, Rio Patuca, Krausirpe; 22–24 May 1994; B.D. Gill leg.; debu00138356/MYCRO563-19 unsuccessfully sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; debu00138349/MYCRO644-20 unsuccessfully sequenced for CO1–5'; DEBU.

PANAMA • 1 ♀; Summit, Panama C.Z.; Sep. 1946; N.L.H. Krauss leg.; USNM • 1 ♀; Cerro Campana; Jul. 1967; W.W. Wirth leg.; USNM • 1 ♀; Barro Colorado Id.; 26 Jan. 1955; C. Rettenmeyer leg.; H771; SEMC • 1 ♀; same collection data as for preceding; 18 Mar. 1952; No. 257; pseudoscorpion associated with specimen; SEMC • 1 ♀; Barro Colorado I.; 16–23 Oct. 1996; J. Pickering leg.; DEBU.

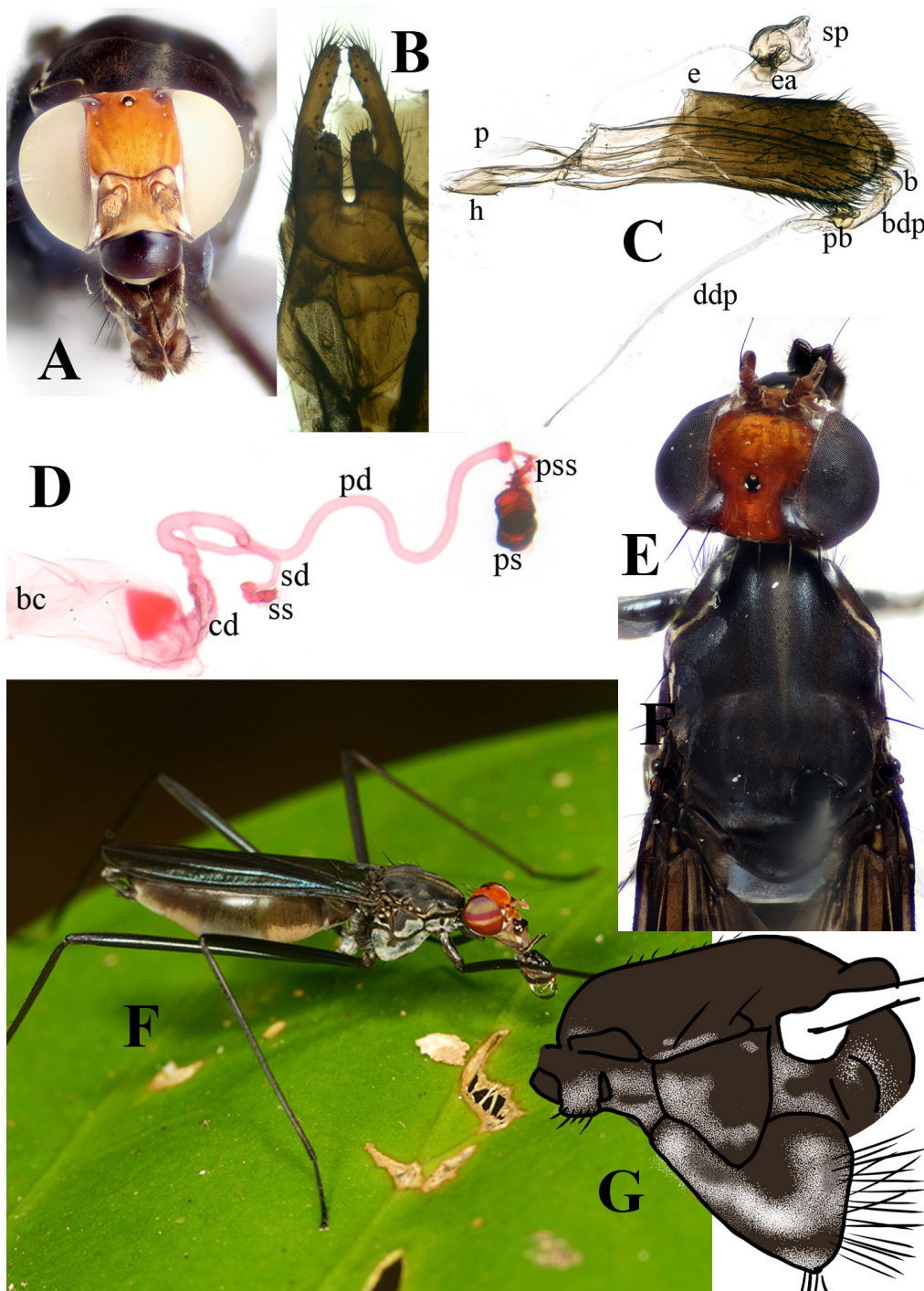


Fig. 10. *Scipopus (Scipopus) calocephalus* Cresson, 1926. **A.** Head, ♀, anterior view, Costa Rica, non-type (MNCR). **B.** Male genital fork, ventral view, Costa Rica, non-type (MNCR). **C.** Male terminalia, lateral view, Costa Rica, non-type (MNCR). **D.** Female spermathecae and associated structures, Costa Rica, non-type (MNCR). **E.** Head and thorax, ♂, dorsal view, Costa Rica, non-type (DEBU). **F.** Living, ♂, Soltis Center, Costa Rica. **G.** Thorax, ♀, left lateral view, illustrating white microtrichosity. Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

Description

LENGTH. 12–17 mm.

HEAD. Palpus dark brown, pale brown microtrichose and setulose on entire surface, denser on ventral edge, narrow (length $5.7 \times$ height). Clypeus light brown to black-brown, width $\sim 2.0 \times$ height, white microtrichose in posterolateral corners. Frontal vitta and orbital plate dull orange, microtrichose. Epicephalon orange or dark brown, shiny, bare anteriorly, white microtrichose posteriorly, narrow (width less than $\frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light to dark brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

THORAX. Scutum black-brown, microtrichose, with anteromedian pale brown vitta flanked by blue sheen. Female cervical sclerite convex. Postpronotal lobe black-brown, some setulae on anterior outer margin. Notopleuron black-brown with pale ventral line of microtrichosity. Pleuron black-brown with the following microtrichosity: entirely white on proepisternum, white with brown median stripe on proepimeron, anteroventral $\frac{1}{2}$ and small posterior spot white on anepisternum, with ventral corner and remainder brown, mostly white on katepisternum with brown posterodorsal margin and ventral brown stripe (Fig. 10G) or completely white ventrally on katepisternum (Fig. 10F), white anteriorly on katatergite. Legs black, fore and hind first tarsomere dark brown with ventral golden fringe. Wing uniformly brown infusate.

ABDOMEN ($\sigma + \text{♀}$). T1 with fine, long, white setae. Pleuron pale grey to light brown, P1, dorsal half of P2–6 dark brown.

FEMALE ABDOMEN. T1+2 approximately twice the length of T3. Oviscape dark brown basally, black apically, sparse black setulose, white-microtrichose on anterior $\frac{1}{3}$, $\sim 2.0\text{--}3.0 \times$ length of T6. Combined spermathecal ducts long and narrow; common duct $\frac{1}{5}\text{--}\frac{1}{3}$ of entire duct length. Paired spermathecal duct short ($\sim 6.0\text{--}8.0 \times$ length of paired spermathecae), narrow, parallel-sided, swollen apically. Paired spermathecal stems of same length or longer than spermathecae with sparse, spiked tubercles. Paired spermathecae approximately spherical or ovoid, striate. Single spermathecal duct arising from basal $\frac{1}{10}$ of paired duct, narrow, $\frac{1}{2}$ the diameter and length of paired duct, swollen apically. Single spermatheca elongate, with sparse, spiked tubercles.

MALE ABDOMEN. T1+2 $> 2 \times$ length of T3. Genital fork with arms converging, nearly touching, inner basal process slightly curved outwards, $\sim \frac{1}{2}$ the length of arms. Epandrium length $2.0 \times$ height, rounded posteriorly, densely short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus short ($\sim 2.0 \times$ phallic bulb). Phallic bulb short, length \approx height, approximately round, with upper chamber with small, round, posterior projection and lower chamber. Distal distiphallus long and slender ($1.5\text{--}2.0 \times$ length of epandrium). Phallapodeme apically expanded and broad.

Remarks

Bigot (1886) described *Scipopus calocephalus* as having a white first fore tarsomere, which is an error as the type specimens very clearly have a dark brown first fore tarsomere. The type of *Scipopus frit* is apparently identical to that of *S. (S.) calocephalus*.

Distribution

Mexico to Panama, Venezuela and Colombia (Steyskal 1968).

Scipopus (Scipopus) cartaboensis Cresson, 1926

Figs 11–12

Scipopus cartaboensis Cresson, 1926: 270.

Scipopus cartaboensis – Cresson 1930: 326. — Curran 1934a: 295 (catalog). — Hennig 1934: 322 (key), 324 (listed). — Aczél 1949: 340 (catalog). — Steyskal 1968: 48.15 (catalog). — Roback 1969: 532 (listed). — Ferro & de Carvalho 2014: 59 (listed).

Differential diagnosis

Scipopus (*Scipopus*) *cartaboensis* resembles *Scipopus* (*Scipopus*) *nitidus* sp. nov. in having a shiny epicephalon and shiny, bare patches on the orbital plate, but differs in the blue vitta on the scutum, the orange clypeus and epicephalon, and the short female T1+2 (~1.6 × length of T3).

Type material examined

Holotype (borrowed, examined and photographed in 2009)

GUYANA • 1 ♀; Kartabo, Bartica District; 17 Mar. 1922; AMNH.

Other material examined

BOLIVIA • 1 ♀; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–11 May 2007; M.D. Jackson leg.; UGIC270-15/MYCRO171-15 sequenced for CO1–5'; DEBU.

BRAZIL • 1 ♀; Amazonas, 30 km W of Itaquiara, Rio Urubu; 15 Jan. 1981; Ekis and Davidson leg.; CMNH • 1 ♀; Amazonas, 26 km NE of Manaus, Reserva Ducke; 10 m a.s.l.; 24 Nov. 1988; J.A. Rafael leg.; arm. suspensa; INPA • 1 ♀; same collection data as for preceding; 45 m a.s.l.; INPA • 1 ♀; Am. Pq. N. Jaú, Rio Unini “Democracia”; “014354' S, 615434' W”; 20–24 Jun. 1996; A.L. Henriques, J. Vidal and F.L. Oliveira leg.; arm. suspensa, baixa; INPA • 2 ♀♀; Amazonas, Novo Airão, AM 352, km-10; 2°42'45" S, 60°57'12" W; 20 Jan 2020; Rafael and Marshall leg.; INPA • 1 ♀; Amazonas, Presidente Figueiredo Cachoeira Iracema, nr. Parking lot; 1°59'4" S, 60°3'39" W; 29 Jan. 2020; Rafael and Marshall leg.; INPA (photographed, Fig. 12B).

FRENCH GUIANA • 2 ♀♀; Cayenne, Comm. Regina, Kaw Mt., Relais de Patawa; 4°33' N, 52°10' W; 300 m a.s.l.; Dec 2005; J.A. Cerda leg.; Malaise; DEBU • 1 ♀; same collection data as for preceding; debu00280298/MYCRO530-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU (dissected and photographed, Fig. 11B) • 2 ♀♀; same collection data as for preceding; Jan. 2006; DEBU • 1 ♀; same collection data as for preceding; Nov. 2005; DEBU • 1 ♀; same collection data as for preceding; Feb. 2006; DEBU • 1 ♂, 2 ♀♀; Mana River; May 1917; Acc. 6003; CMNH (♂ dissected and photographed, Fig. 11D–E).

GUYANA • 1 ♀; Potaro-Siparuni, Mount Wokomung; 5°7'53" N, 59°48'31" W; 698 m a.s.l.; 21–26 Oct. 2004; B. Hubley leg.; 1° forest; ROM (photographed, Fig. 11A, C) • 1 ♀; same collection data as for preceding; debu00379474/MYCRO556-19 sequenced for CO1–5'; ROM.

Description

LENGTH. 11–15 mm.

HEAD. Palpus orange, pale brown microtrichose and setulose on entire surface, narrow (length 4.5 × height). Clypeus orange or light brown, width ~2.0 × height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate orange with anterior, shiny, orange or light brown bare patches (Fig. 11C). Epicephalon orange or light brown, shiny, silvery microtrichose, narrow (width less than 2/3 of frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown or orange, slightly convex on outer portions. All head chaetotaxy well-developed.

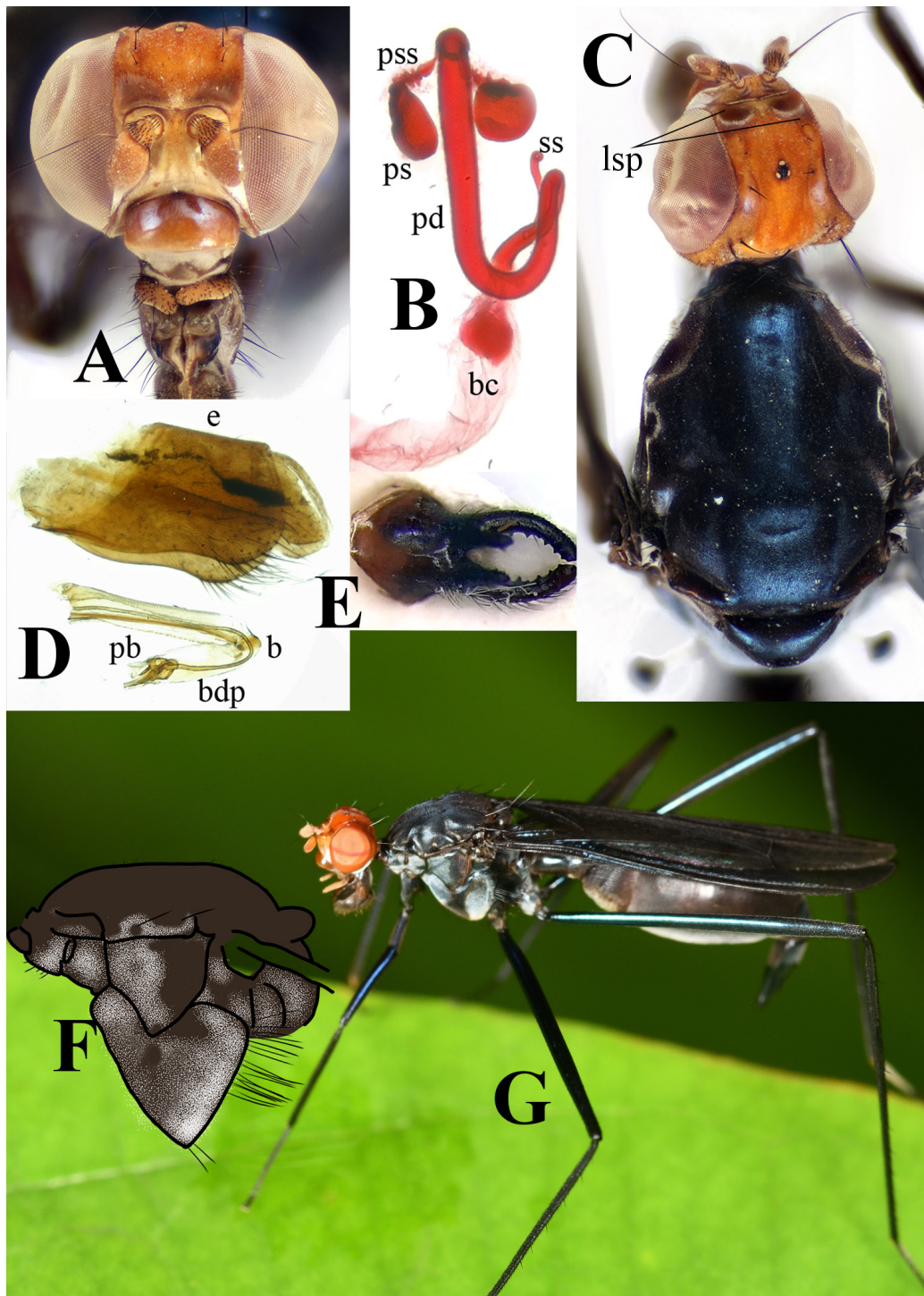


Fig. 11. *Scipopus (Scipopus) cartaboensis* Cresson, 1926. **A.** Head, ♀, anterior view, Guyana, non-type (ROM). **B.** Female spermathecae and associated structures, French Guiana, non-type (DEBU). **C.** Head and thorax, ♀, dorsal view, Guyana, non-type (ROM). **D.** Male terminalia (damaged), lateral view, French Guiana, non-type (CMNH). **E.** Male genital fork, ventral view, French Guiana, non-type (CMNH). **F.** Thorax, ♀, left lateral view, illustrating white microtrichosity, non-type. **G.** Living, ♀, Brazil. Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; e = epandrium; lsp = lateral shiny patches; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermathecae; pss = paired spermathecal stems; ss = single spermatheca.

THORAX. Scutum black-brown, black-brown microtrichose, with median blue sheen. Female cervical sclerite with slight anterior convex bump, otherwise relatively flat. Postpronotal lobe black-brown, pale microtrichose on ventral margin, setulose on outer margin. Notopleuron black-brown with pale microtrichosity outlining anterior notopleural seta and on ventral margin. Pleuron black-brown with the following microtrichosity: entirely white proepisternum and proepimeron, white on anteroventral $\frac{1}{2}$ of anepisternum and posterodorsal corner, with ventral corner and remainder brown, almost entirely white on katepisternum, with median brown spot and dorsal patch (Fig. 11F), or white anteriorly and



Fig. 12. *Scipopus (Scipopus) cartaboensis* Cresson, 1926. **A.** Living, ♀, Brazil, ovipositing. **B.** Living, ♀, Brazil, with pseudoscorpion (INPA).

posteriorly (Fig. 11G), white on margins of katatergite. Legs black-brown; first fore and hind tarsomere dark brown with slight ventral golden fringe.

ABDOMEN (♂+♀). Tergites black-brown. T1 with fine, long, white setae. Pleuron almost entirely dark brown or black, ventral $\frac{1}{4}$ of P2–6 pale grey (Fig. 11G).

FEMALE ABDOMEN. T1+2 $\sim 1.6 \times$ length of T3. Oviscape black-brown, white microtrichose on anterior $\frac{1}{3}$, $\sim 1.5\text{--}2.0 \times$ length of T6. Combined spermathecal ducts short; common duct very short, almost absent. Paired spermathecal duct short ($6.0\text{--}7.0 \times$ length of paired spermathecae), narrow and curved basally, wider distally. Paired spermathecal stems same length as spermathecae, with rounded tubercles. Paired spermathecae narrower basally, wider apically, approximately teardrop-shaped. Single spermathecal duct arising from basal $\frac{1}{6}$ of paired duct, very narrow, less than $\frac{1}{2}$ diameter and length of paired duct. Single spermatheca not clearly delineated, inornate, ending bluntly.

MALE ABDOMEN. T1+2 $\sim 1.9 \times$ length of T3. Genital fork small, $\sim 2.2 \times$ length of T6, with arms converging, nearly touching, inner basal process straight, $\sim \frac{1}{2}$ length of arm. Epandrium of only available male broken, long setose posteroventrally. Basiphallus small, crescent-shaped. Basal distiphallus $\sim 2.0 \times$ length of phallic bulb. Phallic bulb short and small, length \approx height, with upper chamber with posterior projection and lower chamber. Distal distiphallus broken off in only available male specimen, but apparently narrow. Phallapodeme not observed.

Remarks

A female of *Scipopus (Scipopus) cartaboensis* was photographed as it was ovipositing in rotting wood in Novo Airão, Brazil (Fig. 12A) and another individual was photographed in Presidente Figueriedo, Brazil, with an attached pseudoscorpion (Fig. 12B). The pseudoscorpion is not associated with the pinned specimen.

Distribution

Ecuador to Suriname (Steyskal 1968), French Guiana (new record).

Scipopus (Scipopus) chalybeus Hennig, 1934

Figs 13–14

Scipopus chalybeus Hennig, 1934: 328.

Scipopus chalybeus – Aczél 1949: 341 (catalog); 1951: 539 (key). — Steyskal 1968: 48.15 (catalog).

Differential diagnosis

Scipopus (Scipopus) chalybeus resembles other species of *Scipopus* s. str. with an at least partially white first fore tarsomere and a shiny epicephalon that is clearly delineated from the upper frontal vitta (*S. (S.) brikelos* sp. nov., *S. (S.) nigripennis*, *S. (S.) furcifer*, *S. (S.) lateralis* and *S. (S.) nitidus* sp. nov.), but differs in the entirely white microtrichose clypeus and the strongly convex female cervical sclerite. Some specimens of *S. (S.) chalybeus* lack the outer vertical seta, and others have a very short T1+2 that is equal in length to T3.

Type material examined

Holotype (photos provided by Uwe Kallweit, Oct. 2020, SMTD)
BOLIVIA • 1 ♀; Mapiri, Sarampioni; 700 m a.s.l.; 28 Feb. 1903; SMTD.

Paratypes (not examined)

BOLIVIA • 1 ♂, 6 ♀♀; Mapiri, S. Carlos; 800 m a.s.l.; 2 Jan. 1903; SMTD • 1?; same locality as for holotype; 19 Jan. 1903; SMTD • 1 ♀; same locality as for holotype; 20 Jan. 1903; SMTD • 6 ♀♀; same collection data as for holotype; Feb. 1903, 3–25 Jan. 1903, 25–28 Feb. 1903, 2 Mar. 1903; SMTD • 1?; same collection data as for holotype; 3 Feb. 1903; SMTD • 1 ♂; San Ernesto; 800 m a.s.l.; 20 Mar. 1903; SMTD • 1 ♀; same locality as for holotype; 26 Mar. 1903; SMTD • 1 ♀; Yungas v. Coroico; 1000 m a.s.l.; 15 Jan 1903; SMTD.

PERU • 1 ♀; Meshagua, Urubamba; 800–2000 m a.s.l.; 1 Jan. 1903; “Laristal”; SMTD.

CHILE? • 1 ♀; MLUH.

Other material examined

BOLIVIA • 1 ♀; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–12 May 2007; S.M. Paiero leg.; CBFC (dissected and photographed, Fig. 13E) • 1 ♀; same collection data as for preceding; DEBU • 1 ♂, 1 ♀; same collection data as for preceding; S.A. Marshall leg.; CBFC • 1 ♂, 3 ♀♀; same collection data as for preceding; 29 Apr.–11 May 2007; M.D. Jackson leg.; CBFC (♂ dissected and photographed, Fig. 13B, D, F) • 1 ♀; same collection data as for preceding; debu00289616/MYCRO645-20 sequenced for CO1–5'; DEBU • 1 ♀; La Paz, Arroya Tuhiri W of Mapiri; 15.2908' S, 68.2581' W; 10 Apr. 2001; S.A. Marshall leg.; UGIC264-15/MYCRO165-15 sequenced for CO1–5'; CBFC • 1 ♀; Santa Cruz, 4–6 km SSE of Buena Vista, Hotel Flora y Fauna; 17.50° S, 63.65° W; 6–10 Mar. 2014; Steck *et al.* leg.; multilure traps; debu01089060/MYCRO647-20 sequenced for CO1–5'; USNM • 1 ♀; same collection data as for preceding; USNM • 1 ♂; Santa Cruz, Potrerillo del Guenda; 17°40'8" S, 63°27'25" W; 403 m a.s.l.; 9–17 Oct. 2014; Sutton *et al.* leg.; Malaise trap, trail to old river bed; DEBU • 2 ♂♂, 1 ♀; La Paz, San Juanito nr Teoponte; 15°29'42" S, 67°47'48" W; 500 m a.s.l.; 8 April 2001; S.A. Marshall leg.; CBFC • 1 ♀; Depto. La Paz, 5 km W of Mapiri, Arroyo Tuhiri; 15°17.8' S, 68°15.6' W; 750 m a.s.l.; 18 Mar. 2001; S.D. Gaimari leg.; USNM.

BRAZIL • 1 ♀; Novo Airão, AM 352, km-10; 2°42'45" S, 60°57'12" W; 20 Jan. 2020; Rafael and Marshall leg.; INPA.

COLOMBIA • 1 ♀; Amazonas, PNN Amacayacu Cabaña Lorena; 3°0' S, 69°59' W; 210 m a.s.l.; 1–15 Sep. 2001; J. Parente leg.; Malaise; M. 2202; IAVH • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°23' S, 70°6' W; 150 m a.s.l.; 17 Sep.–1 Oct. 2001; D. Chota leg.; Malaise; M.2243; debu01089059/MYCRO646-20 sequenced for CO1–5'; IAVH (dissected and photographed, Fig. 14B) • 1 ♀; Caquetá, PNN Chiribiquete, R. Sararamano; 0°04'16" N, 72°26'48" W; 7–11 Apr. 2000; E. Gonzalez leg.; IAVH.

PERU • 1 ♀; Cusco, Estación Biológica Villa Carmen; 12°54' S, 71°24' W; 500–700 m a.s.l.; 20 Jul. 2014; trap VC-ML-41; MHNJP • 1 ♀; same collection data as for preceding; 29 Jun. 2014; trap VC-ML-40A; MHNJP • 1 ♂, 3 ♀♀; same collection data as for preceding; 6 Jul. 2014; MHNJP • 1 ♂, 2 ♀♀; same collection data as for preceding; 8 Jun. 2014; MHNJP • 1 ♀; same collection data as for preceding; 29 Jun. 2014; trap VC-ML-7B; MHNJP • 1 ♀; same collection data as for preceding; 8 Jun. 2014; trap VC-ML-09; MHNJP • 1 ♂; same collection data as for preceding; 29 Jun. 2014; MHNJP • 2 ♀♀; same collection data as for preceding; 20 Apr. 2014; MHNJP • 1 ♀; same collection data as for preceding; 8 Jun. 2014; trap VC-ML-8B; MHNJP • 1 ♀; same collection data as for preceding; 7 Jun. 2014; trap VC-ML-53; MHNJP • 2 ♀♀; same collection data as for preceding; 15 Jun. 2014; trap VC-ML-30; MHNJP • 1 ♀; same collection data as for preceding; 20 Jul. 2014; trap VC-ML-81; MHNJP • 1 ♀; same collection data as for preceding; 20 Apr. 2014; trap VC-ML-19; USNM • 2 ♂♂, 3 ♀♀; same collection data as for preceding; 29 Jun. 2014; trap VC-ML-84; USNM • 1 ♂; same collection data as for preceding; 8 Jun. 2014; USNM • 1 ♀; same collection data as for preceding; trail 8 mark 8-1724; 702 m a.s.l.; 27 Nov.–20

Jan 2013; Norrbom *et al.* leg.; trap VC-ML-15; USNM • 1 ♀; same collection data as for preceding; mark 8-1877; 721 m a.s.l.; trap VC-ML-16; USNM • 1 ♀; same collection data as for preceding; garden area; 534 m a.s.l.; 20–26 Jan 2013; Steck *et al.* leg.; multilure traps; USNM • 1 ♀, 1?; same collection data as for preceding; garden area; 15–27 Nov. 2012; T. Forster leg.; USNM • 5 ♀♀; Cusco, Est. Biol. Villa Carmen, S side of Oroya; 12.89111° S, 71.41046° W; 527 m a.s.l.; Dec. 2013; Norrbom and Sutton leg.; Malaise trap; USNM • 1 ♂; same collection data as for preceding; Jan. 2014; M. Choque leg.; USNM • 1 ♀; same collection data as for preceding; trail 8; 600–760 m a.s.l.; 27 Mar. 2014; multilure traps; USNM • 1 ♀; same collection data as for preceding; 811 m a.s.l.; 10 Apr. 2014; trap VC-ML-82; USNM • 1 ♀; same collection data as for preceding; trail 0; 530–830 m a.s.l.; 29 Jan. 2014; multilure traps; USNM • 2 ♂♂, 3 ♀♀; same collection data as for preceding; trail 5; 520–580 m a.s.l.; 8 May 2014; USNM • 1 ♀; same collection data as for preceding; debu01088996/MYCRO550-19 sequenced for CO1–5'; USNM • 1 ♀; same collection data as for preceding; 577 m a.s.l.; 16 Dec 2013; trap VC-ML-30; USNM • 1 ♂, 2 ♀♀, 2?; same collection data as for preceding; stream below waterfall; 543 m a.s.l.; 16–26 Nov. 2012; J.K. Alvarez leg.; trap VC-ML-19; DEBU • 1 ♀; same collection data as for preceding; debu01088987/MYCRO527-19 sequenced for CO1–5'; USNM • 1 ♂; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun. 2006; Paiero and Klymko leg.; DEBU • 1 ♂; Madre de Dios Parque Manu, Pakitza; 11°56' S, 71°18' W; 250 m a.s.l.; 20–23 Sep. 1989; N. Adams leg.; stream at Tr1-13; MHNJP.

ECUADOR • 1 ♀; Napo, Res. ethnica Waorani, 1 km S of Onkone Gare Camp, Trans Ent.; 0°39'10" S, 76°26' W; 220 m a.s.l.; 4 Oct. 1994; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants in terre firme forest, at Trans 1, Sat. 3, Project MAXUS, Lot 852; USNM (photographed, Fig. 13G) • 1 ♀; Napo, Tiptutini Biodiversity Station; 0°37'55" S, 076°08'39" W; 216 m a.s.l.; 6 Feb. 1999; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants; Lot 2077, Transect 8; USNM • 1 ♂; same collection data as for preceding; Lot 2073, Transect 8; USNM • 1 ♂, 1 ♀; same collection data as for preceding; Lot 2071, Transect 8; USNM (♀ photographed, Fig. 13C) • 1 ♀; Napo, Tiptutini Biodiversity Stn, vic. Yasuní Natl. Pk.; 14–19 Feb. 1998; D.C. Darling leg.; Malaise trap; QCAZ • 1 ♀; Napo, Tiptutini Biodiversity Stn; 0°36'50" S, 76°9'1" W; 7–14 Jan. 2013; P.D. Careless leg.; debu00379841/MYCRO534-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 2 ♀♀; Napo Province, Yasuní National Park, PUCE, Yasuní Research Station; 76°36' W, 0°38' S; 3–20 Nov. 1998; T. Pape and B. Viklund leg.; QCAZ • 1 ♀; same locality as for preceding; 0°40'50" S, 76°24'2" W; 250 m a.s.l.; 28 Apr.–8 May 2006; V. Belluz leg.; “attracted to sweat”; QCAZ • 2 ♀♀; same locality as for preceding; 0°40' S, 76°24' W; 1–7 Nov. 2002; E.M. Fisher leg.; QCAZ • 1 ♀; same locality as for preceding; May 2011; S.P.L. Luk leg.; on canopy tower; debu00339811/MYCRO558-19 unsuccessfully sequenced for CO1–5'; DEBU • 1 ♀; Napo, Res. ethnica Waorani, 1 km S of Onkone Gare Camp, “Trans.Ent.”; 0°39'10" S, 76°26' W; 220 m a.s.l.; 10 Oct. 1994; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants in terre firme forest, at Trans 3, stn 7, Project MAXUS, Lot 936; USNM • 1 ♀; same collection data as for preceding; 4 Oct. 1994; at Trans. 2, stn 4, Lot 863; USNM • 1 ♀; Napo, Jatun Sacha Res., 6 km E of Misahuali, SOL trail; 1°4' S, 77°37' W; 450 m a.s.l.; 1–4 May 2002; Marshall, Paiero and Lonsdale leg.; QCAZ • 1 ♀; same collection data as for preceding; 30 Apr.–8 May 2002; S.A. Marshall leg.; QCAZ • 2 ♀♀; Puerto Orellana, Tiptutini Biodiversity Station; 0°38'2" S, 76°08'9" W; Aug. 1999; Kotrba leg.; QCAZ • 6 ♂♂, 12 ♀♀; Napo, Narupayacu; 0°43'30" [S], 77°46'2" W; 1100 m a.s.l.; 3 May 2019; K. Lindsay leg.; QCAZ • 2 ♂♂, 2 ♀♀; same collection data as for preceding; DEBU.

Description

LENGTH. 10–15 mm.

HEAD. Palpus dark brown, paler apically, pale brown microtrichose and setulose on entire surface, narrow (length 4.5 × height). Clypeus light to dark brown, width ~2.1 × height, white microtrichose on entire

surface, denser in posterolateral corners. Frontal vitta entirely dull, orange, microtrichose. Epicephalon orange to brown, shiny, bare, narrow or wide, clearly delineated from upper frontal vitta. Paracephalon light to dark brown, slightly convex on posterolateral portions. Outer vertical seta absent or present, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, black microtrichose, with blue sheen. Female cervical sclerite very strongly convex on anterior half (Fig. 13C). Postpronotal lobe black-brown, bare. Notopleuron black-brown. Pleuron black-brown with the following microtrichosity: entirely white on proepisternum and proepimeron, white on anteroventral $\frac{1}{2}$ of anepisternum, remainder brown, entirely white on katapisternum (Fig. 14D) or with slight small brown patch directly below ventral corner of anepisternum; entirely white or white with faint median brown spot on katatergite. Legs black-brown with blue sheen; fore tarsomere 1 white, 2–3 white or brown; hind tarsomere 1 white on inner dorsolateral $\frac{1}{2}$ to almost entirely white dorsally.

ABDOMEN (σ^+ + ω). Tergites black-brown. T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron pale grey, dark brown or black on P1, patch on dorsal $\frac{2}{3}$ of P2 with concave ventral margin, dorsal half of P3–6 dark brown or black, dark grey shading on ventral third of P3–6 (Fig. 13G). T1+2 ~ 1.1 – $2.0 \times$ length of T3. Oviscape black-brown, white microtrichose on anterior $\frac{1}{3}$, ~ 2.0 – $2.5 \times$ length of T6. Combined spermathecal ducts short (Fig. 13E) or long (Fig. 14B); common duct narrow or wide, parallel-sided, $\frac{1}{2}$ – $\frac{3}{4}$ of entire duct length. Paired spermathecal duct short (5.0 – $6.0 \times$ length of paired spermathecae), narrow or wide. Paired spermathecal stems slightly longer than spermathecae, with rounded or spiked tubercles. Paired spermathecae ovoid, bent basally. Single spermathecal duct arising from basal $\frac{1}{3}$ to $\frac{1}{6}$ of paired duct, narrow, $< \frac{1}{2}$ diameter and $\geq \frac{3}{4}$ length of paired duct, sometimes swollen apically. Single spermatheca elongate, teardrop-shaped, inornate or with sparse, minute tubercles.

MALE ABDOMEN. Pleuron pale grey, P1 entirely dark brown or black, dorsal $\frac{1}{2}$ of pleural sac with black patch with concave ventral margin, dorsal half of P3–6 dark brown or black. T1+2 $\sim 2.0 \times$ length of T3. Genital fork $2.0 \times$ length of T6, arms converging, inner basal process pointed inward, $\sim \frac{1}{6}$ – $\frac{1}{3}$ length of arm. Epandrium elongate, 2.0 – $2.5 \times$ as long as high, densely short setose posteroventrally. Basiphallus small, projecting outward, crescent-shaped. Basal distiphallus very short (\approx in length to phallic bulb), ending in phallic bulb. Phallic bulb short and small, length \approx height, approximately round with upper chamber with round posterior projection and lower chamber. Distal distiphallus long and narrow, $\sim 2.0 \times$ length of epandrium. Phallapodeme narrow, not expanded apically.

Remarks

There is variation in spermathecal duct length, the length of T1+2 relative to T3, and the presence/absence of the outer vertical seta. Despite this unusual level of apparent intraspecific variation, *S. (S.) chalybeus* is treated as a single species diagnosed by the entirely white microtrichose clypeus and the strongly convex female cervical sclerite.

Distribution

Bolivia, Brazil (new record), Colombia (new record), Ecuador (new record), Peru. The paratype from “Chile?” listed in Hennig (1934) is unlikely to be from Chile as there are no records of *Scipopus* or any other Taeniapterinae from Chile. The southernmost record for the genus is *S. (S.) diversus* from northern Argentina.

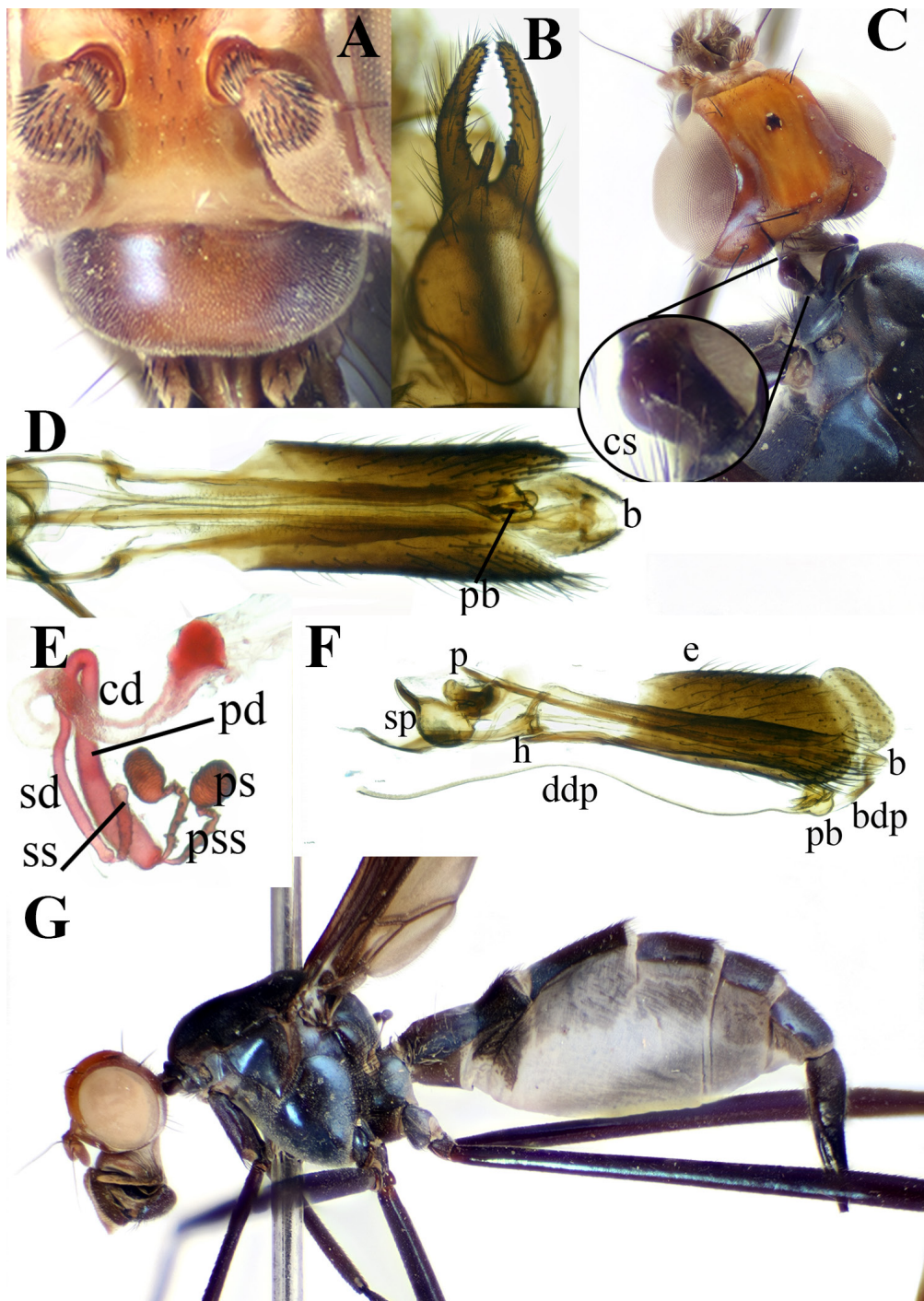


Fig. 13. *Scipopus (Scipopus) chalybeus* Hennig, 1934. **A.** Clypeus, anterior view, ♀, non-type. **B.** Male genital fork, ventral view, Bolivia, non-type (CBFC). **C.** Head and thorax, dorsal view, ♀, highlighting cervical sclerite, Ecuador, non-type (USNM). **D.** Male terminalia, ventral view, Bolivia, non-type (CBFC). **E.** Female spermathecae and associated structures, Bolivia, non-type (CBFC). **F.** Male terminalia, lateral view, Bolivia, non-type (CBFC). **G.** Habitus, ♀, Ecuador, non-type (USNM). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; cs = cervical sclerite; ddp = distal distiphallus; e = epandrium; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermathecae; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

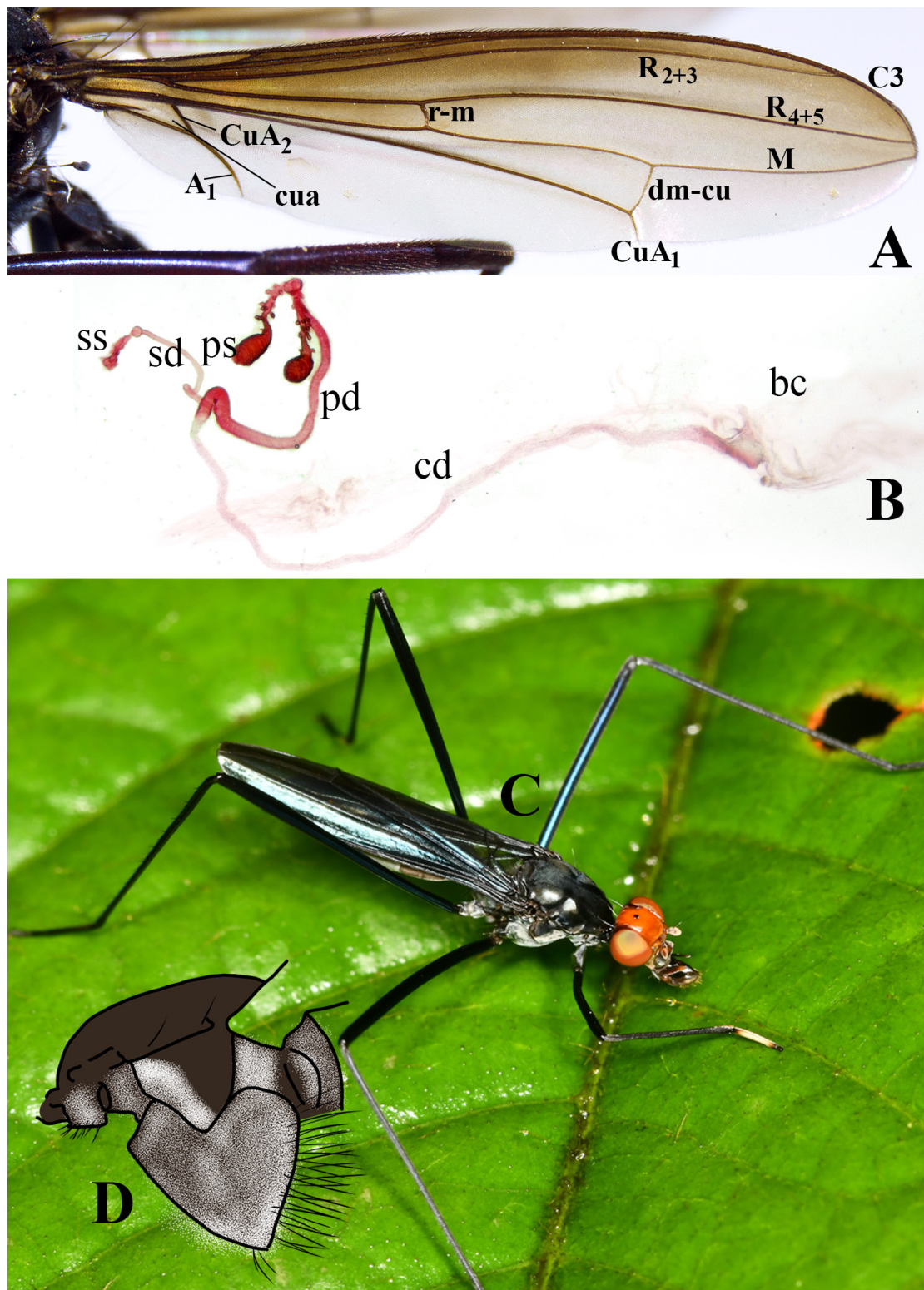


Fig. 14. *Scipopus (Scipopus) chalybeus* Hennig, 1934. **A.** Left wing, ventral view (USNM). **B.** Female spermathecae and associated structures, Colombia, non-type (IAVH). **C.** Living, Ecuador. **D.** Thorax, left lateral view, illustrating white microtrichosity. Abbreviations: bc = bursa copulatrix; cd = common duct; pd = paired spermathecal duct; ps = paired spermathecae; sd = single spermathecal duct; ss = single spermatheca.

Scipopus (Scipopus) convexus sp. nov.

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Figs 15–16

Differential diagnosis

Scipopus (Scipopus) convexus sp. nov. resembles *S. (S.) planus* sp. nov. in having a paracephalon with strongly convex upturned bumps, but differs in having dark, long, fine setae on T1 and a dark first fore tarsomere.

Etymology

The species name, from the Latin word for ‘convex’, refers to the strongly convex bumps on the paracephalon.

Type material examined

Holotype

BOLIVIA • 1 ♀; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–12 May 2007; S.M. Paiero leg.; CBFC.

Paratypes

BOLIVIA • 1 ♀; same collection data as for holotype; CBFC • 1 ♀; same collection data as for holotype; CBFC • 1 ♀; same collection data as for holotype; debu00281750/MYCRO518-19 sequenced for CO1–5'; DEBU • 2 ♂♂, 1 ♀; same collection data as for holotype; S.A. Marshall leg.; CBFC (♂ dissected and photographed, Fig. 15D–E, G).

PERU • 1 ♂, 2 ♀♀; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun. 2006; Paiero and Klymko leg.; MUSM (♀ dissected and photographed, Fig. 15A–B) • 1 ♂; same collection data as for preceding; debu00281553/MYCRO517-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU.

Other material

BRAZIL • 1 ♂, 2 ♀♀; Rondonia, Ariquemes, Rio Ji-Parana; 9°44' S, 61°52' W; 28 Oct. 1986; J.A. Rafael leg.; Arm. Malaise; INPA • 1 ♀; Pará, Tukurui, Faz. Senador; 3°59'48" S, 49°46'03" W; 1 Jul. 2001; J.A. Rafael and J. Vidal leg.; suspensa baixa; INPA • 9 ♂♂, 19 ♀♀; Amazonas, Rio Negro, downstream Uaupés, last right tributary of Rio Curicuriari; 0°19'54" S, 66°48'1" W; 5 Mar. 1994; M. von Tschirnhaus leg.; 1° forest, aspirated from human dung; INPA • 2 ♀♀; Santerem; Acc. No. 2966; CMNH • 2 ♂♂; Manáos, Amazon; Jul.; “Roman”; ZMUH • 1?; same collection data as for preceding; 20 Jul. 1914; illegible collecting note attached; ZMUH • 2 ♀♀; Rio Autaz, Amazon; “Roman”; Oct.; ZMUH • 1 ♂; same collection data as for preceding; Sep.; ZMUH • 1 ♂; same collection data as for preceding; Oct.; illegible collecting note attached; ZMUH • 1 ♂; Pará, Rio Xingu Camp, 60 km S of Altamira; 52°22' W, 3°39' S; 13–21 Oct. 1986; P. Spangler and O. Flint leg.; USNM • 1 ♂; Amazonas, Manaus, 1 km W of Taruma Falls; 100 m a.s.l.; 2 Mar. 1981; C. Young leg.; CMNH • 1 ♂; same collection data as for preceding; G. Ekis leg.; CMNH • 1 ♀; Amazonas, Manaus, AM-10 km 16; 16 Apr. 1988; R.A. Rocha leg.; INPA • 1 ♂; Pará, Benevides; Oct. 1918; S.M. Klages leg.; CMAcc. 6174; CMNH • 1 ♀; Pará, Tukurui, Faz Senador; 03°59'48" S, 49°46'03" W; 1 Jul. 2001; J.A. Rafael and J. Vidal leg.; suspensa baixa; INPA • 1 ♂; Pará, Alter de Chão; 15–18 Feb. 1992; R.A. Vidal leg.; Malaise; INPA • 1 ♂, Amazonas, Campus Universitario; 28 Jul.–5 Aug. 1988; M. Castilho *et al.* leg.; mao [hand]; INPA • 2 ♂♂; Amazonas, Rio Javari, Estirao do Equador; Oct. 1979; M. Alvarenga leg.; CMNH • 1 ♀; Manaquiri Lake, 80 mi. SW of Manaus; 16 Nov. 1970; E.D. Valette leg.; USNM.

COLOMBIA • 1 ♀; Putumayo, PNN La Paya Cabaña Viviano; 0°7' S, 74°56' W; 320 m a.s.l.; 19 Sep.–1 Oct. 2001; R. Cobete leg.; Malaise; M.2440; debu01088991/MYCRO520-19 sequenced for CO1–5';

IAVH • 1 ♀; same collection data as for preceding; Varzea; M.2438; IAVH • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°41' S, 70°15' W; 150 m a.s.l.; 4 Aug.–11 Sep. 2000; A. Parente leg.; Malaise; M.847; IAVH (photographed, Fig. 15C).

ECUADOR • 1 ♀; Prov. Orellano, Yasuni Natl. Pk., Yasuni Research Stn; 0°40'50" S, 76°24'2" W; 250 m a.s.l.; 28 Apr.–8 May 2009; H. Cumming leg.; on monkey dung; QCAZ • 1 ♀; same collection data as for preceding; S. Luk leg.; on ground; debu01089002/MYCRO519-19 sequenced for CO1–5'; DEBU.

FRENCH GUIANA • 1 ♀; Cayenne; Feb. 1917; Acc. 5873; CMNH.

GUYANA • 1 ♂, 1 ♀; Rewa Ecolodge; 3°52'58" N, 58°47'46" W; 19 Jan.–22 Dec. 2012; R.J. Pivar; DEBU.

Description

LENGTH. 11–14 mm.

HEAD. Palpus orange to dark brown, pale brown microtrichose and setulose on entire surface, narrow (length $6.0 \times$ height). Clypeus light brown to black, anterior face $\sim 1.3\text{--}2.0 \times$ as wide as high, bare medially, microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate bare and slightly shiny on outer lateral edges. Epicephalon dull, orange or dark brown, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon orange to black-brown, with upturned convex projections. All head chaetotaxy well-developed.

THORAX. Scutum black or dark brown. Female cervical sclerite relatively flat. Postpronotal lobe black or brown, setulose on outer margin. Notopleuron black or brown with three posterior pale spots, pale microtrichose ventrally. Pleuron black or dark brown, microtrichosity variable: entirely white on proepisternum, mostly white on proepimeron, with brown stripes posterodorsally and medially, white on anteroventral $\frac{1}{3}$ of anepisternum, with white anterodorsal and posterodorsal spots, brown on ventral corner and remainder, mostly white on katatergite, with median brown spots or lines. Microtrichosity on katepisternum varies from mostly white with posterodorsal, ventral and median spots (Fig. 16B) to mostly brown with anterior, posterodorsal and posteromedian white spots (Fig. 16A). Legs dark brown or black, first fore and hind tarsomere dark brown or black with distinct ventral golden fringe. Wing uniformly brown infusate.

ABDOMEN ($\text{♂}+\text{♀}$). Long, fine, setae on T1 dark brown or black. Pleuron grey, microtrichose, P1, dorsal half of P2–6 dark brown or black. Male pleural sac off-white, dark brown on upper half.

FEMALE ABDOMEN. T1+2 $\sim 2.2 \times$ length of T3. Oviscape dark brown or black, white microtrichose on anterior $\frac{2}{3}$, $\sim 1.5\text{--}3.0 \times$ length of T6. Combined duct length short; common duct very short (almost absent). Paired spermathecal duct short ($\sim 4.0 \times$ length of paired spermathecae), narrow and curved basally, wider distally. Paired spermathecal stems shorter than spermathecae, with minute, sparsely distributed tubercles. Paired spermathecae elongate, nearly teardrop-shaped. Single spermathecal duct arising from basal $\frac{1}{6}$ of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct, slightly swollen distally. Single spermatheca elongate, finger-like, with spiked tubercles.

MALE ABDOMEN. Length of T1+2 $\sim 2.3 \times$ length of T3. Genital fork small, ($\sim 1.6 \times$ length of T6), arms converging, touching, sometimes swollen apically; inner basal process straight, $\frac{1}{3}$ the length of arm (not obvious in Fig. 15G). Epandrium stout (length \approx height), densely short setose on posteroventral margin. Basiphallus small, crescent-shaped, projecting outwards. Basal distiphallus \approx length to epandrium, wide. Phallic bulb short, length \approx height, upper chamber with round posterior projection, lower chamber

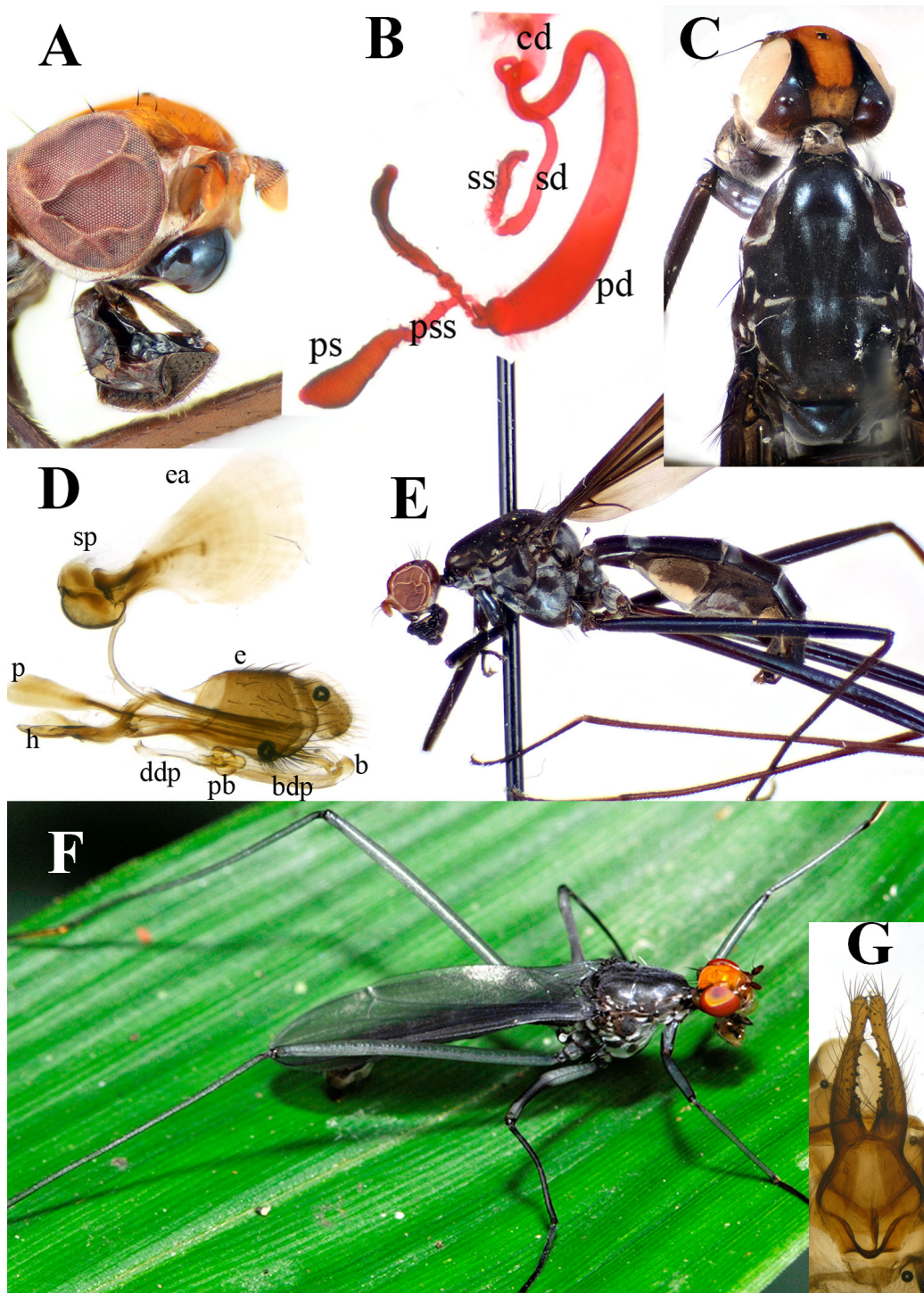


Fig. 15. *Scipopus (Scipopus) convexus* sp. nov. **A.** Head, ♂, anterolateral view, Peru, paratype (MUSM). **B.** Female spermathecae and associated structures, Peru, paratype (MUSM). **C.** Head and thorax, ♀, dorsal view, Colombia, non-type (IAVH). **D.** Male terminalia, lateral view, Bolivia, paratype (CBFC). **E.** Habitus, ♂, Bolivia, paratype (CBFC). **F.** Living, teneral ♂, Bolivia. **G.** Male genital fork, ventral view, Bolivia, paratype (CBFC). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

smaller, rounded. Distal distiphallus shorter than epiandrium, apex with tube-like opening. Phallapodeme broad and expanded apically.

Remarks

Scipopus (Scipopus) convexus sp. nov. has frequently been mistaken for *S. (S.) belzebul* in the past, for example, in Hendel (1933), Hennig (1934) and Albuquerque (1972a). From the current material examined, males of *S. (S.) convexus* were more frequently collected and represented in collections (~40% of total specimens examined) than males of other species of *Scipopus*.

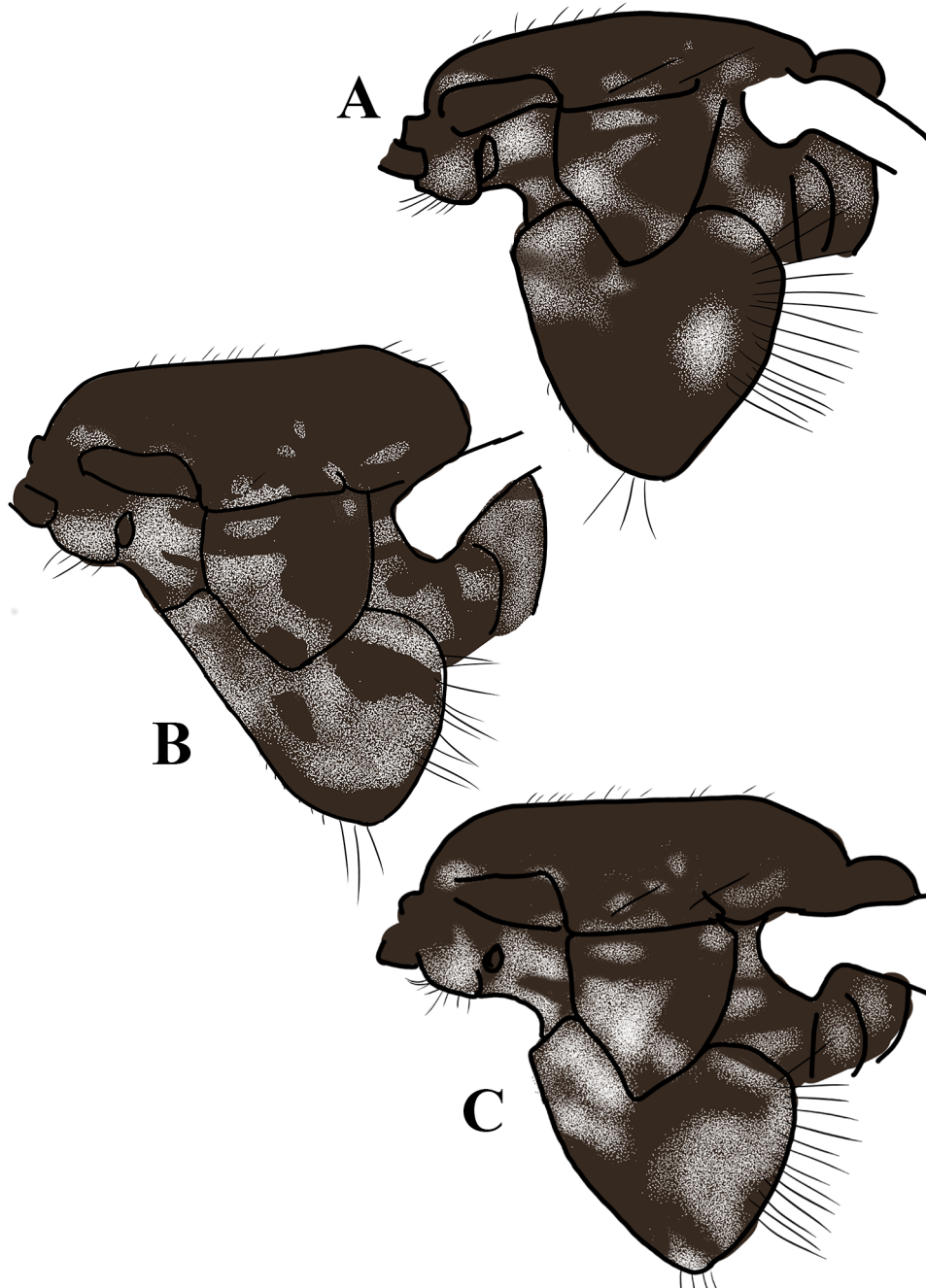


Fig. 16. Varying patterns of white microtrichosity on the left thoracic pleuron of *Scipopus convexus* sp. nov. **A.** ♀, Brazil. **B.** ♀, Bolivia. **C.** ♀, Colombia.

Distribution

French Guiana to Colombia and Ecuador, south to Bolivia and Brazil.

Scipopus (Scipopus) diversus (Schiner, 1868)

Figs 17–19

Calobata diversa Schiner, 1868: 250.

Scipopus ruficeps Hendel, 1936: 68 (in part).

Calobata diversa – van der Wulp 1883: 49 (listed); 1897: 367 (key), 369 (diagnosis). — Aldrich 1905: 616 (catalog). — Cresson 1908: 4 (key), 9 (diagnosis). — Hendel 1922: 231 (listed). — Steyskal 1977: 20 (catalog, unplaced species); 1980: 582 (catalog, unplaced species).

Scipopus diversus – Enderlein 1922: 211. — Frey 1927: 74. — Czerny 1932: 286. — Hennig 1934: 326. — Steyskal 1968: 48.16 (catalog). — Albuquerque 1971: figs 12–20 (redescription).

Scipopus diversa – Curran 1934a: 295 (catalog).

Scipopus ruficeps – Hennig 1937: 49.

Non *Calobata diversa* – van der Wulp 1897: 369 (*Scipopus furcifer*).

Differential diagnosis

Scipopus (Scipopus) diversus resembles *S. (S.) striatithorax* in having a white first fore tarsomere, and a dull, orange, microtrichose epicephalon, but differs in the uniformly black scutum.

Type material examined

Type specimen(s) (*Calobata diversa*) (not located or examined)

BRAZIL • ??; collected on the voyage of the frigate *Novara*, which was docked in Rio de Janeiro 5–31 Aug. 1857 (Fletcher 1985).

Syntypes (*Scipopus ruficeps*) (in part, not examined)

BRAZIL • 5 ♀♀; Taperinha; 1 Jun.–20 Jul.; NHMW.

Other material examined

ARGENTINA • 1 ♀; Misiones, 5 km E of Puerto Iguazo behind Hotel Orquidea; 1–6 Feb. 1992; S.A. Marshall leg.; debu01089000/MYCRO562-19 sequenced for CO1–5'; DEBU • 2 ♀♀; same collection data as for preceding; DEBU • 1 ♀; same collection data as for preceding; UGIC131-15/MYCRO032-15 sequenced for CO1–5'; DEBU.

BOLIVIA • 1 ♂, 9 ♀♀; La Paz, San Juanito nr Teoponte; 15°29'42" S, 67°47'48" W; 500 m a.s.l.; 8 Apr. 2001; S.A. Marshall leg.; CBFC • 2 ♂♂, 1 ♀♀; same collection data as for preceding; DEBU • 1 ♀; same collection data as for preceding; UGIC130-15/MYCRO031-15 sequenced for CO1–5'; CBFC • 5 ♂♂, 14 ♀♀, 1?; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–12 May 2007; S.A. Marshall leg.; CBFC • 1 ♀; same collection data as for preceding; debu00282054/MYCRO639-20 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; J.H. Kits leg.; CBFC • 1 ♂, 3 ♀♀; same collection data as for preceding; S.M. Paiero leg.; CBFC • 1 ♂, 7 ♀♀; same collection data as for preceding; 29 Apr.–11 May 2007; M.D. Jackson leg.; CBFC • 2 ♀♀; Santa Cruz, 4–6 km SSE of Buena Vista, Hotel Flora y Fauna; 17.50° S, 63.65° W; 6–10 Mar 2014; Steck, Sutton, Norrbom and Saravia leg.; multilure traps; USNM • 1 ♀; Santa Cruz, Potrerillo de Guenda, entrance road; 17°40'19" S, 63°23'11" W; 405 m a.s.l.; 9–17 Oct 2014; Sutton *et al.* leg.;

CBFC • 1 ♂; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–11 May 2007; M.D. Jackson leg.; debu00289647/MYCRO536-19 sequenced for CO1–5'; DEBU.

BRAZIL • 3 ♀♀; Amazonas, AM-010 km 31 Embrapa; 31 Jul. 1991; L.P. Albuquerque and J. Binda leg.; Arm. Shannon, C. Cacau, Isc. Fruta [Fruit bait]; INPA • 1 ♂; same collection data as for preceding; 14 Feb. 1991; INPA (dissected and photographed, Fig. 17A, C, F) • 1 ♀; same collection data as for preceding; 24 Jul. 1991; INPA • 1 ♀; same collection data as for preceding; 27 Mar. 1991; INPA • 1 ♀; same collection data as for preceding; 26 Feb. 1992; INPA • 1 ♀; same collection data as for preceding; 9 Jan. 1991; INPA • 1 ♀; AM. Novo Aripuanã, Reserva Soka; 5°15'53" S, 60°07'08" W; 28 Apr.–5 May 1999; R.L. Ferreira and R.A. Rocha leg.; Varradura [sweep]; INPA • 1 ♀; Amazonas, Novo Aripuanã, Reserva Soka; 5°15'53" S, 60°07'08" W; 17–25 Aug. 1999; J.F. Vidal and A.L. Henriques leg.; arm. suspensa; INPA • 4 ♀♀; same locality as for preceding; 28 Apr.–5 May 1999; Ferreira *et al.* leg.; Malaise; INPA • 1 ♀; Pará, Benevides, F. Morelandia, 14 Nov. 1986; J.A. Rafael leg.; Malaise; INPA • 1 ♀; Amazonas, Beruri, Rio Purus; 3°56'62" S, 61°21'02" W; Oct. 2002; F.F. Xavier and U.C. Barbosa leg.; Arm. Malaise; INPA • 4 ♀♀; Amazonas, Rio Negro, Parna do Jau, Ig. Miratuca; L.S. Aguiño leg.; Arm. Shannon; INPA • 1 ♀; Rondania, Ouro Preto do Oeste, Igarapé Mandi; 6–12 Jul. 1995; J.A. Rafael and J. Vidal leg.; INPA • 2 ♀♀; Amazonas, Manaus, ZF-2; 1.5 m a.s.l.; 7–21 Jul. 1994; J.A. Rafael and J. Vidal leg.; arm. suspensa; INPA • 1 ♀; same collection data as for preceding; 6–20 Oct. 1994; INPA • 1 ♀; same collection data as for preceding; Reserva Ducke; 5–16 Aug. 1994; INPA • 1 ♀; same locality as for preceding; 20 m a.s.l.; 22 Jul. 1988; J.A. Rafael leg.; arm. suspensa; INPA • 1 ♀; same locality as for preceding; 4–11 May 1989; Y. Camara and J.E. Binda leg.; Isca de Fruta; INPA • 1 ♀; Roraima, Serra Pacaraima, BR-174; 4°27'04" N, 61°07'56" W; 800 m a.s.l.; 1–7 Sep. 1995; J.A. Rafael *et al.* leg.; arm. suspensa; INPA • 1 ♀; Pará, Benevides; Oct. 1918; S.M. Klages leg.; C.M. Acc.6174; CMNH • 1 ♀; Upper Rocana, N. Pará; S.M. Klages leg.; Jun. 1918; C.M. Acc. 6175; CMNH • 1 ♀; Parana Londrina, Mata dos Godoy; 28 Jan.–2. Feb. 1990; S.A. Marshall leg.; INPA • 2 ♀♀; Amazonas, Novo Airão, AM 352, km-10; 2°42'45" S, 60°57'12" W; 20 Jan 2020; Rafael and Marshall leg.; INPA • 1 ♀; Amazonas, Manaus, ZF2 km-14; 23°5'21" S; 60°57'12" W; 13 Jan 2020; Rafael and Marshall leg.; INPA • 1 ♀; Rio Japura; Amazon, “Roman”; ZMUH • 1 ♀; Manaus; Amazon, “Roman”; ZMUH.

COLOMBIA • 1 ♀; Putumayo, PNN la Paya Cabaña Viviano, Varzea; 0°7' S, 74°56' W; 320 m a.s.l.; 15–30 Oct. 2001; R. Cobete leg.; M.2438 Malaise; debu01088992/MYCRO521-19 sequenced for CO1–5'; IAVH • 1 ♀; Putumayo, PNN la Paya Cabaña Viviano; 0°7' S, 74°56' W; 320 m a.s.l.; 16–30 Dec. 2001, E. Lozano leg.; Malaise; M. 2796; IAVH • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°41' S, 70°15' W; 150 m a.s.l.; 12–26 Feb. 2001; D. Chota leg.; Malaise; M.1606; IAVH • 1 ♀; same collection data as for preceding; 3°23' S, 70°6' W; 17 Sep.–1 Oct. 2001; M.2243; DEBU • 1 ♀; same collection data as for preceding; Mocagua; 300 m a.s.l.; 26 Jun.–6 Jul. 2000; A. Parente leg.; IAVH • 1 ♀; same collection data as for preceding; 3°41' S, 70°15' W; 12–19 Mar. 2000; IAVH • 1 ♀; same collection data as for preceding; 17 Dec.2000–2 Jan. 2001; M.1123; IAVH • 1 ♀; same collection data as for preceding; 11–25 Sep. 2000; M.846; debu01089056/MYCRO640-20 sequenced for CO1–5'; IAVH • 1 ♀; Amazonas PNN Amacayacu San Martin; 3°46' S, 70°18' W; 150 m a.s.l.; D. Chota leg.; Malaise; M.1611; IAVH • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°23' S, 70°6' W; 150 m a.s.l.; 3–17 Dec. 2001; D. Chota leg.; Malaise; M.2765; IAVH • 1 ♀; same collection data as for preceding; 17 Sep.–1 Oct. 2000; M.2243; debu01088990/MYCRO537-19 sequenced for CO1–5'; IAVH • 1 ♀; same collection data as for preceding; 3–17 Dec. 2001; M.2765; DEBU • 2 ♀♀; same collection data as for preceding; 17–31 Dec. 2001; M.2770; IAVH • 1 ♀; same collection data as for preceding; 12–26 Feb. 2001; M.1606; IAVH • 1 ♀; same collection data as for preceding; 17 Dec.–2 Jan. 2001; A. Parente leg.; Malaise; M.1123; IAVH • 1 ♀; same collection data as for preceding; 6–14 Jan. 2001; B. Amado leg.; Malaise; M.1321; IAVH • 1 ♀; Amazonas, PNN Amacayacu San Martin; 3°46' S, 70°18' W; 150 m a.s.l.; 2–16 Apr. 2001; D. Chota leg.; Malaise; M. 1613; IAVH • 1 ♀; same collection data as for preceding; 17–31 Dec. 2001; M.2766; IAVH • 1 ♀; same collection data as for preceding; 26 Feb.–12 Mar. 2001;

M.1611; IAVH • 1 ♀; Putumayo, PNN la Paya Cabaña Viviano; 0°2' S, 75°12' W; 330 m a.s.l.; 20 Nov.–5 Dec. 2001, E. Lozano leg.; Malaise; M. 2798; IAVH.

ECUADOR • 2 ♀♀; Napo, Jatun Sacha Res., 6 km E of Misahualli, SOL trail; 1°4' S, 77°37' W; 450 m a.s.l.; 30 Apr.–8 May 2002; S.A. Marshall leg.; QCAZ • 1 ♀; same collection data as for preceding; debu00179103/MYCRO532-19 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; varzea; QCAZ • 1 ♂, 1 ♀; Napo, Tiputini Biodiversity Stn; 0°36'50" S, 76°9'1" W; May 2011; S.A. Marshall leg.; DEBU • 1 ♀; same collection data as for preceding; debu00339648/MYCRO531-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 1 ♀; same locality as for preceding; 7–14 Jan. 2013; P.D. Careless leg.; QCAZ • 1 ♀; Puerto Orellana, Tiputini Biodiversity Station; 0°38'2" S, 76°08'9" W; Aug. 1999; Kotrba leg.; QCAZ • 2 ♀♀; Napo Province, Yasuni National Park, Yasuni Research Station; 76°36' W, 0°38' S; 3–20 Nov. 1998; T. Pape and B. Viklund leg.; QCAZ • 1 ♂, 1 ♀; Prov. Orellano, Yasuni Natl. Pk., Yasuni Research Stn; 0°40'50" S, 76°24'2" W; 250 m a.s.l.; 28 Apr.–8 May 2009; S.A. Marshall leg.; QCAZ • 1 ♀; same collection data as for preceding; V. Belluz leg.; foliage; QCAZ • 1 ♂; Napo, Res. ethnica Waorani, 1 km S of Onkone Gare Camp, "Trans.Ent."; 0°39'10" S, 76°26' W; 220 m a.s.l.; 4 Oct. 1994; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants in terre firme forest, at Trans. 1, stn 4, Project MAXUS, Lot 853; USNM00053933/MYCRO557-19 unsuccessfully sequenced for CO1–5'; USNM • 1 ♂; same collection data as for preceding; at Trans. 2, stn 2, Lot 861; USNM • 1 ♂; same collection data as for preceding; USNM00053927/MYCRO533-19 unsuccessfully sequenced for CO1–5'; USNM • 1 ♂; same collection data as for preceding; at 8 x-trans., 94 mark, Lot 709; USNM.

FRENCH GUIANA • 1 ♀; Cayenne, Comm. Regina, Kaw Mt. Relais de Patawa; 4°33' N, 52°10' W; 300 m a.s.l.; Jan 2006; J.A. Cerda leg.; Malaise; DEBU • 1 ♀; same collection data as for preceding; Nov. 2005; DEBU • 1 ♀; same collection data as for preceding; Dec. 2005; debu00280300/MYCRO524-19 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; debu00280301/MYCRO559-19 sequenced for CO1–5'; DEBU (dissected, photographed, Fig. 17E) • 1 ♀; same collection data as for preceding; DEBU • 1 ♀; Régina, Kaw, Kaw Mts., Point Rd 40; 300 m a.s.l.; 12 Feb.–3 Mar. 2007; K. Sarv leg.; rainforest/plantation, Malaise; debu00303021/MYCRO523-19 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; DEBU (photographed, Fig. 17B, D) • 2 ♀♀; same collection data as for preceding; 3–27 Mar. 2007; DEBU • 1 ♀; same collection data as for preceding; debu00302943/MYCRO535-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 4 ♀♀; Mana River; May 1917; Acc. 6008; CMNH • 1 ♀; Cayenne, Nourages Field Station; 4°08'797" N, 52°68'13" W; 101 m a.s.l.; 4 Feb. 2011; A. Smith and R. Rougerie leg.; BIOUG01561-A08/ASNOR3440-12 sequenced for CO1–5'; BIOUG.

PERU • 3 ♀♀; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun. 2006; Paiero and Klymko leg.; MUSM • 1 ♀; same collection data as for preceding; debu00281543/MYCRO521-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU.

Description

LENGTH. 11–15 mm.

HEAD. Palpus dark brown, pale brown microtrichose and setulose on entire surface, narrow (length 4.5 × height). Clypeus dark brown or black, width ~2.0 × height, bare medially, white-microtrichose on posterolateral corners. Frontal vitta entirely dull, orange, microtrichose, orbital plate dull, microtrichose or laterally bare with slight shine. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon orange to dark brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

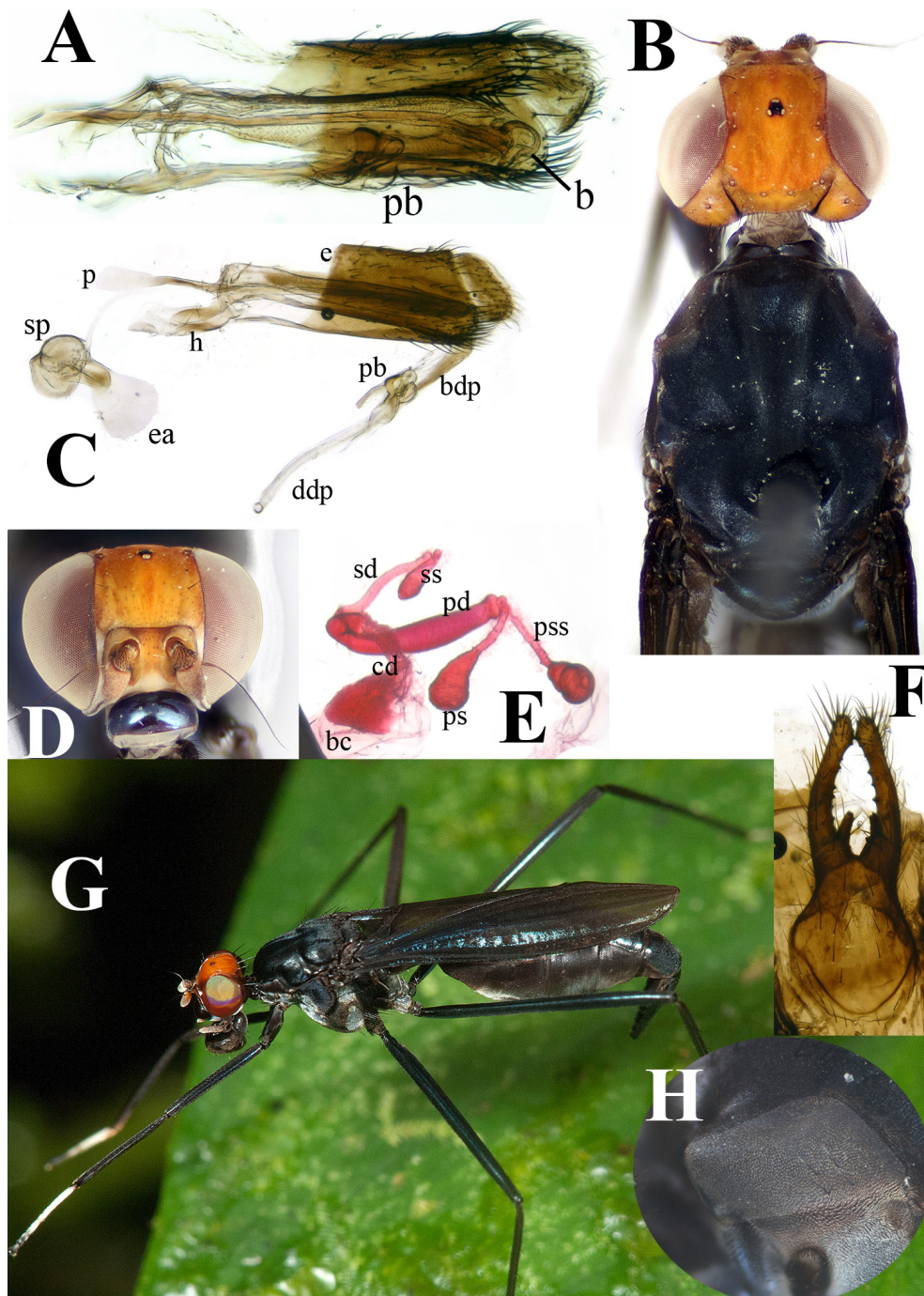


Fig. 17. *Scipopus (Scipopus) diversus* (Schiner, 1868). **A.** Male terminalia, ventral view, Brazil, non-type (INPA). **B.** Head and thorax, ♀, dorsal view, French Guiana, non-type (DEBU). **C.** Male terminalia, lateral view, Brazil, non-type (INPA). **D.** Head, ♀, anterior view, French Guiana, non-type (DEBU). **E.** Female spermathecae and associated structures, French Guiana, non-type (DEBU). **F.** Male genital fork, ventral view, Brazil, non-type (INPA). **G.** Living, ♀, Ecuador (INPA). **H.** Postpronotal lobe, left lateral view, non-type (CBFC). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

THORAX. Scutum uniformly black with sparse silvery microtrichosity. Female cervical sclerite convex. Postpronotal lobe black or brown, setulose or bare on posterior half, subquadrate and stout (length $\sim 2.0 \times$ height) (Fig. 17H) or pointed anteriorly and more elongate (length $\sim 2.5 \times$ height). Notopleuron entirely black or with anterior pale microtrichose spot (Fig. 18C). Anterior half of notum sometimes raised to a slight hump (Fig. 17G). Pleuron black with highly variable microtrichosity: entirely white or almost entirely white on proepisternum and proepimeron, white on anteroventral $\frac{1}{3}$ – $\frac{1}{2}$ of

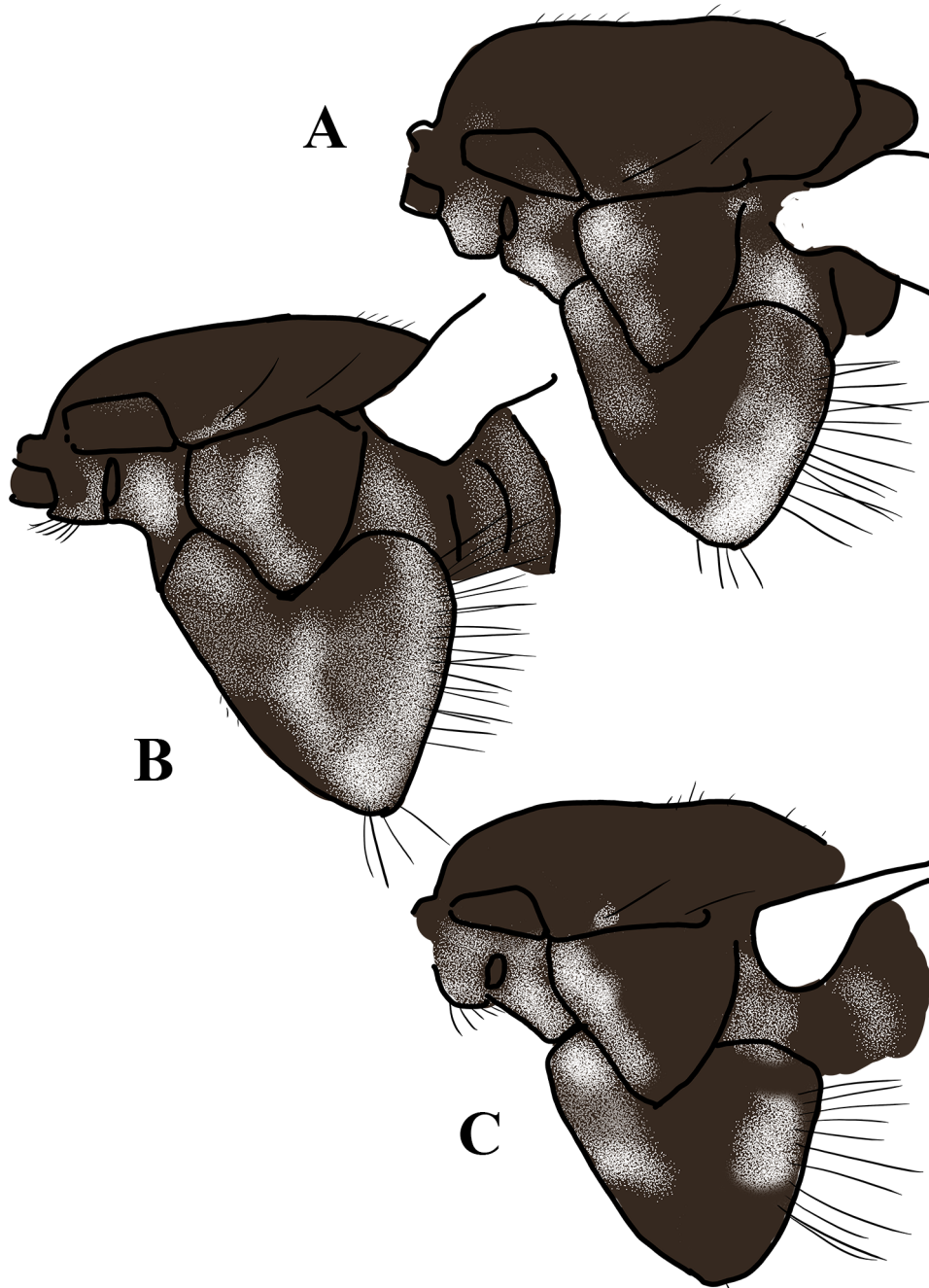


Fig. 18. Varying patterns of white microtrichosity on the left lateral thoracic pleuron of *Scipopus* (*Scipopus*) *diversus* (Schiner, 1868). **A.** Thorax, ♀, Brazil. **B.** Thorax, ♀, Argentina. **C.** Thorax, ♀, Bolivia.

anepisternum, remainder brown or black, entirely white on katatergite, or with dorsal brown or black spot. Microtrichosity on katepisternum ranges from almost entirely white (Fig. 18B) to brown or black with white patches anteriorly and posteriorly (including ventral tip of katepisternum) (Fig. 18A) to single white patch anteriorly and two white patches posteriorly (excluding ventral tip of katepisternum) (Fig. 18C). Legs black or brown with blue sheen; fore tarsomere 1, sometimes 2–3 white, first hind tarsomere $\frac{1}{2}$ to entirely white dorsally. Wing uniformly black-brown infuscate.

ABDOMEN (σ^+ + φ). Long, fine, setae on T1 black or white.



Fig. 19. *Scipopus (Scipopus) diversus* (Schiner, 1868). **A.** Living, φ , Brazil, ovipositing. **B.** Living, φ , Bolivia.

FEMALE. Pleuron mostly black, pale grey on ventral P2, slight pale grey convex marking on ventral P4–5 (Fig. 17G). T1+2 $\sim 2.1 \times$ T3. Oviscape black, bare dorsally, white microtrichose on ventral $\frac{1}{3}$, $1.5\text{--}2.0 \times$ length of T6. Combined spermathecal ducts short; common duct short, $\frac{1}{4}$ of entire duct length. Paired spermathecal duct short ($\sim 3.0 \times$ length of paired spermathecae), forming a basal loop, wider medially. Paired spermathecal stems range from shorter to longer than spermathecae, inornate or with slight tubercles. Paired spermathecae nearly teardrop-shaped, narrower basally and with apical indentation. Single spermathecal duct arising from basal $\frac{1}{8}$ of paired duct, narrow, $< \frac{1}{2}$ diameter and $\geq \frac{1}{2}$ length of paired duct. Single spermatheca elongate, wider distally, inornate.

MALE ABDOMEN. Pleuron pale grey or off-white, microtrichose, P1, entire pleural sac and dorsal half of P3–6 dark brown. T1+2 ~ 2.5 the length of T3. Genital fork $\sim 2.0 \times$ length of T6, arms converging. Inner basal process straight, approximately $\frac{1}{3}$ arm length. Epandrium length $1.5 \times$ height, posteroventral margin densely short-setose. Basiphallus small, crescent-shaped. Basal distiphallus short ($1.0\text{--}2.0 \times$ phallic bulb length), extending and enclosing phallic bulb in sheath-like covering. Phallic bulb short, length \approx height, upper chamber with round posterior projection, lower chamber smaller, rounded. Distal distiphallus short and broad, \approx length as epandrium, apex with tube-like opening. Phallapodeme expanded, broad apically.

Remarks

Dissections of 15 females from various localities showed variation in the shape of the paired spermathecae and length of the paired spermathecal stems. One dissected male from Bolivia has a longer ($>$ length than epandrium), narrower, distiphallus. Many specimens have a posteriorly setulose, subquadrate postpronotal lobe, while others have a more elongate, bare postpronotal lobe. Specimens vary widely in thoracic pleural patterns, some variations (but not all) are pictured in Fig. 18. Despite this variation, *S. (S.) diversus* is treated as a single species diagnosed by the dull, microtrichose epicephalon, the white first fore tarsomere and the black scutum. Because the type(s) for *Scipopus diversus* could not be located, our species concept is based on the original description and follows the treatment of the species by Hennig (1934). The representatives from the syntype series of the junior synonym *S. (S.) ruficeps* with a white first tarsomere are *S. (S.) diversus*, the remainder with dark brown tarsomeres are *S. (S.) erythrocephalus* (Hennig 1938). A member of this species was photographed with pseudoscorpions attached (<https://www.inaturalist.org/observations/39262837>).

Distribution

Argentina (new record), north to Ecuador (new record) and French Guiana (new record).

Scipopus (Scipopus) erythrocephalus (Fabricius, 1805)

Figs 20–21

Calobata erythrocephala Fabricius, 1805: 260

Neria hottentota Robineau-Desvoidy, 1830: 737.

Micropeza loripes Perty, 1833: 188.

Scipopus penicillus Enderlein, 1922: 211.

Scipopus alvarengai Albuquerque, 1972c: 123, figs 1–11. **Syn. nov.**

Calobata erythrocephala – Wiedemann 1830: 532 (diagnosis). — Walker 1849: 1055 (listed). — Osten Sacken 1858: 81 (catalog); 1878: 180 (catalog). — Schiner 1868: 250 (diagnosis). — van der Wulp 1883: 49 (listed); 1897: 367 (keyed), 369 (diagnosis). — Aldrich 1905: 616 (catalog). — Hendel 1922: 231 (listed).

Neria hottentota – Enderlein 1922: 210 (synonymized with *S. erythrocephalus*).

Scipopus penicillus – Frey 1927: 74 (listed). — Cresson 1930: 325 (synonymized with *S. erythrocephalus*).
— Curran 1934a: 295, 452 (listed), 451 (keyed). — Schumann 1988: 104 (catalog).

Scipopus erythrocephala – Cresson 1930: 325 (diagnosis).

Scipopus erythrocephalus – Czerny 1932: 285 (diagnosis). — Hennig 1934: 322 (keyed), 323 (diagnosis).
— Aczél 1949: 341 (catalog). — Steyskal 1968: 48.16 (catalog). — Albuquerque 1971: 89, figs 2–11
(re-description). — Ferro & de Carvalho 2014: 59 (listed). — Marshall *et al.* 2016: 544 (catalog).

Micropeza loripes – Hennig 1934: 323 (listed as a synonym of *S. erythrocephala*).

Scipopus alvarengai – Ratcliffe & Penny 1978: 695 (catalog).

Differential diagnosis

Scipopus (*Scipopus*) *erythrocephalus* resembles *S. (S.) souzalopesi* in having dark tarsomeres and a dull, orange, microtrichose epicephalon that is not clearly delineated from the upper frontal vitta, but it differs in having a black scutum with indistinct silvery vittae.

Type material examined

Holotype (*Calobata erythrocephala*) (damaged thorax and wing on a pin; examined in 2015)
SOUTH AMERICA • “South America”; “Dom. Smidt. Muf. Dom. Lund.”; ZMUC.

Type material (*Neria hottentota*)
UNKNOWN • given as “Cap de Bonne-Esperance” in error; type probably lost.

Holotype (*Micropeza loripes*)
BRAZIL • ? ; “Provincia Piauiensi” [Prov. Plauí]; NMBE.

Paratypes (*Scipopus penicillus*)
BOLIVIA • 1 ♂; Prov. Sara; Sep. 1906–Mar. 1907; 600–700 m a.s.l.; J. Steinbach leg.; MNBG.
BRAZIL • 1 ♀; Pará; 15 Dec. 1893; W.A. Schulz leg.; MNBG.
SURINAME • 1 ♀; Michaelis leg.; MNBG.

Holotype (*Scipopus alvarengai*)
BRAZIL • 1?; Pará, Jacaréacanga; Jun. 1969; M. Alvarenga leg.; Malaise; IOC.

Other material examined

BOLIVIA • 1 ♂; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–11 May 2007; CBFC • 1 ♂, 1 ♀; same collection data as for preceding; 29 Apr.–12 May 2007; S.A. Marshall leg.; DEBU • 1 ♂; same collection data as for preceding; debu00282040/MYCRO544-19 sequenced for CO1–5'; DEBU • 2 ♂♂; same collection data as for preceding; S.M. Paiero leg.; CBFC.

BRAZIL • 1 ♂; Amazonas, Rio Javari, Estirao do Equador; Oct. 1979; M. Alvarenga leg.; CMNH • 1 ♂, 1 ♀; Mato Grosso, Diamantino, Fazenda Sao Joao; 450 m a.s.l.; 5–6 Feb. 1981; Ekis and Young leg.; CMNH • 1 ♀; same collection data as for preceding; C. Young leg.; CMNH • 1 ♂; Amazonas, Manaus, ZFZ km-11; 2°35'21" S, 60°6'55" W; 13 Jan 2020; Rafael and Marshall leg.; INPA (photographed, Fig. 21C).

COLOMBIA • 1 ♀; Amazonas, Leticia Mocagua; 150 m a.s.l.; 27 Mar.–3 Apr. 2000; A. Parente leg.; Malaise trap; debu00138373/MYCRO643-20 unsuccessfully sequenced for CO1–5'; DEBU • 2 ♀♀; Amazonas, PNN Amacayacu San Martin; 3°46' S, 70°18' W; 150 m a.s.l.; 12 Mar.–2 Apr. 2001; D. Chota leg.; Malaise; M. 1612; IAVH • 2 ♀♀; same collection data as for preceding; 2–16 Apr. 2001; M. 1613; IAVH • 2 ♀♀; same collection data as for preceding; 3°23' S, 70°6' W; 15 Oct.–5 Nov. 2001; M. 2767; IAVH • 1 ♀; Amazonas, PNN Amacayacu Cabaña Lorena; 3°00' S, 69°59' W; 210 m a.s.l.;

1–15 Sep. 2001; J. Parente leg.; Malaise; M. 2202; IAVH • 1 ♀; same collection data as for preceding; debu01088993/MYCRO542-19 unsuccessfully sequenced for CO1–5'; IAVH • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°23' S, 70°6' W; 150 m a.s.l.; 25 Aug.–3 Sep. 2001; D. Chota leg.; Malaise; M.2244; DEBU • 1 ♀; same collection data as for preceding; 25 Jun.–9 Jul. 2001; M.2031; IAVH • 1 ♀; same collection data as for preceding; 9–30 Jul. 2001; M.2030; IAVH • 1 ♀; same as preceding; 3–9 Apr. 2000; A. Felix leg.; IAVH • 1 ♀; Vichada, PNN Tuparro, Centro Administrativo; 5°21' N, 67°51' W; 100 m a.s.l.; 22 May–3 Jun. 2001; W. Villalba leg.; Malaise; M.1786; IAVH • 1 ♀; Caqueta Morelia, Rio Bodoquero; 430 m a.s.l.; 19–20 Jan. 1969; Duckworth and Dietz leg.; USNM.

ECUADOR • 1 ♂, 2 ♀♀; Napo, Jatun Sacha Res., 6 km E of Misahuali, SOL trail; 1°4' S, 77°37' W; 450 m a.s.l.; 30 Apr.–8 May 2002; S.A. Marshall leg.; DEBU (♂ dissected and photographed, Fig. 20D, F) • 1 ♀; same collection data as for preceding; MYCRO823-20/debu179098 sequenced for CO1–5' (dissected and photographed, Fig. 20B); DEBU • 1 ♀; same collection data as for preceding; varzea; QCAZ (photographed, Fig. 20C) • 1 ♀; same collection data as for preceding; S.M. Paiero leg.; on dung; QCAZ (photographed, Fig. 20A) • 1 ♀; Puerto Orellana, Tiputini Biodiversity Station; 0°38'2" S, 76°08'9" W; Aug. 1999; Kotrba leg.; QCAZ • 1 ♀; same collection data as for preceding; S.P.L. Luk leg.; QCAZ • 1 ♂; Napo, Res. ethnica Waorani, 1 km S of Onkone Gare Camp, "Trans.Ent."; 0°39'10" S, 076°26' W; 220 m a.s.l.; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants in terre firme forest, at Trans 5, stn 7, Project MAXUS, Lot 916; USNM • 1 ♀; same collection data as for preceding; at Trans 2, stn 5, Lot 864; USNM • 3 ♀♀; Prov. Orellana, Yasuni Natl. Pk., Yasuni Research Stn; 0°40'50" S, 76°24'2" W; 250 m a.s.l.; 28 Apr.–8 May 2009; S.A. Marshall leg.; QCAZ • 1 ♀; same collection data as for preceding; debu01015708/MYCRO540-19 sequenced for CO1–5'; QCAZ • 1 ♀, 1?; Napo Province, Yasuni National Park, Yasuni Research Station; 76°36' W, 0°38' S; 3–20 Nov. 1998; T. Pape and B. Viklund leg.; QCAZ.

FRENCH GUIANA • 2 ♀♀; Cayenne, Comm. Regina, Kaw Mt. Relais de Patawam; 4°33' N, 52°10' W; 300 m a.s.l.; Dec. 2005; J.A. Cerda leg.; Malaise; DEBU • 1 ♀; same collection data as for preceding; debu00280292/MYCRO541-19 sequenced for CO1–5'; DEBU • 1 ♀; Mitaraka; 2°13'59.8" N, 54°27'46.5" W; 471 m a.s.l.; 13–20 Aug. 2015; P.H. Dalens leg.; MIT-E-savane roche 2; MT (6 m), MITARAKA/230; MNHN • 1 ♀; Mitaraka, sites nr base camp and along trails; 1–6 Mar. 2015; J. Touroult and E. Poirier leg.; SLAM, trop. moist forest, MITARAKA/195; MNHN.

PERU • 3 ♂♂, 3 ♀♀; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun. 2006; Paiero and Klymko leg.; MUSM • 1 ♀; same collection data as for preceding; debu00281552/MYCRO543-19 sequenced for CO1–5'; DEBU • 1 ♀; Madre de Dios, CICRA, Trail 2; 12.56104° W, 70.10645° S; 267 m a.s.l.; 1–6 Jan. 2014; T. Perez leg.; MHNJP • 2 ♀♀; Cusco, Est. Biol. Villa Carmen; 12°54' S, 71°24' W; 500–700 m a.s.l.; 22 Jun. 2014; trap VC-ML-84; MHNJP • 1 ♀; same collection data as for preceding; 31 May 2014; trap VC-ML-80; MHNJP • 1 ♀; same collection data as for preceding; 520–580 m a.s.l.; 8 May 2014; M. Choque leg.; multi-lure traps; USNM • 1 ♂; same collection data as for preceding; S side; 527 m a.s.l.; Jan 2014; Malaise trap; USNM • 1 ♀; Loreto Yanamono; 3°26.520' W, 72°50.9' S; 14 Mar. 2004; W. Reeves leg.; MUSM.

VENEZUELA • 1 ♂; Sucre, El Rincón, nr road between Carúpano and El Piler, along Rio El Rincón valley; 10°35'56" N, 63°11'49" W; 84 m a.s.l.; 8–9 Apr. 1998; M. von Tschirnhaus; 1° and 2° forest, sweep, river bank vegetation; debu00256946/MYCRO567-19 sequenced for CO1–5'; DEBU.

Description

LENGTH. 13–16 mm.

HEAD. Palpus orange, brown basally, pale brown microtrichose and setulose on entire surface, denser on ventral edge and apex, narrow (length 5.5× height). Clypeus orange or light brown, shiny, width

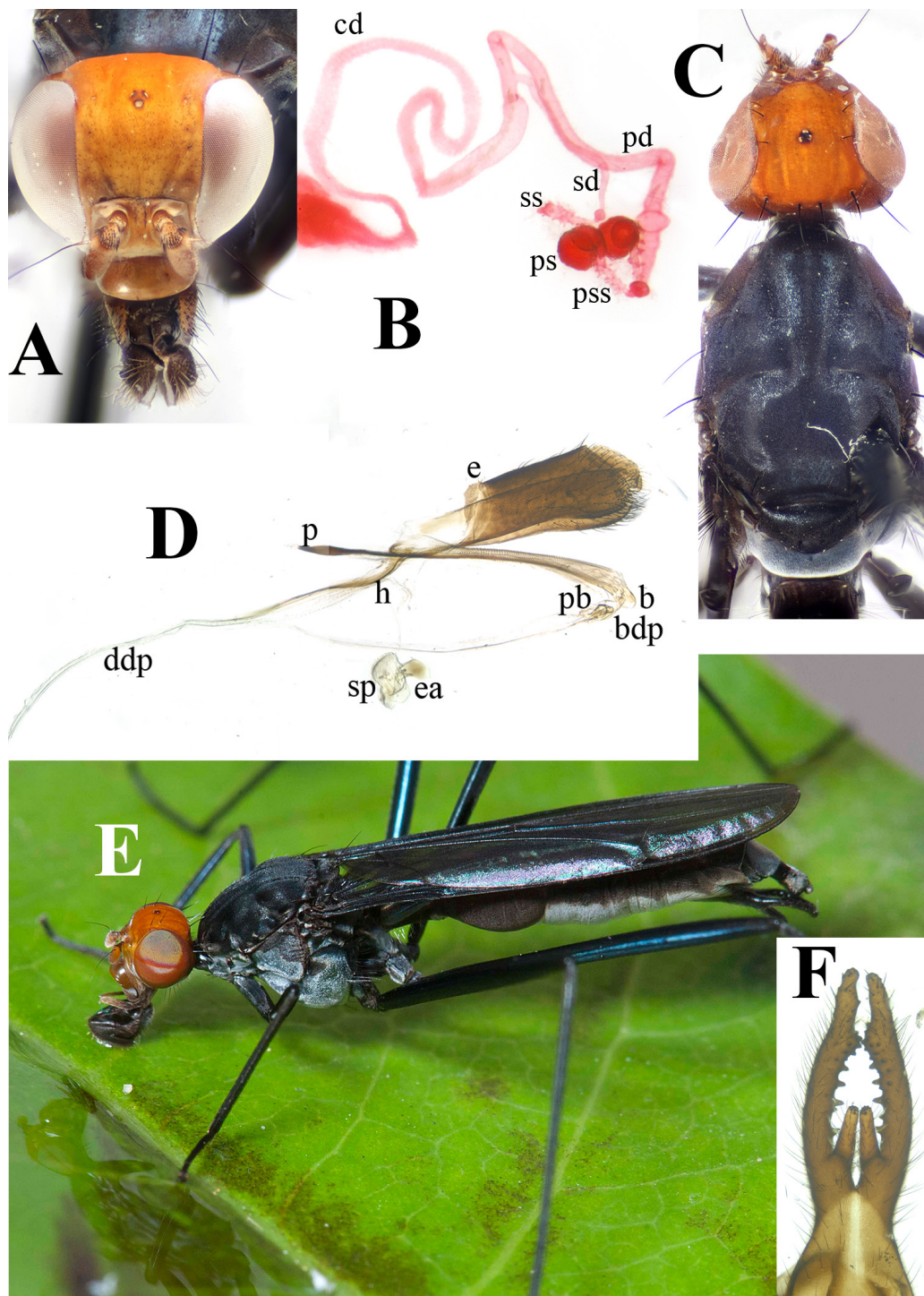


Fig. 20. *Scipopus (Scipopus) erythrocephalus* (Fabricius, 1805). **A.** Head, anterior view, ♀, Ecuador, non-type (QCAZ). **B.** Female spermathecae and associated structures, Ecuador, non-type (DEBU). **C.** Head and thorax, dorsal view, ♀, Ecuador, non-type (QCAZ). **D.** Male terminalia, lateral view, Ecuador, non-type (DEBU). **E.** Living, ♂, Bolivia. **F.** Male genital fork, ventral view, Ecuador, non-type (DEBU). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

~2.0× height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate orange, microtrichose, with shiny anterior orange or light brown bare patches (Fig. 20C). Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon orange or light brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

THORAX. Scutum black, with sparse silvery microtrichosity and three indistinct silvery anteromedian vittae. Female cervical sclerite slightly convex anteriorly. Postpronotal lobe black or brown, with very

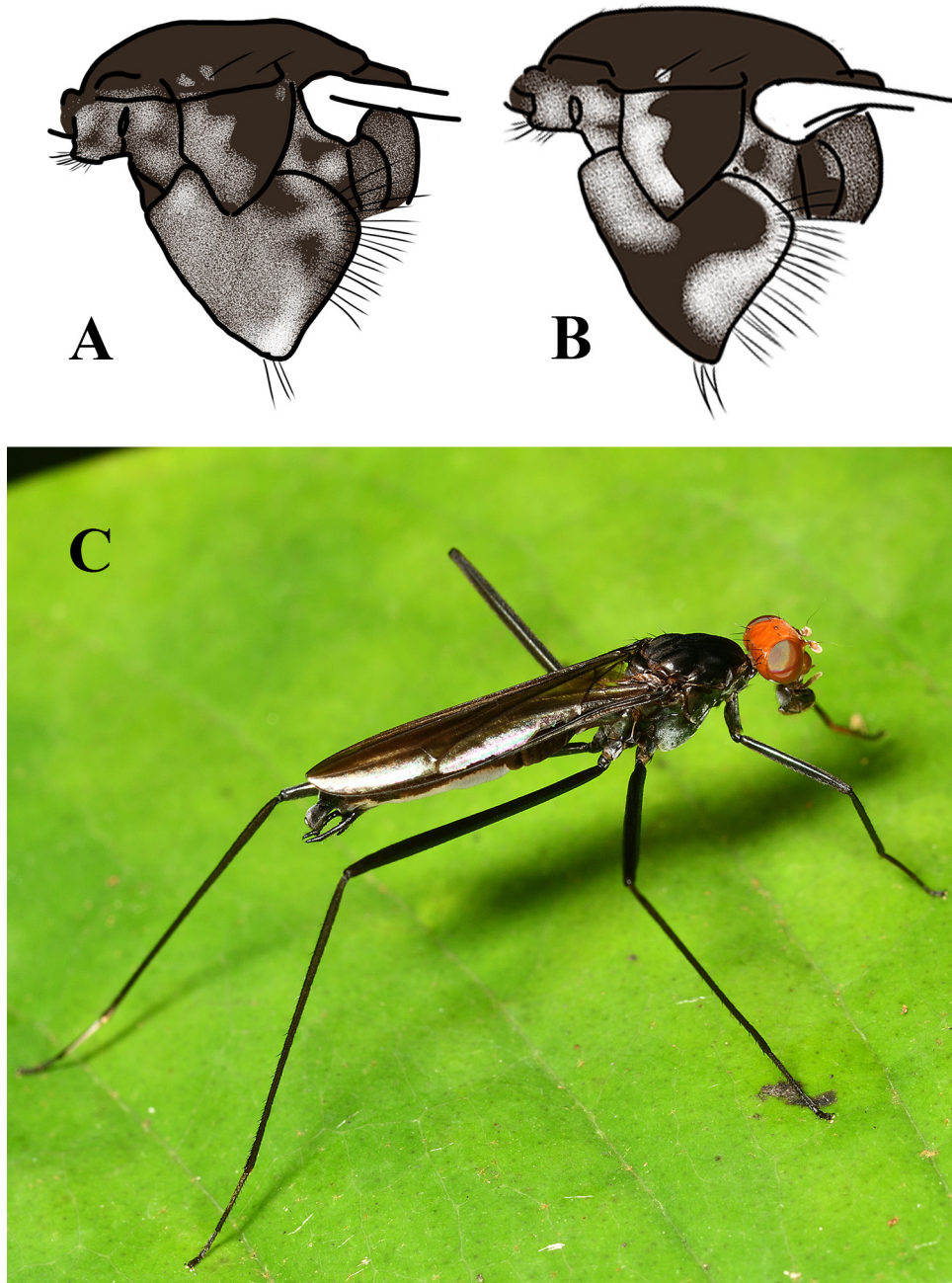


Fig. 21. *Scipopus (Scipopus) erythrocephalus* (Fabricius, 1805). **A.** Thorax, left pleuron, ♂, Peru, illustrating white microtrichosity. **B.** Thorax, left pleuron, ♀, Ecuador, illustrating microtrichosity. **C.** Living, ♂, Brazil (INPA).

few setulae on anterior outer margin. Notopleuron black with 1–2 small pale microtrichose spots. Pleuron with the following microtrichosity: entirely white on proepisternum, white except brown median line on proepimeron, white on anteroventral $\frac{1}{2}$ of anepisternum, otherwise brown, white with brown median spot on katatergite. Microtrichosity on katepisternum ranging from entirely white to mostly white, with brown ventral and dorsal patches or spots (Fig. 21A), to white anteriorly and posteriorly, with remainder brown (Fig. 21B).

ABDOMEN (σ^+ + ω). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose; P1 and dorsal half of P2–6 dark brown. T1+2 $\sim 2.0 \times$ length of T3. Oviscape black, white microtrichose on anteroventral $\frac{1}{2}$, ~ 2.0 – $3.0 \times$ length of T6. Combined spermathecal ducts long; common duct long, $\frac{2}{3}$ to $\frac{3}{4}$ of entire duct length. Paired spermathecal duct narrow, short (5.0 – $7.0 \times$ length of paired spermathecae), parallel-sided, distally smooth with swollen bulb (Fig. 20B), or with distal striae. Paired spermathecal stems same length or longer than spermathecae, relatively inornate but with some small tubercles. Paired spermathecae narrower basally, with well-defined groove or bend on basal $\frac{1}{3}$, separating spermathecae into smaller basal portion and larger distal portion. Single spermathecal duct arising from basal $\frac{1}{6}$ of paired duct, narrow, $\frac{1}{2}$ the diameter and \approx length as paired duct, swollen apically. Single spermatheca elongate, finger-like, with minute spiked tubercles.

MALE ABDOMEN. Pleuron pale grey, microtrichose, dark grey or brown on P1, most of P2 and dorsal half of P3–6 (Fig. 20E). T1+2 $\sim 2.0 \times$ length of T3. Genital fork large ($3.0 \times$ length of T6), distal ends straight or converging, inner basal process pointed inward or straight, $\sim \frac{1}{3}$ – $\frac{1}{2}$ length of arm. Epandrium elongate, length $2.0 \times$ height, densely setose on posteroventral margin. Basiphallus small, projecting posteriorly, crescent-shaped. Basal distiphallus very short (shorter than phallic bulb), ending in phallic bulb. Phallic bulb short and small, length \approx height, with upper and lower chamber and rounded posterior projection. Distal distiphallus very long, $> 3.0 \times$ length of epandrium. Phallapodeme slender, slightly expanded distally.

Remarks

The type of this species is severely damaged and only one wing remains; however, the original descriptions and treatments of the species by Hennig (1934) and Albuquerque (1971) are consistent with our concept of the species. *Scipopus alvarengai* is synonymized with *S. (S.) erythrocephalus* based on the similar pleural patterns on the thorax, the similar male and female terminalia (including the exceptionally large genital fork), and molecular data.

Distribution

Steyskal (1968) gives the distribution of this species as Panama south to Brazil and Bolivia, but the material we have examined suggests that *S. (S.) erythrocephalus* is restricted to South America.

Scipopus (Scipopus) furcifer Hennig, 1934 Figs 22–23

Scipopus furcifer Hennig, 1934: 327, tab. 3, figs 28–29.

Scipopus furcifer – Hennig 1937: 48 (listed). — Aczél 1949: 342 (catalog). — Steyskal 1968: 48.16 (catalog).

Differential diagnosis

Scipopus (Scipopus) furcifer resembles *S. (S.) nigripennis* in having a white first fore tarsomere and a shiny epicephalon that is clearly delineated from the upper frontal vitta, but it differs by the brown microtrichose ventral corner of the katepisternum.

Type material examined

Syntypes (photos provided Frank Menzel, Dec. 2020, SDEI)

HONDURAS? • 1 ♂; Bolixe, VII; coll. Oldenberg; SDEI.

BELIZE • 1 ♀; SDEI.

Other material examined

GUATEMALA • 1 ♂; Piedras Negras; Apr.–Jun. 1937; T. Proskouriakoff leg.; Lot 904; DEBU • 1?; Concepción; 1400 ft. a.s.l.; Mar. 4 1932; “C.N.A. Inslie” leg.; USNM.

MEXICO • 5 ♂♂, 7 ♀♀; Chiapas, 6 km N of Ococingo; 840 m a.s.l.; 8 May 1985; A. Freidberg leg.; TAU1 (1 ♂, 1 ♀ dissected and photographed, Fig. 22B–C, E–F) • 1 ♀; same collection data as for preceding; debu01089057/MYCRO642-20 unsuccessfully sequenced for CO1–5'; TAU1 • 1 ♀; Chiapas, Nahá; 16°56'55" N, 91°35'37" W; 930 m a.s.l.; 9–13 Jun. 2008; Malaise trap, mesophil forest; debu00312075/MYCRO566-19 sequenced for CO1–5'; DEBU (photographed, Fig. 22A, D, G) • 1 ♀; same collection data as for preceding; debu00312073/MYCRO538-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 1 ♀; Veracruz “#11”, 14 mi. SE of San Andres Tuxtla; 600 ft. a.s.l.; 24 Jun. 1961; G.W. Byers leg.; SEMC • 1 ♂; Chiapas, Finca Prusia, 33 km S of Jaltenango; 1000 m a.s.l.; 10–12 May 1985; A. Freidberg leg.; TAU1 • 1 ♀; same collection data as for preceding; debu01089058/MYCRO641-20 unsuccessfully sequenced for CO1–5'; TAU1 • 1 ♀; Veracruz, Fortin, Barranca de Metlac; 25–23 Jun. 2003; R. Arce and L. Delgado leg.; IEXA • 1 ♀; San Luis Potosi, Aquismon, Tambaque; 13 Jun. 2001; V. Hernandez leg.; IEXA • 1 ♀; Veracruz, Teocela, Texolo; 1167 m a.s.l.; 21 Aug. 1989; res area; V. Hernandez leg.; IEXA • 1 ♂; Veracruz, San Andrés Tuxtla, Est. Biol. Lox Tuxtlas; 80 m a.s.l.; 11–13 Jul. 1990; red area; R. Pérez leg.; IEXA.

Description

LENGTH. 14–17 mm.

HEAD. Palpus light brown or orange, pale brown microtrichose and setulose, narrow (length $5.0 \times$ height). Clypeus orange or light brown, width $\sim 1.8 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta and orbital plate dull, orange, microtrichose. Epicephalon orange to light brown, shiny, indistinctly silvery-microtrichose, narrow or wide, clearly delineated from upper frontal vitta. Paracephalon slightly convex on posterolateral portions (Fig. 22H). All head chaetotaxy well-developed.

THORAX. Scutum black-brown, brown microtrichose, with three pale brown median vittae, sometimes overlaid by blue sheen; pale brown spot anterior to transverse suture (Fig. 22D). Female cervical sclerite convex. Postpronotal lobe black-brown, sparsely setulose on outer margin. Notopleuron black-brown with pale line of microtrichosity anteriorly and medially. Pleuron black-brown with the following microtrichosity: entirely white on proepisternum, entirely white on proepimeron except median brown line, white on anteroventral $\frac{1}{3}$ of anepisternum, with ventral corner and remainder brown, almost entirely brown on katapisternum, or mostly brown with white transverse band and median brown spot; ventral corner always brown (Fig. 23), white on margins of katatergite. Legs black-brown with blue sheen; first fore tarsomere white, hind tarsomere 1 almost entirely white dorsally. Wing uniformly black-brown infuscate.

ABDOMEN (♂+♀). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose, P1 and dorsal half of P2 dark brown, dorsal half of P3–6 lighter brown. T1+2 $\sim 2.0 \times$ length of T3. Oviscape $\sim 2.0\text{--}3.0 \times$ length of T6, black-brown, white microtrichose on anterior $\frac{1}{3}$. Combined spermathecal ducts short; common duct narrow, $\frac{1}{4}$ of total

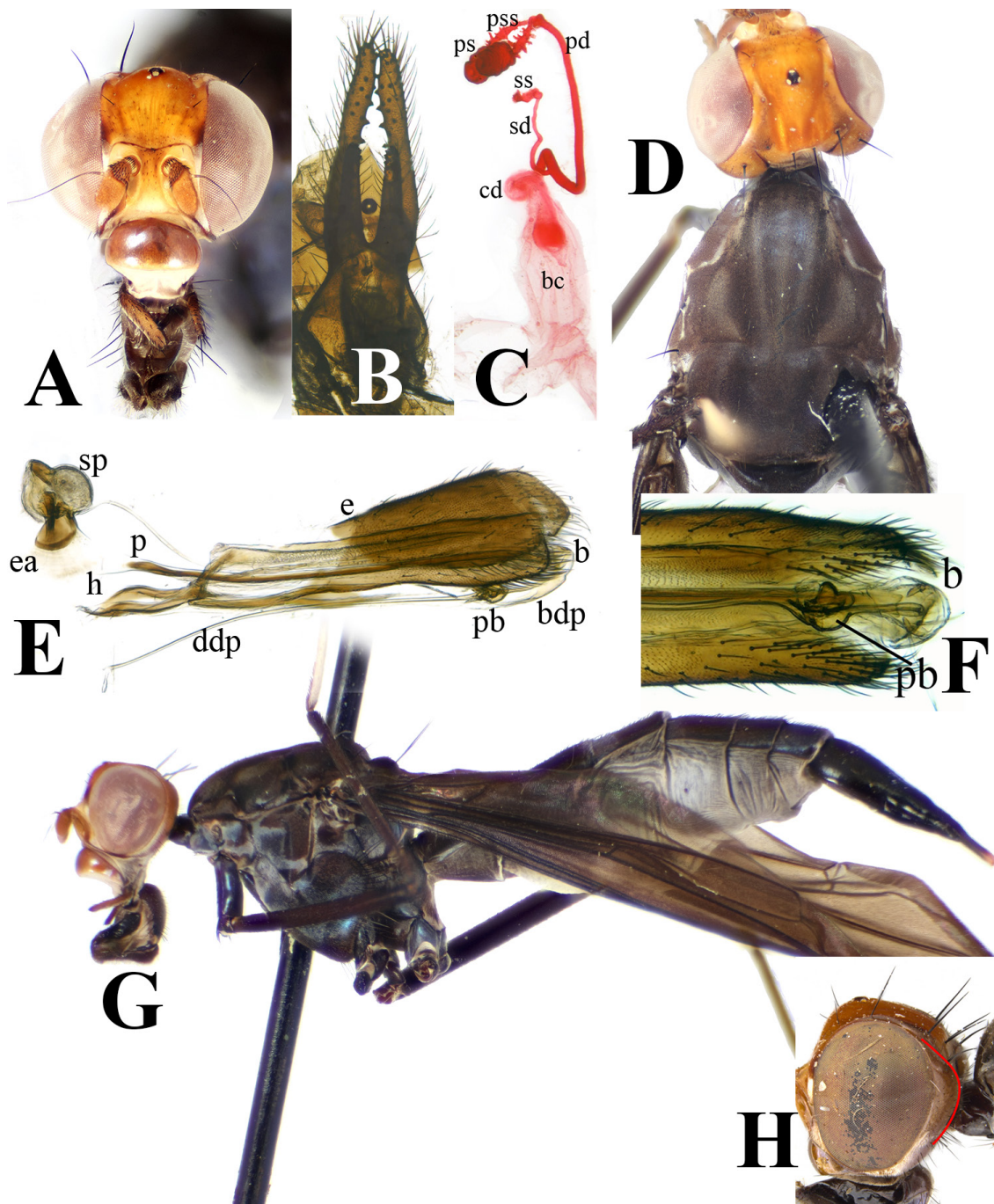


Fig. 22. *Scipopus (Scipopus) furcifer* Hennig, 1934. **A.** Head, ♀, anterior view, Mexico, non-type (DEBU). **B.** Male genital fork, ventral view, Mexico, non-type (TAUI). **C.** Female spermathecae and associated structures, Mexico, non-type (TAUI). **D.** Head and thorax, ♀, dorsal view, Mexico, non-type (DEBU). **E.** Male terminalia, lateral view, Mexico, non-type (TAUI). **F.** Male terminalia, ventral view, Mexico, non-type (TAUI). **G.** Habitus, ♀, Mexico, non-type (DEBU). **H.** Head, lateral view, red line indicating slight convexity, Mexico, syntype (SDEI) (Photo credit: Frank Menzel). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

duct length. Paired spermathecal duct narrow, short ($5.0 \times$ length of paired spermathecae), bent basally, parallel-sided, swollen apically. Paired spermathecal stems of equal length to spermathecae, with pointed tubercles. Paired spermathecae ovoid, bent basally, with apical indentations. Single spermathecal duct arising from basal $\frac{1}{8}$ of paired duct, very narrow, $\frac{1}{2}$ diameter and length of paired duct, swollen apically. Single spermatheca elongate, finger-like, with sparse, minute tubercles.

MALE ABDOMEN. Pleuron of available specimens discoloured. T1+2 $\sim 2.2\text{--}3.0 \times$ length of T3. Genital fork $\sim 2.5 \times$ length of T6, arms converging, inner basal process straight, over $\frac{1}{2}$ length of arms. Epandrium elongate (length $2.0 \times$ height), posteroventral margin densely short setose. Basiphallus small, crescent-

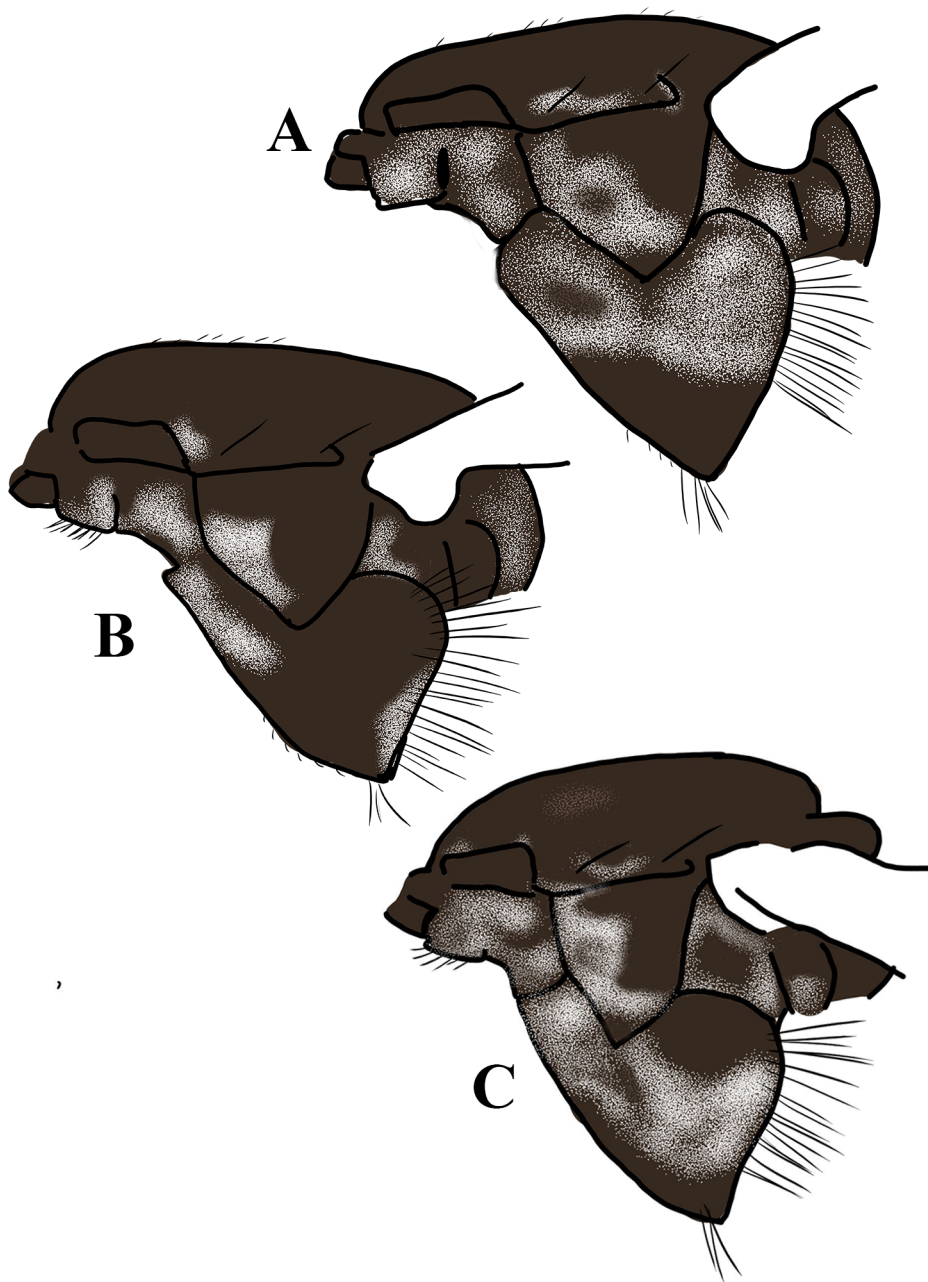


Fig. 23. Variation in white microtrichosity on the left lateral thoracic pleuron of *Scipopus* (*Scipopus*) *furcifer* Hennig, 1934. **A.** ♀, Mexico. **B.** ♀, Mexico. **C.** ♂, Mexico.

shaped. Basal distiphallus short ($\sim 3.0 \times$ phallic bulb), broad, ending in phallic bulb. Phallic bulb small and short, length \approx height, approximately round, upper chamber with very small rounded posterior projection, lower chamber semi-circular. Distal distiphallus long and slender, $\sim 2.0 \times$ length of epandrium, apex very slightly expanded. Phallapodeme apically expanded (not visible in Fig. 22E).

Distribution

Honduras, Belize, Mexico (new record) to Guatemala (new record).

Scipopus (Scipopus) lateralis Hennig, 1934

Figs 24–25

Scipopus lateralis Hennig, 1934: 326.

Scipopus lateralis – Hennig 1937: 48 (listed). — Aczél 1949: 342 (catalog). — Steyskal 1968: 48.16 (catalog).

Differential diagnosis

Scipopus (Scipopus) lateralis resembles other species of *Scipopus* s. str. that also have an at least partially white first fore tarsomere and a shiny, clearly delineated epicephalon (*S. (S.) brikelos* sp. nov., *S. (S.) nigripennis*, *S. (S.) furcifer* and *S. (S.) chalybeus*), but differs in the straight line of white microtrichosity on the anteroventral part of the anepisternum and the dense lines of pale microtrichosity on the postpronotal lobe and notopleuron (Fig. 25).

Type material examined

Holotype (examined and photographed in Halle, 2002)

ECUADOR • 1 ♀; Cordillera [The Mountains]; MLUH.

Paratype (examined and photographed in London, 2014)

ECUADOR • 1 ♀; Balzapamba; R. Haensch leg.; BMNH.

Other material examined

ECUADOR • 1 ♀; Rio Palenque, Univ. Miami. Res. stn; 29 Jul. 1978; G.J. Umphrey leg.; debu01088999/MYCRO553-19 unsuccessfully sequenced for CO1–5'; QCAZ • 1 ♂, 1 ♀; Pich. Pr., 47 km S of Sto. Domingo, Rio Palenque Station; 250 m a.s.l.; 17–25 Feb. 1979; S.A. Marshall leg.; QCAZ (dissected and photographed, Fig. 24B, D) • 1 ♀; same collection data as for preceding; debu00242010/MYCRO561-19 unsuccessfully sequenced for CO1–5'; DEBU (dissected and photographed, Fig. 24A, C, E–G).

Description

LENGTH. 11–12 mm.

HEAD. Palpus dark brown, paler apically, pale brown microtrichose and setulose on entire surface, denser on ventral edge and apex, broad (length $3.6 \times$ height). Clypeus dark brown, width $\sim 2.1 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate bare, with slight shine anterolaterally. Epicephalon light brown, shiny, white microtrichose, narrow (width $< \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon dark brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

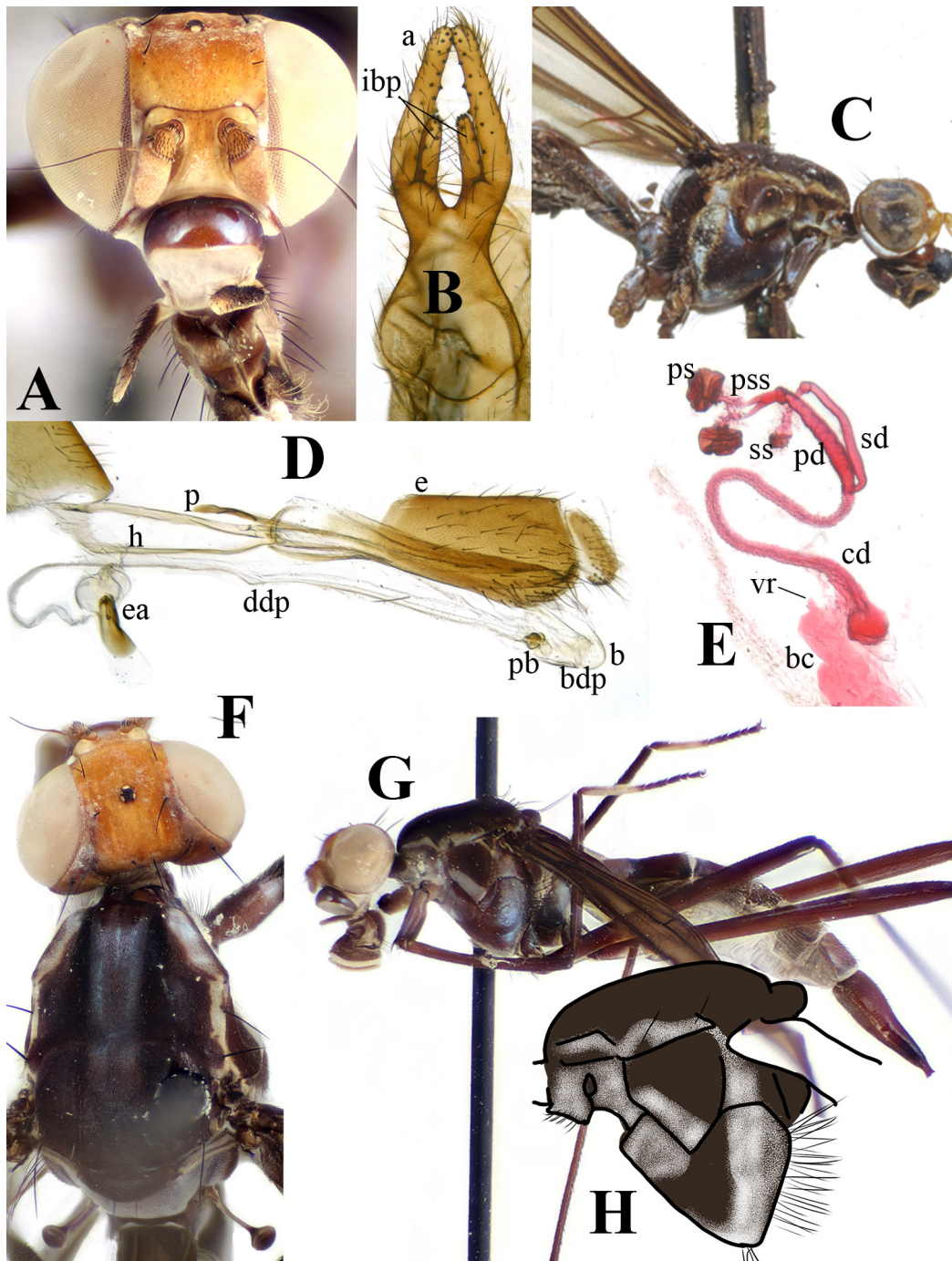


Fig. 24. *Scipopus (Scipopus) lateralis* Hennig, 1934. **A.** Head, ♀, anterior view, Ecuador, non-type (DEBU). **B.** Male genital fork, ventral view, Ecuador, non-type (QCAZ). **C.** Right lateral view, ♀, Ecuador, paratype (DEBU). **D.** Male terminalia, lateral view, Ecuador, non-type (QCAZ). **E.** Female spermathecae and associated structures, Ecuador, non-type (DEBU). **F.** Head and thorax, ♀, dorsal view, Ecuador, non-type (DEBU). **G.** Habitus, ♀, Ecuador, non-type (DEBU). **H.** Thorax, ♀, left lateral view, illustrating white microtrichosity. Abbreviations: a = genital fork arms; b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; ibp = inner basal process; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; ss = single spermatheca; vr = ventral receptacle.

THORAX. Scutum black-brown, with median light brown vitta, margins of vitta with silvery blue sheen. Female cervical sclerite slightly convex anteriorly. Postpronotal lobe black-brown, pale microtrichose dorsally, with very few to no setulae on outer margin. Notopleuron black-brown, pale microtrichose ventrally. Pleuron black-brown with the following microtrichosity: entirely white on proepisternum and proepimeron, white on anteroventral $\frac{1}{4}$ of anepisternum, forming a parallel-sided band, remainder brown, white anterior patch and posterior band on katepisternum which extends onto anterior half of katatergite. Legs dark brown; fore tarsomere 1 white dorsally; hind tarsomere 1 almost entirely white dorsally. Wing uniformly brown infuscate.

ABDOMEN ($\text{\textcircled{♂}}+\text{\textcircled{♀}}$). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron almost entirely black, pale grey on ventral corners of P1–2 (Fig. 25). T1+2 $\sim 2.0 \times$ length of T3. Oviscape dark brown basally, darker apically, sparse black setulose, white microtrichose on anterior $\frac{1}{3}$, $\sim 1.5\text{--}2.0 \times$ length of T6. Combined spermathecal ducts long; common duct narrow, $\frac{2}{3}$ of entire duct length. Paired spermathecal duct wide, nearly parallel-sided, swollen apically and basomedially. Paired spermathecal stems longer than spermathecae, smooth on basal half, with tubercles on distal half. Paired spermathecae approximately spherical, collapsed in Fig. 24E. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ diameter and \approx length as paired duct,



Fig. 25. *Scipopus (Scipopus) lateralis* Hennig, 1934, mating, Santo Domingo, Ecuador. Photo credit: Nataly Lara. <https://www.inaturalist.org/observations/60961790>

swollen apically. Single spermatheca elongate, wider distally, nearly teardrop-shaped, with minute tubercles.

MALE ABDOMEN. Ventral pleuron pale grey, P1, entire pleural sac and dorsal half of P3–6 dark brown or black. T1+2 $\sim 2.0 \times$ length of T3. Genital fork $\sim 2.5 \times$ length of T6, arms converging, touching, inner basal process straight, $\sim \frac{1}{2}$ the length of arm. Epandrium elongate, length $2.0 \times$ height, wider posteriorly, short setose posteroventrally. Basiphallus small, crescent-shaped. Basal distiphallus short ($\sim 2.0 \times$ phallic bulb length), broad, ending in phallic bulb. Phallic bulb short and small, length \approx height, approximately round, with upper chamber with large, rounded posterior projection and lower rounded chamber. Distal distiphallus long and narrow, $> 2.0 \times$ length of epandrium. Phallapodeme expanded apically (not visible in Fig. 24E).

Distribution

Ecuador.

Scipopus (Scipopus) nigripennis (Hendel, 1922)

Figs 26–27

Tanypoda nigripennis Hendel, 1922: 321.

Scipopus albimanus Enderlein, 1922: 212.

Scipopus limbativertex Enderlein, 1922: 211. **Syn. nov.**

Scipopus limbativertex – Frey 1927: 74 (listed). — Cresson 1930: 328 (diagnosis). — Hennig 1934: 328 (key). — Aczél 1949: 342 (catalog); 1951: 539 (key). — Steyskal 1968: 48.16 (catalog). — Schumann 1988: 99 (catalog). — Ferro & de Carvalho 2014: 60 (listed). — Marshall *et al.* 2016: 544 (catalog).

Scipopus albimanus – Hennig 1934: 328 (synonymized with *S. nigripennis*). — Schumann 1988: 85 (catalog).

Scipopus nigripennis – Hennig 1934: 328 (key). — Aczél 1949: 342 (catalog). — Steyskal 1968: 48.16 (catalog). — Marshall *et al.* 2016: 544 (catalog).

Differential diagnosis

Scipopus (Scipopus) nigripennis resembles *S. (S.) furcifer* in having an at least partially white first fore tarsomere and a shiny epicephalon that is clearly delineated from the upper frontal vitta, but it differs by the white microtrichose ventral corner of the katapisternum.

Type material examined

Holotype (*Tanypoda nigripennis*, photos provided by Peter Sehnal at NHMW, Oct 2020)
ECUADOR • 1 ♀; Balzapamba; R. Haensch leg.; NHMW.

Syntypes (*Scipopus albimanus*, not examined)
COLOMBIA • 1 ♂, 1 ♀; “Cordilliere, terra caliente”; Dr. Thieme leg.; MNBG.

Syntypes (*Scipopus limbativertex*, examined and photographed in Berlin, 2002, additional photos provided by Jenny Pohl, MNBG)
COLOMBIA • 1 ♂; Cordillieren (terra caliente); Dr Thieme leg.; MNBG.

BRAZIL • 1 ♀; Matto Grosso; Rhode leg.; MNBG.

COLOMBIA • 2 ♂♂; Cordillieren (terra caliente); Dr Thieme leg.; MNBG • 1 ♀; Moritz leg.; MNBG • 1 ♀; Muzo; Rhode leg.; MNBG.

MEXICO • 1 ♀; Soconusco; 30 Jul. 1911; C.A. Purpus leg.; MNBG • 1 ♀; same collection data as for preceding; 22 Jul. 1911; MNBG.

Other material examined

COSTA RICA • 1 ♂, 2 ♀♀; Heredia, Santo Domingo, INBio Pk.; 19–21 Aug. 2001; S.A. Marshall leg.; DEBU • 1 ♀; same collection data as for preceding; USNM • 1 ♀; Monteverde Cloud Forest; 1500 m a.s.l.; 21–26 Aug. 1993; E.R. Barr leg.; Malaise traps; MNCR • 1 ♀; Turrialba; 15 Jul. 1965; P.J. Spangler leg.; USNM • 1 ♂; San Jose, Farm La Caja; 15 May 1919; H. Schmidt leg.; USNM • 1 ♂; Prov. Puntarenas, 2 km N of Hacienda Barú de Dominical Reserve; 22–25 Feb. 2008, S.A. Marshall leg.; MNCR • 1 ♂; same collection data as for preceding; debu00294649/MYCRO545-19 sequenced for CO1–5'; DEBU • 1 ♂; same collection data as for preceding; debu00294650/MYCRO555-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 1 ♂; Prov. Puntarenas, Golfito, P.N. Corvocado, Sector Los Patos, S of al Mirador; 130 m a.s.l.; 15 Nov. 2000; K. Caballero leg.; manual; L_S_517200_279665#61791; MNCR • 1?; same collection data as for preceding; UGIC261-15/MYCRO162-15 sequenced for CO1–5'; L_S_517200_279665#61792; MNCR • 1 ♀; Alajuela, Volcán Tenorio, N slope nr Bijagua Biol. Stn; 700 m a.s.l.; 19 Jun. 2000; M. Buck leg.; rain forest; MNCR • 1 ♀; Puntarenas, Corcovado Natl. Pk., San Pedrillo; 8°37'15" N, 83°44'6" [W]; 5–50 m a.s.l.; M. Buck leg.; human dung; UGIC129-15/MYCRO030-15 sequenced for CO1–5'; DEBU • 1 ♀; San José, San Carlos, Riosparaiso Res., Pecari Stn, 16 km NNE of Quepos; 9°33'53" N, 84°7'32" W; 400 m a.s.l.; 15 Feb. 2003; S.A. Marshall leg.; MNCR • 4 ♀♀; Puntarenas, Osa Peninsula, 2.5 km D of Rincón; 8°42'1" N, 83°30'50" S; ~50 m a.s.l.; 10–11 Aug. 2001; S.A. Marshall leg.; MNCR (dissected and photographed, Fig. 26C) • 1 ♂, 1 ♀; Alajuela, Volcán Tenorio, N slope nr Bijagua Biol. Stn; 700 m a.s.l.; 17 Jun. 2000; M. Buck leg.; rain forest; MNCR (dissected and photographed, Fig. 26B, E) • 1 ♀; same collection data as for preceding; 16–20 Jun. 2000; S.A. Marshall leg.; RET over Atta mound; DEBU • 1 ♀; same collection data as for preceding; rain forest; UGIC132-15/MYCRO033-15 sequenced for CO1–5'; DEBU • 2 ♀♀; same collection data as for preceding; trail to laguna; ~1000 m a.s.l.; rain forest; DEBU • 2 ♀♀; same collection data as for preceding; 19 Jun. 2000; Buck and Marshall leg.; pan traps in tree fall; MNCR • 1 ♀; same collection data as for preceding; debu00138141/MYCRO514-19 sequenced for CO1–5'; DEBU • 1 ♀; Alajuela, San Ramon Biol. Res.; 900 m a.s.l.; May 2000; P. Hanson leg.; MNCR • 1 ♀; San Juan de Peñas Blancas, San Ramón, Soltis Research Centre; 17 Jul. 2013; S.A. Marshall leg.; debu01088995/MYCRO547-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU (photographed, Fig. 26G) • 2 ♀♀; Alajuela, San Gerardo Biol. Stn; 10°52'51" N, 85°23'20" W; ~590 m a.s.l.; 15 Aug 2010; M.D. Jackson leg.; MNCR (photographed, Fig. 26F) • 1 ♀; San José, San Carlos Riosparaiso Res. Pecari Stn, 16 km NNE of Quepos; 9°33'53" N, 84°7'32" W; 400 m a.s.l.; 12–15 Apr. 2006; S.A. Marshall leg.; DEBU • 1 ♀; same locality as for preceding, upper trail to Rio Negro; 26 Feb. 2006; S.M. Paiero leg.; 1° forest; MNCR • 1 ♀; same locality as for preceding, along road from lodge; ~1000 m a.s.l.; 15 Apr. 2015; S.A. Marshall leg.; debu00260110/MYCRO546-19 sequenced for CO1–5'; DEBU • 1 ♀; San Jose, Heredia Biodiversity Garden; 2 Jun. 1998; S.A. Marshall leg.; DEBU • 1 ♀; Guanacaste, Santa Rosa Natl. Pk., hilltop nr La Casona; 10°50'3" N, 85°36'41" W; 320 m a.s.l.; 16 Aug. 2016; M.D. Jackson leg.; DEBU • 2 ♂♂, 2 ♀♀, 2?; Heredia, Santo Domingo, INBio Pk.; 19–21 Aug. 2001; S.A. Marshall leg.; DEBU • 3 ♂♂, 1 ♀; same locality as for preceding; 3 Oct. 1999; Marshall and Buck leg.; DEBU • 1 ♀; same locality as for preceding; Jun. 2000; M. Buck leg.; DEBU • 1 ♀; Heredia, etac. Biol. La Selva; 2 Apr. 1993; ALAS exped.; Malaise trap; M/11/058; MNCR • 1 ♀; same locality as for preceding; 2 Mar. 1993; ALAS exped.; MNCR • 1 ♀; Cartago, El Copal. Biol. Res., along Gárvula trail; 9°47' N, 83°45' W; ~1100 m a.s.l.; 4–7 Aug. 2010; G.F.G. Miranda leg.; DEBU • 1 ♀; Cartago Prov., Turriabla; 13 Jul. 1965; G. and K. Eickwort leg.; SEMC • 1 ♀, 1?; same locality as for preceding; "4" Jun. 1951; O.L.

Cartworth leg.; USNM • 1?; same collection data as for preceding, 6 Jun. 1951; USNM • 1 ♀; same collection data as for preceding; 22 May 1951; USNM.

HONDURAS • 1 ♂; Gracias a Dios, Rio Patuca, Krausirpe; 22–24 May 1994; B.D. Gill leg.; debu00138356/MYCRO563-19 unsuccessfully sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; debu00138349/MYCRO644-20 unsuccessfully sequenced for CO1–5'; DEBU.

PANAMA • 1 ♂; Potrerillos; 27 Apr. 1954; D.V. Brown leg.; USNM • 1 ♂; Barro Colo. C.Z.; 22 Apr. 1929; S.W. Frost leg.; USNM • 1 ♂; same collection data as for preceding; 12 Feb. 1929; USNM • 1 ♂; same collection data as for preceding; 1 Apr. 1929; USNM • 1 ♀; same collection data as for preceding; Apr. 16 1926; USNM • 1 ♀; Canal Zone Barro Colorado Island; 25 Mar. 1956; C.W. and M.E. Rettenmeyer leg.; SEMC • 1 ♀; Summit, C.Z.; Nov. 1946; N.L.H. Krauss leg.; USNM • 1 ♀; same collection data as for preceding; Oct. 1946; USNM • 1 ♂; Barro Colorado Isl. Canal Zone; 11 May 1978; Silberglied and Aiello leg.; DEBU • 1 ♀; Barro Colorado Isl.; 1–9 May 1964; W.D. and S.S. Duckworth leg.; USNM.

Description

LENGTH. 11–15 mm.

HEAD. Palpus dark brown, pale brown microtrichose and setulose on entire surface, microtrichosity denser on ventral edge and apex, narrow (length $5.0 \times$ height). Clypeus light brown to black, width $1.2\text{--}2.0 \times$ height, bare medially, white microtrichose posterolaterally. Frontal vitta and orbital plate dull, orange, microtrichose. Epicephalon light to dark brown, shiny, mostly bare, white microtrichose near upper fronto-orbital, narrow (width $< \frac{2}{3}$ of upper frontal vitta width at upper fronto-orbitals), clearly delineated. Paracephalon light to dark brown, slightly convex on outer portions. All head chaetotaxy well-developed.

THORAX. Scutum black-brown, light brown microtrichose, with narrow, anteromedian pale brown vitta flanked by black-brown vittae overlaid with a blue sheen; dull silvery-blue patch anterolaterally to transverse suture. Cervical sclerite slightly convex. Postpronotal lobe black-brown, silvery microtrichose anterodorsally, some black setulae on outer lateral margin. Notopleuron black-brown, pale microtrichose line or spot posterior to anterior notopleural seta extending onto ventral edge. Pleuron with the following microtrichosity: entirely white on proepisternum, almost entirely white on proepimeron, with brown on posterodorsal corner, white on anteroventral $\frac{1}{2}$ and posterodorsal corner of anepisternum, sometimes white on dorsal margin (Fig. 27); ventral corner and remainder brown, almost entirely white on katatergite, at some angles small median brown spot visible. Microtrichosity on katepisternum ranges from entirely white with a small median brown spot (Fig. 27A), to large white patches anteriorly and posteriorly, with remainder brown (Figs 26G, 27B). Legs black-brown with blue sheen; first fore tarsomere entirely white dorsally, hind tarsomere 1 almost entirely white dorsally. Wing uniformly black-brown infusate.

ABDOMEN (♂+♀). T1 with fine, long white setae. Pleuron light grey, microtrichose, P1 and dorsal half of P2–6 dark brown.

FEMALE. T1+2 $2.0 \times$ length of T3. Oviscape $2.0\text{--}3.0 \times$ length of T6, dark brown, sparsely brown setulose, white microtrichose on anterior $\frac{1}{3}$. Combined spermathecal ducts long; common duct $\sim \frac{2}{3}$ of total duct length. Paired spermathecal duct long ($8\text{--}10 \times$ length of paired spermathecae), parallel-sided, slightly swollen apically. Paired spermathecal stems slightly longer than spermathecae, bare or with sparse pointed tubercles. Paired spermathecae approximately spherical. Single spermathecal duct arising from basal $\frac{1}{8}$ of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct, swollen apically. Single spermatheca apically round and sclerotized, inornate.

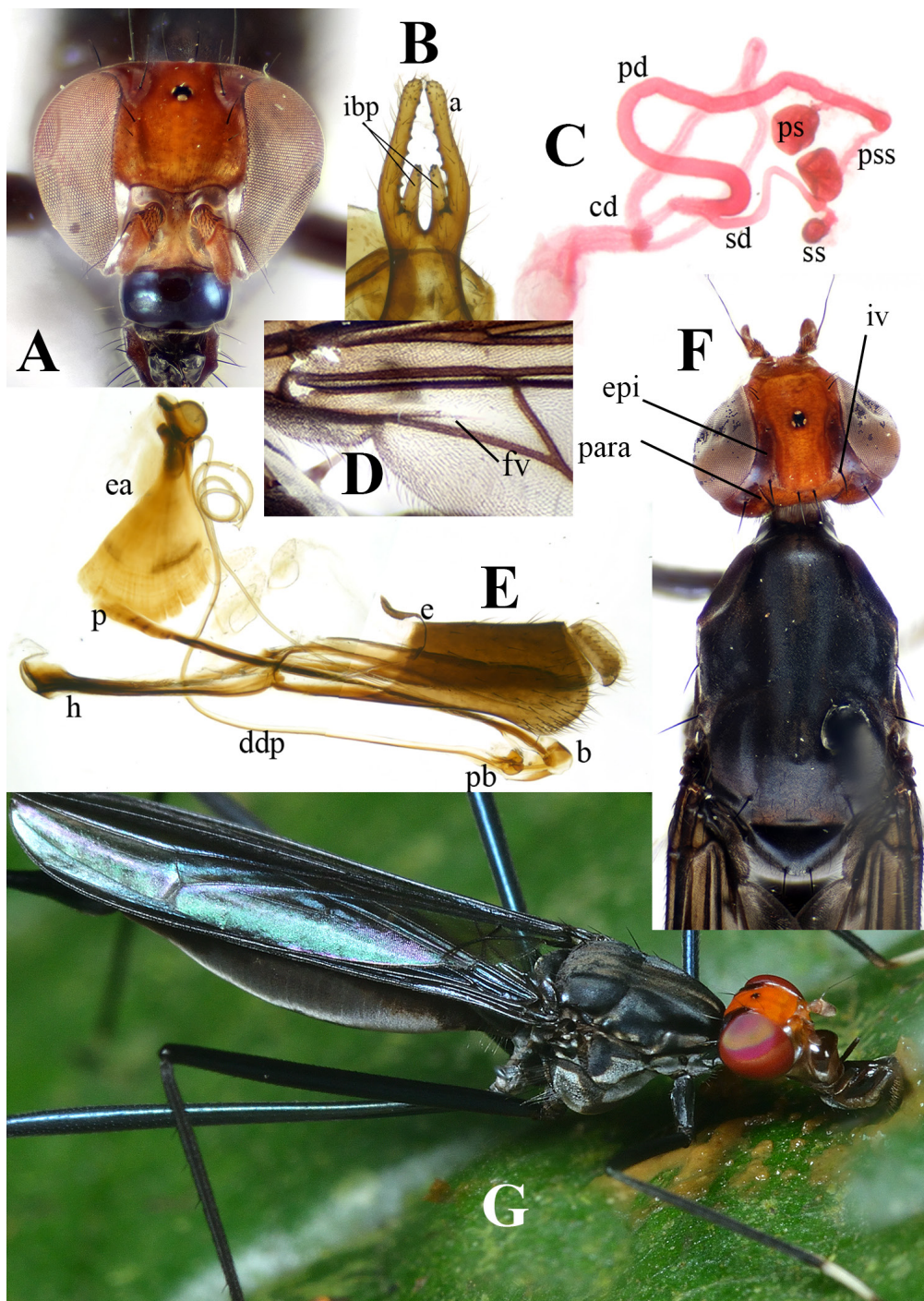


Fig. 26. *Scipopus (Scipopus) nigripennis* (Hendel, 1922). **A.** Head, anterior view, ♀, non-type. **B.** Male genital fork, ventral view, Costa Rica, non-type (MNCR). **C.** Female spermathecae and associated structures, Costa Rica, non-type (MNCR). **D.** Wing, close-up of anal (*cua*) cell (MNCR). **E.** Male terminalia, lateral view, Costa Rica, non-type (MNCR). **F.** Head and thorax, dorsal view, ♀, Costa Rica, non-type (MNCR). **G.** Living, ♀, Costa Rica (DEBU). Abbreviations: a=genital fork arms; b = basiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; epi = epicephalon; fv = false vein; h = hypandrium; ibp=inner basal processes; iv = inner vertical seta; p = phallopodeme; para = paracephalon; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; ss = single spermatheca.

MALE. T1+2 $\sim 2.1 \times$ length of T3. Genital fork $\sim 2.5 \times$ length of T6, arms converging, nearly touching, inner basal process straight, $\sim \frac{1}{2}$ length of arm. Epandrium elongate, (length $2.0 \times$ height), taller posteriorly, short setose on posteroventral edge. Basiphallus small, frame-like. Basal distiphallus very short ($< 1.0 \times$ phallic bulb length), broad, ending in phallic bulb. Phallic bulb small and short, length \approx height, upper chamber with or without rounded posterior projection, lower chamber rounded. Distal distiphallus very long and narrow, $3.0 \times$ length of epandrium, distal end coiled, apex expanded and funnel-like. Phallapodeme slender, not expanded apically.

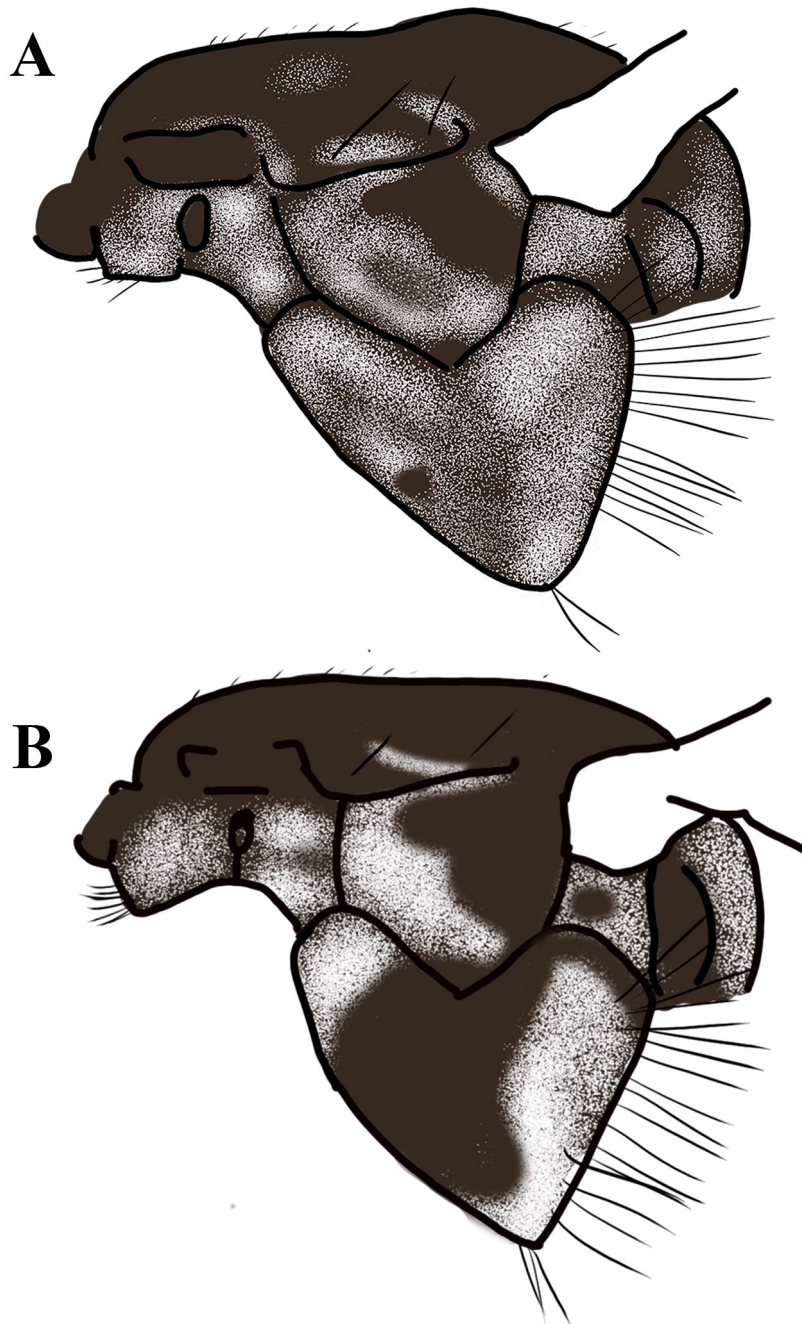


Fig. 27. Variation in white microtrichosity on the left thoracic pleuron of *Scipopus* (*Scipopus*) *nigripennis* (Hendel, 1922). **A.** Thorax ♂, Costa Rica. **B.** Thorax, ♀, Costa Rica.

Remarks

Some dried specimens of *S. (S.) nigripennis* have a very narrow abdomen and lightly infusate wings. *Scipopus limbativertex* is considered a junior synonym as it has similar external morphology, identical female terminalia, and very similar male terminalia to *S. (S.) nigripennis*. The name of Enderlein is treated as a junior synonym since Enderlein (1922) was published several months after Hendel (1922). The syntypes from Mexico appear to be *S. (S.) furcifer*.

Distribution

Although the type material of this species is from Colombia, Ecuador and Brazil, there are no specimens of this species among the extensive recently collected material that we have examined from those countries. However, the specimens of this species that we have examined from Central America (Honduras to Panama) match the South American type specimens, so we consider *S. (S.) nigripennis* to be a widely distributed Neotropical species. The only specimens from Mexico that we have examined are the syntypes we have confirmed to be *S. (S.) furcifer*, and no additional specimens of *S. (S.) nigripennis* have been found in other collections, including TAUI, MNBG, and the CNC in particular, which had an extensive collection of micropezids from throughout the country. As such, we are removing Mexico from the known distribution of this species.

Scipopus (Scipopus) nitidus sp. nov.

[urn:lsid:zoobank.org:act:D809A117-C772-49F8-B78B-9A09716BDE0E](https://zoobank.org/urn:lsid:zoobank.org:act:D809A117-C772-49F8-B78B-9A09716BDE0E)

Fig. 28

Differential diagnosis

Scipopus (Scipopus) nitidus sp. nov. resembles *S. (S.) erythrocephalus* in having a dull, microtrichose epicephalon, a dark first fore tarsomere and an orbital plate with a shiny, bare, anterior patch, but differs in the blue sheen on the scutum and the anteriorly pale postpronotal lobe.

Etymology

The name, from the Latin adjective for ‘shiny’, refers to the glossy blue sheen on the scutum.

Type material examined

Holotype

COLOMBIA • 1 ♀; Putumayo, PNN la Paya Cabaña Viviano; 0°07' S, 74°56' W; 320 m a.s.l.; 16–30 Dec. 2001, E. Lozano leg.; Malaise; M. 2796; debu01089001/MYCRO564-19 sequenced for CO1–5'; IAVH (dissected and photographed, Fig. 28A–E).

Description

LENGTH. 14 mm.

HEAD. Palpus dark brown, pale brown microtrichose and setulose on entire surface, denser on basal half, narrow (length $5.0 \times$ height). Clypeus dark brown, width $\sim 2.2 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate orange, microtrichose, shiny and bare anteriorly. Epicephalon shiny, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon light brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed.

THORAX. Scutum black with blue sheen. Female cervical sclerite slightly convex anteriorly. Postpronotal lobe dark brown or black posteriorly, pale brown anteriorly, very few to no setulae on outer margin.

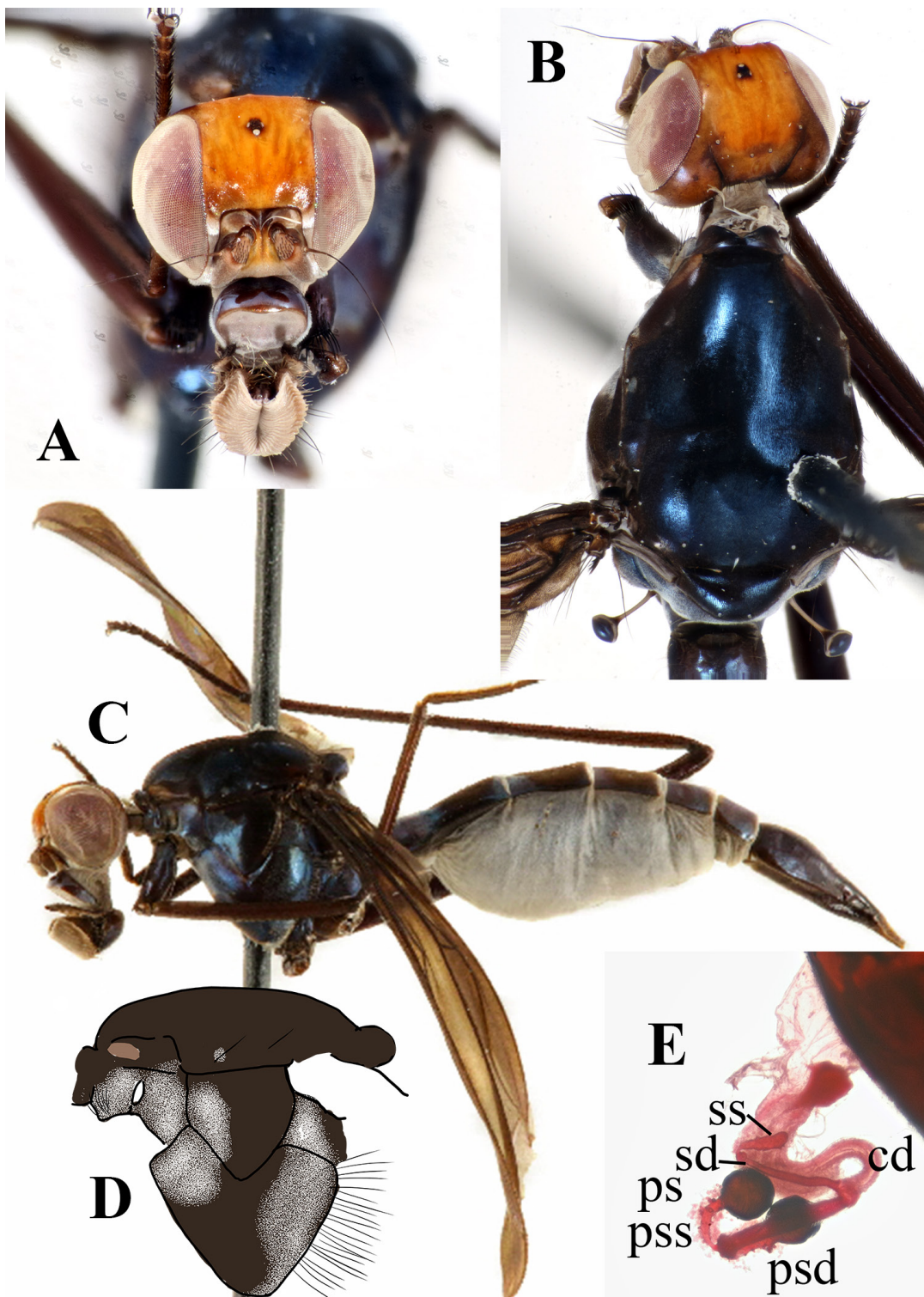


Fig. 28. *Scipopus (Scipopus) nitidus* sp. nov., ♀, Colombia, holotype (IAVH). **A.** Head, anterior view. **B.** Head and thorax, dorsal view. **C.** Habitus. **D.** Thorax, left lateral view, illustrating white microtrichosity. **E.** Female spermathecae and associated structures. Abbreviations: cd = common duct; pd = paired spermathecal duct; ps = paired spermatheca; psd = paired spermathecal duct; pss = paired spermathecal stems; sd = single spermathecal duct; ss = single spermatheca.

Notopleuron dark brown with pale microtrichose spot. Pleuron with the following microtrichosity (Fig. 28D): entirely white on proepisternum and proepimeron, white on anteroventral $\frac{1}{3}$ of anepisternum, with ventral corner and remainder brown, anterior white patch and posterior white band on katepisternum which extends onto katatergite. Legs dark brown with blue sheen; first fore tarsomere dark brown with ventral golden fringe, hind tarsomeres dark brown. Wing uniformly black-brown infusate.

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron pale grey microtrichose, P1 dark grey, P2–6 indistinctly dark grey (likely discoloured). T1+2 $1.8 \times$ length of T3. Oviscape dark brown, microtrichosity not observed (dissected), $3.0 \times$ as long as T6. Combined spermathecal ducts short; common duct wide basally, narrow distally, $\frac{1}{2}$ of entire duct length. Paired spermathecal duct narrow, very short ($2.0 \times$ spermathecal length), straight, parallel-sided, swollen apically. Paired spermathecal stems longer than spermathecae, relatively inornate, with sparsely distributed, minute tubercles. Paired spermathecae spherical. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ diameter and \approx length as paired duct, slightly swollen apically. Single spermatheca elongate, teardrop-like, inornate.

MALE ABDOMEN. Not observed.

Distribution

Colombia.

Scipopus (Scipopus) planus sp. nov.

[urn:lsid:zoobank.org:act:596FA239-FF99-4BF7-BBAA-617A15584416](https://doi.org/10.21203/rs.3.rs-281539/v1)

Figs 6A, 29–30

Differential diagnosis

Scipopus planus sp. nov. resembles *Scipopus convexus* sp. nov. in having a paracephalon with strongly convex, upturned bumps, but differs by the white first fore tarsomere and the fine white setae on T1.

Etymology

The name, from the Latin adjective for ‘flat’, refers to the flat dorsal surface of the head (most obvious when viewed from the side).

Type material examined

Holotype

BOLIVIA • 1 ♀; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 1–11 May 2007; S.M. Paiero leg.; rainforest, Malaise; CBFC (photographed, Fig. 29A, C).

Paratypes

BOLIVIA • 4 ♀♀; same collection data as for holotype; 29 Apr.–11 May 2007; M.D. Jackson leg.; CBFC (♀ dissected and photographed, Fig. 29E–F) • 1 ♀; same collection data as for preceding; debu00289615/MYCRO515-19 sequenced for CO1–5'; DEBU.

BRAZIL • 1 ♀; Amazonas, Manaus, Reserva Ducke; 31 Sep. 1986; “Luiz:uly SSES”; INPA.

PERU • 1 ♀; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun. 2006; Paiero & Klymko leg.; debu00281540/MYCRO638-20 unsuccessfully sequenced for CO1–5'; MUSM • 1 ♂; same collection data as for preceding; debu00281539/MYCRO516-19 sequenced for CO1–5'; MUSM (dissected and photographed, Fig. 29B, D).

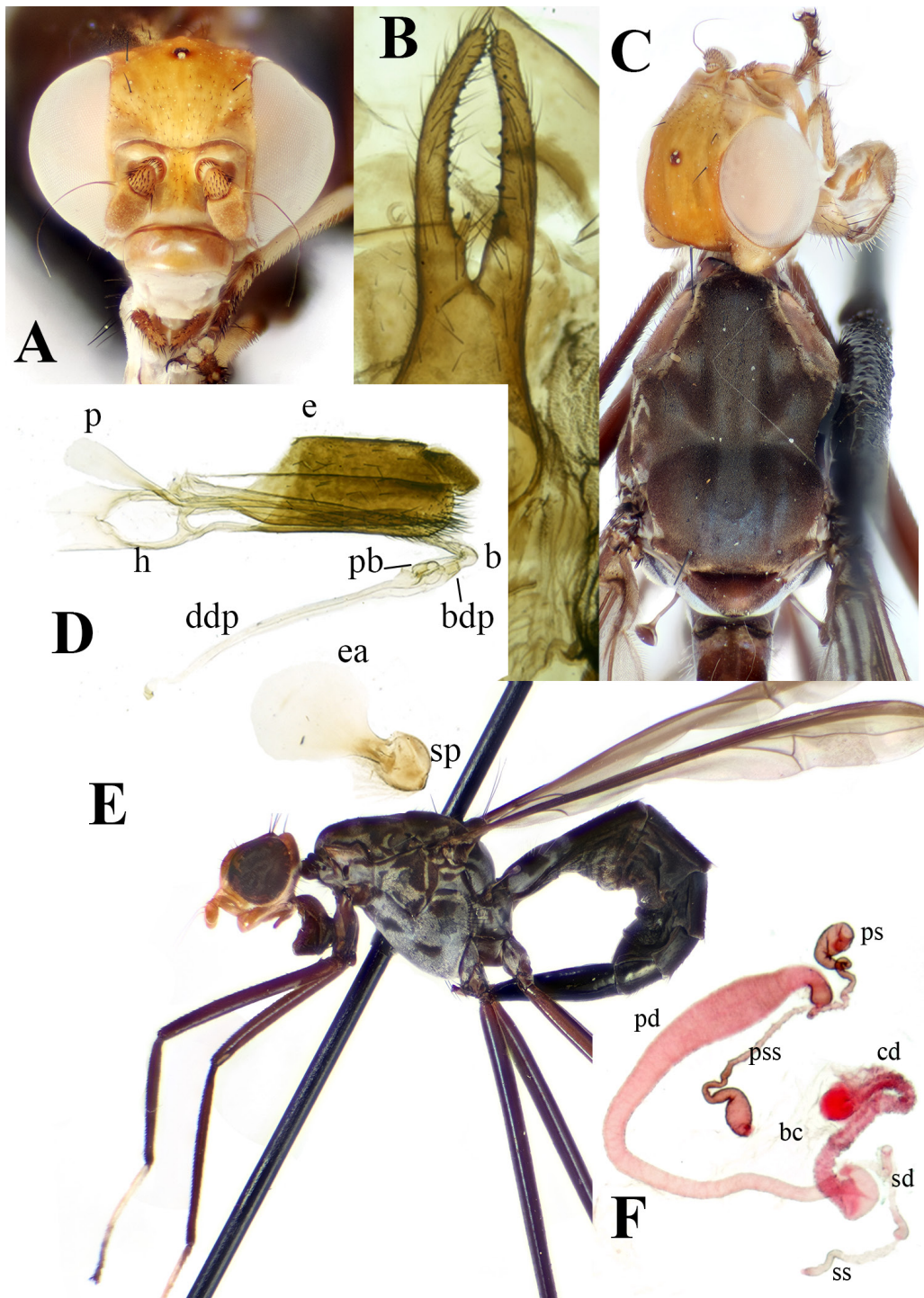


Fig. 29. *Scipopus (Scipopus) planus* sp. nov. **A.** Head, ♀, anterior view, holotype (CBFC). **B.** Male genital fork, ventral view, Peru, paratype (MUSM). **C.** Head and thorax, ♀, dorsal view, holotype (CBFC). **D.** Male terminalia, lateral view, Peru, paratype (MUSM). **E.** Habitus, ♀, Bolivia, paratype (CBFC). **F.** Female spermathecae and associated structures, Bolivia, paratype (CBFC). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

COLOMBIA • 1 ♀; Amazonas PNN Amacayacu, Cabaña Lorena; 3°0' S, 69°59' W; 210 m a.s.l.; 1–15 Sep. 2001; J. Parente leg.; Malaise; M. 2202; debu01088994/MYCRO548-19 sequenced for CO1–5', CO1–3', 12S, 28S; IAVH • 1 ♀; Putumayo, PNN La Paya Cabaña Viviano; 0°7' S, 74°56' W; 320 m a.s.l.; 1–15 Nov. 2000; R. Cobete leg.; Malaise; M. 2439; IAVH • 1 ♀; Amazonas PNN Amacayacu San Martin; 3°23' S, 70°06' W; 150 m a.s.l.; 2–16 Apr. 2001; D. Chota leg.; M.1613; IAVH.

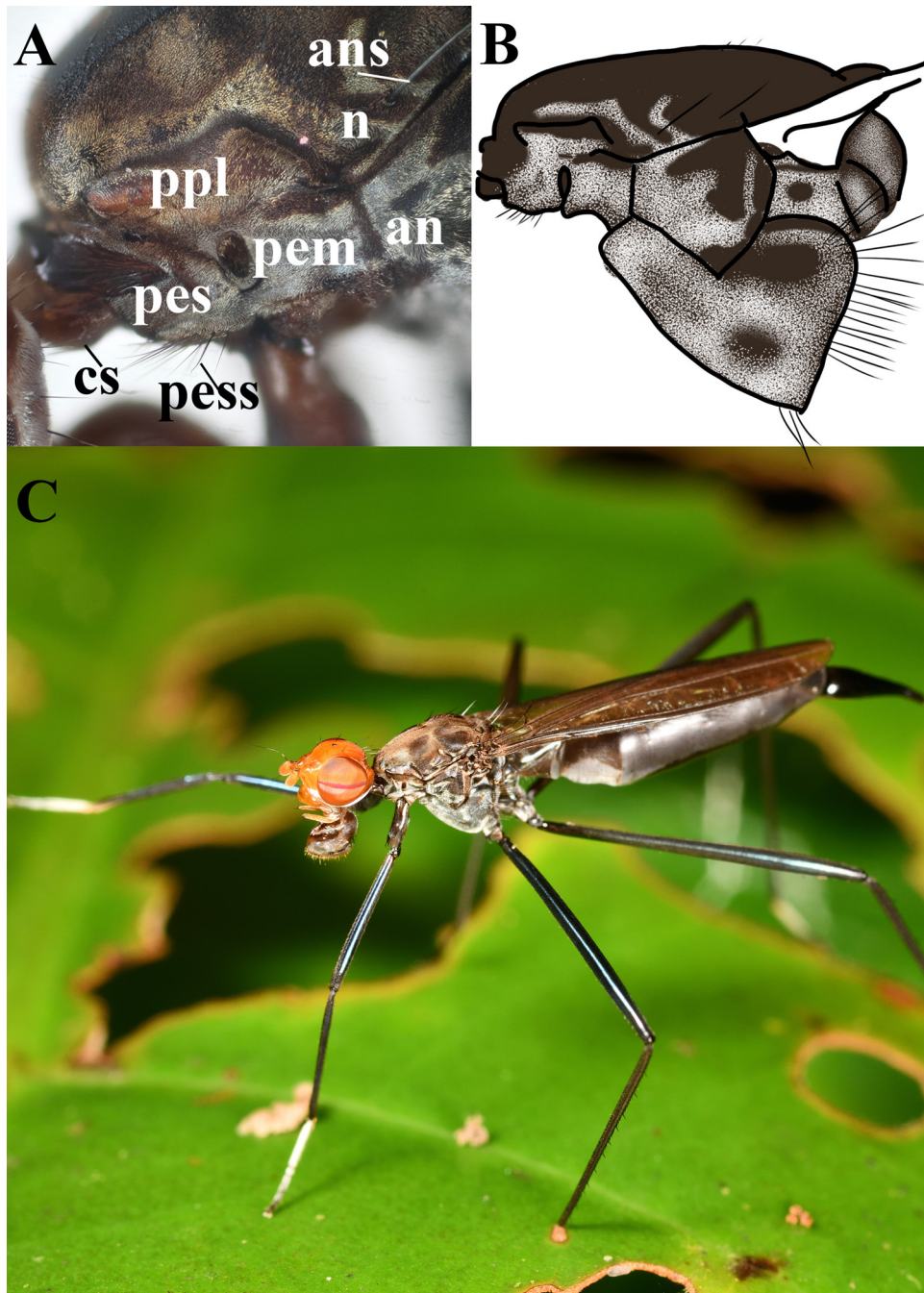


Fig. 30. *Scipopus (Scipopus) planus* sp. nov. (CBFC). **A.** Anterior thorax, lateral view, ♀. **B.** Thorax, ♀, left lateral view, illustrating white microtrichosity. **C.** Living, ♀, Brazil. Abbreviations: an = anepisternum; ans = anterior notopleural seta; cs = cervical sclerite; n = notopleuron; pem = proepimeron; pes = proepisternum; pess = proepisternal seta; ppl = postpronotal lobe.

Description

LENGTH. 13–15 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow (length $6.0 \times$ height). Clypeus orange, width $1.9 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Orbital plate bare and shiny anteriorly. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon orange, with upturned strongly convex projections (Fig. 29C). All head chaetotaxy well-developed.

THORAX. Scutum dark brown, microtrichose, with pale brown median vitta and pale microtrichose spots anterior to transverse suture. Female cervical sclerite very slightly convex medially. Postpronotal lobe dark brown, setulose anterolaterally. Notopleuron dark brown, pale microtrichose anteriorly and posteriorly, with median pale chevron (Fig. 30B). Pleuron with the following microtrichosity: entirely white on proepisternum, white on proepimeron with posterodorsal corner brown, white on anteroventral $\frac{1}{2}$, dorsal and posterior margins of anepisternum, with ventral corner and remainder brown, almost entirely white on katapisternum, with small brown median and posterodorsal spots, white with median brown spot on katatergite. Legs dark brown or black, fore tarsomere 1, sometimes 2–3 white, hind tarsomere 1 almost entirely white.

ABDOMEN ($\sigma + \text{♀}$). T1 with fine, long, white setae.

FEMALE ABDOMEN. P1 mostly dark brown, grey on posterior margin, dorsal half of P2 with dark brown patch with concave ventral margin, lower half pale grey, P3–6 dark grey, lower third darker (Fig. 30C). T1+2 $\sim 1.8 \times$ T3. Oviscape black, white-microtrichose spot anterodorsally and on anteroventral $\frac{1}{3}$, $\sim 3.0 \times$ length of T6. Combined spermathecal ducts long; common duct narrow, $\frac{1}{3}$ of entire duct length. Paired spermathecal duct long ($> 10.0 \times$ length of paired spermathecae), narrow basally, swollen distally and apically. Paired spermathecal stems very long, $\geq 2.0 \times$ length of spermathecae, relatively inornate but with minute tubercles. Paired spermathecae bent basally, rounded. Single spermathecal duct arising from basal $\frac{1}{8}$ of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct, swollen apically. Single spermatheca finger-like and very elongate.

MALE ABDOMEN. Pleuron of available specimen discoloured. T1+2 $\sim 2.0 \times$ T3. Genital fork $\sim 2.0 \times$ length of T6, arms converging, inner basal process small and straight, $\sim \frac{1}{5}$ length of arm. Epandrium elongate, length $2.0 \times$ height, nearly rectangular in lateral view, short setose on posteroventral margin. Basiphallus projecting outwards, crescent-shaped. Basal distiphallus very short (shorter than phallic bulb), broad, ending in phallic bulb. Phallic bulb short, length \approx height, upper and lower chambers of nearly equal size. Distal distiphallus long, broad, $\sim 1.5 \times$ length of epandrium, apex tube-like. Phallapodeme very broad and apically expanded. Anterior apex of hypandrium broad and expanded.

Distribution

Bolivia, Colombia, Brazil.

Scipopus (Scipopus) souzalopesi Albuquerque, 1972

Figs 31–32

Scipopus souzalopesi Albuquerque, 1972b: 93, figs 1–11.

Scipopus souzalopesi – Ratcliffe & Penny 1978: 695 (catalog). — Ferro & de Carvalho 2014: 60 (listed).

Differential diagnosis

Scipopus (Scipopus) souzalopesi closely resembles *S. (S.) erythrocephalus* in having a dull, orange epicephalon, shiny, bare anterior patches on the orbital plate and a dark first fore tarsomere. *Scipopus*

(*S.*) *souzalopesi* differs in the distinct pattern of pale microtrichose spots on the scutum, the long (3.0–4.0 × as long as T6) oviscape, and the small (~2.3 × length of T6) genital fork.

Type material

Holotype (not examined)

BRAZIL • 1 ♂; Acre, Estrada do Xapuri, Rio Branco; 30 Jan. 1971; A. Faustino leg.; INPA.

Paratypes (not examined)

BRAZIL • 1 ♀; Estrada Manaus-Itacoatiara km 26 Reserva Florestal Ducke; 14 Aug. 1969; L.P. Albuquerque and A. Faustino leg.; INPA • 2 ♀♀; same collection data as for preceding; INPA • 1 ♀; Estrada Manaus Rio Branco km 38; 5 Aug. 1961; E.V. Silva leg.; INPA • 1 ♀; Pará, Capanema; n° 1216 a 1222; H.S. Lopes leg.; INPA.

Other material examined

BRAZIL • 1 ♀; Amazonas, AM:010 km 31, Embrapa; 9 Jan. 1991; L.P. Albuquerque and J.E. Binda leg.; INPA • 1 ♀; Amazonas, Manaus; 13–20 May 1989; Y. Camara and J.F. Vidal leg.; “Isca de Fruta” [fruit bait]; INPA • 1 ♀; Rondonia, Vilhena; 27 Jul. 1983; N. Penny leg.; INPA • 1 ♂; Pará, Benevides; Oct. 1918; S.M. Klages leg.; “C.M. Acc. 6174”; CMNH.

COLOMBIA • 1 ♀; Amazonas, PNN Amacayacu, Matamata; 3°41' S, 70°15' W; 150 m a.s.l.; 11–25 Sep. 2000; A Parente leg.; Malaise; M.846; IAVH • 3 ♀♀; same collection data as for preceding; 27 Mar–3 Apr. 2000; IAVH • 1 ♀; same collection data as for preceding; 3–9 Apr. 2000; IAVH • 2 ♀♀; Amazonas, PNN Amacayacu, Matamata m2; 3°23' S, 70°6' W; 150 m a.s.l.; 25 Jun.–9 Jul. 2001; D. Chota leg.; Malaise; M.2031; IAVH • 2 ♀♀; same collection data as for preceding; 9–30 Jul. 2001; M.2030; IAVH • 1 ♀; same collection data as for preceding; 2–15 Oct. 2001; M.2239; IAVH • 1 ♀; same collection data as for preceding; 25 Aug.–3 Sep. 2001; M.2240; IAVH (dissected and photographed, Fig. 31F) • 1 ♀; same collection data as for preceding; M.2244; IAVH • 4 ♀♀; same collection data as for preceding; San Martin; 15 Oct.–5 Nov. 2001; M.2767; IAVH (photographed, Fig. 31A, C, E) • 3 ♀♀; same collection data as for preceding; 26 Feb.–12 Mar. 2001; M.1611; IAVH • 1 ♀; same collection data as for preceding; 3°46' S, 70°18' W; 2–16 Apr. 2001; M.1613; IAVH • 1 ♀; Putumayo, PNN La Paya Cabaña Viviano; 0°02' S, 75°12' W; 330 m a.s.l.; 5–25 Dec. 2001; E Lozano leg.; Malaise; M.2797 • 1 ♀; same collection data as for preceding; debu01088986/MYCRO526-19 sequenced for CO1–5'; IAVH.

ECUADOR • 1 ♀; Napo, Tiputini Biodiversity Stn; 0°36'50" S, 76°9'1" W; May 2011; S.A. Marshall leg.; DEBU (photographed, Fig. 32) • 3 ♀♀; Prov. Orellano, Yasuni Natl. Pk., Yasuni Research Stn; 0°40'50" S, 76°24'2" W; 250 m a.s.l.; 28 Apr.–8 May 2009; M.D. Jackson leg.; QCAZ • 1 ♀; same collection data as for preceding; “S. Pances” leg.; on log; debu01088985/MYCRO525-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 1 ♀; same locality as for preceding; 0°38' S, 76°36' W; 3–20 Sep. 1998; T. Pape and B. Viklund leg.; DEBU.

PERU • 1 ♀; Cusco, Estación Biológica Villa Carmen; 12°54' S, 71°24' W; 500–700 m a.s.l.; 29 Jun. 2014; trap VC-ML-40A; USNM • 1 ♀; Iquitos, Mar.–Apr. 1931; R.C. Shannon leg.; USNM.

Description

LENGTH. 9–15 mm.

HEAD. Palpus orange, pale brown microtrichose, black setulose, narrow (length 4.3 × height). Clypeus orange or light brown, width ~2.0 × height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose, orbital plate anteriorly bare, shiny, orange or light brown. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon orange or light brown, slightly convex on posterolateral portions. All head chaetotaxy well-developed (missing in specimen from Fig. 31).

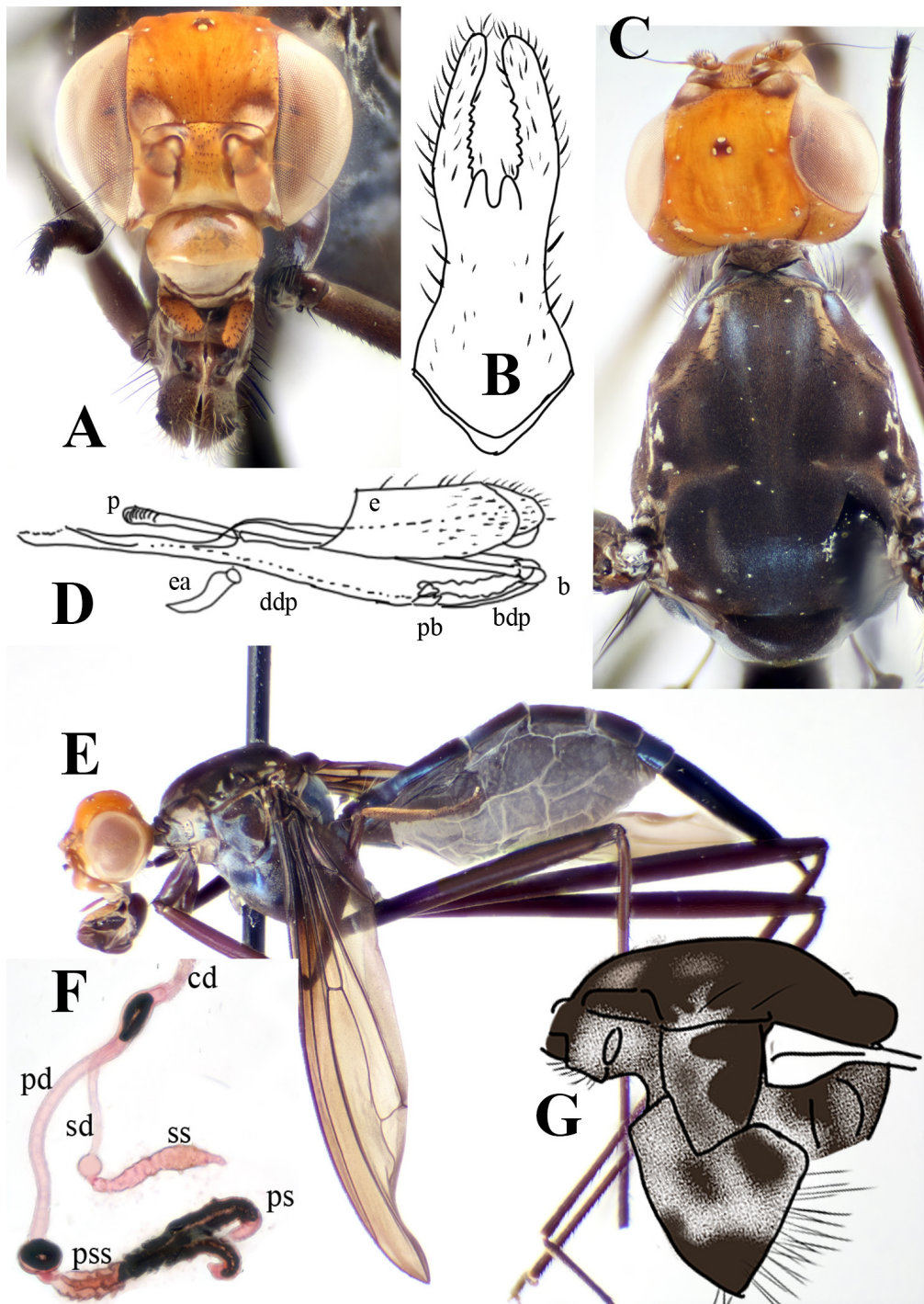


Fig. 31. *Scipopus (Scipopus) souzalopesi* Albuquerque, 1972. **A.** Head, anterior view, ♀, Colombia, non-type (IAVH). **B.** Male genital fork, ventral view (redrawn from Albuquerque 1972b). **C.** Head and thorax, dorsal view, ♀, Colombia, non-type (IAVH). **D.** Male terminalia, lateral view (redrawn from Albuquerque 1972b). **E.** Habitus, ♀, Colombia, non-type (IAVH). **F.** Female spermathecae and associated structures, Colombia, non-type (IAVH). **G.** Thorax, left lateral view, ♀, illustrating white microtrichosity. Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; ss = single spermatheca.

THORAX. Scutum black-brown, dark brown microtrichose with indistinct pale brown median vitta flanked by blue sheen; distinct pale brown microtrichosity above anterior postpronotal lobe, indistinct pale spots anterior and posterior to transverse suture, pair of small pale brown spots on most median points of transverse suture (Fig. 31C). Female cervical sclerite relatively flat. Postpronotal lobe dark brown, several short setulae on outer margin. Notopleuron dark brown with pale microtrichose spots. Thorax dark brown or black with the following microtrichosity: entirely white on proepisternum and proepimeron, white on anteroventral $\frac{1}{2}$ and posteromedian margin of anepisternum (Fig. 31E), otherwise brown, mostly white on katepisternum, with brown spots ventrally, posterodorsally and medially, white with brown median spot on katatergite. Legs black-brown with blue sheen. First fore and hind tarsomere brown with ventral golden fringe. Wing uniformly brown infuscate.

FEMALE ABDOMEN. T1 with fine, long, white setae. T1+2 $\sim 2.0 \times$ length of T3. Pleuron grey microtrichose, P1, dorsal half of P2–3 and P6, entirety of P4–5 dark brown. Oviscape black, sparsely setulose, pale brown microtrichose on ventral $\frac{1}{3}$, $\sim 3.0\text{--}4.0 \times$ length of T6. Combined spermathecal ducts short and narrow; common duct just under $\frac{1}{2}$ of entire duct length. Paired spermathecal duct narrow, short (\approx to spermathecal length, although spermathecae are longer in this species), parallel-sided, apex very swollen. Paired spermathecal stems very short, almost absent. Paired spermathecae narrow, elongate, curved apically with numerous reflexed tubercles. Single spermathecal duct arising from basal $\frac{1}{8}$ of paired duct, narrow, $\frac{1}{2}$ diameter and $\frac{2}{3}$ length of paired duct, swollen apically. Single spermatheca finger-like and elongate, with sparse tubercles.

MALE ABDOMEN (from Albuquerque 1972b). T1+2 approximately twice the length of T3. Genital fork $\sim 2.3 \times$ length of T6, arms converging, inner basal process straight, $\frac{1}{3}$ the length of arm. Epandrium



Fig. 32. *Scipopus (Scipopus) souzalopesi* (Albuquerque, 1972), living, ♀, ovipositing, Ecuador (DEBU).

elongate (length $>2.0 \times$ height), rounded posteriorly, sparsely short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus short ($\sim 3.0 \times$ phallic bulb length), broad, ending in short (length \approx height), small phallic bulb with upper and lower chamber. Distal distiphallus long, expanded apically, $\sim 2.0 \times$ length of epandrium. Phallapodeme slender, not apically expanded.

Distribution

Brazil, Colombia (new record), Ecuador (new record), Peru (new record).

Scipopus (Scipopus) striatithorax Hennig, 1934

Fig. 33

Scipopus striatithorax Hennig, 1934: 326.

Scipopus striatithorax – Aczél 1949: 342 (catalog). — Steyskal 1968: 48.16 (catalog). — Ferro & de Carvalho 2014: 60 (listed).

Differential diagnosis

Scipopus (Scipopus) striatithorax resembles *S. (S.) diversus* in having a dull, orange epicephalon and an at least partially white first fore tarsomere, but differs in the distinct pale brown median vitta with a silvery-bluish sheen on the scutum, which also differentiates it from all other species in *Scipopus* s. str.

Type material examined

Holotype (examined and photographed in Berlin, 2002)
BRAZIL • 1 ♀; Minas Gerais; Fruhstorfer leg.; MNBG.

Description

LENGTH. Unknown.

HEAD. Clypeus light brown. Frontal vitta dull, orange, microtrichose. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. Paracephalon light brown, outer portions slightly convex. All head chaetotaxy well-developed.

THORAX. Scutum dark brown with wide, pale brown median vitta overlaid with silvery-blue sheen. Female cervical sclerite very slightly convex medially. Postpronotal lobe dark brown. Notopleuron dark brown with anterior and ventral pale microtrichosity. Pleuron dark brown with the following microtrichosity: entirely white on proepisternum, white on proepimeron, with brown line medially, white on anteroventral $\frac{1}{2}$ of anepisternum, with ventral corner and remainder brown, mostly white on katepisternum, with brown ventral and posterodorsal spots, white with brown median spot on katatergite. Legs brown, first fore tarsomere at least $\frac{3}{4}$ white dorsally, hind tarsomere 1 almost entirely white. Wing uniformly brown infusate.

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron pale grey, P1, dorsal half of P2–6 dark brown. Terminalia unknown (physical specimen unavailable for dissection).

MALE ABDOMEN. Unknown (physical specimen unavailable for dissection).

Remarks

This species is known only from the holotype.

Distribution

Brazil (Steyskal 1968).

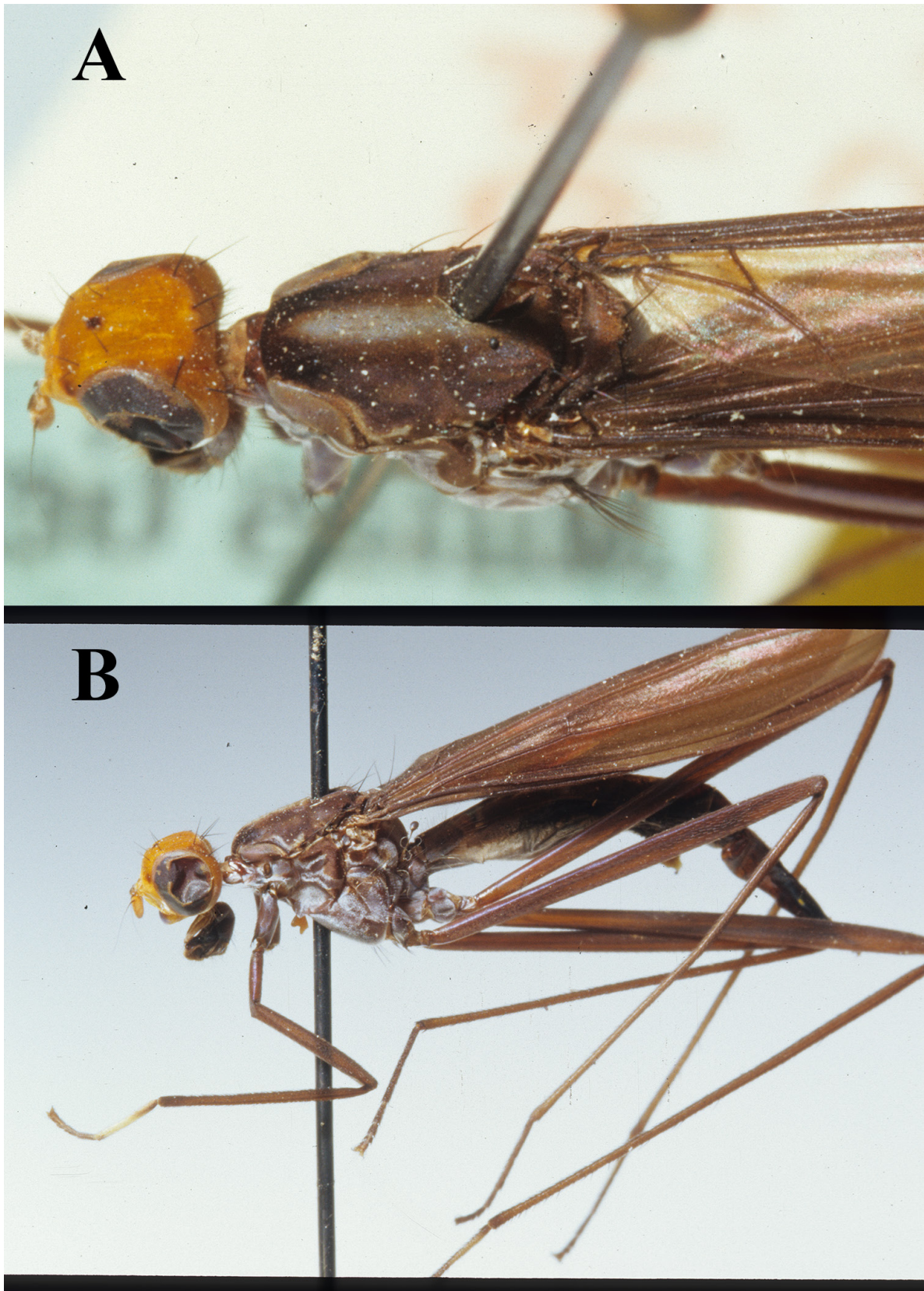


Fig. 33. *Scipopus (Scipopus) striatithorax* Hennig, 1943, holotype, ♀ (MLUH). **A.** Head and thorax, dorsal view. **B.** Habitus.

Scipopus (Scipopus) wokomung sp. nov.

[urn:lsid:zoobank.org:act:6E220724-6E7C-4705-B44F-4D1E7BD31959](https://doi.org/10.21203/rs.3.rs-220724-v1)

Fig. 34

Differential diagnosis

Scipopus (Scipopus) wokomung sp. nov. resembles *Scipopus (S.) chalybeus* in the absence of outer vertical seta, an at least partially white first fore tarsomere and a shiny epicephalon that is clearly delineated from the upper frontal vitta. It differs in having a wide blue median sheen on the scutum, a depressed Z-shaped pattern of pale microtrichia on the notopleuron and a bare median clypeus.

Etymology

The species name is a noun in apposition derived from the exact name of the type locality.

Type material examined

Holotype

GUYANA • 1 ♀; Potaro-Siparuni, Mount Wokomung; 5°7'53" N, 59°48'31" W; 698 m a.s.l.; 26 Oct. 2004; B. Hubley leg.; forest, pitfall trap (human dung); ROM.

Paratypes

BRAZIL • 1 ♂; MA, Pedro da Água Branca, F. Sta Rosa; 05°07'07" S, 48°15'19" W; 6 Jul. 2001; J.A. Rafael, F.L. Oliveira and J. Vidal leg.; Malaise; INPA.

GUYANA • 1 ♂, 3 ♀♀; same collection data as for holotype; ROM (♂, ♀ dissected and photographed, Fig. 34A–F) • 1 ♀; same collection data as for preceding; debu00379786/MYCRO565-19 sequenced for CO1–5'; ROM.

Description

LENGTH. 11–15 mm.

HEAD. Palpus light brown, pale brown microtrichose and setulose on entire surface, denser on ventral edge, narrow (length $5.5 \times$ height). Clypeus light brown or orange, width $\sim 2.0 \times$ height, bare medially, white microtrichose in posterolateral corners. Frontal vitta dull, orange, microtrichose. Epicephalon orange, shiny, bare, wide (width $\frac{2}{3}$ or more of frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon orange, slightly convex on posterolateral portions. Outer vertical seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with wide, median blue sheen. Female cervical sclerite slightly convex anteriorly. Postpronotal lobe black-brown setulose, especially on anterior outer margin. Notopleuron black-brown, white microtrichose above anterior notopleural seta and on posterior ventral margin; white microtrichosity forming depressed Z-shape (Fig. 34G). Pleuron black-brown with the following microtrichosity: white on proepisternum and proepimeron, white on anteroventral $\frac{3}{4}$ of anepisternum, white on entire katepisternum, denser posteriorly, forming transverse band extending onto katatergite (only seen at some angles). Legs black-brown with blue sheen; fore tarsomeres 1–2 white, hind tarsomere 1 almost entirely white dorsally. Wing uniformly black-brown infuscate.

ABDOMEN (♂+♀). T1 with fine, long, white setae. Pleuron pale grey microtrichose, P1 dark brown, dorsal half of pleural sac in males dark brown, pleural pattern otherwise indistinct on available (dried) specimens.

FEMALE ABDOMEN. T1+2 $\sim 1.8 \times$ length of T3. Oviscape dark brown or black, white microtrichose on anterior $\frac{1}{3}$, ~ 2.0 – $3.0 \times$ length of T6. Combined spermathecal ducts long and narrow; common duct $\frac{2}{3}$

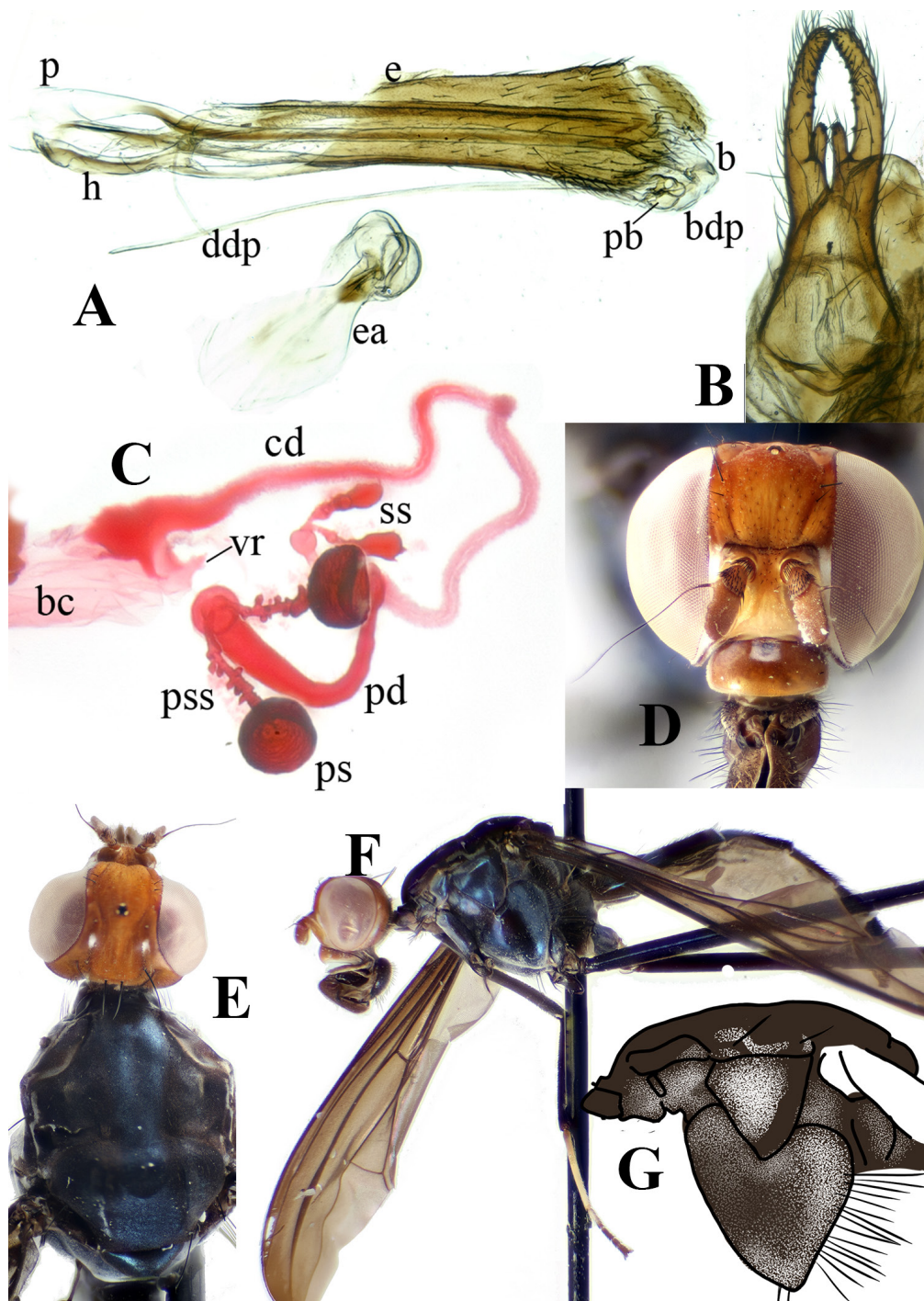


Fig. 34. *Scipopus (Scipopus) wokomung* sp. nov. (ROM). **A.** Male terminalia, lateral view, Guyana, paratype. **B.** Male genital fork, ventral view, Guyana, paratype. **C.** Female spermathecae and associated structures, Guyana, paratype. **D.** Head, ♀, anterior view, Guyana, paratype. **E.** Head and thorax, ♀, dorsal view, Guyana, paratype. **F.** Habitus, ♀, Guyana, paratype. **G.** Thorax, ♀, left lateral view, illustrating white microtrichosity. Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; ss = ‘single’ spermathecae (2 present); vr = ventral receptacle.

of entire duct length. Paired spermathecal duct narrow, slightly wider distally, short ($\sim 3.0 \times$ length of paired spermathecae), swollen apically. Paired spermathecal stems long and slender with prominent rounded tubercles. Paired spermathecae spherical (partially collapsed in Fig. 34C). Single spermathecal duct arising from basal $\frac{1}{6}$ of paired duct, narrow, $\frac{1}{2}$ diameter and $\frac{3}{4}$ length of paired duct, swollen apically, terminating in one or two elongate, teardrop-shaped “single” spermathecae with minute pointed tubercles.

MALE ABDOMEN. T1+2 $\sim 2.2 \times$ length of T3. Genital fork $\sim 2.5 \times$ as long as T6, arms converging and touching, inner basal process straight, $\frac{1}{4}$ length of arm. Epandrium elongate, length $2.0 \times$ height, taller posteriorly, short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus very short ($< 1.0 \times$ length of phallic bulb), broad, ending in phallic bulb. Phallic bulb short and small, length \approx height, upper chamber with rounded posterior projection, lower chamber rounded. Distal distiphallus long and narrow, $1.5 \times$ length of epandrium. Phallapodeme apically expanded.

Remarks

Scipopus (*Scipopus*) *wokomung* sp. nov. and *S.* (*S.*) *chalybeus* (in part) are the only species of *Scipopus* s. str. that lack the outer vertical seta. They are resolved on separate branches on the maximum-likelihood barcode tree (Fig. 1), suggesting that the loss of the outer vertical seta is a homoplastic character. There is sometimes more than one “single” spermatheca (up to two) in *S.* (*S.*) *wokomung*.

Distribution

Brazil, Guyana.

Scipopus (*Parascipopus*) subgen. nov.

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Type species

Calobata manifesta Wulp, 1897: 370.

Diagnosis

Scipopus (*Parascipopus*) is differentiated from other subgenera in *Scipopus* s. lat. by a shiny, clearly delineated orbital plate and a strongly tapered anterior frontal vitta (except in *S.* (*Pa.*) *fenestratus* sp. nov., the most basal species of the group, which can be recognized by the absence of the apical scutellar seta, a character state only occurring in some species of *S.* (*Parascipopus*) and not found elsewhere in *Scipopus* s. lat.). The single spermathecal duct arises from a rugose common spermathecal duct extending beyond the bursa copulatrix, or from the side of a smooth paired duct. The distal distiphallus is usually long and narrow but is absent in *S.* (*Pa.*) *alturas* sp. nov. *Scipopus* (*Phaeopterina*) *fraudator* sp. nov. has all of the external diagnostic character states of *S.* (*Parascipopus*) but is resolved as *S.* (*Phaeopterina*) on a molecular phylogeny and differs from *S.* (*Parascipopus*) by the single and paired spermathecal ducts arising separately from the bursa. This species can be further distinguished from similar species of *S.* (*Parascipopus*) by the presence of apical scutellar setae and other characters in the key.

Description

LENGTH. 10–15 mm.

COLOUR. Varies widely between species.

HEAD. Antenna orange to black. Palpus narrow or wide (length $3.0\text{--}5.0 \times$ height) and nearly parallel-sided, rounded or pointed apically, setulose and pale microtrichose. Clypeus short, $1.7\text{--}2.4 \times$ as

wide as high, orange and/or brown, or black, white microtrichose on entire surface. Frontal vitta dull microtrichose, strongly pointed or ending in a rounded point posteriorly (Fig. 43D) (except in *S. (Pa.) fenestratus* sp. nov.); orbital plate shiny and clearly delineated (Fig. 43A) (except in *S. (Pa.) fenestratus*). Epicephalon shiny, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta, bare. Paracephalon shiny. Head chaetotaxy always including inner vertical, postocellar, and 1–2 lower fronto-orbital setae; outer vertical and upper fronto-orbital setae present or absent.

THORAX. Mesothorax tapered anteriorly. Thorax stout or elongate (length/height ≥ 0.93). Cervical sclerite subquadrate, often slightly convex. Anterior edge of mesonotum vertical, scutum relatively flat (Fig. 39F). Postpronotal lobe distinct, raised, approximately parallelogram-shape, elongate (length $\sim 3.0\text{--}4.0 \times$ height). Scutellum with or without two long, strong apical setae ($2.0 \times$ length of scutellum) and 0–3 pairs of short, lateral discal setulae.

WING. Uniformly black-brown infusate, or with preapical hyaline spots, or hyaline with apical and/or discal infuscation.

ABDOMEN ($\sigma + \rho$). T1 with fine, white, yellow, black or dark brown setae, remainder of abdomen with short dark brown or black setulae. Pleuron orange, off-white or pale grey, usually with darker orange or dark brown on dorsal half of P2–6.

FEMALE ABDOMEN. T1+2 $2.2\text{--}3.0 \times$ length of T3. Oviscape variable in dimensions but tapered distally, sparsely covered in short black setulae and white microtrichose basally. Common spermathecal duct arising from apex of bursa, roughly textured and ranging from very short ($\frac{1}{8}$ of entire duct length) (Fig. 38C) to long ($\frac{1}{2}$ of entire duct length) (Fig. 36A), clearly delineated from paired duct. Paired spermathecal duct smooth, usually narrow (Fig. 39E), strongly swollen distally in *S. (Pa.) kubus* sp. nov. (Fig. 38C). Paired spermathecal stem usually swollen, often sinuate, limit between end of stem and beginning of spermatheca usually not clearly delineated. Single spermathecal duct arising from either base or distal half of common duct, or base of paired duct, smooth and narrow, swollen distally, single spermatheca usually smaller than paired, bulb- or finger-like.

MALE ABDOMEN. T1+2 $1.4\text{--}3.0 \times$ length of T3. Genital fork arm with inner basal process, length and shape of arm and process variable. Epandrium elongate (length $\sim 2.0 \times$ height). Basiphallus small, usually frame-like or crescent-shaped when viewed ventrally. Basal distiphallus very short ($\frac{1}{3}$ epandrium length) to long (\approx epandrium length), ending in phallic bulb. Phallic bulb approximately round and small (Fig. 42E) to large and irregular or ovoid (Fig. 41E). Distal distiphallus (absent in *S. (Pa.) alturas* sp. nov.) short to long, usually narrow (Fig. 43E). Phallapodeme narrow or broad, usually expanded apically (Fig. 36D). Ejaculatory apodeme varying in size, usually with a fan-like apodeme attached to a bulbous sperm pump (Fig. 36D).

Scipopus (Parascipopus) alturas subgen. et sp. nov.

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Fig. 35

Differential diagnosis

Scipopus (Parascipopus) alturas sp. nov. is easily distinguished from congeners by the dark reddish-brown thorax, the hyaline wings with apical and discal infuscations, the orange head and the basally yellow legs.

Etymology

The name is a noun in apposition inspired by the collection locality of the holotype.

Type material examined

Holotype

COSTA RICA • 1 ♂; Prov. Puntarenas, Coto Brus, Z.P. Las Tablas, Est. Biol. Las Alturas; 8°57'07" N, 82°50'04" W; 1500–1600 m a.s.l.; 3–11 Jun. 2013; Proyecto ZADBI; Malaise trap; #107105; MNCR.

Paratypes

COSTA RICA • 1 ♂, 1 ♀; same collection data as for holotype; 2–9 Apr. 2013; #106674; MNCR (♀ photographed, Fig. 35C) • 3 ♂♂, 2 ♀♀; Prov. Puntarenas, Coto Brus, Z.P. Las Tablas, Camino a Cotoncito, Send. la Juntas; 1400–1500 m a.s.l.; 26 Apr. 2002; M. Alfaro leg.; Libre; L_S_320800_594500 #68061; MNCR (♂ photographed, Fig. 35A, E) • 1 ♀; Prov. Puntarenas, Coto Brus, Sabalito, Z.P. Las Tablas, Send. Saino; 1250 m a.s.l.; 25 Jul. 2002; M. Alfaro leg.; Libre; L_S_317700_594900; UGIC271-15/MYCRO172-15 sequenced for CO1; MNCR • 1 ♂; Puntarenas, Monteverde, San Luis; 1000–1350 m a.s.l.; Apr. 1994; Z. Fuentes leg.; L_N_449250_250850; #2845; MNCR (dissected and photographed, Fig. 35B, D) • 1 ♀; Prov. Puntarenas, Coto Brus, Sabalito, Est. El Progreso, Sector Fila Pizote; 1400 m a.s.l.; 11 May 2001; M. Alfaro leg.; Libre; L_S_317700_597800; #63209; MNCR • 1 ♀; Prov. Puntarenas, Estación Altmua, 1 km S of Cerro Biolley; 1300–1450 m a.s.l.; 5–9 Mar. 1996; R. Villabos leg.; L_S_331700_572100; #45499; MNCR (dissected and photographed, Fig. 35F) • 1 ♂; Puntarenas, Finca Cafrosa, 2100 al. E of Escuela Progreso; 2100 m a.s.l.; 5–7 Mar. 1996; M. Chinchilla leg.; L_S_318300_596400; #7298; MNCR • 1 ♂; Puntarenas, Las Alturas Bio. Stn; 8°57' N, 82°58' W; 15–1700 m a.s.l.; 12–14 Aug. 1995; S.A. Marshall leg.; MNCR.

Description

LENGTH. 11–12 mm.

HEAD. Antenna orange. Palpus orange, pale brown microtrichose and setulose on entire surface, narrow (length $4.5 \times$ height). Clypeus pale orange, shiny, width $\sim 1.8 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose, posterior apex strongly tapered, pointed. Orbital plate shiny, bare. Epicephalon shiny, wide (width $> \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. All head chaetotaxy well-developed.

THORAX. Scutum black-brown with wide median silvery-blue sheen. Female cervical sclerite slightly convex. Postpronotal lobe black-brown, setulose on outer margins. Notopleuron black-brown. Pleuron dark reddish-brown, entirely white microtrichose, with microtrichia denser anteriorly and posteriorly, forming posterior transverse band. Legs light brown, femur pale brown or yellow basally, gradually fading to darker brown apically. Tarsomeres dark brown. Wing mostly hyaline, apex dark infusate anterior to *M*, with discal patch divided into anterior and posterior sections by a clear band. Scutellum with apical seta.

ABDOMEN (♂+♀). T1 with fine, long, white or yellow setae.

FEMALE ABDOMEN. Pleuron pale yellow, microtrichose, dark brown or black on P1, dorsal half of P2–6. T1+2 $\sim 2.2 \times$ length of T3. Oviscape dark brown, white microtrichose on anterior $\frac{1}{2}$, $\sim 3.0 \times$ length of T6. Combined spermathecal ducts short; common duct short, $\frac{1}{4}$ of entire duct length. Paired spermathecal duct short ($3.0 \times$ length of paired spermathecae), mostly parallel-sided, narrower basally, swollen distally. Paired spermathecal stems bare, narrow basally, wrinkled and sinuate distally, longer than spermathecae. Paired spermathecae cup-shaped, with apical indentation. Single spermathecal duct arising from halfway point of common duct, narrow ($\frac{1}{2}$ the diameter and $\frac{1}{2}$ the length of paired duct), swollen apically. Single spermatheca elongate, swollen and wrinkled distally, inornate (not visible in Fig. 35F).

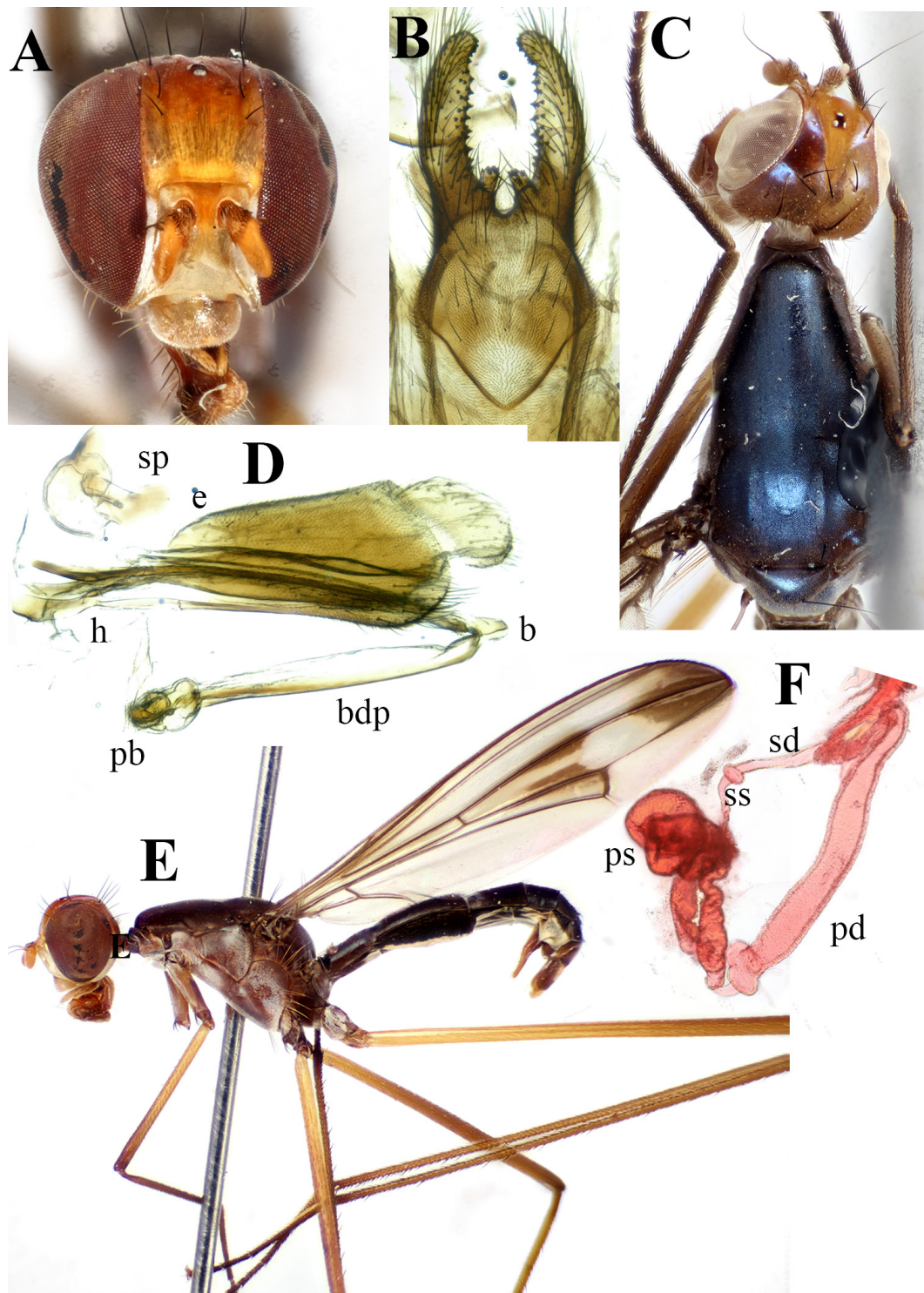


Fig. 35. *Scipopus (Parascipopus) alturas* subgen. et sp. nov. (MNCR). **A.** Head, ♂, anterior view, Costa Rica, paratype. **B.** Male genital fork, ventral view, Costa Rica, paratype. **C.** Head and thorax, ♀, dorsal view, Costa Rica, paratype. **D.** Male terminalia, lateral view, Costa Rica, paratype. **E.** Habitus, ♂, Costa Rica, paratype. **F.** Female spermathecae and associated structures, Costa Rica, paratype. Abbreviations: b = basiphallus; bdp = basal distiphallus; e = epandrium; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal ducts; sp = sperm pump; ss = single spermatheca.

MALE ABDOMEN. Pleuron off-white or pale yellow, dark brown or black on anterior $\frac{3}{4}$ of P1, dorsal $\frac{3}{4}$ of pleural sac and dorsal third of P3–6 (Fig. 35E). T1+2 $\sim 2.8\times$ length of T3. T6 short, genital fork $3.0\times$ as long as T6, arms densely setose, broad, converging; inner basal process angled inwards, $\frac{1}{6}$ the length of arm. Epandrium elongate, $\sim 2.0\times$ as long as high, short setose on posteroventral margin. Basiphallus projecting posteriorly, crescent-shaped. Basal distiphallus long (\approx length of epandrium), terminating at short (length \approx height), approximately round single-chambered phallic bulb. Distal distiphallus absent. Phallopodeme slender, not expanded apically.

Distribution

Costa Rica.

Scipopus (Parascipopus) fenestratus subgen. et sp. nov.

[urn:lsid:zoobank.org:act:269ABDDC-F6F2-4B07-A791-227B5432BC5B](https://zoobank.org/act:269ABDDC-F6F2-4B07-A791-227B5432BC5B)

Figs 36–37

Differential diagnosis

Scipopus (Parascipopus) fenestratus resembles *S. (Pa.) nigriscapus* sp. nov. in having a mostly orange body, but it differs by the three well-defined subapical hyaline spots on the wing, the absence of an apical scutellar seta, and the black distal and basal bands on the femora.

Etymology

The species name, from the Latin noun for ‘window’, refers to the subapical well-defined, window-like hyaline spots on the wing.

Type material examined

Holotype

COSTA RICA • 1 ♀; Puntarenas, Monteverde Bio. Stn, along lower trail; 10°18'7" N, 84°48'10" W; 1500 m a.s.l.; 14 Aug. 2010; S.A. Marshall leg.; MNCR.

Paratypes

COSTA RICA • 2 ♀♀; same collection data as for holotype; MNCR • 1?; same collection data as for preceding; MYCRO015-15/UGIC114-15 sequenced for CO1; MNCR • 1 ♀; Puntarenas, Coto Brus, Z.P. Las Tablas, Est. Biol. Las Alturas; 82°50'04" W, 08°57'07" N; 1500–1600 m a.s.l.; 18–24 Jun. 2013; Proyecto ZADBI; Malaise Trap; ZADBI-889; MNCR • 1 ♂; San José, Moravia, Zurquí de Moravia, North pasture; 84°00'57" W, 10°02'58" N; 1600 m a.s.l.; 22–29 Mar. 2013; Proyecto ZADBI; Malaise trap #3; ZADBI-662; MNCR • 1 ♀; same collection data as for preceding; 12–19 Apr. 2013; ZADBI-712; MYCRO045-15/UGIC144-15 sequenced for CO1; MNCR • 1 ♀; same collection data as for preceding; Creek 2 north; 24–31 May 2013; Malaise trap #2; ZADBI-786; MNCR (photographed, Fig. 36C) • 1 ♀; same collection data as for preceding; 10–17 May 2013; ZADBI-743; MNCR • 1 ♀; Prov. Cartago, Paraíso, P.N. Tapanti-Macizo de la Muerte; 1420 m a.s.l.; 19 May 2000; C. Hanson and D. Rubi leg.; Malaise; L_N_188500_561800 #56722; MNCR • 1 ♂; San José, est. Zurquí 500 m antes de Tunel; 1600 m a.s.l.; Mar. 1991; G. Maass leg.; L-N-226800, 535200; MNCR.

Other material examined

COSTA RICA • 1 ♀; Prov. San José, Moravia, Zurquí de Moravia, Tower path; 10°02'58" N, 84°00'57" W; 1600 m a.s.l.; 12–19 Apr. 2013; Proyecto ZADBI; Malaise trap #1; ZADBI-710; MNCR • 1 ♀; same collection data as for preceding; 24–31 May 2013; ZADBI-785; MNCR • 1 ♀; same collection data as for preceding; North pasture; Malaise trap #3; ZADBI-787; MNCR • 1 ♀; same collection data as for

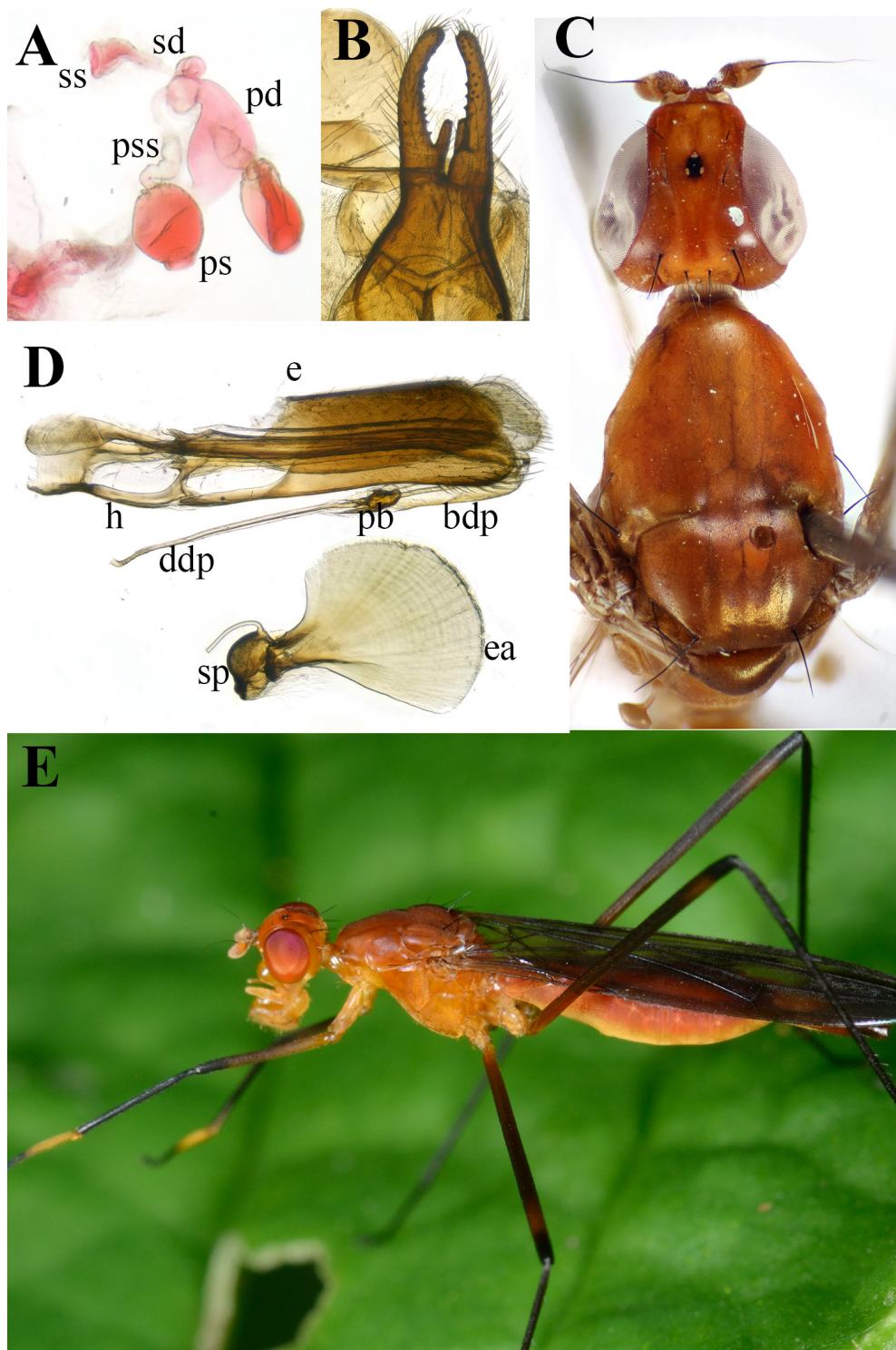


Fig. 36. *Scipopus (Parascipopus) fenestratus* subgen. et sp. nov. **A.** Female spermathecae and associated structures, Costa Rica, non-type (MNCR). **B.** Male genital fork, ventral view, Costa Rica, paratype (MNCR). **C.** Head and thorax, ♀, dorsal view, paratype (MNCR). **D.** Male terminalia, lateral view, Costa Rica, paratype (MNCR). **E.** Living, ♀, Costa Rica. Abbreviations: bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal ducts; sp = sperm pump; ss = single spermatheca.

preceding; 16 Apr. 2013; hand collected; ZADBI-663; MNCR • 1 ♀; same collection data as for preceding; Creek 2 north; 12–19 Apr. 2013; Malaise trap #2; ZADBI-711; MNCR • 1 ♀, 1?; same collection data as for preceding; 5–9 Aug. 2013; S.A. Marshall leg.; hand collected at light; ZADBI-1193; MNCR • 2 ♀♀; same collection data as for preceding; 5–6 Aug. 2013; mixed methods; ZADBI-1041; MNCR • 1 ♀; same collection data as for preceding; 20 Oct.–1 Nov. 2012; Projecto ZADBI; Malaise trap #1; ZADBI-190; MNCR • 1 ♀; same collection data as for preceding; Creek 2 north; 24–31 May 2013; Malaise trap #2; ZADBI-786; MNCR • 1 ♀; Prov. Cartago, Paraiso, P.N. Tapanti-Macizo de la Muerte; 1500 m a.s.l. 19 May 2000; C. Hanson and D. Rubi leg.; Malaise; Torre ICE #28; L_N_189400_561700; MNCR (dissected and photographed, Fig. 36A).

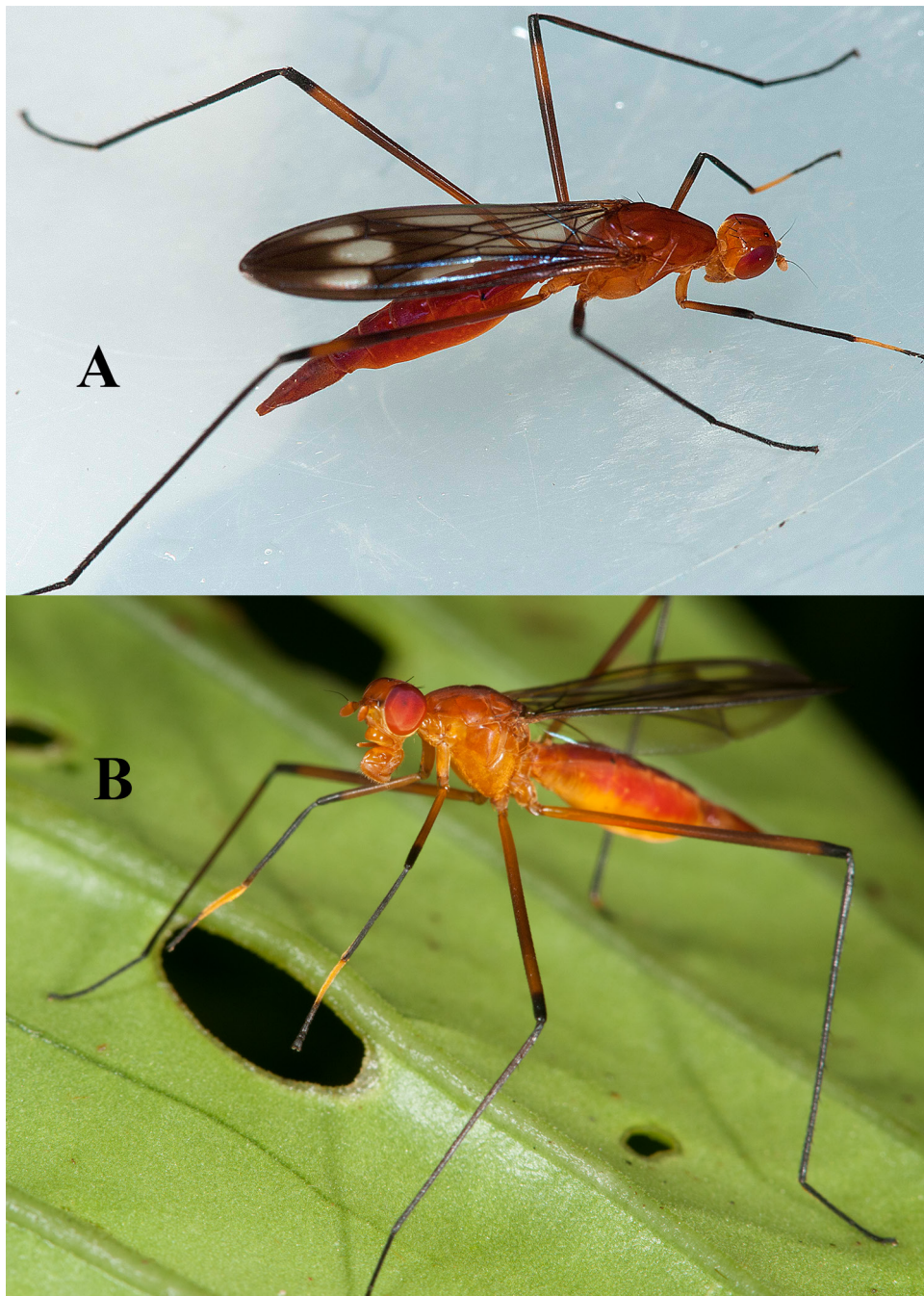


Fig. 37. *Scipopus* (*Parascipopus*) *fenestratus* subgen. et sp. nov. **A–B.** Living, Monteverde, Costa Rica.

Description

LENGTH. 13–15 mm.

HEAD. Antenna orange. Palpus orange, pale orange microtrichose and sparsely black setulose on entire surface, broad (length $3.1 \times$ height). Clypeus orange, width $\sim 2.4 \times$ height, silvery microtrichose on entire surface. Frontal vitta entirely dull, orange, microtrichose, tapered posteriorly but posterior apex expanded. Orbital plate dull, orange, microtrichose, clearly delineated. Epicephalon orange, shiny, white-microtrichose, wide (width $> \frac{2}{3}$ of frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon orange or light brown. One lower fronto-orbital seta, upper fronto-orbital seta absent or present, outer vertical seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum orange, microtrichose. Female cervical sclerite convex. Postpronotal lobe orange, orange setulose anteriorly and on outer margin. Notopleuron orange. Pleuron orange, uniformly white microtrichose. Tibiae dark brown or black, fore femur orange on basal $\frac{3}{4}$, dark brown or black apically, mid and hind femora pale brown or orange basally and preapically, darker brown or black medially, black apically. First fore tarsomere yellow, hind tarsomere 1 dark brown or black with ventral golden fringe. Wing brown infusate on r_1 , distal $\frac{1}{2}$ and apex; with three hyaline window-like spots in m_1 , r_{2+3} , r_{3+4} (Fig. 37A).

ABDOMEN ($\sigma + \text{♀}$). Tergites orange or brown, black setulose. T1 with long, fine, yellow or orange setae. Pleuron yellow or pale orange, microtrichose, dark orange or brown on P1, dorsal half of P2–6 dark orange (Fig. 37B).

FEMALE ABDOMEN. T1+2 $\sim 2.2 \times$ length of T3. Oviscape orange and/or brown, white microtrichose on anterior $\frac{1}{2}$, $\sim 4.0\text{--}5.0 \times$ length of T6. Combined spermathecal duct length short; common duct $\frac{1}{2}$ of entire duct length. Paired spermathecal duct very short ($1.0\text{--}2.0 \times$ length of paired spermathecae), very swollen medially, less swollen apically. Paired spermathecal stems inornate, bulbous and wrinkled, longer than spermathecae. Paired spermathecae spherical, with apical indentation (collapsed in Fig. 36A). Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ the diameter and \approx length to paired duct. Single spermatheca swollen distally, inornate.

MALE ABDOMEN. T1+2 $\sim 3.0 \times$ length of T3. T6 short, genital fork $2.3 \times$ as long as T6, arms converging, inner basal process angled inwards, $\frac{1}{5}$ the length of arm. Epandrium elongate, length $\sim 2.0 \times$ height, short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus long ($\sim \frac{1}{2}$ epandrial length), ending in small, short (length \approx height) single-chambered phallic bulb, with narrow anterior projections. Distal distiphallus narrow, long (\approx length to epandrium), with apex slightly expanded and tube-like. Phallapodeme broad and expanded apically. Hypandrium expanded anteriorly.

Distribution

Costa Rica.

Scipopus (Parascipopus) kubus subgen. et sp. nov.

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Fig. 38

Differential diagnosis

Scipopus (Parascipopus) kubus sp. nov. resembles most species of *Scipopus* s. str. in having a primarily orange head and dark brown body with a blue sheen, but differs from *Scipopus* s. str. in having an entirely white microtrichose anepisternum, an anteriorly tapered and pointed frontal vitta, a shiny orbital plate and a more anteriorly tapered thorax (length/height > 1).

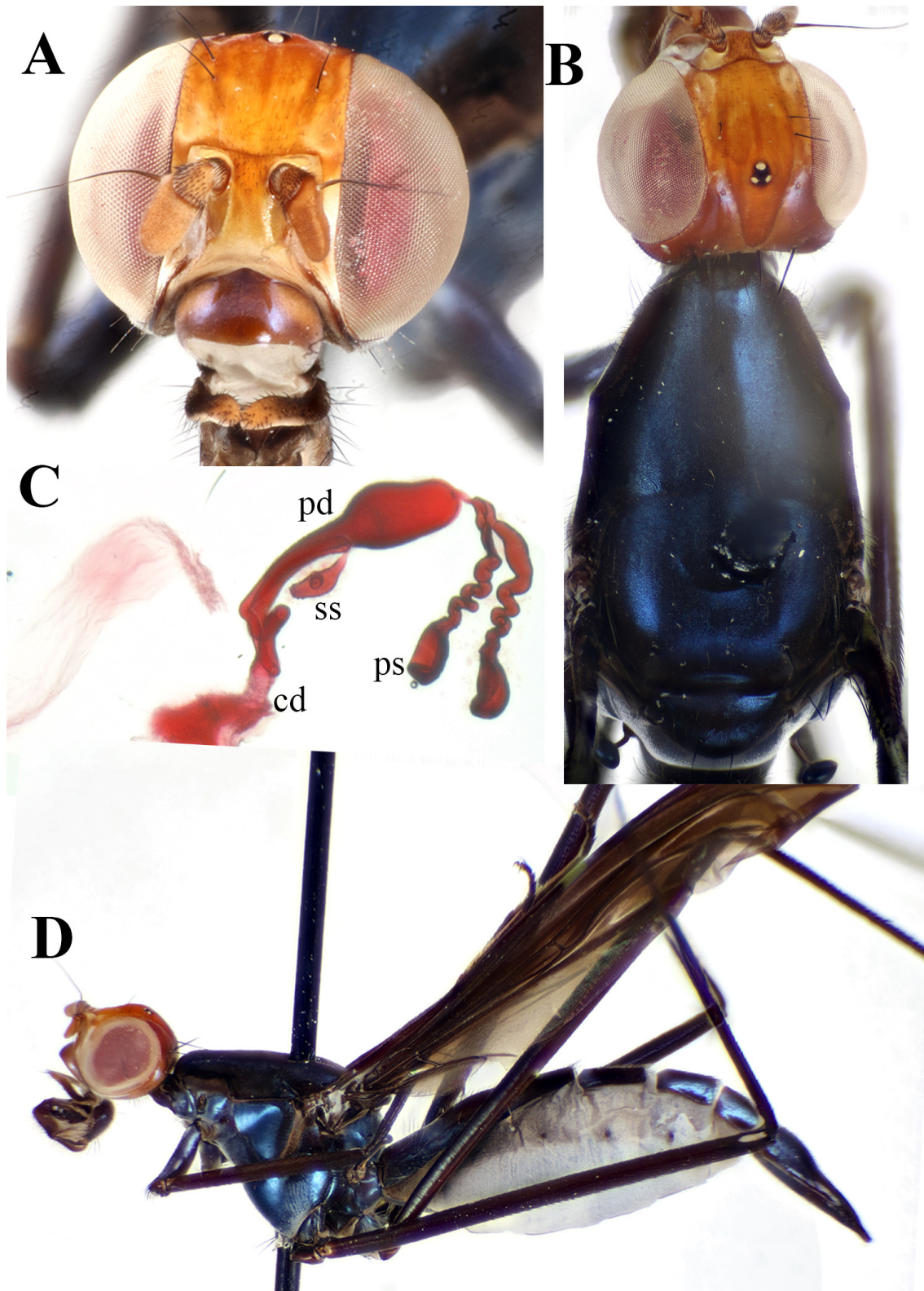


Fig. 38. *Scipopus* (*Parascipopus*) *kubus* subgen. et sp. nov. (MNCR) **A.** Head, ♀, anterior view, holotype. **B.** Head and thorax, dorsal view, holotype. **C.** Female spermathecae and associated structures. **D.** Habitus, holotype. Abbreviations: cd=common duct; pd = paired spermathecal duct; ps = paired spermatheca; ss = single spermatheca.

Etymology

The species name is a noun in apposition that honours the first author's significant other.

Type material examined

Holotype

COSTA RICA • 1 ♀; Alajuela, San Ramón Biol. Res.; 900 m a.s.l.; Apr–May 2000.; P. Hanson leg.; debu00206289/MYCRO579-19 sequenced for COI; MNCR (photographed, Fig. 38A, B, D).

Paratypes

COSTA RICA • 1 ♀; same collection data as for holotype; debu00206315/MYCRO568-19 sequenced for COI; MNCR (dissected and photographed, Fig. 38C) • 1 ♀; same collection data as for preceding; MNCR.

Description

LENGTH. 11–15 mm.

HEAD. Antenna orange. Palpus orange, brown basally, pale microtrichose and setulose, narrow (length $5.0 \times$ height). Clypeus orange, brown medially, width $\sim 2.1 \times$ height, sparsely silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose, posterior apex evenly tapered to a narrow apex. Orbital plate orange, shiny, bare, clearly delineated. Epicephalon orange, shiny, bare, wide (width $> \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon orange. All head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with a very broad silvery-blue median sheen. Female cervical sclerite convex. Postpronotal lobe black-brown, setulose on outer lateral margin. Notopleuron black-brown. Pleuron black-brown with blue sheen, entirely covered in silvery microtrichosity, denser on posterior katapisternum and forming transverse silvery band (only visible at some angles). Legs black-brown; fore and hind tarsomere 1 dark brown or black with ventral golden fringe. Wing evenly dark brown infusate. Apical scutellar seta present.

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron pale grey, microtrichose, P1, dorsal half of P2 dark brown or grey, indistinctly dark brown or grey on dorsal half of P3–6. T1+2 $\sim 2.2 \times$ length of T3. Oviscape black-brown, setulose, white microtrichose on anterior $\frac{1}{3}$, $\sim 3.0 \times$ length of T6. Common duct very short, $\frac{1}{8}$ of entire duct length. Paired spermathecal duct short ($4.0 \times$ length of paired spermathecae) narrow, very swollen distally. Paired spermathecal stems with very short, narrow, straight basal section and long, sinuate distal portion. Paired spermathecae ovoid, with an apical indentation (collapsed in Fig. 38C). Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ diameter and $\frac{3}{4}$ length of paired duct, single spermatheca elongate, inornate.

MALE ABDOMEN. Not observed.

Distribution

Costa Rica.

Scipopus (Parascipopus) manifestus (Wulp, 1897) subgen. et comb. nov.
Figs 39–40

Calobata manifesta Wulp, 1897: 370, Tab. IX, fig. 20.

Calobata manifesta – Hennig 1934a: 67 (species inquirenda); 1934b: 323 (“in the next issue”); 1935: 27.
Scipopus manifestus – Enderlein 1922: 208 (key to species). — Steyskal 1967: 80.

Differential diagnosis

Scipopus (Parascipopus) manifestus resembles *S. (Pa.) savegre* sp. nov. in having a mostly black body but the first fore tarsomere is at least partially white.

Type material examined

Holotype (examined and photographed at BMNH, 2014)

COSTA RICA • 1 ♀; Volcan de Irazu; 6–7000 ft a.s.l.; H. Rogers leg.; BMNH.

Other material examined

COSTA RICA • 1 ♀; Prov. San José, Moravia, Zurquí de Moravia, Creek 1 north; 84°00'57" W, 10°02'58" N; 1600 m a.s.l.; 16 Jun. 2013; Proyecto ZADBI; hand collected; ZADBI-858; MNCR • 1 ♀; same collection data as for preceding; 2–5 Aug. 2013; mixed methods; ZADBI-1076; MNCR (photographed, Fig. 39A) • 2 ♀♀; same collection data as for preceding; North pasture; 16 Apr. 2013; ZADBI-663; MNCR • 1 ♀; same collection data as for preceding; 24–31 May 2013; ZADBI-787; MNCR • 1 ♀; same collection data as for preceding; 16 Apr. 2013; ZADBI-663; MNCR • 1 ♀; same collection data as for preceding; 17 Mar. 2013; ZADBI-604; MNCR • 2 ♀♀; same collection data as for preceding; Tower path; 26 Apr.–3 May 2013; Malaise trap #1; ZADBI-728; MNCR • 1 ♀; same collection data as for preceding; 28 Jun.–5 Jul. 2013; emergence trap, over vegetation 50 m; ZADBI-904; MNCR • 1 ♀; same collection data as for preceding; 5–12 Jul. 2013; ZADBI-909; MNCR • 2 ♀♀; same collection data as for preceding; 1–7 Jun. 2013; ZADBI-810; MNCR • 1 ♀; same collection data as for preceding; 7–14 Jun. 2013; ZADBI-853; MNCR • 1 ♀; same collection data as for preceding; 24–31 May 2013; ZADBI-785; MNCR • 1 ♀; same collection data as for preceding; Creek 2 north; 17 Mar. 2013; Malaise trap #2; ZADBI-604; MNCR • 1 ♀; same collection data as for preceding; 3–10 May 2013; ZADBI-716 • 1 ♀; same collection data as for preceding; 1–7 Jun. 2013; ZADBI-811; MNCR • 1 ♀; Cartago, Tapanti Natl. Pk; 1650–1750 m a.s.l.; 7 Oct. 1999; Marshall and Buck leg.; DEBU_0074/DEBU0074 sequenced for CO1; DEBU • 1 ♀; same collection data as for preceding; DEBU (photographed, Fig. 39C, F) • 1 ♂, 1 ♀; Prov. Punt., Res. Biol. Monteverde, Est. La Casona; 1520 m a.s.l.; Apr. 1993; N. Obando leg.; L-N-253250, 449700; MNCR (♂ dissected and photographed, Fig. 39B, D) • 1 ♂; same collection data as for preceding; Mar. 1992; K. Flores leg.; MNCR • 1 ♂, 1 ♀; Prov. Cartago, Paraíso, P.N. Tapanti; 83°46'3" W, 9°43'21" N; 1600 m a.s.l.; 28 Apr.–5 May 2013; Proyecto ZADBI; Malaise trap; ZADBI-806; MNCR • 2 ♂♂; same collection data as for preceding; 30 Mar.–7 Apr. 2013; ZADBI-802; MNCR • 1 ♂; same collection data as for preceding; 12–19 May 2013; ZADBI-808; MNCR • 1 ♂; same collection data as for preceding; 24–30 Mar. 2013; ZADBI-801; MNCR • 1 ♂; same collection data as for preceding; 19–26 May 2013; ZADBI-809; MNCR • 1 ♀; same collection data as for preceding; 29 Sep.–6 Oct. 2013; ZADBI-1262; MNCR • 3 ♀♀; same collection data as for preceding; 21–28 Apr. 2013; ZADBI-805; MNCR • 1 ♀; same collection data as for preceding; 2–9 Jun. 2013; ZADBI-1245; MNCR • 1 ♀; same collection data as for preceding; 11–18 Aug. 2013; ZADBI-1255; MNCR • 1 ♀; same collection data as for preceding; 7–14 Apr. 2013; ZADBI-803; MNCR • 1 ♂; San Rafael HDIA, C. Chompipe; 2100 m a.s.l.; 31 Jul. 1993; M.A. Zumbad leg.; MNCR • 1 ♀; Prov. Puntarenas, Monteverde; 1700 m a.s.l.; 1 Jun. 1988; B.V. Brown leg.; clearcut edge; Malaise; CMNH • 1 ♀; same collection data as for preceding; 1–5 May 1988; cloud forest; CMNH (dissected and photographed, Fig. 39E) • 1 ♀; Prov. Puntarenas, Coto Brus, Send Cerro Echandi, Orilla R. Vellavista, 1^{er} Campamento; 1900 m a.s.l.; 16 May 2000; M. Alfaro leg.; manual; L_S_326500_591700; MNCR • 1 ♀; Prov. Cartago, Paraíso, P.N. Tapanti-Macizo de la Muerte; 1410 m a.s.l.; 19 May 2000; C. Hanson and D. Rubi leg.; Malaise; L_N_188550_561800; MNCR • 1 ♀; same locality as for preceding; 1500 m a.s.l.; 13 May 2000; C. Hanson and D. Rubi leg.; Malaise; L_N_187400_561600; MNCR.

Description

LENGTH. 10–14 mm.

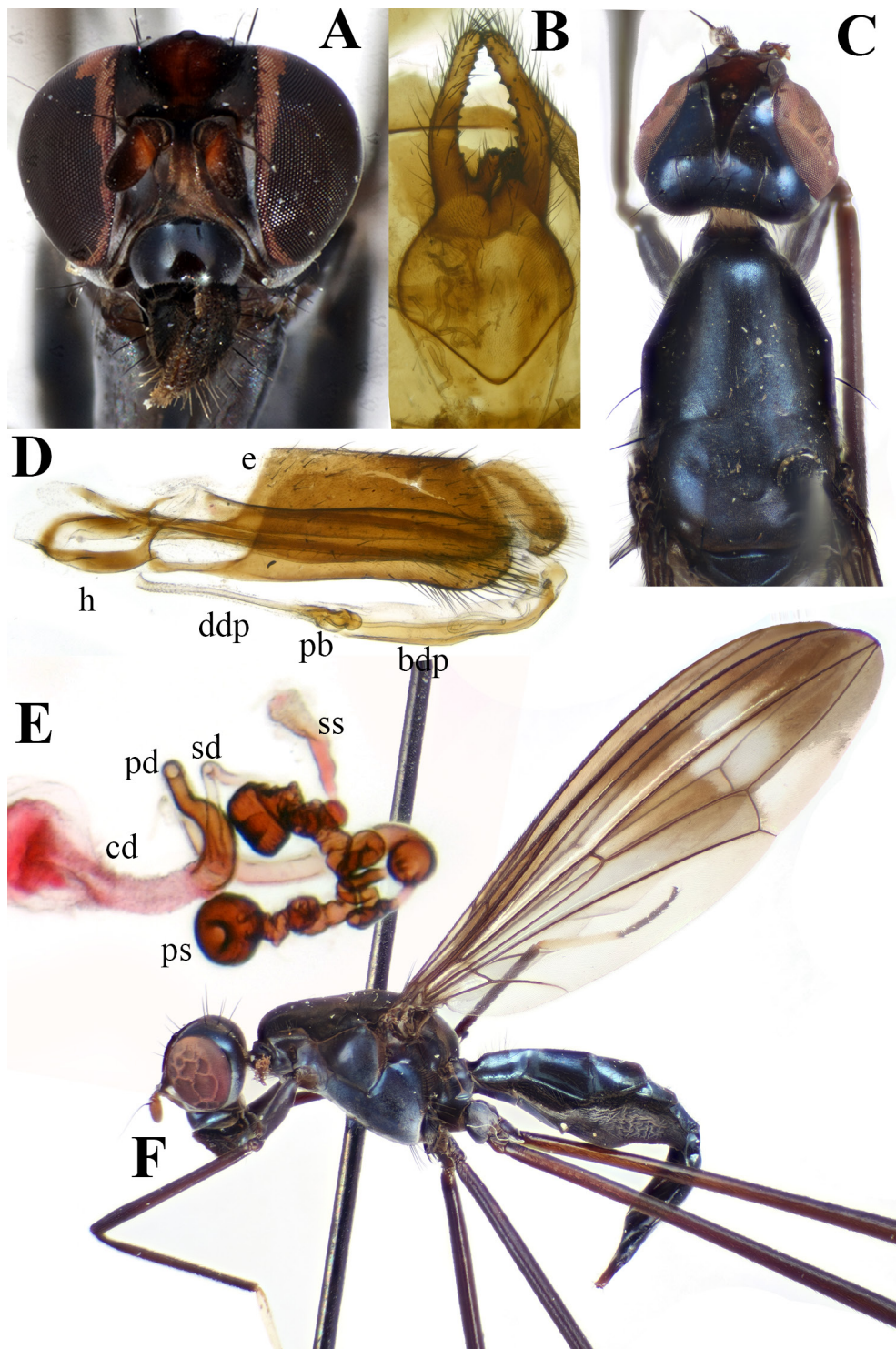


Fig. 39. *Scipopus (Parascipopus) manifestus* (Wulp, 1897) subgen. et comb. nov. **A.** Head, ♀, anterior view, Costa Rica, non-type (MNCR). **B.** Male genital fork, ventral view, Costa Rica, non-type (MNCR). **C.** Head and thorax, ♀, dorsal view, Costa Rica, non-type (DEBU). **D.** Male terminalia, lateral view, Costa Rica, non-type (MNCR). **E.** Female spermathecae and associated structures, Costa Rica, non-type (CMNH). **F.** Habitus, ♀, Costa Rica, non-type (DEBU). Abbreviations: cd = common duct; bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca.

HEAD. Antenna dark orange and/or black. Palpus dark brown or black, silvery microtrichose and black setulose on entire surface, broad (length $3.0 \times$ height). Clypeus black, width $\sim 1.7 \times$ height, silvery microtrichose on entire surface, denser in posterolateral corners. Frontal vitta dull, orange and/or black or dark brown microtrichose, posterior apex strongly tapered into a point (Fig. 39C). Orbital plate shiny, black or brown, bare and clearly delineated. Epicephalon shiny, bare, wide (width $> \frac{2}{3}$ of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon dark brown or black, slightly convex on posterolateral portions. One lower fronto-orbital seta; all other head chaetotaxy well-developed.

THORAX. Scutum dark brown or black, microtrichose with broad median blue sheen (Fig. 39C). Female cervical sclerite convex. Postpronotal lobe black, densely setulose. Notopleuron black. Pleuron black, white microtrichose, denser anteriorly and posteriorly, forming posterior transverse band (Fig. 40). Legs dark brown or black, first fore tarsomere almost entirely white, hind tarsomere 1 pale brown or white on inner basolateral $\frac{1}{2}$. Wing brown-black infuscate on r_p , distal $\frac{1}{2}$ and apex, three hyaline window-like spots in m_p , r_{2+3} , r_{3+4} (Fig. 39F). Apical scutellar seta present.

ABDOMEN ($\sigma + \text{♀}$). Tergites dark brown or black, short black setulose. T1 with fine, long dark brown or black setae. Pleuron pale grey or cream-coloured, P1, upper half of P2–6 dark brown or black in males, same for females but lower third of P3–6 also dark grey.

FEMALE ABDOMEN. T1+2 $\sim 2.3 \times$ length of T3. Oviscape dark brown or black, white microtrichose on anterior $\frac{1}{2}$, $\sim 4.0\text{--}5.0 \times$ length of T6. Combined spermathecal duct length short; common duct short, $\frac{1}{4}$



Fig. 40. *Scipopus* (*Parascipopus*) *manifestus* (Wulp, 1897) subgen. et comb. nov., living, with associated pseudoscorpion, ♀, Costa Rica, non-type.

of entire duct length. Paired spermathecal duct long ($\sim 6.0 \times$ length of paired spermathecae), narrow, slightly swollen apically, relatively parallel-sided. Paired spermathecal stems sinuate, long, ending in cup-like paired spermathecae with large apical indentation. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ the diameter and length of paired duct, swollen apically. Single spermatheca elongate, wider distally, inornate.

MALE ABDOMEN. T1+2 $\sim 2.8 \times$ length of T3. T6 short, genital fork $2.0 \times$ as long as T6, with arms converging, inner basal process angled inwards, $\frac{1}{3}$ the length of arm. Epandrium elongate, length $\sim 2.0 \times$ height, taller posteriorly; long setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus long (\approx length to epandrium), broad, ending in small, short, irregular phallic bulb. Distal distiphallus narrow, expanded and funnel-like apically, $\frac{1}{2}$ the length of epandrium. Phallapodeme slightly expanded apically (not apparent in Fig. 39D), length $2.0 \times$ height.

Distribution

Costa Rica.

Scipopus (Parascipopus) monteverde subgen. et sp. nov.
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Fig. 41

Differential diagnosis

Scipopus (Parascipopus) monteverde sp. nov. resembles *S. (Pa.) tico* sp. nov. in having an orange frontal vitta and a primarily dark brown or black body with a blue sheen, but it differs in having evenly dark brown or black femora, a darkly infuscate wing, and a dark brown or black first fore tarsomere.

Etymology

The name is a noun in apposition inspired by the type locality.

Type material examined

Holotype

COSTA RICA • 1 ♀; Monteverde, sweep nr Biol Stn; 25 May 1998; S.A. Marshall leg.; pseudoscorpion associated with specimen; MNCR (photographed, Fig. 41F).

Paratypes

COSTA RICA • 1 ♂; Prov. Puntarenas, Coto Brus, Z.P. Las Tablas, Est. Biol. Las Alturas; 82°50'04" W, 08°57'07" N; 1500–1600 m a.s.l.; 2–9 Apr. 2013; Proyecto ZADBI; Malaise Trap; ZADBI -683; MYCRO170-15/UGIC169-15 sequenced for CO1; MNCR • 1 ♀; same collection data as for preceding; MNCR • 1 ♀; same collection data as for preceding; 15–22 Apr. 2013; ZADBI685; MNCR • 1 ♀; same collection data as for preceding; 13–20 May 2013; ZADBI-884; MNCR • 1 ♀; same collection data as for preceding; 22–29 Apr. 2013; ZADBI-881; MYCRO166-15 UGIC265-15 sequenced for CO1; MNCR (photographed, Fig. 41A) • 1 ♂; same collection data as for preceding; 5–11 Mar. 2013; ZADBI-679 • 1 ♂; Prov. Alajuela, Upala, Albergue Heliconias, S. Laguna Danto; 1100 m a.s.l.; 24–26 Jan. 2001; J.D. Gutiérrez leg.; manual; L_N_423760_298100; MNCR • 1 ♂; Prov. Puntarenas, Buenos Aires, Estación Altamira, Sendero Los Gigantes; 1460 m a.s.l.; 2–18 Feb. 2001; O. Alemán leg.; manual; L_S_572200_331700; MNCR • 1 ♂; Prov. Cartago, Turriabla, Santa Teresita, Monumento Nacional Guayabo; 1100 m a.s.l.; Oct. 1994; G. Fonseca leg.; Malaise; L_N_570000_217400; MNCR • 1 ♀; Puntarenas, Monteverde Biol. Res.; 1500 m a.s.l.; 12 Jun. 2000; M. Buck leg.; cloud forest; debu00118150; DEBU • 2 ♀♀; same locality as for preceding; lower trail; 11 Jun. 2000; S.A. Marshall leg.; debu00118248; DEBU • 1 ♀; same locality as for preceding; 1500 m a.s.l.; 13–14 Jun. 2000; D.

Bickel leg.; sticky trap on tree trunk; debu00138177; MNCR (dissected and photographed, 41C) • 1 ♀; same locality as for preceding; along lower trail; 10°18'7" N, 84°48'10" W; ~1500 m a.s.l.; 14 Aug. 2012; S.A. Marshall leg.; debu0033024; MNCR (photographed, Fig. 41D) • 1 ♂; San José, San Carlos, Cerro Cura, 14 km SSW of San Marcos de Tarrazú; 1800 m a.s.l.; 9°36'31" N, 84°7'9" W; 15 Feb. 2003; S.A. Marshall leg.; debu00205682; DEBU (dissected and photographed, Fig. 41B, E).

Description

LENGTH. 10–13 mm.

HEAD. Antenna orange. Palpus dark brown, apically light brown and pointed, pale microtrichose and setulose, narrow (length $4.1 \times$ height). Clypeus dark brown or black, width $\sim 2.1 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose, posterior apex strongly tapered to a point (Fig. 41D). Orbital plate orange, shiny, bare, clearly delineated. Epicephalon black or dark brown, shiny, bare, wide (width $> \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon dark brown or black. Upper fronto-orbital seta and one of the usual two lower fronto-orbital setae absent, all other head chaetotaxy well-developed.

THORAX. Scutum black, brown microtrichose, with a wide, shiny, blue indistinct sheen medially. Female cervical sclerite slightly convex. Postpronotal lobe black, setulose anteriorly. Notopleuron black with blue sheen at some angles. Pleuron black with blue sheen, entirely covered in silvery microtrichosity, denser on posterior katepisternum, forming silvery transverse band only seen at some angles (Fig. 41F). Legs black, mid and hind femora sometimes slightly paler basally; fore and hind first tarsomere black with ventral golden fringe. Wing slightly brown infuscate. Apical scutellar seta absent.

ABDOMEN (♂+♀). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron mostly dark brown or black, ventral half of P1–3 grey (Fig. 41G). T1+2 $\sim 2.2 \times$ length of T3. Oviscape black, setulose, white microtrichose on anteroventral and lateral $\frac{1}{3}$, dorsomedian $\frac{1}{6}$; $\sim 3.0 \times$ length of T6. Common duct very short, $\frac{1}{8}$ of entire duct length. Paired spermathecal duct long ($7.0 \times$ length of paired spermathecae), mostly parallel-sided, wider basally, swollen apically. Paired spermathecal stems separated into very short, narrow basal section and long, swollen, distal section; sparse tubercles at base of paired spermathecae. Paired spermathecae cup-like, with apical indentation. Single spermathecal duct arising from basal $\frac{1}{6}$ of common duct, narrow, $\frac{1}{2}$ diameter of base of paired duct, $< \frac{1}{2}$ the length of paired duct, slightly swollen apically. Single spermatheca teardrop-shaped, elongate.

MALE ABDOMEN. Pleuron pale grey or off-white, dark brown or black on P1, dorsal $\frac{3}{4}$ of pleural sac and dorsal half of P2–6. T1+2 $\sim 2.6 \times$ length of T3. Genital fork $2.0 \times$ as long as T6, arms converging; inner basal process angled inwards, $\frac{1}{6}$ the length of arm. Epandrium elongate (length $\sim 2.0 \times$ height), long setose on posteroventral margin. Basiphallus small, projecting posteriorly, crescent-shaped. Basal distiphallus long ($> \frac{1}{2}$ epandrial length), partially ending in large, long (length $2.0 \times$ height), approximately ovoid phallic bulb. Distal distiphallus wide, long (\approx length to epandrium, diameter slightly greater than basal distiphallus). Phallapodeme apically expanded and broad (not visible in Fig. 41E). Anterior hypandrium expanded.

Remarks

A female *S. (Pa.) monteverde* sp. nov. was photographed ovipositing in mossy substrate in Monteverde, Costa Rica (Fig. 41G).

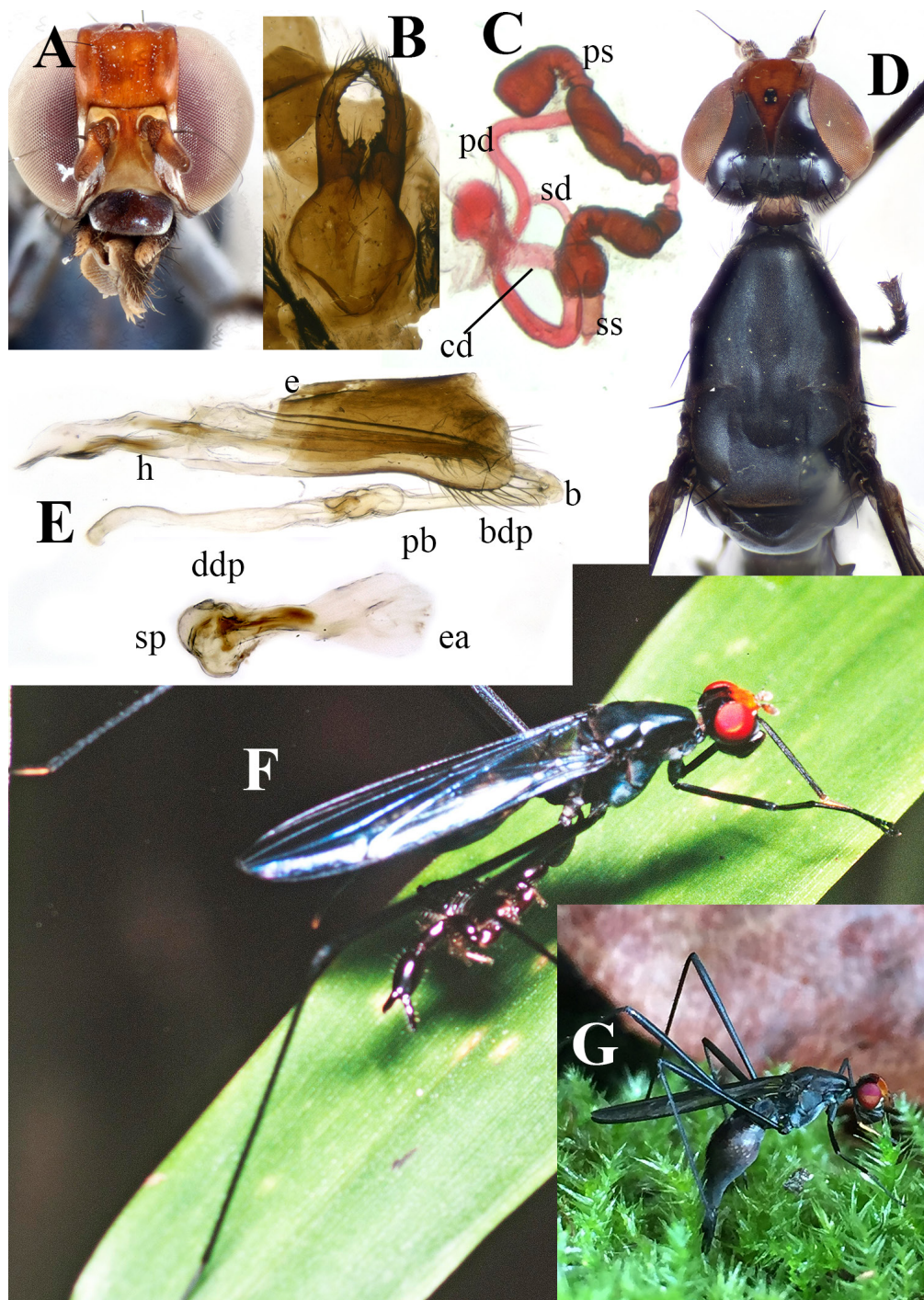


Fig. 41. *Scipopus (Parascipopus) monteverde* subgen. et sp. nov. **A.** Head, ♀, anterior view, Costa Rica, paratype (MNCR). **B.** Male genital fork, ventral view, Costa Rica, paratype (DEBU). **C.** Female spermathecae and associated structures, Costa Rica, paratype (MNCR). **D.** Head and thorax, ♀, dorsal view, Costa Rica, paratype (MNCR). **E.** Male terminalia, lateral view, with cercus broken off, Costa Rica, paratype (DEBU). **F.** Living, with associated pseudoscorpion, Costa Rica, holotype (MNCR). **G.** Living, ♀, ovipositing, Costa Rica (photo credit: Jeff Cole). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

Distribution

Costa Rica.

Scipopus (Parascipopus) nigriscapus subgen. et sp. nov.
[urn:lsid:zoobank.org:act:F905C84D-EBE3-49C4-9C71-226396A23583](https://zoobank.org/urn:lsid:zoobank.org:act:F905C84D-EBE3-49C4-9C71-226396A23583)
Figs 6C, 42

Differential diagnosis

Scipopus (Parascipopus) nigriscapus sp. nov. resembles *S. (Pa.) fenestratus* sp. nov. in having a mostly orange body, but differs by the basally orange mid and hind femora with preapical orange bands, the apical scutellar seta, and the shiny, bare orbital plate. The frontal vitta of *S. (Pa.) nigriscapus* is often (but not always) partially or entirely dark brown or black.

Etymology

The name refers to the partially or entirely dark antennal scape on many representatives of this species.

Type material examined

Holotype

COSTA RICA • 1 ♂; San Jose, San Carlos, Cerro Cura, 14 km SSW of San Marcos de Tarrazú; 9°36'31" N, 84°07'09" W; 1800 m a.s.l.; 15 Feb. 2003; S.A. Marshall leg.; UGIC116-15/MYCRO017-15 sequenced for CO1; MNCR.

Paratypes

COSTA RICA • 3 ♂♂, 12 ♀♀; same collection data as for holotype; MNCR (2 ♂♂ specimens photographed, Fig. 42A,C) • 1 ♂; same collection data as for holotype; UGIC260-15/MYCRO161-15 sequenced for CO1; MNCR • 2 ♂♂, 1 ♀; same collection data as for holotype; 24 Feb. 2006; S.M. Paiero leg.; cloud forest; MNCR • 1 ♀; same collection data as for holotype; MNCR • 1 ♂; San Jose, Finca Zacatales; 2100 m a.s.l.; 8–10 Aug. 1995; M.A. Zumbado leg.; L_S_389000_484300; MNCR • 1 ♂; San Jose, San Gerardo de Dota; 2000–2500 m a.s.l.; 22–26 Feb. 1992; Curso Tachinidae y Syrphidae; L-S 387400,482700; MNCR • 1 ♂; Prov. Punta, Send ac. Pittier; 1800–2500 m a.s.l.; 17 Jan. 1995; S. Avila leg.; L_S_331800_577400; MNCR • 1 ♀; Prov. Puntarenas, Coto Brus, Z.P. Las Tablas, Est. Biol. Las Alturas; 82°50'04" W, 08°57'07" N; 1500–1600 m a.s.l.; 7–13 May 2013; Malaise trap; Proyecto ZADBI; ZADBI-883; MNCR • 1 ♀; same collection data as for preceding; 22–29 Apr. 2013; ZADBI-881; INBIO0004442497/MYCRO581-19 sequenced for CO1; MNCR • 1 ♀; same collection data as for preceding; 27 May–3 Jun. 2013; ZADBI-886; MNCR • 1 ♀; same collection data as for preceding; 2–9 Apr. 2013; ZADBI-683; MNCR • 1 ♀; same collection data as for preceding; 9–16 Jul. 2013; ZADBI-1266; UGIC258-15/MYCRO159-15 sequenced for CO1; MNCR • 1 ♀; same collection data as for preceding; 1–7 Jan. 2013; ZADBI-544; MNCR • 1 ♀; same collection data as for preceding; 9–15 Apr. 2013; ZADBI-684; MNCR • 2 ♀♀; same collection data as for preceding; 11–19 Mar. 2013; ZADBI-680; MNCR • 1 ♀; same collection data as for preceding; 5–13 Aug. 2013; ZADBI-1270; MNCR (dissected and photographed, Fig. 42D) • 1 ♀; same collection data as for preceding; 29 Jun.–2 Jul. 2013; ZADBI-1264; MNCR • 1 ♀; same collection data as for preceding; 3–11 Jun. 2013; ZADBI-887; MNCR • 1 ♀; same collection data as for preceding; 29 Apr.–7 May 2013; ZADBI-887; MNCR • 1 ♀; same collection data as for preceding; 19–26 Mar. 2013; ZADBI-681; MNCR • 1 ♀; same collection data as for preceding; 15–22 Apr. 2013; ZADBI-685; MNCR • 1 ♀; same collection data as for preceding; 11–18 Jun. 2013; ZADBI-888; MNCR • 1 ♂; Prov. Puntarenas, Coto Brus, Z.P. Las Tablas, Camino a Cotoncito, Send a las Juntas; 1400–1500 m a.s.l.; 26 Apr. 2002; M. Alfaro leg.; libre; L_S_320800_594500; MNCR • 6 ♀♀; Prov. Puntarenas, Buenos Aires, Estación Altamira, C. Biolley; 1766 m a.s.l.; 14 May–8 Jun. 2000; D. Rubi leg.; Malaise; L_S_332400_572200; MNCR •

1 ♀; Prov. Puntarenas, Coto Brus, P. Int. La Amistad, Estación Pittier, Fila Pittier; 2200 m a.s.l.; 19 Feb. 2002; M. Alfaro leg.; Libre; L_S_332800_579050 • 1 ♀; Prov. Punta, Est. Pittier, Send. A Rio Canasta; 1670 m a.s.l.; 22–28 Jun. 1995; R. Villalobos leg.; L_S_330900_577400; MNCR • 1 ♂; Prov. Puntarenas, Coto Brus, Send a C. Echandi; 2500 m a.s.l.; 16 May 2000; A. Picado leg.; manual; L_S_382900_593000; MNCR (dissected and photographed, Fig. 42B, E).

MEXICO • 1 ♂; Chiapas, 4 km SE of Custepec; 15°42'30" N, 92°55'51" W; 2100 m a.s.l.; 20 May 2008; cloud forest, Malaise trap; DEBU.

PANAMA • 4 ♀♀; Chiriqui, Hartmann's Finca, 15 km NW of Hato de Volcán; 1200 m a.s.l.; 20–31 May 1977; S. Peck leg.; DEBU • 1 ♀; same collection data as for preceding; DEBU_0085/DEBU085-06 sequenced for CO1; DEBU.

Description

LENGTH. 10–13 mm.

HEAD. Antenna dark orange and/or black and/or light orange, flagellum usually darker apically (Fig. 42A). Palpus orange, pale microtrichose and setulose, narrow (length $4.5 \times$ width). Clypeus orange or light brown, dark brown medially, width $\sim 1.8 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange and/or black, microtrichose, posterior apex strongly tapered to a point. Epicephalon light brown and/or orange, wide (width $> \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown and/or orange. Outer vertical seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum orange to reddish brown. Female cervical sclerite convex. Postpronotal lobe orange, orange setulose anteriorly. Notopleuron orange. Proepisternum orange, with dark brown or black stripe on posteroventral margin. Pleuron orange, sparsely covered in silvery microtrichosity. Tibiae black. Fore femur mostly dark brown or black, orange basally; mid and hind femora black or dark brown, orange on basal $\frac{1}{8}$ to $\frac{1}{2}$, with preapical orange band. Fore tarsomere 1 and sometimes 2 almost entirely white, hind tarsomere 1 dark brown or black with ventral golden fringe. Wing brown infuscate with indistinct, coalesced subapical hyaline spots (Fig. 42F). Apical scutellar seta present.

ABDOMEN ($\sigma + \omega$). T1 with fine, yellow or orange setae. T1–6 dark brown or black, setulose.

FEMALE ABDOMEN. Pleuron pale yellow or off-white, microtrichose, P1, dorsal $\frac{2}{3}$ of P2 and dorsal half of P3–6 dark brown or black. T1+2 $\sim 2.2 \times$ length of T3. Oviscape dark brown or black, darker apically, white microtrichose on anterior ventral $\frac{1}{3}$, lateral $\frac{1}{3}$ and dorsomedian $\frac{1}{8}$ (Fig. 6C), ~ 4.0 – $5.0 \times$ length of T6. Combined spermathecal duct length short; common duct $\frac{1}{2}$ of entire duct length. Paired spermathecal duct narrow, short (2.0 – $3.0 \times$ length of paired spermathecae), parallel-sided. Paired spermathecal stems narrow basally, swollen and wrinkled distally, longer than paired spermathecae. Paired spermathecae ovoid with an apical indentation. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ diameter and \approx length as paired duct. Single spermatheca elongate, swollen apically, inornate.

MALE ABDOMEN. Pleuron off-white, P1–3, dorsal half of P4–6 dark grey, pleural sac dark brown or black. T1+2 $\sim 2.3 \times$ length of T3. T6 short, genital fork $2.3 \times$ as long as T6, with arms converging, inner basal process angled inwards, $\frac{1}{8}$ the length of arm. Epandrium elongate (length $\sim 2.0 \times$ height), short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus short ($\sim \frac{1}{3}$ length of epandrium), ending in small, short (length \approx height) phallic bulb with upper chamber with indistinct posterior round projection and rounded lower chamber. Distal distiphallus narrow, long (\approx in length to epandrium), apex very expanded, spinulose and funnel-like. Phallapodeme very broad and expanded apically. Anterior hypandrium expanded and broad.

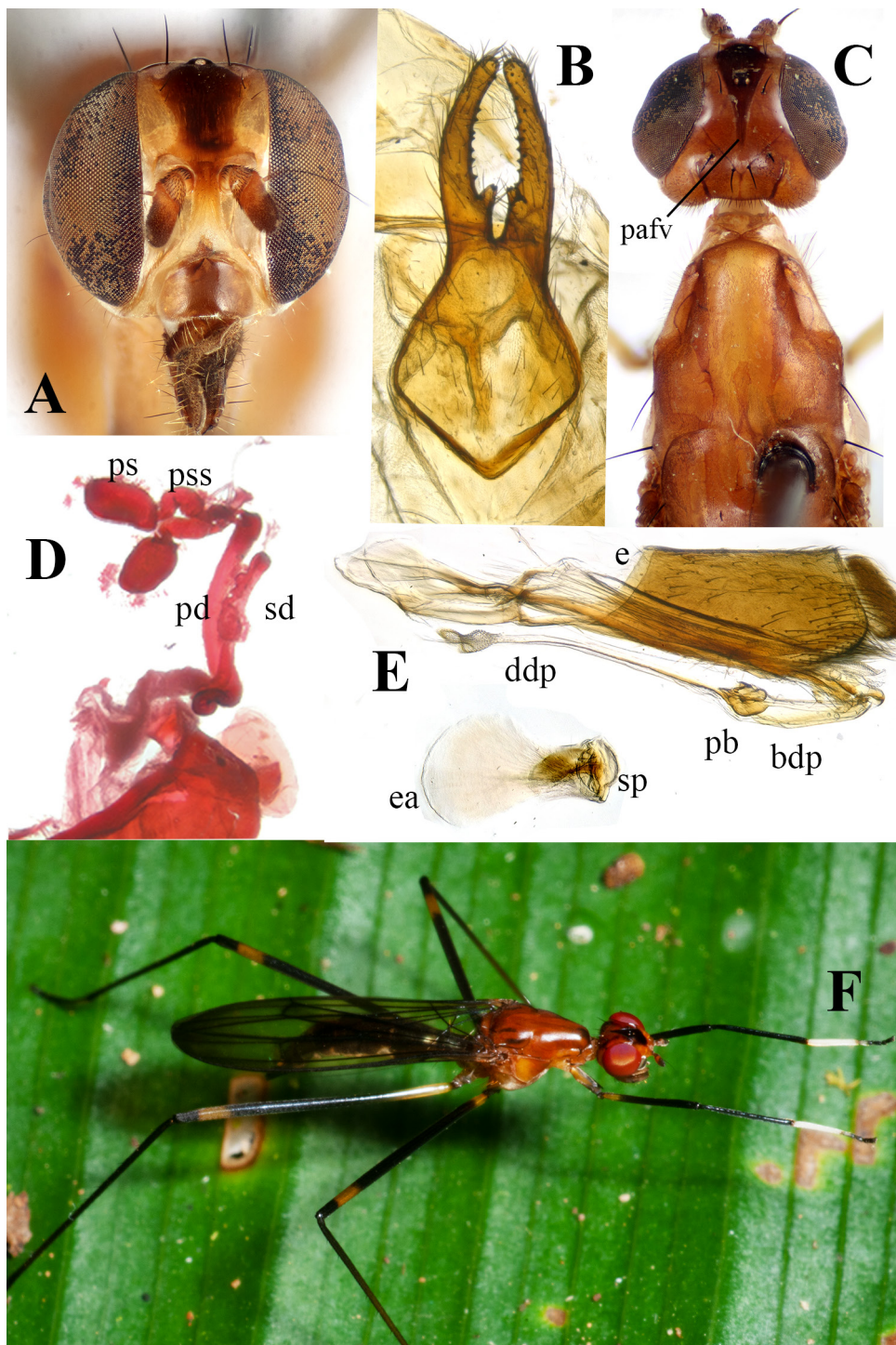


Fig. 42. *Scipopus (Parascipopus) nigriscapus* subgen. et sp. nov. **A.** Head, ♂, anterior view, Costa Rica, paratype (MNCR). **B.** Male genital fork, ventral view, Costa Rica, paratype (MNCR). **C.** Head and thorax, ♂, dorsal view, Costa Rica, paratype (MNCR). **D.** Female spermathecae and associated structures, Costa Rica, paratype (MNCR). **E.** Male terminalia, lateral view, Costa Rica, paratype (MNCR). **F.** Living, ♀, Costa Rica. Abbreviations: bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; pafv = posterior apex of the frontal vitta; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump.

Remarks

The expanded and spinulose distiphallus apex of this species is an unusual character state, not found elsewhere in *Scipopus* s. lat. The modified apex resembles what is referred to as the ‘glans’ in some Afrotropical genera (Marshall 2014).

Distribution

Mexico to Panama.

Scipopus (Parascipopus) otisi subgen. et sp. nov

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Fig. 43

Differential diagnosis

Scipopus (Parascipopus) otisi sp. nov. resembles *S. (Pa.) savegre* sp. nov. and *S. (Pa.) manifestus* in having a mostly black or dark brown body, but differs in having a highly contrasting, basally yellow femur.

Etymology

The name is a patronym honoring Gard Otis, a fellow field entomologist, long-time colleague of the second author, and professor, mentor, and colleague to the first author at the University of Guelph.

Type material examined

Holotype

COSTA RICA • 1 ♀; Puntarenas, Monteverde; 1700 m a.s.l.; 1 Jun. 1988; B.V. Brown leg.; Clearcut Edge; Malaise; MNCR.

Paratypes

COSTA RICA • 1 ♂; same collection data as for holotype; 1–5 May 1988; cloud forest; MNCR • 1 ♀; Prov. San José, Moravia, Zurquí de Moravia, Tower path; 84°00'57" W, 10°02'58" N; 1600 m a.s.l.; 5–12 Apr. 2013; Projecto ZADBI; Malaise trap #1; ZADBI-648; MNCR • 1 ♀; same collection data as for preceding; 12–19 Apr. 2013; ZADBI-710; MNCR • 1 ♀; same collection data as for preceding; 26 Apr–3 May 2013; ZADBI-720; MNCR • 1 ♀; same collection data as for preceding; North pasture; 24–31 May 2013; Malaise trap #3; ZADBI-787; MNCR • 1 ♀; same collection data as for preceding; 12–19 Apr. 2013; ZADBI-712; MYCRO018-15/UGIC117-15 sequenced for CO1; MNCR (photographed, Fig. 43D) • 1 ♂; same collection data as for preceding; MNCR (dissected and photographed, Fig. 43B, E) • 1 ♀; Prov. Cartago, Paraiso, P.N. Tapanti-Macizo de la Muerte; 1410 m a.s.l.; 9 Jun. 2000; C. Hanson and D. Rubi leg.; Torre #31; manual; L_N_188500_561800; MNCR.

Other material examined

COSTA RICA • 1 ♀; Puntarenas, Monteverde Biol. Stn, lower trail, cloud forest; 11 Jun. 2011; S.A. Marshall leg.; debu00118226; DEBU (photographed, Fig. 43F) • 1 ♀; Puntarenas, Monteverde; 13 Jun 2000; D.M. Wood leg.; debu00118590/MYCRO813-20 sequenced for CO1–5'; DEBU (photographed, Fig. 43A) • 1 ♀; Puntarenas, Monteverde Biol. Res.; 1500 m a.s.l.; 13 Jun. 2000; M. Buck leg.; debu00118190/MYCRO818-20 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for preceding; debu00118191/MYCRO582-19 sequenced for CO1; DEBU • 1 ♀; Puntarenas, Monteverde; 12 Jun. 2000; S.D. Gaimari leg.; on foliage; debu00118591/MYCRO606-19 sequenced for CO1; DEBU • 1 ♀; Puntarenas, Monteverde, cloud forest; 13 Jun. 2000; S.D. Gaimari leg.; debu0011587; DEBU072-06/DEBU0072 sequenced for CO1; DEBU (dissected and photographed, Fig. 43C).

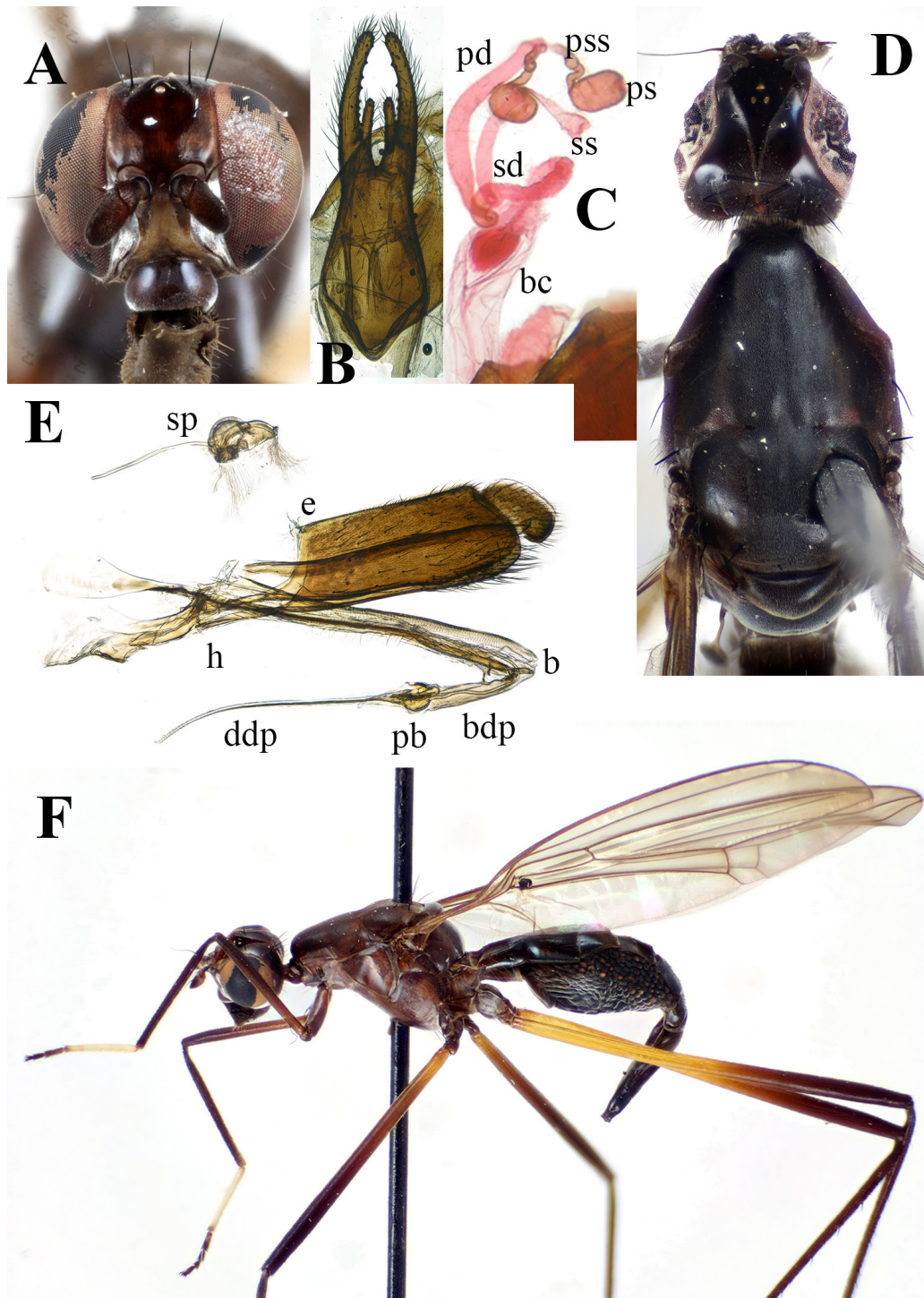


Fig. 43. *Scipopus (Parascipopus) otisi* subgen. et sp. nov. **A.** Head, ♀, anterior view, Costa Rica, non-type (DEBU). **B.** Male genital fork, ventral view, Costa Rica, paratype (MNCR). **C.** Female spermathecae and associated structures, Costa Rica, non-type (DEBU). **D.** Head and thorax, ♀, dorsal view, Costa Rica, paratype (MNCR). **E.** Male terminalia, lateral view, Costa Rica, paratype (MNCR). **F.** Habitus, ♀, Costa Rica, non-type (DEBU). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

Description

LENGTH. 11–13 mm.

HEAD. Antenna black. Palpus dark brown, pale brown microtrichose and setulose on entire surface, denser on ventral edge and apex, narrow (length $4.5 \times$ height). Clypeus dark brown or black, width $\sim 2.0 \times$ height, silvery microtrichose on entire surface. Frontal vitta dark brown or black, microtrichose, posterior apex tapered to a sharp point. (Fig. 43D). Orbital plate dark brown or black, shiny, bare, clearly delineated (Fig. 43A). Epicephalon dark brown or black, shiny, bare, wide (width $> \frac{2}{3}$ of frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon dark brown or black. All head chaetotaxy normally well-developed but one or both outer vertical setae absent in two specimens.

THORAX. Scutum dark brown or black with a silvery blue sheen medially, brown microtrichose. Female cervical sclerite convex. Postpronotal lobe dark brown or black, setulose on outer lateral margin. Notopleuron dark brown or black. Pleuron dark brown or black, entirely silvery microtrichose; microtrichosity denser anteriorly and posteriorly, forming posterior transverse band only seen at some angles. Legs mostly dark brown or black, fore femur yellow on basal $\frac{1}{4}$, mid and hind femora yellow on basal $\frac{1}{2}$ to $\frac{3}{4}$. Fore tarsomere 1 almost entirely white, hind tarsomere 1 dark brown or black with ventral golden fringe. Wing mostly hyaline, very slightly brown infuscate on apex. Apical scutellar seta absent.

ABDOMEN ($\sigma + \varphi$). T1 with fine, long, white or yellow setae.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose, dark grey or black on dorsal half of P1–6 (not evident in Fig. 43F as specimen is discoloured). T1+2 $\sim 2.4 \times$ length of T3. Oviscape dark brown or black, white microtrichose on anterior $\frac{1}{3}$, $\sim 4.0 \times$ length of T6. Combined spermathecal duct length short; common duct $\frac{1}{2}$ of entire duct length. Paired spermathecal duct short ($4.0 \times$ length of paired spermathecae), narrow and curved basally, wider medially and distally. Paired spermathecal stems slightly sinuate and curved, slightly bulbous, longer than spermathecae. Paired spermathecae ovoid, with apical indentation. Single spermathecal duct arising from base of common duct, $> \frac{1}{2}$ diameter and length of paired duct, slightly swollen apically. One or two elongate, distally wider “single” spermathecae.

MALE ABDOMEN. Pleuron pale grey, microtrichose, P1, 3–6 light grey, pleural sac dark grey or black. T1+2 $\sim 2.7 \times$ length of T3. T6 short, genital fork dark brown, $2.0 \times$ as long as T6, arms converging, inner basal process slightly converging, $\frac{1}{2}$ the length of arm. Epandrium elongate, length $\sim 2.0 \times$ height, short setose on posteroventral margin. Basiphallus small, frame-like. Basal distiphallus short ($> \frac{1}{2}$ epandrial length), ending in small, approximately round, short, phallic bulb with rounded posterior projection and rounded lower chamber. Distal distiphallus narrow, long (\approx in length to epandrium), apex very slightly expanded. Phallapodeme very broad and expanded apically. Anterior hypandrium expanded and broad.

Remarks

Species of *Scipopus* s. lat. normally lack presutural dorsocentral seta, but one specimen of *S. (Pa.) otisi* sp. nov. has two pairs of short presutural dorsocentral setae. One specimen has only a single outer vertical seta, and another is missing both outer verticals.

Distribution

Costa Rica.

Scipopus (Parascipopus) savegre subgen. et sp. nov.
[urn:lsid:zoobank.org:act:4A53A1DC-7234-46C8-B8D7-EE14C43966AA](https://urn.lsid:zoobank.org:act:4A53A1DC-7234-46C8-B8D7-EE14C43966AA)

Fig. 44

Differential diagnosis

Scipopus (Parascipopus) savegre sp. nov. resembles *S. (Pa.) manifestus* in having a primarily black head and body, but it differs in having a black first fore tarsomere and three indistinct subapical hyaline spots on the wing (often hard to see, as in Fig. 44F).

Etymology

The name is a noun in apposition inspired by the type locality.

Type material examined

Holotype

COSTA RICA • 1 ♂; San José, San Gerardo de Dota, Savegre Lodge; 9°33'14" N, 83°47'48" W; 4–8 Aug. 2010; S.A. Marshall leg.; MYCRO091-15/UGIC190-15 sequenced for CO1; MNCR (dissected and photographed, Fig. 44B, D).

Paratypes

COSTA RICA • 1 ♀; San José; Mirador Quetzal, 19 km S of Empalme; 2600 m a.s.l.; May 2000; P. Hanson leg.; MYCRO090-15/UGIC189-15 sequenced for CO1; DEBU • 2 ♀♀; same collection data as for preceding; DEBU (dissected and photographed, Fig. 44C) • 1 ♀; Prov. San José, Est. Cuerici, Sendero al Mirador, 4.6 km al E. de Villa Mills; 2640–2700 m a.s.l.; 9 Jun. 1996; A. Picado leg.; L_S_389700_499600; MNCR • 1 ♀; same collection data as for preceding; Canto de la Alves Trail; 19–21 Feb. 2008; MYCRO158-15/UGIC257-15 sequenced for CO1; DEBU (photographed, Fig. 44A) • 1 ♂, 1 ♀; Prov. Puntarenas, Coto Brus, Zona Prot Las Tablas, Sura; 2100 m a.s.l.; 29 Mar. 2000; M. Alfaro leg.; manual; L_S_323300_601500; MNCR (♀ photographed, Fig. 44E).

Description

LENGTH. 12–14 mm.

HEAD. Antenna black. Palpus black, pale microtrichose and setulose, wide (length $3.5 \times$ height). Clypeus black, width $\sim 1.9 \times$ height, silvery microtrichose on entire surface. Frontal vitta dark brown or black, entirely silvery microtrichose, posterior apex strongly tapered to a point. Orbital plate black, shiny, bare, clearly delineated. Epicephalon black, shiny, wide (width $> \frac{2}{3}$ of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon black. One lower fronto-orbital seta, outer vertical seta present or absent, all other head chaetotaxy well-developed.

THORAX. Scutum black, dark brown microtrichose. Female cervical sclerite convex. Postpronotal lobe black, densely setulose. Notopleuron black. Pleuron black, entirely white microtrichose, denser posteriorly, forming silvery transverse band only visible at some angles. Legs black, fore and hind tarsomere 1 black with very slight ventral golden fringe. Wing mostly dark black-brown infuscate with three indistinct subapical, slightly hyaline spots. Apical scutellar seta present.

ABDOMEN (♂+♀). T1 with fine, long, dark brown or black setae.

FEMALE ABDOMEN. Pleuron mostly dark brown or black, microtrichose, pale grey or with white medial spots ventral to posterior edge of P1+2 and P4 (Fig. 44F). T1+2 $\sim 2.3 \times$ length of T3. Oviscape black, setulose, white microtrichose on anterior ventral and lateral $\frac{1}{2}$, anteromedian $\frac{1}{8}$; $\sim 4.0\text{--}5.0 \times$ length of T6. Common duct short, $\frac{1}{4}$ of entire duct length. Paired spermathecal duct long ($9.0 \times$ length of paired

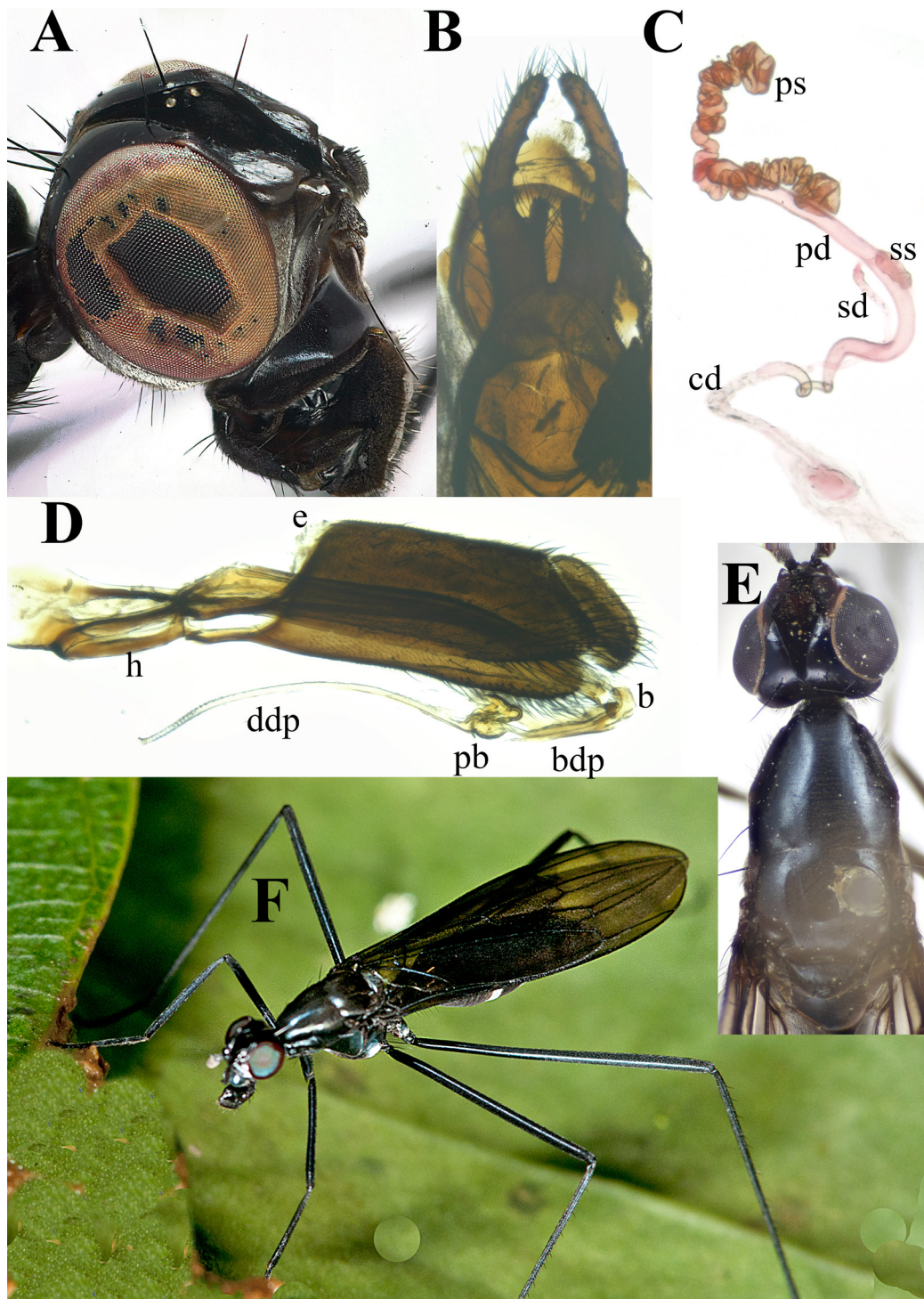


Fig. 44. *Scipopus (Parascipopus) savegre* subgen. et sp. nov. **A.** Head, ♀, lateral view, Costa Rica, paratype (DEBU). **B.** Male genital fork, ventral view, Costa Rica, holotype (MNCR). **C.** Female spermathecae and associated structures, Costa Rica, paratype (DEBU). **D.** Male terminalia, lateral view, Costa Rica, holotype (MNCR). **E.** Head and thorax, ♀, dorsal view, Costa Rica, paratype (MNCR). **F.** Living, ♂, Costa Rica, holotype (MNCR). Abbreviations: b = basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca.

spermathecae), narrow basally, gradually becoming wider distally. Paired spermathecal stems divided into very short, straight basal section and long, coiled and sinuate distal portion with sparsely distributed tubercles. Paired spermathecae cup-like (collapsed in Fig. 44C) with prominent apical indentation. Single spermathecal duct arising from base of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct. Single spermatheca elongate, wider distally, inornate.

MALE ABDOMEN. Pleuron dark brown or black, microtrichose, anterior half of P3 light grey or white. T1+2 $\sim 2.3 \times$ length of T3. T6 short, genital fork $2.3 \times$ as long as T6, with arms converging, inner basal process angled inward, $\frac{1}{3}$ length of arm. Epandrium elongate (length $\sim 2.0 \times$ height), short setose on posteroventral margin. Basiphallus small, crescent-shaped. Basal distiphallus short ($\sim \frac{1}{3}$ length of epandrium). Phallic bulb with upper chamber with rounded posterior projection and rounded lower chamber. Distal distiphallus long, narrow (\approx in length to epandrium), very slightly expanded apically. Phallapodeme broad and expanded apically. Anterior hypandrium expanded and broad.

Remarks

Scipopus (Parascipopus) savegre sp. nov. is known only from relatively high elevation forests, from 2100–2700 m.

Distribution

Costa Rica.

Scipopus (Parascipopus) tico subgen. et sp. nov.

[urn:lsid:zoobank.org:act:0AB771B4-EE45-45D7-93DE-089F9420E16F](https://zoobank.org/act:0AB771B4-EE45-45D7-93DE-089F9420E16F)

Fig. 45

Differential diagnosis

Scipopus (Parascipopus) tico sp. nov. resembles *S. (Pa.) zadbi* in having a primarily dark brown or black body with a blue sheen but it differs by the at least partially white first fore tarsomere.

Etymology

The name is a noun in apposition derived from the idiomatic term for a native of Costa Rica.

Type material examined

Holotype

COSTA RICA • 1 ♂; Prov. San José, P.N. Chirripó, Pérez Zeledón, Cementerio de la Máquina; 1900 m a.s.l.; 2 Feb. 2001; M. Alfuro leg.; manual; INBIO0003330662/MYCRO580-19 sequenced for CO1; MNCR (photographed, Fig. 45D–E).

Paratype

COSTA RICA • 1 ♀; same collection data as for holotype; L_S_378500_513200 #63191; MNCR (dissected and photographed, Fig. 45A–C).

Description

LENGTH. 11–12 mm.

HEAD. Antenna dark orange and/or black. Palpus dark brown, pale brown apically, pale microtrichose and setulose, wide (length $3.8 \times$ height). Clypeus light to dark brown, darker brown or black medially, width $\sim 1.9 \times$ height, silvery microtrichose on entire surface. Frontal vitta dark orange, microtrichose, posterior apex strongly tapered to a point. Orbital plate dark brown, shiny, bare. Epicephalon black-

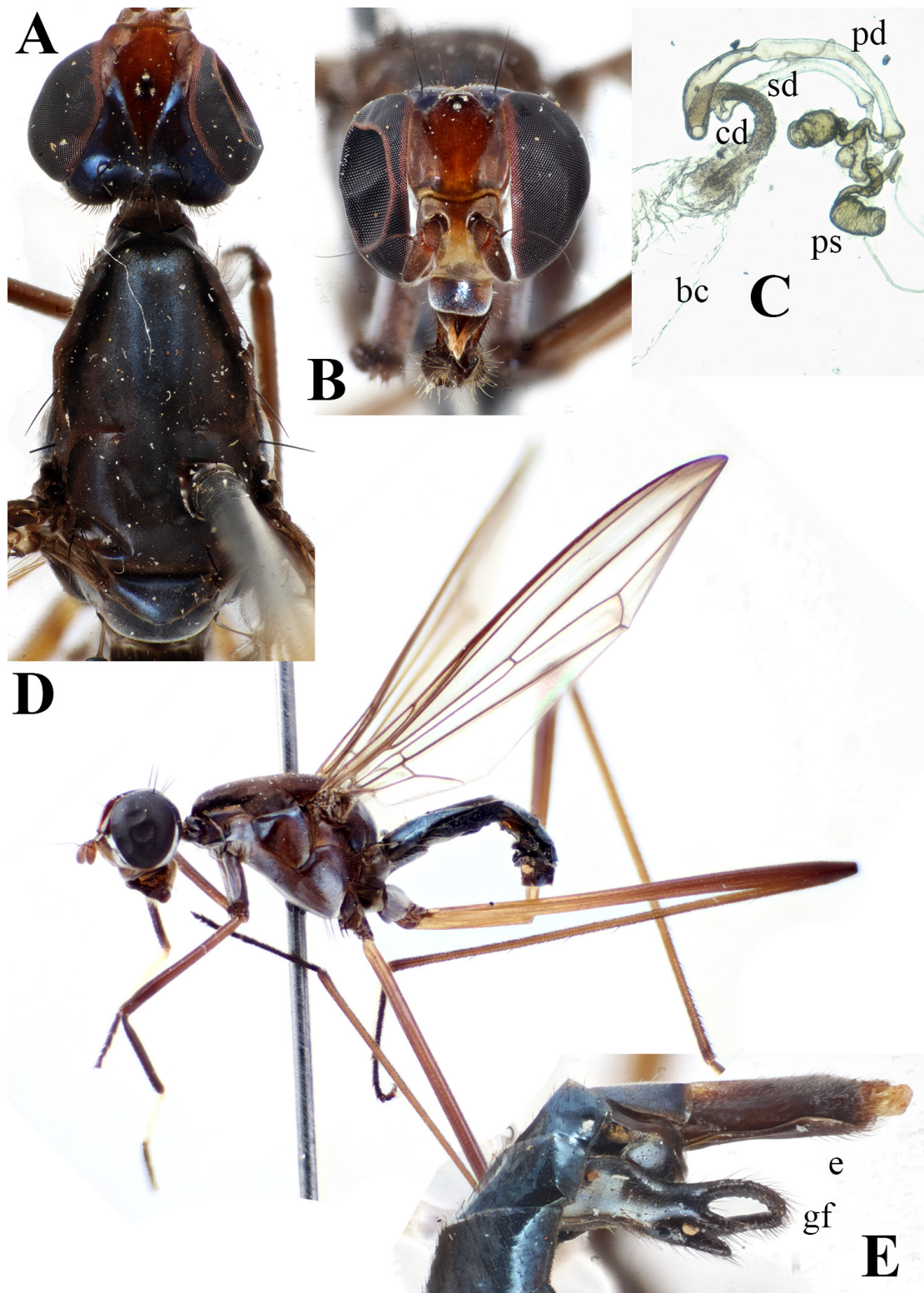


Fig. 45. *Scipopus* (*Parascipopus*) *tico* subgen. et sp. nov. (MNCR). **A.** Head and thorax, ♀, dorsal view, Costa Rica, paratype. **B.** Head, ♀, anterior view, Costa Rica, paratype. **C.** Female spermathecae and associated structures, Costa Rica, paratype. **D.** Habitus, Costa Rica, holotype. **E.** Male terminalia, lateral view, Costa Rica, holotype. Abbreviations: bc = bursa copulatrix; cd = common duct; e = epandrium; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct.

brown, shiny, bare, wide (width $> \frac{2}{3}$ upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon black-brown. One lower fronto-orbital seta, outer vertical seta and upper fronto-orbital seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, silvery blue sheen medially. Female cervical sclerite convex. Postpronotal lobe black-brown, setulose anteriorly. Notopleuron black-brown. Pleuron black-brown with blue sheen, entirely covered in silvery microtrichosity, denser on posterior corner of katepisternum and extending anterodorsally to form silvery transverse band only seen at some angles. Legs dark brown or black, mid and hind femora paler brown basally. Fore tarsomere 1 almost entirely white; hind tarsomere 1 dark brown or black with ventral golden fringe. Wing mostly hyaline with slight brown infuscation on apex and anterior margin. Apical scutellar seta absent.

ABDOMEN (σ^+ + φ). T1 with fine, long, white or pale brown setae.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose, P1 and dorsal half of P2–6 dark brown. T1+2 $\sim 3.0 \times$ length of T3. Oviscape black-brown, setulose, microtrichosity not observed (not visible in dissection), $\sim 3.0 \times$ length of T6. Common duct short, $\frac{1}{3}$ of entire duct length. Paired spermathecal duct short ($5.0 \times$ length of paired spermathecae), tapered medially, swollen apically. Paired spermathecal stems slightly sinuate, longer than spermathecae. Paired spermathecae nearly ovoid, slightly constricted distally, with apical indentation. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ diameter of base of paired duct. Single spermatheca elongate, wider distally, with median swollen process.

MALE ABDOMEN. Pleuron of available male discoloured. T1+2 $\sim 3.0 \times$ length of T3. T6 short, genital fork $3.0 \times$ as long as T6, with arms converging, inner basal process straight, $\frac{1}{2}$ the length of arms. Epandrium elongate (length $\sim 2.0 \times$ height), densely setose on posteroventral margin. Male terminalia not dissected and internal characters are thus not available for description.

Distribution

Costa Rica.

Subgenus *Phaeopterina* Frey, 1927

Phaeopterina Frey, 1927: 73 (type species: *Phaeopterina heteropus* Frey, 1927).

Pseudeurybata Hennig, 1935: 28 (type species: *Pseudeurybata stigmatica* Hennig, 1935). **Syn. nov.**

Scipopus (*Phaeopterina*) – Hennig 1934: 321 (key). — Steyskal 1968: 48.15. — Jackson *et al.* 2015: 415. — Marshall 2010: 810 (key).

Scipopus (*Phaeopterinus*) – Aczel 1949: 344 (catalog).

Phaeopterina – Marshall 2016: 254 (listed).

Remarks

Phaeopterina was originally diagnosed as being similar to *Scipopus* in most characteristics other than the absence of postocellar setae, but only a quarter of the species in the subgenus as now defined lack postocellar setae. We here circumscribe the subgenus based on molecular data and re-diagnose the newly defined subgenus using the combination of characters below. Molecular data show the type species of *Phaeopterina* and *Pseudeurybata* in monophyletic sister clades, but we were unable to find morphological characters by which to diagnose the clades. Since there are no practical morphological means of diagnosing *Pseudeurybata* from *Phaeopterina*, the new definition of *S. (Phaeopterina)* includes *Pseudeurybata* as a junior synonym, maintaining the monophyly of the subgenus while making it more easily diagnosable. *Pseudeurybata* was previously diagnosed by the tall and strongly deflexed clypeus, but the group of species with this character is shown to be paraphyletic in our molecular analysis, which places *Pseudeurybata zeta* within *S. (Phaeopterina)*.

Diagnosis

Scipopus (*Phaeoptera*) (including *Pseudeurybata*) is recognizable by the combination of an entirely or mostly dull orbital plate, a developed pair of apical scutellar setae, an elongate thorax (length/height ≥ 0.97) and postpronotal lobe (length/height ≥ 3), and sometimes a smooth or absent common spermathecal duct (rugose in Caribbean species). *Scipopus* (*Ph.*) *fraudator* sp. nov., placed in *S.* (*Phaeoptera*) mainly on the basis of molecular data (Fig. 2), is the only species of *S.* (*Phaeoptera*) to have shiny, clearly delineated orbital plates, making it superficially similar to species of *S.* (*Parascipopus*). It differs from *S.* (*Parascipopus*) in having the single and paired spermathecal ducts arising independently from the bursa and is further distinguished from similar species of *S.* (*Parascipopus*) by characters given in the key. Most *S.* (*Phaeoptera*) also have a shiny epicephalon, but the two Caribbean species have a dull epicephalon (as in some species of *Scipopus* s. str.).

Description

LENGTH. 9–17 mm.

HEAD. Palpus orange to black, wide or narrow, nearly parallel-sided, rounded and tapered apically, setulose. Antenna and parafacial orange (brown in *S.* (*Ph.*) *brunneus* sp. nov.). Clypeus orange, brown or black, short or tall (length $1.4\text{--}2.7 \times$ height), white microtrichose on entire surface or bare. Frontal vitta dull, orange, microtrichose (brown posteriorly in *S.* (*Ph.*) *fraudator* sp. nov.). Orbital plate dull, orange, microtrichose (shiny and bare in *S.* (*Ph.*) *fraudator*, partially shiny and bare in *S.* (*Ph.*) *brunneus*). Epicephalon orange, brown or black, wide or narrow, shiny and clearly delineated from upper frontal vitta or dull, orange, microtrichose, and not clearly delineated from upper frontal vitta. Paracephalon orange to black. Head with inner vertical, outer vertical and 1–2 lower fronto-orbital setae; upper fronto-orbital absent in *S.* (*Ph.*) *gorgonae* and sometimes *S.* (*Ph.*) *turgidus* sp. nov., and postocellar seta absent in a quarter of species.

THORAX. Scutum orange, dark brown or black, often with a wide, silvery blue median sheen (Fig. 50A) (sometimes only visible at certain angles) and spots or patches of pale microtrichosity (Fig. 47B). Mesothorax tapered anteriorly. Thorax elongate (length/height > 0.97). Cervical sclerite often relatively flat or slightly convex, sometimes swollen in females. Postpronotal lobe orange, brown or black, elongate (length $3.0\text{--}4.0 \times$ height), bare or setulose. Notopleuron uniformly orange, brown or black, or with varying patterns of silvery or pale brown microtrichia. Pleuron dark brown or black, entirely white microtrichose (at most small bare spot on anteroventral margin of anepisternum) (Fig. 47A). Legs orange, dark brown or black, femora sometimes yellow or pale brown basally or with orange or black bands. Fore and hind tarsomere 1 partially or entirely white or entirely brown dorsally, often with ventral golden fringe. Female abdominal pleuron pale yellow or grey, microtrichose, usually with dark shading on P1 and dorsal half of some or all of P2–6; male abdominal pleuron orange or pale grey, microtrichose, usually with dark shading on P1, dorsal half or entirety of pleural sac, and some or all of P3–P6.

WING. Patterning variable, ranging from uniformly brown infuscate, clear, infuscate with three subapical hyaline spots (Fig. 61D), with subapical hyaline band (Fig. 58F) or hyaline with apical infuscation (Fig. 68).

ABDOMEN (σ^+ and ω). Tergites orange, dark brown or black. T1 with fine white, yellow and/or black setae, remainder of abdomen with medium length or short black or orange setulae.

FEMALE ABDOMEN. T1+2 $1.1\text{--}2.5 \times$ length of T3. Anterior margin of T2 sometimes swollen, posterior margin of T2 $1.4\text{--}2.1 \times$ the width of T1. Oviscape variable in dimension but tapered distally and sparsely covered in short or medium length pale or black setulae and white microtrichia basally. Paired and single spermathecal duct arising independently from bursa copulatrix in most species (Fig. 47E),

single duct arising from common duct in Caribbean species (Fig. 58E), and single duct arising from very short, smooth common duct in a few species (*S. (Ph.) brunneus* sp. nov., *S. (Ph.) musculosus* sp. nov., *S. (Ph.) sexguttatus*) (Fig. 61C). Paired spermathecal duct smooth, usually narrow and long, often with a swollen distal bulb (Fig. 70C). Paired spermathecal stems usually bare, sometimes with bumps or spiked projections. Paired spermathecae usually elongate and approximately ovoid or sac-like. Single spermathecal duct smooth and usually narrow, ending in one or two small ovoid or finger-like spermathecae.

MALE ABDOMEN. T1+2 2.0–2.5 × length of T3. Genital fork arms with or without inner basal processes, length and shape of arms and processes variable. Epandrium stout (length ≈ height) to elongate (length >2.5 × height). Basiphallus small and usually crescent-shaped or frame-like when viewed ventrally (Fig. 71B). Basal distiphallus usually long and wide (≈ length of epandrium), ending in phallic bulb. Phallic bulb usually large and ovoid, with multiple chambers. Distal distiphallus absent (Fig. 47D), short and wide (Fig. 54D), or long and narrow (Fig. 58D). Phallapodeme usually broad and expanded apically (Fig. 60D). Anterior margin of hypandrium often with broad, fan-like extensions (Fig. 60D), otherwise slender. Ejaculatory apodeme varying in size, usually with a fan-like apodeme attached to a bulbous sperm pump.

Scipopus (Phaeopterina) alces (Marshall, 2016) comb. nov.

Fig. 46

Pseudeurybata alces Marshall, 2016: 256, figs 1–7.



Fig. 46. *Scipopus (Phaeopterina) alces* (Marshall, 2016), habitus, holotype (MNCR).

Differential diagnosis

Scipopus (Phaeopterina) alces is most easily recognized by its large, antler-like male genital fork. It otherwise differs from congeners by the combination of brown tarsi, an orange scutum and orange-banded femora (Marshall 2016).

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.

Distribution

Costa Rica.

Scipopus (Phaeopterina) argentum sp. nov.

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Fig. 47

Differential diagnosis

Scipopus (Phaeopterina) argentum sp. nov. resembles *S. (Ph.) zeta* and *S. (Ph.) noturgidus* sp. nov. in its brown first fore tarsomere, brown infusate wings, and absence of postocellar setae, but differs by the short clypeus (width $2.0 \times$ height), the brown first hind tarsomere and the pale microtrichose spots anterior to the transverse suture.

Etymology

The species name, from the Latin word for ‘silver’ and refers to the broad silvery blue median sheen on the scutum.

Type material examined

Holotype

PERU • 1 ♀; Madre de Dios, Rio Pini Pini & Rio Amalia confluence, nr Manu Natl. Pk.; 17 Apr. 2004; M. von Tschirnhaus leg.; MUSM.

Paratypes

PERU • 1 ♀; Madre de Dios, Tambopata-Candamo; 20–24 Feb 1994; A.A. Rios leg.; Malaise and Pan traps; UGIC127-15/MYCRO028-15 sequenced for CO1; MUSM • 1 ♂; Madre de Dios, Manu, Rio Manu, Pakitza; 12°07' S, 70°58' W; 250 m a.s.l.; A. Freidberg leg.; MUSM.

Other material examined

BOLIVIA • 1 ♀; La Paz, Heath River Wildlife Centre, ~21 km SSW of Puerto Heath; 12°40' S, 68°42' W; 29 Apr.–11 May 2007; M.D. Jackson leg.; DEBU.

ECUADOR • 1 ♂; Napo, Res. Ethnica Waorani, 1 km S of Onkone Gare Camp, Trans Ent.; 00°39'10" S, 76°26" W; 220 m a.s.l.; 4 Oct. 1994; T.L. Erwin *et al.* leg.; insecticidal fogging of mostly bare green leaves, some with covering of lichens or bryophytic plants in terra firme forest [= upland forest]; at trans. 2, stn 5, Project MAXUS, Lot 864; USNM (photographed, Fig. 47A–C) • 1 ♀; Napo, Tiputini Biodiversity Stn; 0°36'50" S, 76°09'01" W; May 2011; S.A. Marshall leg.; debu00339716/MYCRO572-19 sequenced for CO1–5'; QCAZ • 1 ♂; Napo, Jatun Sacha Res.; 6 km E of Misahuali; 1°04' S, 77°37' W; 450 m a.s.l.;

2 May 2002; M. Buck leg.; debu00177942/MYCRO570-19 sequenced for CO1–5'; QCAZ (dissected and photographed, Fig. 47D) • 1 ♀; same collection data as for preceding; 30 Apr.–8 May 2002; S.A. Marshall leg.; debu00178908/MYCRO812-20 sequenced for CO1–5'; QCAZ.

PERU • 4 ♀♀; Madre de Dios, Los Amigos Biol. Stn; 2–14 Jun 2006; Paiero and Klymko leg.; DEBU • 1 ♀; Cusco, Estacion Biológica Villa Carmen; 12°54' S, 71°24' W; 500–700 m a.s.l.; 20 Apr. 2014; trap VC-ML-75; USNM • 1 ♀; same collection data as for preceding; trap VC-ML-09; USNM • 1 ♂; same collection data as for preceding; 8 Jun. 2014; trap VC-ML-40A; USNM • 1 ♀ same collection data as for preceding; 27 Apr. 2014; USNM • 1 ♀; same collection data as for preceding; 20 Jul. 2014; trap VC-ML-41A; USNM • 1 ♀; same collection data as for preceding; trap VC-ML-49; USNM • 1 ♀; same collection data as for preceding; 22 Jun. 2014; trap VC-ML-84; USNM • 1 ♂; same collection data as for preceding; 31 May 2014; trap VC-ML-77; USNM • 1 ♂, 1 ♀; same collection data as for preceding; 29 Jun. 2014; trap VC-ML-35; USNM • 2 ♀♀; same collection data as for preceding; 19 Jul. 2014; trap VC-ML-42; USNM • 1 ♀; same collection data as for preceding; 8 Jun. 2014; trap VC-ML-09; USNM • 1 ♂, 1 ♀; same collection data as for preceding; 6 Jul 2014; trap VC-ML-30; USNM • 2 ♀♀; same collection data as for preceding; trap VC-ML-40A; USNM (♀ photographed, Fig. 47F) • 1 ♀; same collection data as for preceding; 27 Apr. 2014; USNM • 2 ♀♀; same collection data as for preceding; trap VC-ML-49; USNM • 2 ♀♀; same collection data as for preceding; 15 Jun. 2014; trap VC-ML-7B; USNM • 1 ♂; same collection data as for preceding; 27 May 2014; trap VC-ML-8B; USNM • 1 ♀; Cusco, Est. Biol. Villa Carmen, oroya, S side; 12.89111° S, 71.41046° W; 527 m a.s.l.; Dec. 2013; Norrbom and Sutton leg.; Malaise trap; USNM • 1 ♂, 1 ♀; same collection data as for preceding; Jan. 2014; M. Choque leg.; USNM (dissected and photographed, Fig. 47E) • 1 ♀; same collection data as for preceding; 7 Apr. 2014; trap VC-ML-41A; USNM • 1?; same collection data as for preceding; 543 m a.s.l.; 16–26 Nov. 2012; J.K. Alvarez leg.; stream below waterfall, trap VC-ML-19; USNM.

Description

LENGTH. 11–14 mm.

HEAD. Palpus orange, white microtrichose and setulose on entire surface, narrow (length $4.2 \times$ width). Clypeus orange, width $\sim 2.2 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon shiny, light brown or orange, white microtrichose posteriorly, wide or narrow, clearly delineated from upper frontal vitta. Postocellar seta absent, one or two pairs of lower fronto-orbital seta; all other head chaetotaxy well-developed.

THORAX. Scutum dark brown with a wide, median silvery-blue sheen, and one pair of indistinct pale silvery-blue spots anterior to transverse suture (Fig. 47B). Female cervical sclerite relatively flat. Postpronotal lobe light or dark brown, with several scattered setulae on anterior surface. Notopleuron dark brown, with wide line of silvery microtrichia on ventral margin and outlining anterior notopleural seta. Thorax reddish-brown with blue sheen, entirely silvery microtrichose. Legs dark brown, mid and hind femur pale yellowish-brown on basal $\frac{1}{8}$ – $\frac{1}{4}$, gradually fading to dark brown apically; first fore and hind tarsomere dark brown with ventral golden fringe. Wing brown infuscate.

ABDOMEN (♂+♀). T1 with fine, long, white or pale yellow setae.

FEMALE ABDOMEN. T1+2 $\sim 2.3 \times$ length of T3. Posterior margin of T2 $1.6 \times$ the width of T1. Oviscape dark brown or black, darker apically, white microtrichose on anterior $\frac{1}{2}$, $\sim 3.5 \times$ length of T6. Paired and single spermathecal ducts arising separately from bursa copulatrix (single spermatheca duplicated so the distally bulbous “single” duct terminates in two small, rounded spermathecae with narrow, apical curled projections). Paired spermathecal duct narrow, long ($6.0 \times$ length of paired spermathecae), parallel-

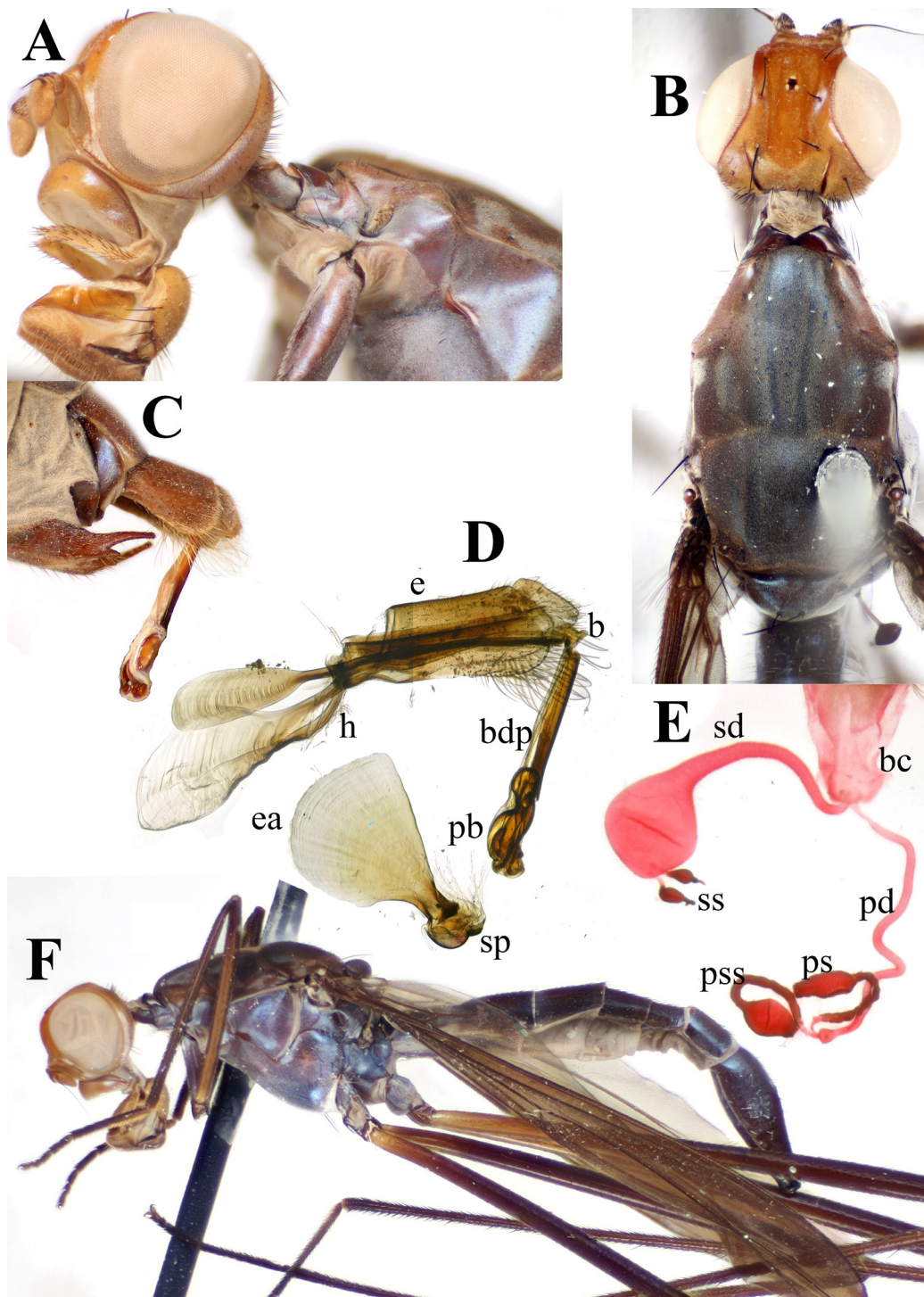


Fig. 47. *Scipopus (Phaeopterina) argentum* sp. nov. **A.** Head, ♀, lateral view, Ecuador, non-type (USNM). **B.** Head and thorax, ♀, dorsal view, Ecuador, non-type (USNM). **C.** External male terminalia, lateral view, Ecuador, non-type (USNM). **D.** Internal male terminalia, lateral view, Ecuador, non-type (QCAZ). **E.** Female spermathecae and associated structures, Peru, non-type (USNM). **F.** Habitus, ♀, Peru, non-type (USNM). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

sided, swollen apically. Paired spermathecal stems narrow, longer than spermathecae, inornate. Paired spermathecae elongate, cup-like, with apical indentation.

MALE ABDOMEN. T1+2 $\sim 2.0\times$ length of T3. T6 short, genital fork $2.8\times$ as long as T6, with arms converging, inner basal process angled inwards, $\frac{1}{5}$ the length of arm. Epandrium elongate (length $2.0\times$ height), very long setose on posteroventral margin. Basiphallus small, frame-like, with posterior notch. Basal distiphallus long (\approx in length to epandrium), with heavily sclerotized ventral plate, broad, ending in phallic bulb. Phallic bulb elongate (length $> 3.0\times$ height), complex, approximately dumbbell-shaped. Distal distiphallus absent. Phallapodeme very expanded and broad apically. Hypandrium very broad and expanded anteromedially (Fig. 47D).

Distribution

Bolivia, Ecuador, Peru.

Scipopus (Phaeopterina) brevifurca Enderlein, 1922

Fig. 48

Scipopus brevifurca Enderlein, 1922: 210.

Scipopus brevifurca – Czerny 1932: 274 (listed). — Hennig 1934: 322 (key), 325 (diagnosis); 1937: 48 (listed). — Steyskal 1968: 48.15 (catalog). — Schumann 1988: 88 (catalog).

Differential diagnosis

Scipopus (Phaeopterina) brevifurca resembles *S. (Ph.) rufilabris*, *S. (Ph.) gorgonae*, and *S. (Ph.) uniformis* sp. nov. in having uniformly dark brown wings and hind legs, but differs from consubgenera by the dark brown or black epicephalon.

Type material examined

Holotype (photographed in Berlin, 2002)

ECUADOR • 1 ♂; Santa Inéz. Distr.; R. Haensch leg.; MNBG.

Description

HEAD. Palpus and clypeus orange. Frontal vitta dull, orange, microtrichose. Epicephalon shiny, dark brown, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. All head chaetotaxy well-developed.

THORAX. Scutum dark brown or black with silvery-blue sheen. Female cervical sclerite not observed. Postpronotal lobe and notopleuron dark brown. Thorax dark brown or black, entirely silvery microtrichose. Legs dark brown, paler brown basally; first fore tarsomere dark brown with ventral golden fringe, first hind tarsomere white. Wing uniformly brown infusate.

FEMALE ABDOMEN. Not observed.

MALE ABDOMEN. Trichosity and ratios of tergites not observed. Genital fork with arms converging, inner basal process very short, barely distinguishable from arm. Epandrium elongate (length $2.0\times$ height). Basiphallus not observed. Basal distiphallus long (\approx in length to epandrium). Phallic bulb, distal distiphallus, phallapodeme and hypandrium not observed.

Distribution

Ecuador. Hennig (1937) listed “Brazi, Pebas” as a locality, which more likely refers to Pebas, Peru.

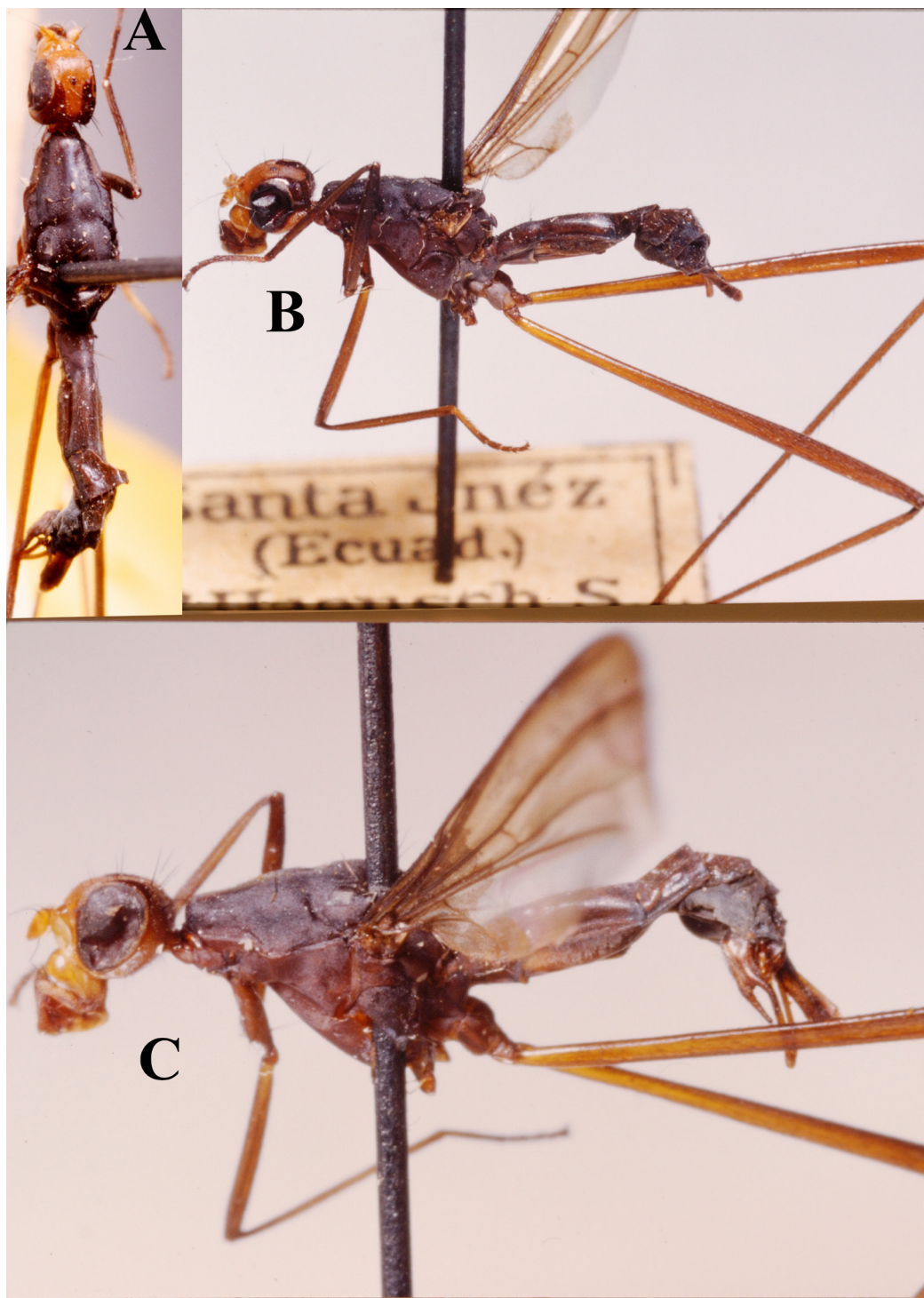


Fig. 48. *Scipopus (Phaeopterina) brevifurca* (Enderlein, 1922), holotype (MNBG). A. Dorsal view. B–C. Habitus.

Scipopus (Phaeopterina) browni (Marshall, 2016) comb. nov.

Fig. 49

Pseudeurybata browni Marshall, 2016: 258, figs 8–16.

Differential diagnosis

Scipopus (Phaeopterina) browni differs from consubgenera by the orange halter knob and the uniformly dark brown legs, which are only yellow basally on the femora (Marshall 2016).

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.

Distribution

Costa Rica.



Fig. 49. *Scipopus (Phaeopterina) browni* (Marshall, 2016), habitus, holotype (MNCR).

Scipopus (Phaeopterina) brunneus sp. nov.

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Fig. 50

Differential diagnosis

Scipopus (Phaeopterina) brunneus sp. nov. resembles *S. (Ph.) sexguttatus* and *S. (Ph.) musculosus* sp. nov. in having three subapical hyaline spots on the wing and a mostly white first fore tarsomere. *Scipopus (Ph.) brunneus* can be differentiated from these by its dark brown clypeus, antenna and parafacial.

Etymology

The species name, from the Latin noun for ‘brown’, refers to the brown parafacial and clypeus of this species.

Type material examined

Holotype

COLOMBIA • 1 ♀; Caqueta San José de Fragua R Yuruyaco; 1°20'55" N, 76°06'11" W; 1300 m a.s.l.; 9–13 Sep. 2000; E. Gonzalez leg.; Malaise 5; debu 01089018/MYCRO600-19 sequenced for CO1–5', CO1–3', 12S, 28S; IAVH (dissected and photographed, Fig. 50A–D).

Description

LENGTH. 12 mm.

HEAD. Palpus light brown, darker apically, entirely pale microtrichose and setulose on ventral margin, narrow (length $5.3 \times$ height). Antenna and parafacial dark brown in ground colour, white microtrichose. Clypeus dark brown, width $\sim 2.0 \times$ height, silvery microtrichose on entire surface, denser in posterolateral corners. Frontal vitta dull, orange, microtrichose, strongly tapered posteriorly. Orbital plate orange, microtrichose, bare and slightly shiny on lateral edges. Epicephalon light brown, shiny, white microtrichose except bare anteriorly, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Postocellar seta absent; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown with wide, blue median sheen. Postpronotal lobe black-brown, densely setulose on anterior half. Notopleuron black-brown, pale brown microtrichose ventromedially and posteriorly. Female cervical sclerite very slightly swollen posteriorly. Pleuron dark brown with blue sheen, completely silvery microtrichose but denser posteriorly, forming silvery transverse band. Legs dark brown; fore tarsomere 1 almost entirely white; hind tarsomere 1 pale basally, with ventral white fringe. Wing brown-black infuscate on r_1 , distal $\frac{1}{2}$ and apex, three hyaline window-like spots in m_1 , r_{2+3} , r_{3+4} .

FEMALE ABDOMEN. T1 with fine, long, dark brown setae. Pleuron off-white, dorsal quarter of P3–5 dark brown. T1+2 $\sim 2.0 \times$ length of T3; posterior margin of T2 $\sim 1.6 \times$ as wide as T1. Oviscape dark brown, darker apically, anterior $\frac{2}{3}$ white microtrichose, $\sim 3.0 \times$ length of T6. Common duct very short, smooth, ventral receptacle apparently originating from duct. Paired spermathecal duct (duct leading to large paired spermathecae) arising from bursa, long ($> 10.0 \times$ length of paired spermathecae), mostly parallel-sided but very swollen distally. Paired spermathecal stems with very short, narrow, basal section and long, bulbous, swollen distal section (Fig 50C). Paired spermathecae nearly spherical, sparsely tuberculate especially near base. “Single” spermathecal duct (smaller spermathecal duct, in this case leading to two small spermathecae) short and narrow, $\frac{1}{2}$ diameter and $> \frac{1}{2}$ length of paired duct, arising from base of paired duct, terminating in pair of elongate, bulbous and distally rounded spermathecae.

MALE ABDOMEN. Unknown.

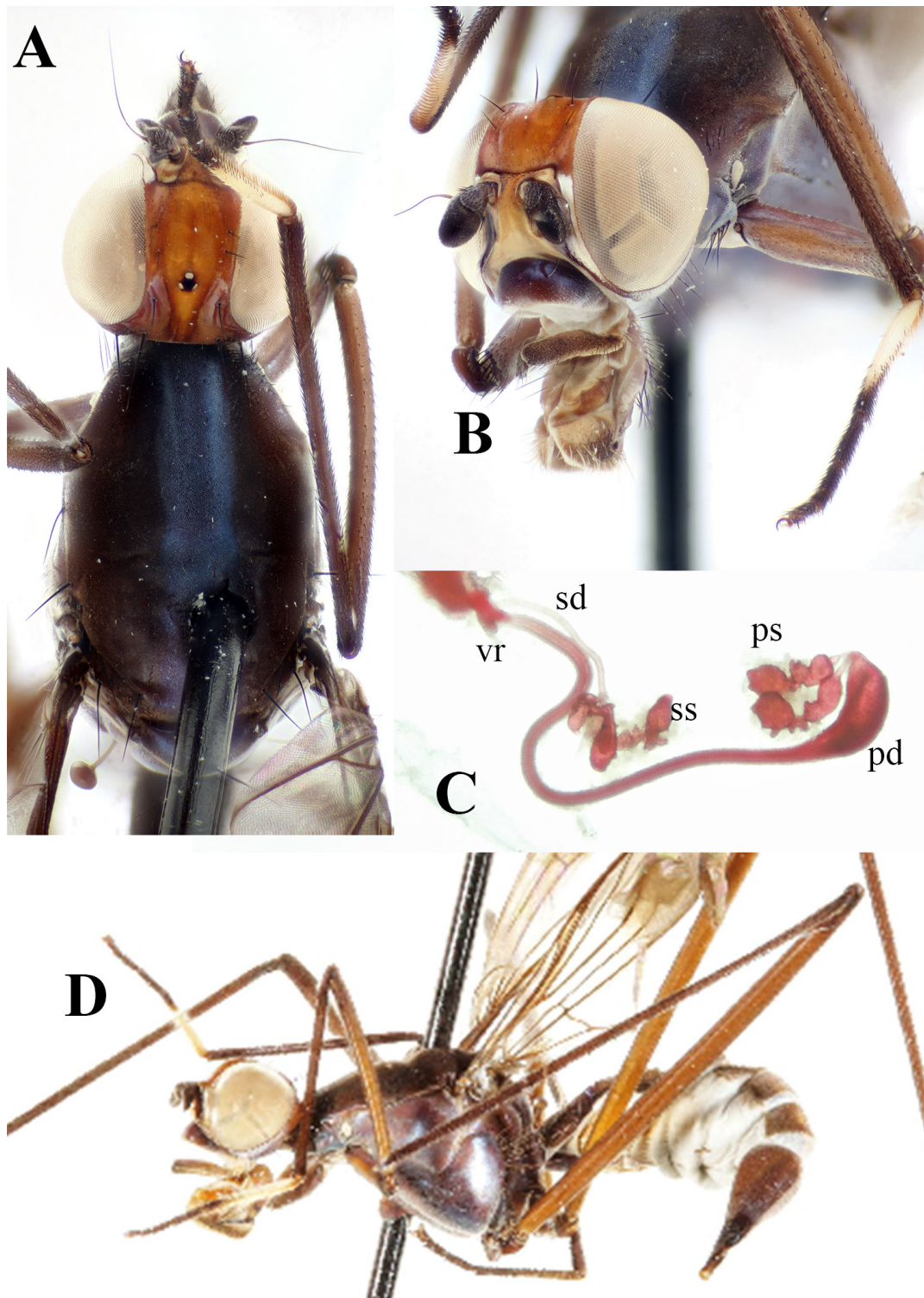


Fig. 50. *Scipopus (Phaeopterina) brunneus* sp. nov. ♀, Colombia, holotype (IAVH). **A.** Head and thorax, dorsal view. **B.** Head, anterolateral view. **C.** Female spermathecae and associated structures. **D.** Habitus. Abbreviations: pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca; vr = ventral receptacle.

Remarks

See *S. (Ph.) musculosus* sp. nov. for discussion.

Distribution

Colombia.

Scipopus (Phaeopterina) compeditus Hennig, 1934 comb. nov.
Fig. 51

Scipopus compeditus Hennig, 1934: 329.

Pseudeurybata compeditus – Marshall 2016: 260, figs 17–23.

Differential diagnosis

Scipopus (Phaeopterina) compeditus can be distinguished from consubgenera by the combination of entirely dark tarsomeres, preapical orange femoral bands, a dark epicephalon and a dark scutum (Marshall 2016).

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.



Fig. 51. *Scipopus (Phaeopterina) compeditus* Hennig, 1934, ♀, habitus, Costa Rica, non-type (NHMW).

Distribution

Mexico, Costa Rica.

Scipopus (Phaeopterina) dasypogon (Marshall, 2016) comb. nov.

Fig. 52

Pseudeurybata dasypogon Marshall, 2016: 261, figs 24–31.

Differential diagnosis

Scipopus (Phaeopterina) dasypogon differs from consubgenera by the combination of uniformly brown and unbanded femora, and an at least partially white first fore and hind tarsomere (Marshall 2016).

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.

Distribution

Mexico.



Fig. 52. *Scipopus (Phaeopterina) dasypogon* (Marshall, 2016), ♀, habitus, Mexico, non-type (CNC).

Scipopus (Phaeopterina) fraudator sp. nov.
[urn:lsid:zoobank.org:act:36B468A6-C505-4EAA-86D6-6DFF207CBEAD](https://doi.org/10.3896/eb.2023.904.1.1)

Fig. 53

Differential diagnosis

Scipopus (Phaeopterina) fraudator sp. nov. resembles *S. (Pa.) monteverde* sp. nov. and *S. (Pa.) tico* sp. nov. in having a short clypeus, dark body colouration and a frontal vitta with a strongly tapered apex, but it differs by the hyaline subapical spot on the wing, the densely setulose postpronotal lobe and the apical scutellar seta.

Etymology

The species name, from the Latin noun for ‘impostor’ and refers to the external characters of the species that would suggest it belongs to *S. (Parascipopus)*.

Type material examined

Holotype

MEXICO • 1 ♂; Chiapas, El Triunfo, 49 km S of Jaltenanango; 2000 m a.s.l.; 13–15 May 1985; A. Friedberg leg.; TAUI (photographed, Fig. 53C, G).

Paratypes

MEXICO • 2 ♂♂, 3 ♀♀; same collection data as for holotype; TAUI (♂, ♀ dissected and photographed, Fig. 53A–B, D–E) • 1 ♂, same collection data as for preceding; debu01089007/MYCRO577-19 sequenced for CO1–5', CO1–3', 12S, 28S; TAUI • 1 ♂, same collection data as for preceding; debu01089008/MYCRO578-19 sequenced for CO1–5', CO1–3', 12S, 28S; TAUI (photographed, Fig. 53F).

Other material examined

GUATEMALA • 1 ♀; Sacatepéq, 5 km SE of Antigua; 14°31'43" N, 41°20" W; 2330 m a.s.l.; 10–13 Jun. 2009; oak forest; Malaise; DEBU.

MEXICO • 1 ♀; same collection data as for holotype; W. Mathis leg.; USNM.

Description

LENGTH. 12–14 mm.

HEAD. Palpus dark brown, pale microtrichose and setulose, wide (length $3.8 \times$ height). Clypeus dark brown, width $\sim 2.0 \times$ height, bare medially, silvery microtrichose on posterolateral corners. Frontal vitta dull, orange, microtrichose, frontal vitta posterior to ocellar triangle dark brown, microtrichose, strongly tapered to a point at apex. Orbital plate well-defined, shiny, bare. Epicephalon black-brown, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon black-brown. One lower fronto-orbital seta absent; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, brown microtrichose, with a wide, shiny, silvery-blue median sheen. Female cervical sclerite convex. Postpronotal lobe black-brown, densely setulose on outer lateral margin. Thorax black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown; fore tarsomere 1 almost entirely white, hind tarsomere 1 dark brown with ventral golden fringe. Wing mostly brown infuscate with indistinct subapical hyaline spot (Fig. 53F).

ABDOMEN (♂+♀). T1 with fine, long, dark brown or black setae.

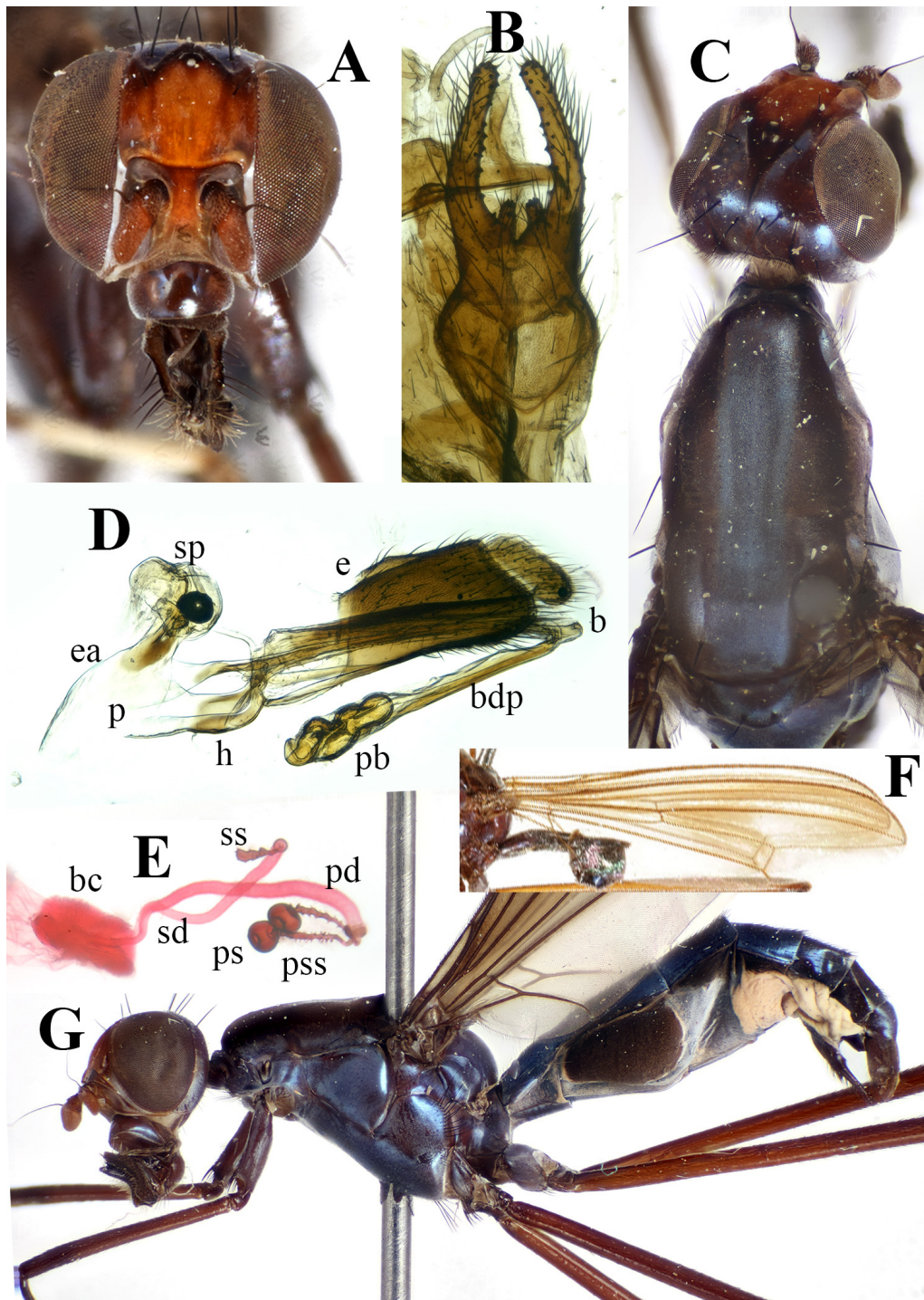


Fig. 53. *Scipopus (Phaeopterina) fraudator* sp. nov. (TAUI). **A.** Head, ♂, anterior view, Mexico, paratype. **B.** Genital fork, ventral view, Mexico, paratype. **C.** Head and thorax, ♂, dorsal view, Mexico, holotype. **D.** Male terminalia, lateral view, Mexico, paratype. **E.** Female spermathecae and associated structures, Mexico, paratype. **F.** Wing, lateral view, Mexico, paratype. **G.** Habitus, ♂, Mexico, holotype. Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose, dark brown on dorsal half of P2–6. T2 swollen, posterior margin $2.0\times$ as wide as posterior margin of T1 dorsally. T1+2 $\sim 2.3\times$ length of T3. Oviscape black, setulose, anterior $\frac{1}{4}$ white microtrichose, $4.0\times$ length of T6. Paired and single spermathecal ducts arising independently from bursa copulatrix. Paired duct long ($> 10.0\times$ length of paired spermathecae), narrow basally, slightly wider distally. Paired spermathecal stems narrow, with numerous, minute spiked tubercles, longer than spermathecae. Paired spermathecae spherical with apical indentation. Single spermathecal duct narrow, \approx diameter and $\frac{3}{4}$ length of paired duct. Single spermatheca nearly teardrop-shaped.

MALE ABDOMEN. P1–3 mostly dark grey, microtrichose, pleural sac entirely dark brown, P4–6 off-white on ventral $\frac{2}{3}$, dark brown on dorsal $\frac{1}{3}$. T1+2 $\sim 2.5\times$ length of T3. T6 short, genital fork $\sim 2.0\times$ as long as T6, arms slightly converging, inner basal process angled inwards, $\frac{1}{6}$ the length of arm. Epandrium elongate, (length $\sim 2.0\times$ height), short setose on posteroventral margin. Basiphallus small, projecting outward, frame-like. Basal distiphallus long (\approx length to epandrium), broad, partially ending in phallic bulb. Phallic bulb large, elongate (length $> 3.0\times$ height), complex and multi-chambered. Distal distiphallus absent. Phallapodeme apically broad and expanded. Anterior hypandrium slightly broad and expanded.

Remarks

Scipopus (Phaeopterina) fraudator sp. nov. is the only species of *S. (Phaeopterina)* that has a frontal vitta with a strongly tapered posterior apex and an entirely shiny orbital plate. These character states are also found in most species of *S. (Parascipopus)*, but character states in the female terminalia (primary and secondary ducts arising separately from the bursa copulatrix), male terminalia (the large, approximately ovoid phallic bulb and lack of distal distiphallus) and molecular data confidently place *S. fraudator* in *S. (Phaeopterina)* despite its external similarity to species of *S. (Parascipopus)*.

Distribution

Guatemala, Mexico.

Scipopus (Phaeopterina) gorgonae Hennig, 1934

Figs 54–55

Scipopus gorgonae Hennig, 1934: 329.

Scipopus gorgonae – Aczél 1949c: 342 (catalog). — Steyskal 1968: 48.16 (catalog). — Marshall *et al.* 2016: 544 (catalog).

Differential diagnosis

Scipopus (Phaeopterina) gorgonae resembles *S. (Ph.) rufilabris*, *S. (Ph.) turgidus* sp. nov. and *S. (Ph.) noturgidus* sp. nov. in having brown infuscate wings, a light brown epicephalon and clypeus, and dark brown legs, but differs from all congeners in having an apically swollen and diverging male genital fork, a bare postpronotal lobe and the narrow epicephalon (width $< \frac{2}{3}$ of frontal vittal width at inner verticals).

Type material examined

Syntypes

COLOMBIA • 1 ♂, 1 ♀; Gorgona Island; 2.59' N, 78.20' W; 24 Jul.; L.E. Cheeseman leg.; BMNH.

Other material examined

COSTA RICA • 1 ♂, 10 ♀♀; San Juan de Peñas Blancas, San Ramón, Soltis Research Centre; 17 Aug. 2013; S.A. Marshall leg.; MNCR (♂, ♀ dissected and photographed, Fig. 54A–F) • 1?; same collection

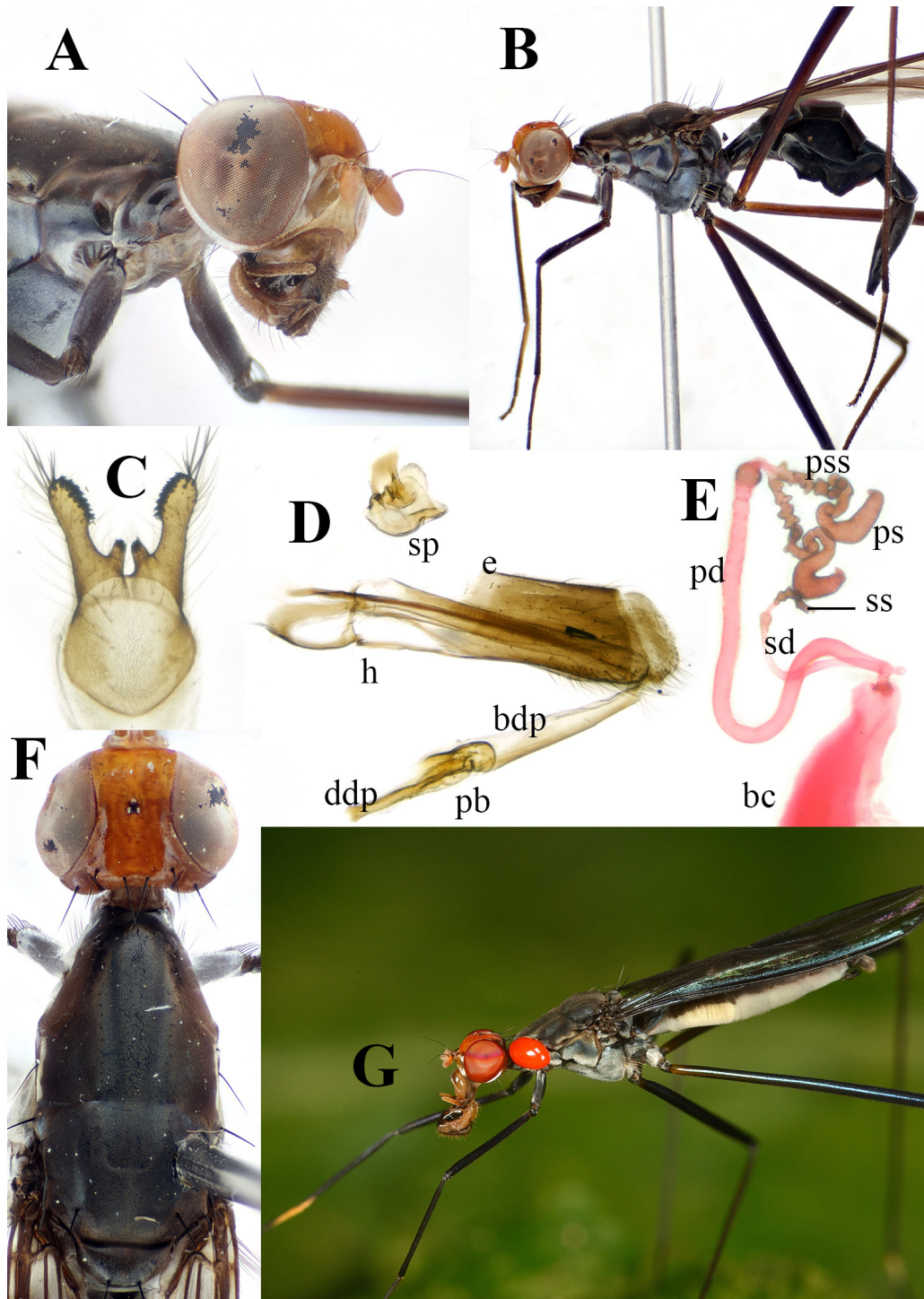


Fig. 54. *Scipopus (Phaeopterina) gorgonae* (Hennig, 1935) (MNCR). **A.** Head, ♀, anterolateral view, Costa Rica, non-type. **B.** Habitus, ♀, Costa Rica, non-type. **C.** Male genital fork, ventral view, Costa Rica, non-type. **D.** Male terminalia, lateral view, Costa Rica, non-type. **E.** Female spermathecae and associated structures, Costa Rica, non-type. **F.** Head and thorax, ♀, dorsal view, Costa Rica, non-type. **G.** Living, ♂, Costa Rica. Abbreviations: bc = bursa copulatrix; bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; h = hypandrium; pb = phallic pulb; pd = paired spermathecal duct; ps = paired spermathecae; pss = paired spermathecal stems; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

data as for preceding; UGIC201-15/MYCRO102-15 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU • 1 ♀; Alajuela, Volcán Tenorio, N slope nr Bijagua Biol. Stn; 700 m a.s.l.; 19 Jun. 2000; Buck and Marshall leg.; pan traps in treefall; DEBU.

Description

LENGTH. 10–14 mm.

HEAD. Palpus orange apically, light brown basally, entirely pale microtrichose and setulose. Clypeus orange or light brown, width $\sim 2.2 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon light brown or orange, shiny, conspicuously silvery microtrichose, narrow (width $< \frac{2}{3}$ of upper frontal vitta width), clearly delineated from upper frontal vitta (Fig. 54F). Upper fronto-orbital seta absent, 1–2 pairs of lower fronto-orbital setae; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with a wide, silvery blue median sheen. Female cervical sclerite convex anteriorly. Postpronotal lobe black-brown, bare. Notopleuron black-brown, pale microtrichose on ventral margin and outlining anterior notopleural seta. Legs dark brown or black, slightly lighter basally. Fore tarsomere 1 dark brown or black with prominent ventral golden fringe; hind tarsomere 1 dark brown or black with slight anteroventral golden fringe. Wing evenly dark brown infusate.

ABDOMEN (♂+♀). T1 with fine, long white setae.



Fig. 55. *Scipopus (Phaeopterina) gorgonae* (Hennig, 1935), living, ♀, Costa Rica.

FEMALE ABDOMEN. Pleuron pale grey, dorsal half of P1–2 dark brown, P3–6 almost entirely dark brown. T1+2 $\sim 1.9 \times$ length of T3; posterior margin of T2 $\sim 1.4 \times$ as wide as T1. Oviscape black-brown, white microtrichose on anterior $\frac{2}{3}$, $\sim 2.5 \times$ length of T6. Common duct very short, smooth, not delineated from paired duct. Paired spermathecal duct long ($7.0 \times$ length of paired spermathecae), narrow, parallel-sided, swollen apically and with slight striae. Paired spermathecal stems narrow, with jagged irregular tubercles, longer than spermathecae. Paired spermathecae elongate, curved, pointed apically. Single spermathecal duct arising from base of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct, slightly swollen apically. Single spermatheca elongate, with jagged tubercles.

MALE ABDOMEN. Pleuron pale grey, dorsal half of P1, 3–6 dark brown; pleural sac off-white on ventral half, dark brown on dorsal half. T1+2 $\sim 2.5 \times$ length of T3. Genital fork small (\approx in length to T6), arms diverging, distal ends swollen, densely lined with spinules on inner margins (Fig. 54C); inner basal process angled inwards, $\frac{1}{4}$ length of arm. Epandrium elongate (length $2.0 \times$ height), short setose on posteroventral margin. Basiphallus small, frame-like. Basal distiphallus long (\approx length to epandrium), broad, partially ending in phallic bulb. Phallic bulb elongate (length $2.0 \times$ height), complex and multi-chambered. Distal distiphallus short (\approx length to phallic bulb), apex expanded and rounded. Phallapodeme slender, not apically expanded. Anterior hypandrium narrow, only slightly expanded.

Remarks

The male syntype has very pale hind legs, which are probably faded from their original colour.

Distribution

Colombia, Costa Rica (new record).

Scipopus (Phaeopterina) guatemalensis (Marshall, 2016) comb. nov.

Fig. 56

Pseudeurybata guatemalensis Marshall, 2016: 262, figs 32–37.

Differential diagnosis

Scipopus (Phaeopterina) guatemalensis resembles the sympatric *S. (Ph.) quetzal* sp. nov. and *S. (Ph.) uniformis* sp. nov. in having a brown median stripe on the clypeus, but it differs by the combination of the medially bare clypeus, the bright orange subapical band on the mid femur and the relatively flat female cervical sclerite.

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.

Distribution

Guatemala, Mexico (new record), Honduras (new record).



Fig. 56. *Scipopus (Phaeopterina) guatemalensis* (Marshall, 2016), ♀, Guatemala, non-type, anterolateral view.

Scipopus (Phaeopterina) heteropus (Frey, 1927) comb. nov.

Fig. 57

Phaeopterina heteropus Frey, 1927: 74.

Scipopus heteropus – Hennig 1934: 321 (key), 330 (listed).

Phaeopterinus heteropus – Aczél 1949: 342 (catalog). — Steyskal 1968: 48.15 (catalog). — Ferro & de Carvalho 2014: 60 (listed).

Differential diagnosis

Scipopus (Phaeoptera) heteropus appears to be identical to *S. (Ph.) noturgidus* sp. nov. in characters of the female terminalia but differs from *S. (Ph.) noturgidus* and other congeners by its black body and basally yellow mid and hind femora.

Type material examined

Syntypes

BOLIVIA • 1 ♂ (examined and photographed at NHMW 2002); NHMW • 1 ♀ (not examined); Yungas; NHMW.

Other material examined

BOLIVIA • 2 ♀♀; La Paz, Chulumani, Apa Apa Reserve; 16°21'15" S, 67°30'21" W; 2000 m a.s.l.; 1 April 2001; S.A. Marshall leg.; DEBU (photographed, Fig. 57B–C, E) • 1 ♀; same collection data as for preceding; DEBU0083/DEBU083-06 sequenced for CO1; DEBU • 1?; Mapiri, Arroyo Tuhiri W; 15°29'08" S, 68°25'8" W; S.A. Marshall leg.; UGIC255-15/MYCRO156-15 sequenced for CO1–5; DEBU.

Description

LENGTH. 11–12 mm.

HEAD. Palpus light brown, entirely pale brown microtrichose and setulose, narrow (length $4.5 \times$ height). Clypeus dark brown or black, width $\sim 2.2 \times$ height, bare. Frontal vitta dull, orange, darker posteriorly, microtrichose. Epicephalon dark brown or black, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Postocellar seta absent, one lower fronto-orbital seta absent; all other head chaetotaxy well-developed.

THORAX. Scutum black, dark brown microtrichose. Female cervical sclerite slightly swollen anteriorly. Postpronotal lobe black, setulose on anterior half and outer lateral margin. Notopleuron black, with indistinct silvery microtrichose patch posterior to anterior notopleural seta. Thorax black, entirely silvery microtrichose. Legs black, yellow on basal $\frac{1}{3}$ of mid femur, basal $\frac{1}{2}$ of hind femur; fore tarsomere 1 black with prominent ventral golden fringe; hind tarsomere 1 black with slight anteroventral golden fringe. Wing evenly black-brown infusate.

ABDOMEN (♂+♀). T1 with long, fine black setae. Abdominal pleuron of available specimens discoloured.

FEMALE ABDOMEN. T1+2 $\sim 1.8 \times$ length of T3; posterior margin of T2 $\sim 1.3 \times$ as wide as T1. Oviscape black, setulose, anterior $\frac{1}{2}$ white microtrichose, $\sim 3.5 \times$ length of T6. Common duct absent, two paired spermathecal ducts arising separately from bursa copulatrix. Both paired spermathecal ducts short ($3.0\text{--}4.0 \times$ length of paired spermathecae), narrow, parallel-sided, swollen apically. Paired spermathecal stems narrow, longer than spermathecae, with sparse tubercles. Paired spermathecae approximately crescent-shaped, indented or pointed apically.

MALE ABDOMEN. T1+2 $\sim 2.3 \times$ length of T3. T6 short, genital fork $4.0 \times$ as long as T6, with arms converging. Epandrium stout (length \approx height); basiphallus, distiphallus, phallic bulb, phallapodeme not dissected (no male specimen available) and therefore not available for description.

Distribution

Brazil, Ecuador, Peru (Steyskal 1968), Bolivia.

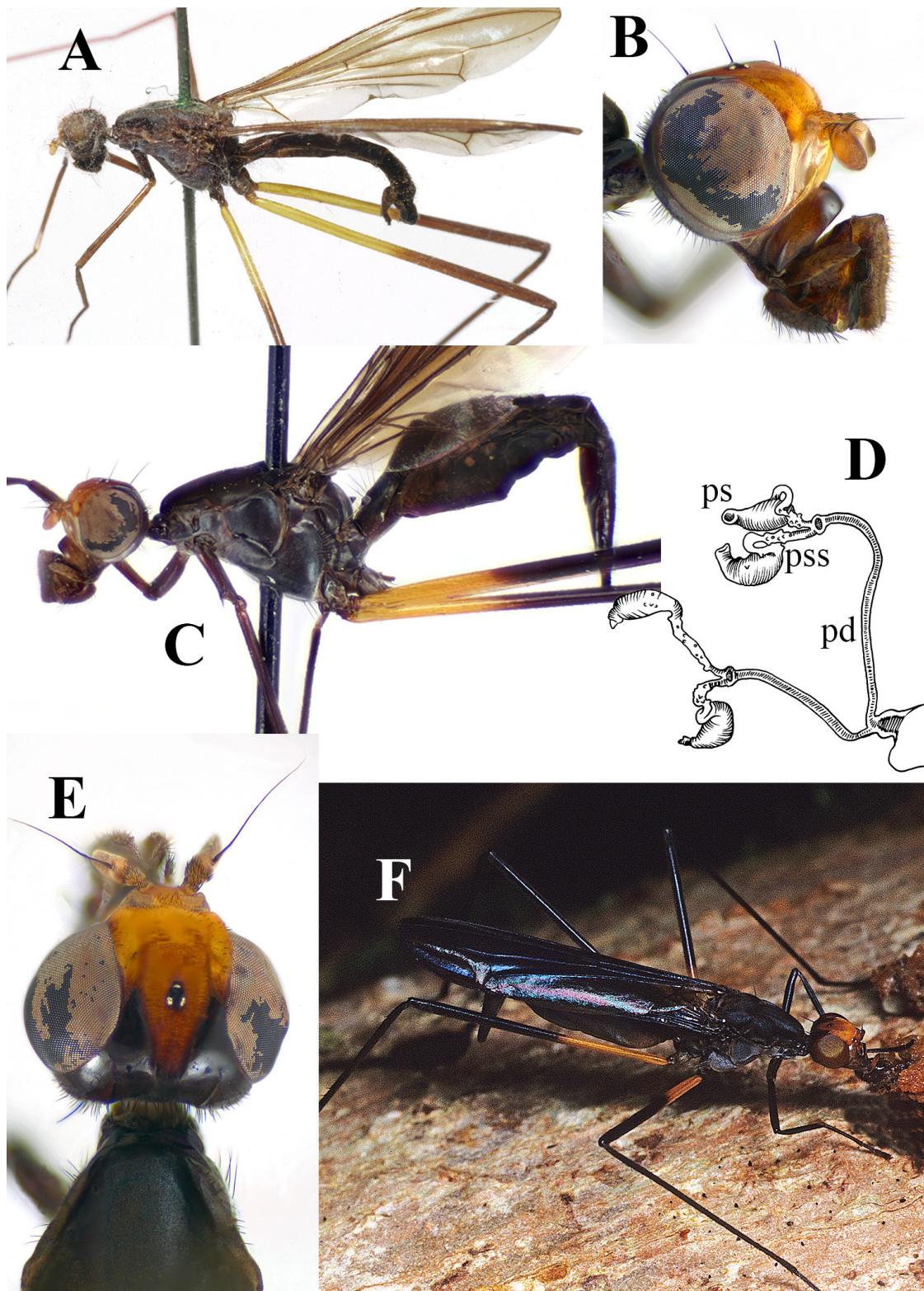


Fig. 57. *Scipopus (Phaeopterina) heteropus* (Frey, 1927). A. ♂, lateral view, Bolivia, syntype (NHMW). B. Head, ♀, lateral view, Bolivia, non-type (DEBU). C. Habitus, ♀, Bolivia, non-type (DEBU). D. Female spermathecae and associated structures (illustration credit: Sarah Schorno). E. Head, ♀, dorsal view, Bolivia, non-type (DEBU). F. Living, ♀, Bolivia. Abbreviations: pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stems.

Scipopus (Phaeoptera) lineatus sp. nov.

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Fig. 58

Differential diagnosis

Scipopus (Phaeoptera) lineatus sp. nov. resembles *S. (Ph.) melaneuris* in having a dull, orange, microtrichose epicephalon but can be easily distinguished by the almost entirely yellow femora.

Etymology

The species name, from the Latin word for ‘streak’ refers to the hyaline stripe on the wing.

Type material examined

Holotype

SAINT LUCIA • 1 ♂; Descartiers Trail; 400 m a.s.l.; 25 Dec 2002; S.A. Marshall leg.; UGIC256-15/MYCRO157-15 sequenced for CO1; DEBU (dissected and photographed, Fig. 58B, D).

Paratype

SAINT LUCIA • 1 ♀; same collection data as for holotype; UGIC232-15/MYCRO133-15 unsuccessfully sequenced for CO1; DEBU (dissected and photographed, Fig. 58A, C, E–F).

Description

LENGTH. 10 mm.

HEAD. Palpus orange, pale microtrichose, setulose and narrow (length $4.2 \times$ height). Clypeus light brown, width $\sim 2.1 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. One lower fronto-orbital seta absent; all other head chaetotaxy well developed.

THORAX. Scutum black-brown, brown microtrichose, with a wide, silvery blue median sheen. Female cervical sclerite relatively flat. Postpronotal lobe black-brown with silvery microtrichosity lining posterior margin, setulose on outer lateral margin. Notopleuron black-brown with silvery-blue spot surrounding anterior notopleural seta. Thorax black-brown with blue sheen, entirely silvery microtrichose, more sparsely ventrally and medially on anepisternum and katepisternum, appearing bare at some angles. Femora almost entirely yellow, apex black; first fore and hind tarsomere black with ventral golden fringe. Wing mostly hyaline, infuscate apically and discally, forming subapical hyaline stripe.

ABDOMEN (♂+♀). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron pale grey, dark brown on dorsal half of P2–5. T1+2 $\sim 2.0 \times$ length of T3. Posterior margin of T2 $\sim 1.8 \times$ as wide as that of T1. Oviscape black, microtrichosity not observed (not visible on dissection), $\sim 3.5 \times$ length of T6. Common duct rugose, clearly delineated from paired duct, long and narrow ($\sim \frac{1}{3}$ of entire duct length). Paired spermathecal duct short ($2.0 \times$ length of paired spermathecae, although spermathecae are large in this species), parallel-sided, swollen apically. Paired spermathecal stems very short. Paired spermathecae large, elongate, slightly expanded distally and conspicuously and densely tuberculate. Single spermathecal duct arising from base of paired duct, narrow, $< \frac{1}{2}$ diameter and length as paired duct, swollen distally. Single spermatheca similar in structure to paired spermathecae but much smaller and apically bifid.

MALE ABDOMEN. Pleuron of available male discoloured. T1+2 $\sim 2.0 \times$ length of T3. Genital fork $1.5 \times$ as long as T6, with arms converging; inner basal process pointed inwards, very short. Epandrium elongate

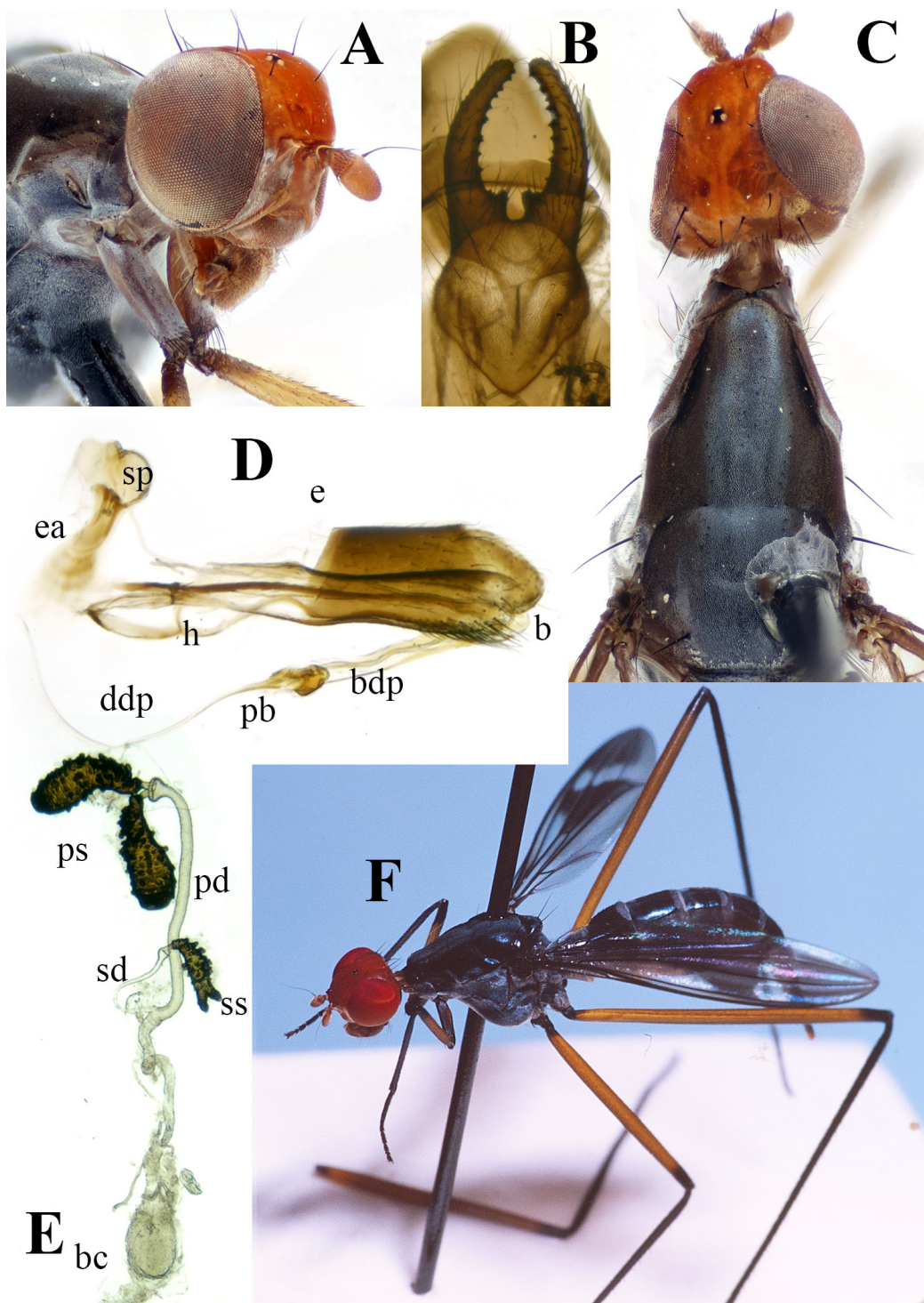


Fig. 58. *Scipopus (Phaeopterina) lineatus* sp. nov. (DEBU). **A.** Head, ♀, anterolateral view, Saint Lucia, paratype. **B.** Male genital fork, ventral view, Saint Lucia, holotype. **C.** Head and thorax, ♀, ventral view, Saint Lucia, paratype. **D.** Male terminalia, lateral view, Saint Lucia, holotype. **E.** Female spermathecae and associated structures, Saint Lucia, paratype. **F.** Pinned, freshly mounted, ♀, Saint Lucia, paratype. Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

(length $\sim 2.0 \times$ height). Basiphallus small, frame-like. Basal distiphallus long (\approx length of epandrium), broad. Phallic bulb small, short (length \approx height), with poorly defined upper and lower chamber. Distal distiphallus long and whip-like, $1.5 \times$ epandrial length. Phallapodeme and anterior hypandrium slender, not expanded.

Distribution

Saint Lucia.

Scipopus (Phaeopterina) melaneuris Cresson, 1926 Fig. 59

Scipopus melaneuris Cresson, 1926: 271.

Scipopus melaneuris – Cresson 1930: 328 (listed). — Hennig 1934: 323 (key), 328 (listed), pl. 2, figs 14, 17. — Aczél 1949: 342 (catalog). — Steyskal 1967: 81 (notes); 1968: 48.16 (catalog).

Differential diagnosis

Scipopus (Phaeopterina) melaneuris resembles *S. (Ph.) lineatus* sp. nov. in having a dull, microtrichose epicephalon, but differs by the entirely dark brown or black femora and the uniformly brown infusate wings.

Type material examined

Holotype (examined and photographed at USNM, 2001)

DOMINICA • 1 ♀; Lesser Antilles; Jun.–Jul. 1913; H.W. Foote leg.; No. 27074; USNM.

Other material examined

DOMINICA • 3 ♀♀; Parish of St. Joseph Springfield Estate; 15°22.8' N, 61°20.5' W; 430 m a.s.l.; 15–20 Mar. 2003; M.E. Irwin *et al.* leg.; Malaise trap in humid forest; DEBU (dissected and photographed, Fig. 59B–C, F–G) • 1 ♀; same collection data as for preceding; debu01089004/MYCRO571-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU.

MARTINIQUE • 1 ♀; nr Vert Caplet; 15 Aug. 2013; DEBU • 1 ♂; Macouba; 14°50.575' N, 61°09.701' W; 27 Oct. 2013; E. Dumbardon leg.; debu01089019/MYCRO602-19 sequenced for CO1–5', CO1–3', 12S, 28S; DEBU (dissected and photographed, Fig. 59A, D–E).

Description

LENGTH. 10–11 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow (length $5.0 \times$ width). Clypeus orange, width $\sim 2.5 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon dull, orange, microtrichose, not clearly delineated from upper frontal vitta. 1–2 pairs of lower fronto-orbital setae; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown with a wide, silvery-blue median sheen. Female cervical sclerite slightly convex. Postpronotal lobe black-brown, some setulae on outer lateral margin. Notopleuron black-brown with spot of pale microtrichia posterior to anterior notopleural seta. Thorax black-brown with blue sheen, entirely silvery microtrichose, sometimes more sparsely distributed dorsally and medially on anepisternum and katepisternum, giving the appearance of no microtrichia at some angles. Legs dark brown or black; fore tarsomere 1 dark brown or black with ventral golden fringe; hind tarsomere 1 dark brown or black with slight golden ventral fringe. Wing evenly brown infusate.

ABDOMEN (♂+♀). T1 with fine, long, white or black setae.

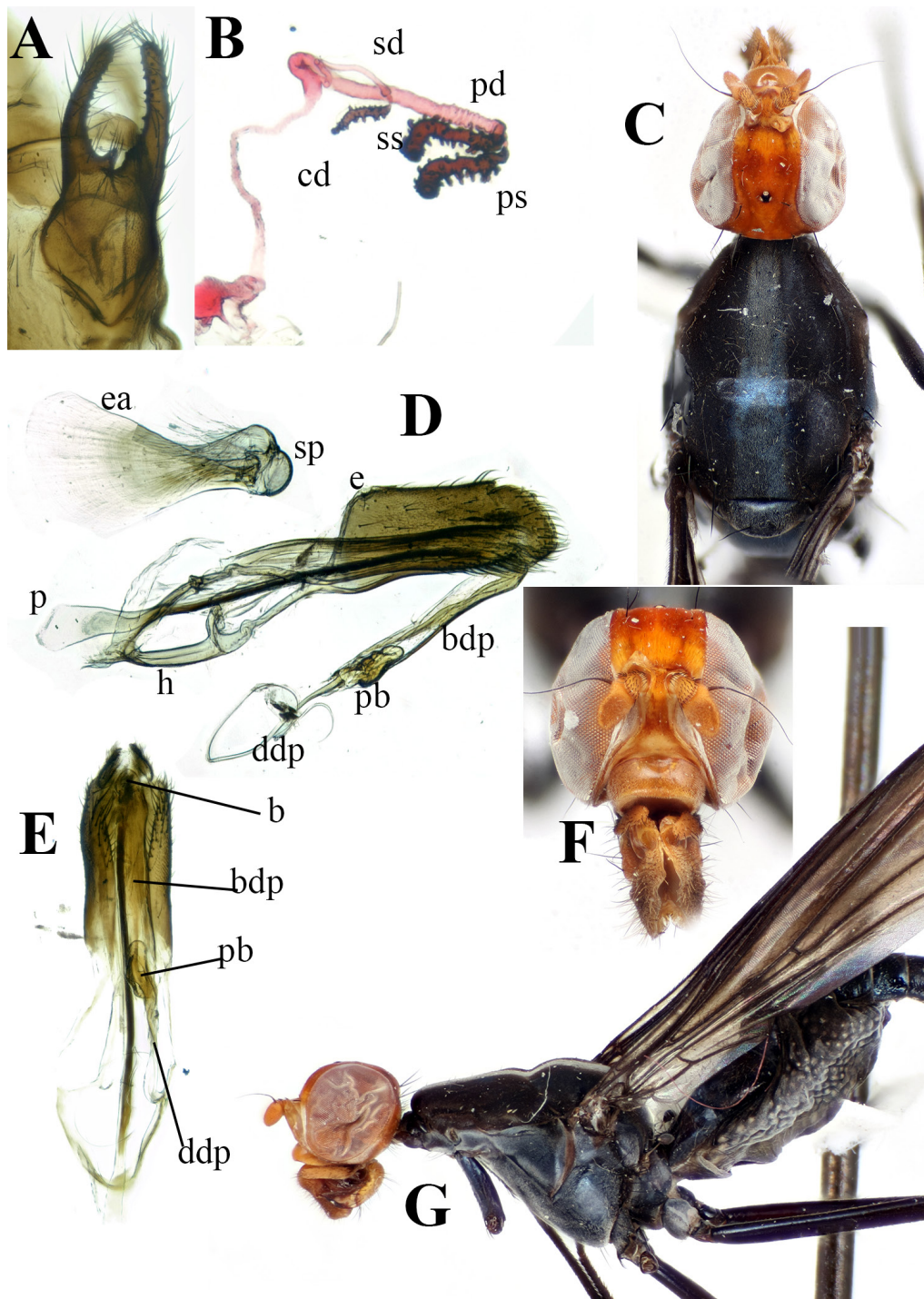


Fig. 59. *Scipopus (Phaeopterina) melaneuris* Cresson, 1926 (DEBU). **A.** Male genital fork, ventral view, Martinique, non-type. **B.** Female spermathecae and associated structures, Dominica, non-type. **C.** Head and thorax, ♀, dorsal view, Dominica, non-type. **D.** Male terminalia, lateral view, Martinique, non-type. **E.** Male terminalia, ventral view, Martinique, non-type. **F.** Head, ♀, anterior view, Dominica, non-type. **G.** Habitus, ♀, Dominica, non-type. Abbreviations: b=basiphallus; bdp = basal distiphallus; cd = common duct; ddp = distal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallopodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; sp = sperm pump; ss = single spermatheca.

FEMALE ABDOMEN. Pleuron pale grey, microtrichose, dark brown on dorsal half of P1–6. T1+2 $\sim 2.0 \times$ length of T3; posterior margin of T2 $\sim 1.5 \times$ as wide as that of T1. T6 very short; oviscapae black, setulose, white microtrichose on anterolateral and ventral $\frac{1}{2}$, anteromedian $\frac{1}{4}$; $\sim 4.0\text{--}4.5 \times$ length of T6. Common duct rugose, clearly delineated from paired duct, long, $\sim \frac{1}{2}$ of combined duct length. Paired spermathecal duct narrow distally, swollen apically, ringed with slight striae and ridges. Paired spermathecal stems very short, almost absent. Paired spermathecae elongate, wider distally, rounded, densely tuberculate. Single spermathecal duct arising from base of paired duct, narrow, $< \frac{1}{2}$ diameter and length of paired duct, slightly swollen distally. Single spermatheca elongate, with sparse tubercles.

MALE ABDOMEN. Pleuron pale grey, microtrichose, dark brown on dorsal half of P1, dorsal, posterior and ventral margins of pleural sac, and dorsal half of P3–5. T1+2 $\sim 2.3 \times$ length of T3. Genital fork $1.5 \times$ as long as T6, with arms converging; inner basal process pointed inwards, $\frac{1}{6}$ the length of arm. Epandrium elongate (length $2.0 \times$ height), densely short setose posteroventrally. Basiphallus small, crescent-shaped. Basal distiphallus long (\approx length to epandrium), broad, ending in phallic bulb. Phallic bulb large, elongate (length $3.0 \times$ height), irregular and complex, with multiple chambers. Distal distiphallus long and narrow ($>$ length of epandrium). Phallopodeme apically broad and expanded. Anterior hypandrium slender, not expanded.

Remarks

Scipopus (Phaeopterina) melaneuris is placed in *Scipopus (Phaeopterina)* based on the entirely white microtrichose anepisternum, and the elongate thorax and postpronotal lobe. *Scipopus (Ph.) melaneuris* is likely closely related to *S. (Ph.) lineatus* sp. nov. based on shared apomorphic character states including the long, whip-like phallus and the single spermathecal duct arising from the base of the paired duct.

Distribution

Dominica, Martinique.

Scipopus (Phaeopterina) metallicus sp. nov.

[urn:lsid:zoobank.org:act:0FB1911F-B642-4D16-BB16-D80AAC86614B](https://zoobank.org/act:0FB1911F-B642-4D16-BB16-D80AAC86614B)

Fig. 60

Differential diagnosis

Scipopus (Phaeopterina) metallicus sp. nov. resembles *S. (Ph.) dasypogon* in having an at least partially white first fore tarsomere, a light brown epicephalon and uniformly brown legs and wings, but differs by the entirely white microtrichose clypeus, and the inner basal process on the male genital fork arms. The male thoracic pleuron of *S. (Ph.) metallicus* is very similar to that of *S. (Ph.) fraudator* sp. nov., but *S. (Ph.) metallicus* has uniformly brown infusate wings.

Etymology

The species name, from the Latin adjective for ‘metallic’, refers to the metallic blue shine on the body.

Type material examined

Holotype

MEXICO • 1 ♂; Puebla, 5 mi. NE of Teziutlán, cloud forest; 5100 ft a.s.l.; 20 Jun. 1961; U. Kans. Mex. Exped.; cloud forest; SEMC (photographed, Fig. 60A, C, E).

Paratype

MEXICO • 1 ♂; same collection data as for holotype; SEMC.

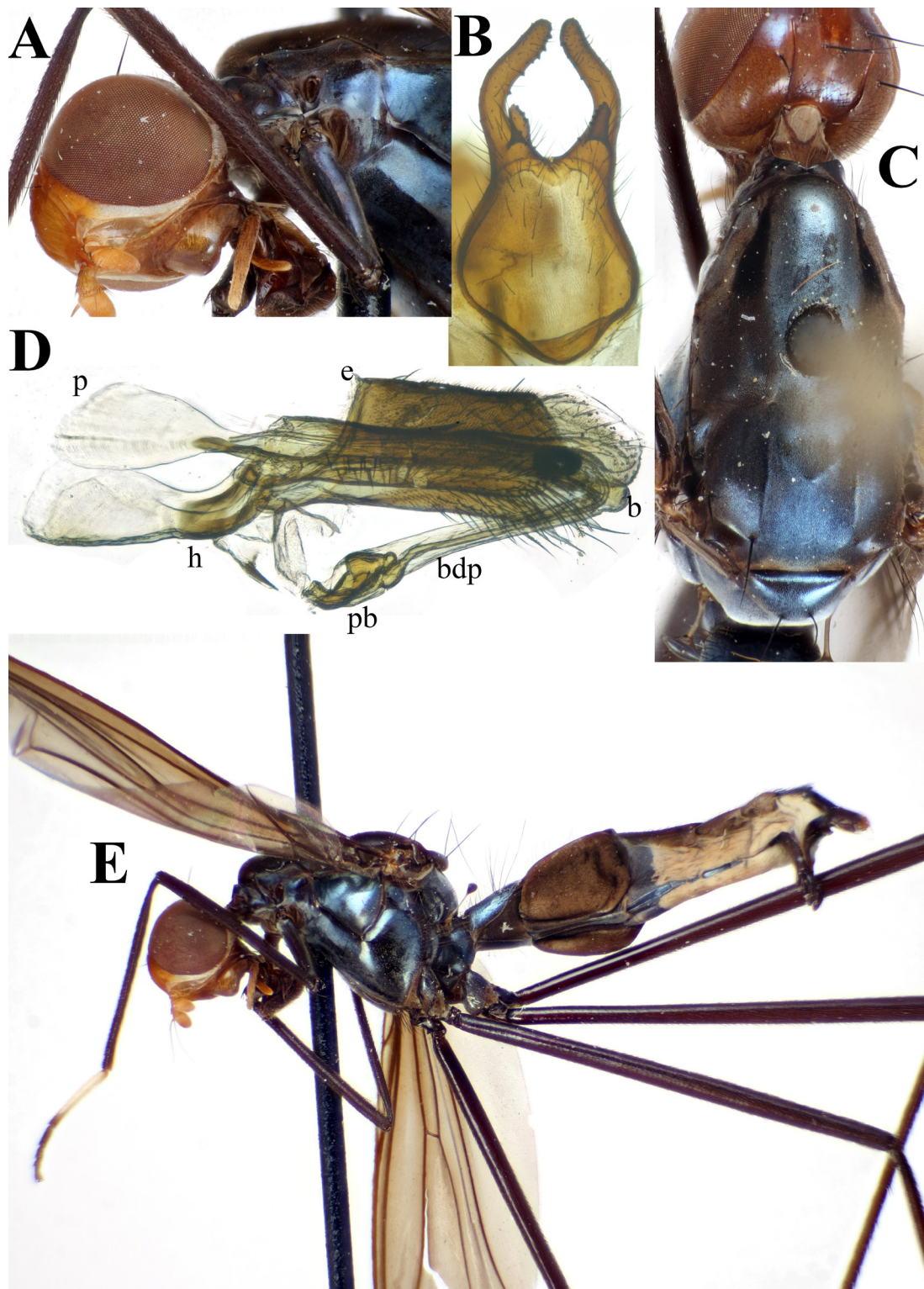


Fig. 60. *Scipopus (Phaeopterina) metallicus* sp. nov. (SEMC). **A.** Head, ♂, anterolateral view, Mexico, holotype. **B.** Genital fork, ventral view, Mexico, paratype. **C.** Head and thorax, dorsal view, holotype. **D.** Male terminalia, lateral view, Mexico, paratype. **E.** Habitus, Mexico, holotype. Abbreviations: b = basiphallus; bdp = basal distiphallus; e = epandrium; h = hypandrium; p = phallapodeme; pb = phallic bulb.

Description

LENGTH. 15 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow (length $5.0 \times$ height). Clypeus light brown, width $\sim 1.5 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon light brown, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown. One lower fronto-orbital seta absent; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with a wide, shiny, silvery median sheen. Female cervical sclerite unknown. Postpronotal lobe black-brown, sparsely setulose on outer lateral margin. Notopleuron black-brown. Pleuron black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown or black; fore and hind tarsomere 1 almost entirely white. Wing uniformly brown infusate.

FEMALE ABDOMEN. Not observed.

MALE ABDOMEN. T1 with fine, long black setae. T2 with medium-length black setulae, T3–6 with short black setulae. T1+2 $\sim 2.4 \times$ length of T3. P1 dark brown, pleural sac dark brown, anterior half of P3 dark grey, posterior third of P3, ventral $\frac{2}{3}$ of P4–5 and P6 off-white, upper $\frac{1}{3}$ of P3–5 dark brown (Fig. 60E). T6 short, genital fork $2.5 \times$ length of T6 with arms converging, inner basal process angled outwards, $\frac{1}{3}$ the length of arm. Epandrium elongate (length $\sim 2.0 \times$ height), very long setose on posteroventral margin. Basiphallus small, crescent-shaped, rounded posteriorly. Basal distiphallus long (\approx length to epandrium), broad, ending in phallic bulb. Phallic bulb elongate (length $> 2.0 \times$ height), large, upper chamber with small, rounded posterior projection and rounded lower chamber. Phallic bulb either terminating in tube-like opening or in very short, wide, distal distiphallus. Phallapodeme very broad and expanded apically. Anterior hypandrium very broad.

Remarks

The tube-like opening located at the posterior apex of the phallic bulb is either part of the phallic bulb, or is a very short, stout, distal distiphallus. This character state is also present in *S. (Ph.) narupa* sp. nov. but does not occur elsewhere in *Scipopus* s. lat.

Distribution

Mexico.

Scipopus (Phaeopterina) musculosus sp. nov.

[urn:lsid:zoobank.org:act:3DCB2B4B-F697-405E-841C-3F8677B87C8B](https://zoobank.org/act:3DCB2B4B-F697-405E-841C-3F8677B87C8B)

Fig. 61

Differential diagnosis

Scipopus (Phaeopterina) musculosus sp. nov. resembles *S. (Ph.) sexguttatus* and *S. (Ph.) brunneus* sp. nov. in having three subapical hyaline spots on the wing and an at least partially white first fore tarsomere but differs by the black setae on T1 and the dark first hind tarsomere.

Etymology

The species name is inspired by the female single spermatheca that is divided into two parts that resemble the arms of a strongman showing off his muscles in a classic strongman pose.

Type material examined

Holotype

VENEZUELA • 1 ♀; Ar., Rancho Grande; 1100 m a.s.l.; 12 Jul. 1967; R.W. Poole leg.; USNM (photographed, Fig. 61A, D).

Paratypes

VENEZUELA • 1 ♀; Aragua, Henri Pittier Nat. Park, nr Rancho Grande; 1150 m a.s.l.; 15–30 Nov. 1997; T. Pape leg.; Malaise trap; DEBU_0081/DEBU081-06 sequenced for CO1; ZMUC (dissected and photographed, Fig. 61B–C) • 1 ♀; Carabobo, Henri Pittier Natl. Pk., Portachuelo Pass; 10°20'51" N, 67°41'16" W; 1143 m a.s.l.; 13–15 Sep. 2008; M.D. Jackson leg.; DEBU • 1 ♀; Aragua, Henri Pittier Natl. Pk., Rancho Grande; 12–30 Dec. 1987; M. Sanborne leg.; DEBU.

Description

LENGTH. 12–13 mm.

HEAD. Palpus orange or light brown, pale microtrichose and setulose, narrow (length $5.0 \times$ height). Clypeus orange, very short (width $\sim 2.7 \times$ height), silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose, tapered posteriorly. Epicephalon light to dark brown, shiny, white microtrichose posteriorly, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Postocellar seta absent, 1–2 pairs of lower fronto-orbital setae; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown with a wide, indistinct silvery blue median sheen. Female cervical sclerite slightly swollen posteriorly. Postpronotal lobe black-brown, with several scattered setulae on anterior surface. Notopleuron black-brown, with indistinct pale brown microtrichosity surrounding anterior notopleural seta. Thorax black-brown, entirely silvery microtrichose, microtrichia denser posteriorly, forming silvery transverse band seen at only some angles. Legs dark brown, paler brown basally on hind femur. Fore tarsomere 1 white on basal $\frac{1}{2}$; hind tarsomere 1 dark brown. Wing brown-black infuscate on r_{1i} , distal $\frac{1}{2}$ and apex; three hyaline window-like spots in m_1 , r_{2+3} , r_{3+4} (Fig. 61D).

FEMALE ABDOMEN. T1 with fine, long, black setae. Pleuron pale grey, dorsal half of P2–5 dark brown. T1+2 $\sim 1.5 \times$ length of T3, posterior margin of T2 $\sim 2.1 \times$ as wide as T1. Oviscape black-brown, short black setulose, white microtrichose on anterior $\frac{2}{3}$, $\sim 3.0 \times$ length of T6. Common duct very short, smooth, not delineated from paired duct. Paired spermathecal duct long ($10.0 \times$ length of paired spermathecae), narrow, parallel-sided, very swollen distally. Paired spermathecal stems very short and narrow. Paired spermathecae split into two sections by a constriction: basal section ovoid, distal section tapered apically. “Single” spermathecal duct (smaller duct, leading to two spermathecae with a large, ovoid basal section and a smaller, bent distal section) $\frac{1}{2}$ length and \approx diameter of paired duct, parallel-sided, arising from basal $\frac{1}{10}$ of paired duct.

MALE ABDOMEN. Unknown.

Remarks

Scipopus (Phaeopterina) musculosus sp. nov., *S. (Ph.) sexguttatus* and *S. (Ph.) brunneus* sp. nov. appear to be closely related, and are all characterized by a smooth common spermathecal duct arising from the bursa (in lieu of a rugose common duct), from which both the paired and “single” duct originates; this contrasts most other Central and South American species of *S. (Phaeopterina)*, in which the common duct is absent but the single and paired ducts arise independently from the bursa copulatrix.

Distribution

Venezuela.

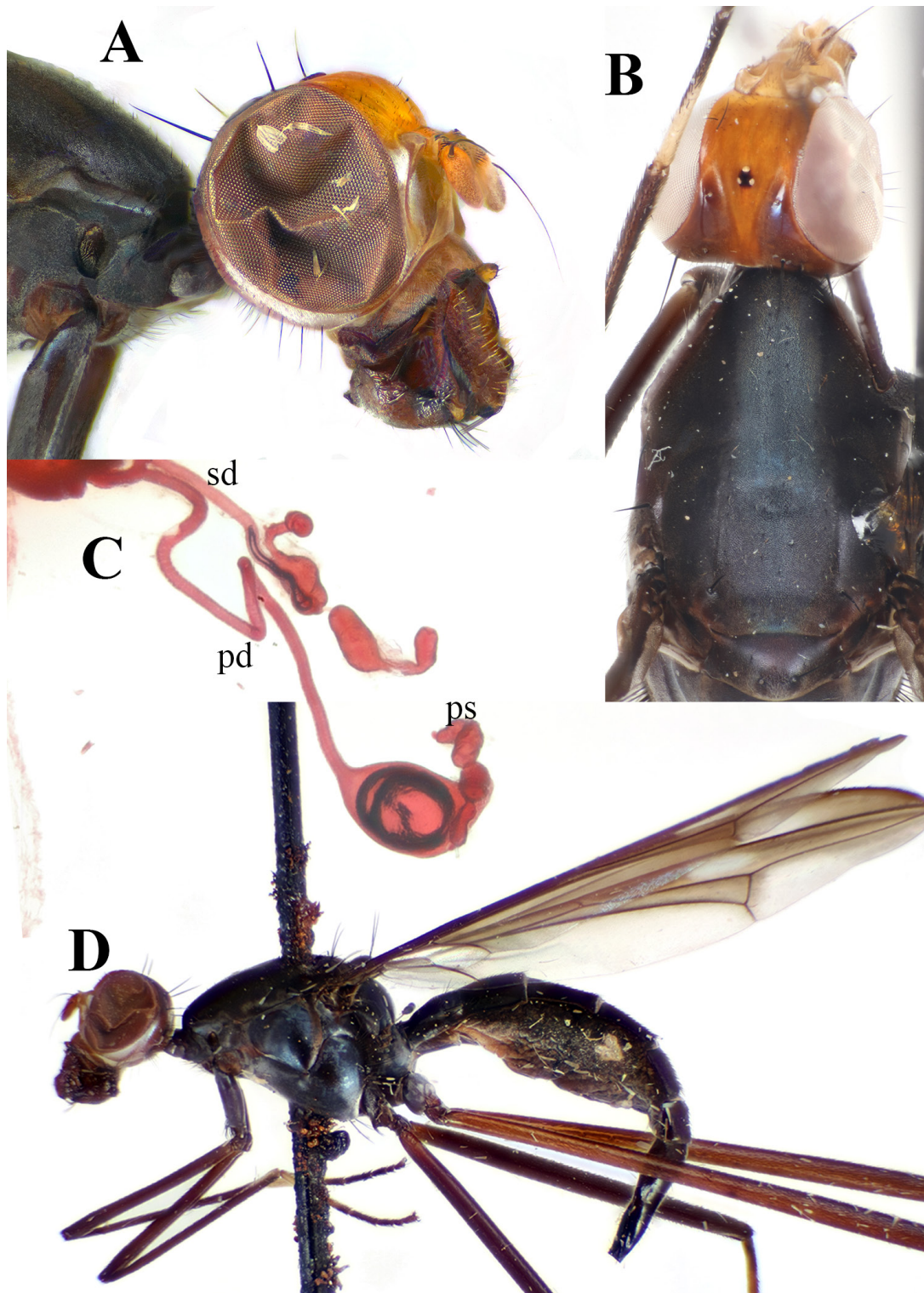


Fig. 61. *Phaeopterina musculosus* sp. nov. **A.** Head, ♀, lateral view, Venezuela, holotype (USNM). **B.** Head and thorax, ♀, dorsal view, Venezuela, paratype (ZMUC). **C.** Female spermathecae and associated structures, Venezuela, paratype (ZMUC). **D.** Habitus, ♀, Venezuela, holotype (USNM). Abbreviations: pd = paired spermathecal duct; ps = paired spermatheca (partially hidden by swollen duct); sd = “single” spermathecal duct (leading to pair of spermathecae).

Scipopus (Phaeopterina) narupa sp. nov.

urn:lsid:zoobank.org:act:5034DA1D-9B72-4D92-A75F-8455C572AE1D

Figs 62–63

Differential diagnosis

Scipopus (Phaeopterina) narupa sp. nov. is easily distinguished from consubgenera by the blue-black, wide epicephalon and the primarily dark brown or black body with dark brown or black legs.

Etymology

The species name is a noun in apposition inspired by the type locality.

Type material examined

Holotype

ECUADOR • 1 ♀; Napo, Narupayacu; 0°43'30" N, 77°46'02" W; 1100 m a.s.l.; 3 May 2019; K. Lindsay leg.; QCAZ (photographed, Fig. 62A, C–D).

Paratypes

ECUADOR • 1 ♂, 11 ♀♀; same collection data as for holotype; QCAZ.

Other material examined

ECUADOR • 2 ♂♂, 4 ♀♀; same collection data as for holotype; DEBU (♂, ♀ dissected and photographed, Fig. 62B, E–F) • 1 ♀; same collection data as for holotype; debu0399728/MYCRO810-20 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for holotype; debu0399675/MYCRO811-20 sequenced for CO1–5'; DEBU • 1 ♀; same collection data as for holotype; debu00399732/MYCRO816-20 sequenced for CO1–5'; DEBU.

Description

LENGTH. 11–12 mm.

HEAD. Palpus orange, pale microtrichose and black setulose, narrow (length $4.5 \times$ height). Clypeus orange, width $\sim 2.0 \times$ height, entirely silvery microtrichose. Frontal vitta dull, orange, microtrichose, posteriorly tapered. Epicephalon black, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. One of the two usual lower fronto-orbital setae absent, postocellar seta present or absent, all other head chaetotaxy well-developed.

THORAX. Scutum black with a wide, silvery-blue median sheen. Female cervical sclerite relatively flat. Postpronotal lobe black, with dense tuft of setulae on anterior corner. Notopleuron black with silvery-blue microtrichia outlining anterior notopleural seta and extending onto ventral margin. Thorax black with blue sheen, entirely silvery microtrichose. Legs black; fore and hind tarsomere 1 black with ventral golden fringe. Wing evenly black-brown infuscate.

ABDOMEN (♂+♀). T1 with fine, long, white setae.

FEMALE ABDOMEN. Pleuron pale grey, dorsal and ventral third of P2–5 dark brown or grey, leaving an indistinct pale convex median line on pleuron (Fig. 62G). T1+2 $\sim 1.8 \times$ length of T3; posterior margin of T2 $\sim 1.4 \times$ as wide as T1. Oviscape black, medium-length black setulose and white microtrichose on anterior $\frac{1}{2}$, $\sim 3.0 \times$ length of T6. Spermathecal ducts arising independently from bursa copulatrix. Paired spermathecal duct short ($4.0 \times$ length of paired spermathecae), narrow basally, swollen distally. Paired spermathecal stems long, narrow, inornate. Paired spermathecae nearly crescent-shaped, tapered apically. Single spermathecal duct narrow, same diameter as paired duct at base, same length as paired

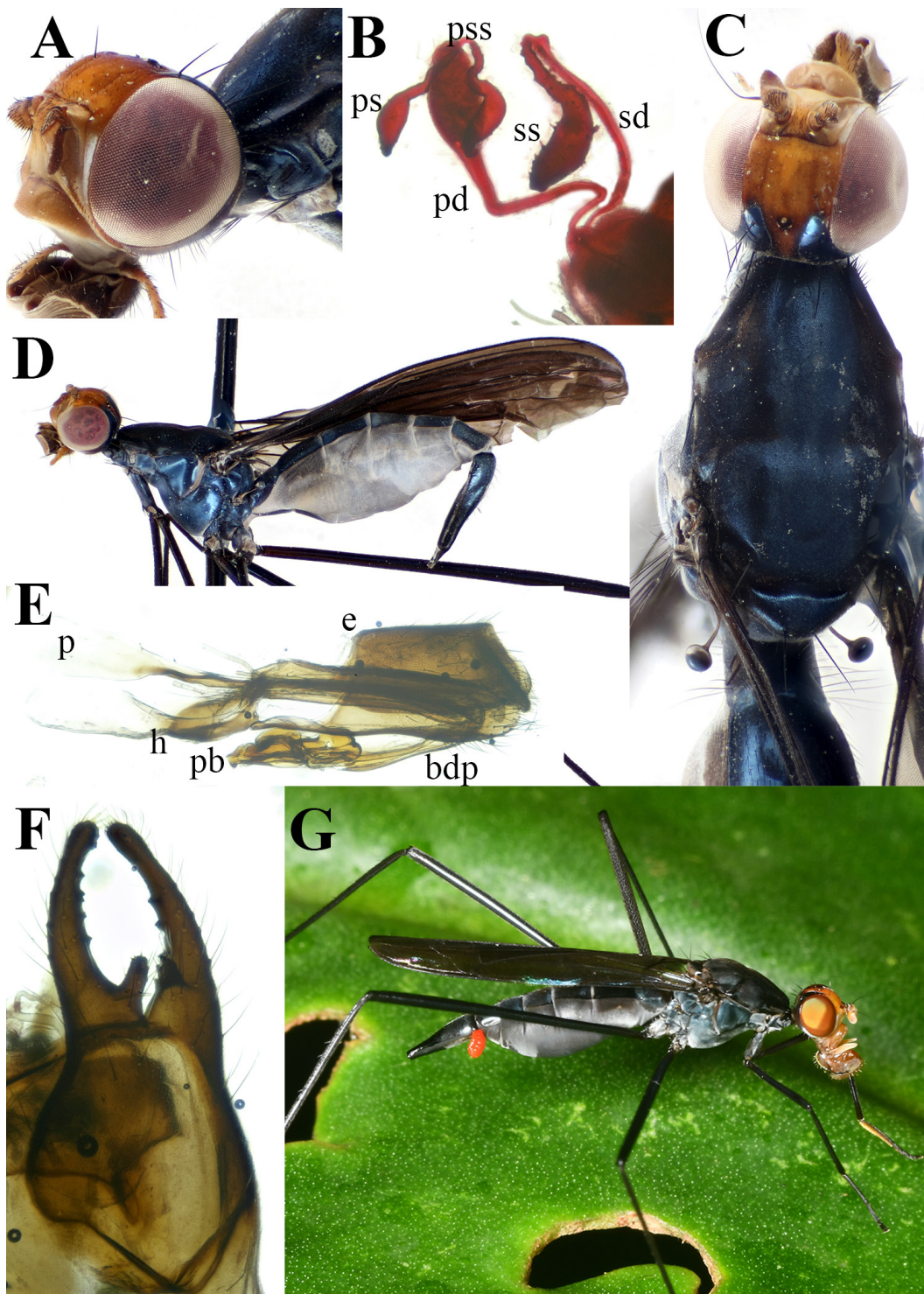


Fig. 62. *Scipopus (Phaeopterina) narupa* sp. nov. **A.** Head, ♀, anterolateral view, Ecuador, holotype (QCAZ). **B.** Female spermathecae and associated structures, Ecuador, non-type (DEBU). **C.** Head and thorax, dorsal view, holotype (QCAZ). **D.** Habitus, holotype (QCAZ). **E.** Male terminalia, lateral view, Ecuador, non-type (DEBU). **F.** Male genital fork, ventral view, Ecuador, non-type (DEBU). **G.** Living, ♀, Ecuador. Abbreviations: bdp = basal distiphallus; e = epandrium; h = hypandrium; p = phallapodeme; pb = phallic bulb; pd = paired spermathecal duct; ps = paired spermatheca; pss = paired spermathecal stem; sd = single spermathecal duct; ss = single spermatheca.

duct, swollen apically. Single spermatheca large (larger than paired), elongate, cup-shaped, with sparse tubercles.

MALE ABDOMEN. Pleuron pale grey, dorsal half of P2–5 dark brown. T1+2 $\sim 2.0 \times$ length of T3. Genital fork $2.5 \times$ as long as T6, arms converging; inner basal process $\frac{1}{4}$ the length of arm. Epandrium stout, length $\sim 1.5 \times$ height, posteroventral margin short setose. Basiphallus frame-like. Basal distiphallus long (\approx length of epandrium). Phallic bulb large, elongate (length $3.0 \times$ height), irregular and complex, with multiple chambers, either terminating in a tube-like opening or a very short, wide distal distiphallus. Phallopodeme very broad and expanded apically. Anterior hypandrium broad and expanded.

Remarks

We observed *S. (Ph.) narupa* sp. nov. feeding at a dung bait in Narupayacu, Ecuador in a characteristic posture previously noted in *S. (Ph.) stigmatica*, with the abdomen almost perpendicular to the feeding surface (Fig. 63B). A female of this species has been photographed with an associated pseudoscorpion (<https://www.inaturalist.org/observations/31649795>).

Distribution

Ecuador.

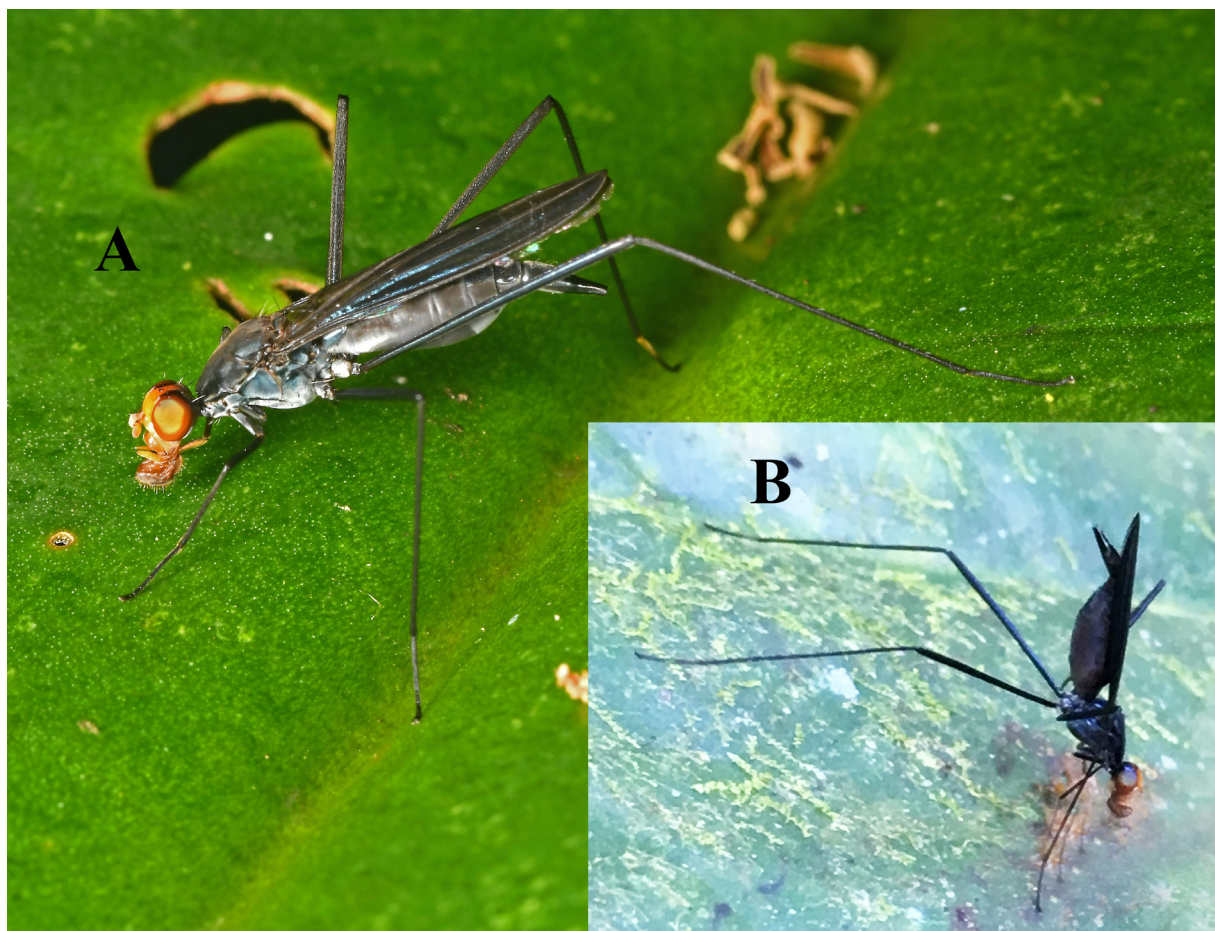


Fig. 63. *Scipopus (Phaeopterina) narupa* sp. nov. **A.** Living, ♀, Ecuador. **B.** Feeding, with abdomen upright, ♀, Ecuador (photo: K. Lindsay).

Scipopus (Phaeopterina) noturgidus sp. nov.

[urn:lsid:zoobank.org:act:3E98F6BE-0B52-44AA-BEF3-14A58CD7409E](https://doi.org/10.3896/BI.2021.14A58CD7409E)

Fig. 64

Differential diagnosis

Scipopus (Phaeopterina) noturgidus sp. nov. resembles *S. (Ph.) turgidus* sp. nov., *S. (Ph.) argentum* sp. nov. and *S. (Ph.) zeta* in having a brown first fore tarsomere and brown infusate wing, but differs by the short anterior face of the clypeus (width $2.0 \times$ height), the brown first hind tarsomere, the black-brown scutum and the absent postocellar seta. The female terminalia of *S. (Ph.) noturgidus* are nearly identical to those of *S. (Ph.) heteropus*, but *S. (Ph.) noturgidus* differs externally by the orange epicephalon and paracephalon, and the relatively uniform dark brown or black legs.

Etymology

This species was named by adding a prefix to the superficially similar *S. (Phaeopterina) turgidus* sp. nov.

Type material examined

Holotype

COLOMBIA • 1 ♀; Amazonas, PNN Amacayacu Matamata; 3°23' S, 70°06' W; 150 m a.s.l.; 17 Sep.–1 Oct. 2001; D. Chota leg.; Malaise; M. 2239; debu01089017/MYCRO569-19 sequenced for CO1; IAVH (photographed, Fig. 64A–B, D).

Paratype

COLOMBIA • 1 ♀; same collection data as for holotype; debu01089021/MYCRO604-19 sequenced for CO1–5'; IAVH (dissected and photographed, Fig. 64C).

Description

LENGTH. 15 mm.

HEAD. Palpus orange, pale microtrichose and black setulose, narrow (length $4.5 \times$ height), apex pointed. Clypeus orange, width $\sim 2.5 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon orange and/or light brown, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Anterior lower fronto-orbital seta and postocellar seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown with a wide, silvery blue median sheen. Female cervical sclerite relatively flat. Postpronotal lobe black-brown, some setulae on outer lateral margin. Notopleuron black-brown with indistinct pale microtrichosity surrounding anterior notopleural seta and on ventral margin. Thorax black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown, mid and hind femur light brown basally, gradually fading to dark brown apically. Fore and hind tarsomere 1 dark brown with ventral golden fringe. Wing entirely brown infusate.

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron pale grey, dorsal half of P2 dark brown, dorsal half of P3–5 dark grey (Fig. 64C). T1+2 $\sim 2.0 \times$ length of T3; posterior margin of T2 $\sim 1.3 \times$ as wide as T1. Oviscape dark brown, black setulose, white microtrichose on anterior $\frac{1}{3}$, $\sim 2.5 \times$ length of T6. Spermathecal complex with two paired ducts arising separately from bursa copulatrix, each duct narrow, parallel-sided with apical bulb-like swelling. Paired spermathecal stems elongate, slightly sinuate, longer than spermathecae. Paired spermathecae elongate, nearly almond-shaped; one pair with flat, invaginated apices, the other pair with pointed projections arising from apical invaginations. Both spermathecal ducts and all four spermathecae similar in size and shape.

MALE ABDOMEN. Not observed.

Distribution

Colombia.

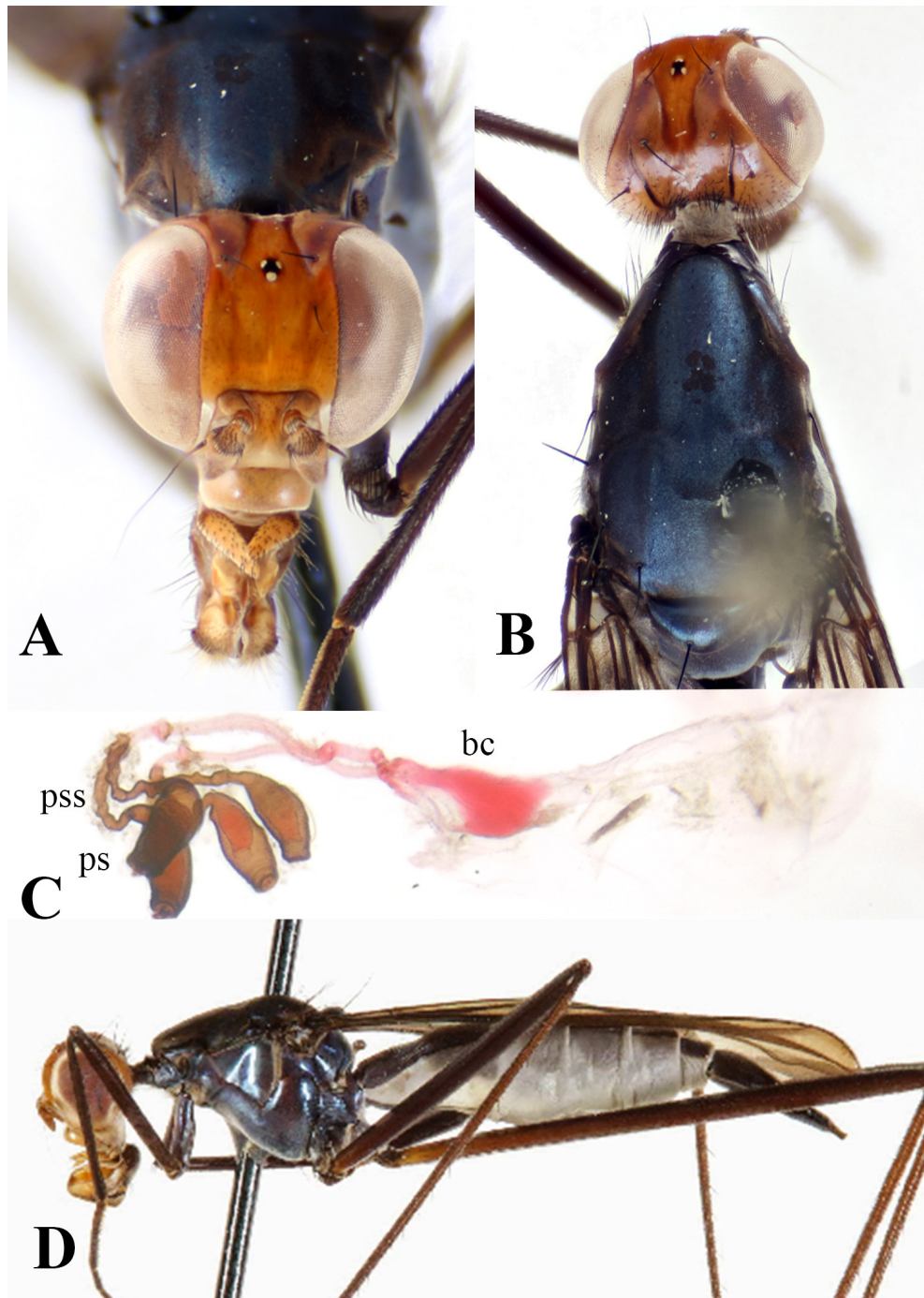


Fig. 64. *Scipopus (Phaeopterina) noturgidus* sp. nov. (IAVH). **A.** Head, anterior view, ♀, Colombia, holotype. **B.** Head and thorax, dorsal view, holotype. **C.** Female spermathecae and associated structures, Colombia, paratype. **D.** Habitus, holotype. Abbreviations: bc = bursa copulatrix; ps = paired spermatheca; pss = paired spermathecal stem.

Scipopus (Phaeopterina) quetzal sp. nov.

[urn:lsid:zoobank.org:act:9AD7F67E-87E6-4721-A306-F23CD79B310E](https://doi.org/10.3896/BIID.9AD7F67E-87E6-4721-A306-F23CD79B310E)

Fig. 65

Differential diagnosis

Scipopus (Phaeopterina) quetzal sp. nov. resembles the sympatric species *S. (Ph.) guatemalensis* and *S. (Ph.) uniformis* sp. nov. in having a brown median stripe on the clypeus, but it differs by the white microtrichose clypeus, the bright orange subapical band on the mid femur and the strongly convex female cervical sclerite.

Etymology

The species name is a noun in apposition inspired by the type locality.

Type material examined

Holotype

GUATEMALA • 1 ♀; Baja Vera, Biotopo Quetzal; 15°12'49" N, 15°12'49" W; 1690 m a.s.l.; 7–10 May 2009; cloud forest; Malaise trap; debu00334712/MYCRO607-19 sequenced for CO1–5', CO1–3', 12S, 28S; UVG (dissected and photographed, Fig. 65A–D).

Description

LENGTH. 12 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow (length $5.0 \times$ height). Clypeus orange, brown medially, width $\sim 1.6 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon light brown and/or orange, shiny, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown and/or orange. One lower fronto-orbital seta absent; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose with a wide, shiny, silvery-blue median sheen. Female cervical sclerite strongly convex. Postpronotal lobe black-brown, sparsely setulose on outer lateral margin. Notopleuron black-brown. Thorax dark black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown, mid femur with subapical bright orange band; fore tarsomere 1 entirely white, mid tarsomere 1 brown, hind leg and tarsomeres unknown. Wing entirely brown infusate.

FEMALE ABDOMEN. T1 with fine, long, dark brown or black setae. Pleuron pale grey, faded on available specimen but apparently darker grey or brown on P1, P2 and dorsal half of P3–6. Posterior margin of T2 $\sim 1.5 \times$ as wide as T1 dorsally. T1+2 $\sim 2.0 \times$ length of T3. Oviscape black-brown, microtrichosity not observed (dissected), $\sim 3.0 \times$ length of T6. Common duct very short, smooth, not delineated from paired duct. Paired duct short ($4.0 \times$ length of paired spermathecae), narrow, relatively parallel-sided. Paired spermathecal stems not differentiated from spermathecae. Paired spermathecae elongate, ringed by well-defined striae and ridges. Single spermathecal duct arising from base of paired duct, narrow, $\frac{1}{2}$ the diameter and $\frac{3}{4}$ the length of paired duct, with small swollen bulb apically. Single spermatheca similar to paired but much smaller.

MALE ABDOMEN. Not observed.

Distribution

Guatemala.

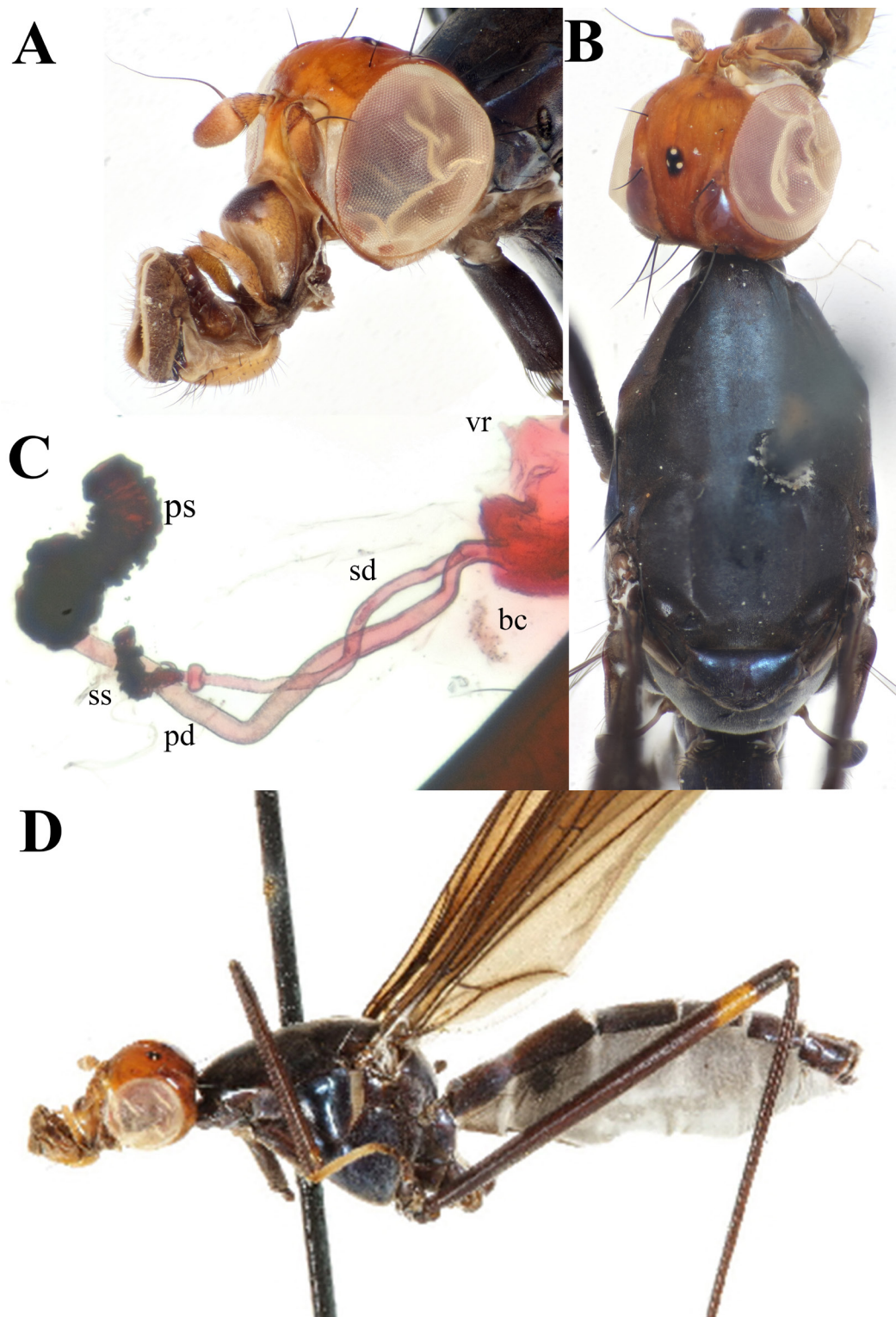


Fig. 65. *Scipopus (Phaeopterina) quetzal* sp. nov. ♀, Guatemala, holotype (UVG). **A.** Head, anterolateral view. **B.** Head and thorax, dorsal view. **C.** Female spermatheca and associated structures. **D.** Habitus (retrieved from BOLD). Abbreviations: bc = bursa copulatrix; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca; vr = ventral receptacle.

Scipopus (Phaeopterina) rufilabris Enderlein, 1922 comb. nov.

Fig. 66

Scipopus rufilabris Enderlein, 1922: 210.

Scipopus rufilabris – Hennig 1934: 329 (listed). — Aczél 1949: 343 (catalog). — Steyskal 1968: 48.16 (catalog). — Schumann 1988: 107 (catalog).

Pseudeurybata rufilabris – Marshall 2016: 265, figs 32–35.

Differential diagnosis

Scipopus (Phaeopterina) rufilabris resembles species of *Scipopus* s. str. that also have a primarily orange head with a shiny, narrow, clearly delineated epicephalon, primarily dark brown body and evenly brown legs and wings, but differs from species in that subgenus by the entirely white microtrichose anepisternum, the more elongate thorax (length/height = 0.97) and characters in the female and male terminalia.

New material examined

MEXICO • 2 ♀♀; Veracruz, Totutla, Finca el Mirador; 23 Mar. 2004; S. Ibañez and F.A. Pech leg.; IEXA (photographed, Fig. 66A–B, F).

Other material examined

See Marshall (2016).

Description

LENGTH. 11–12 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow to wide (length 3.5–4.2 × height). Clypeus orange, width ~1.6–2.0 × height, bare. Frontal vitta dull, orange, microtrichose. Epicephalon orange or light brown, white microtrichose, narrow (width < 2/3 of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown. 1–2 pairs of lower fronto-orbital setae; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with wide, shiny, silvery-blue median sheen flanked anteriorly by black triangular spots (Fig. 66A). Female cervical sclerite very slightly convex. Postpronotal lobe black-brown, very few scattered setulae on outer lateral margin. Notopleuron black-brown. Pleuron black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown; first fore tarsomere 1 dark brown with ventral golden fringe, hind tarsomere 1 dark brown. Wing entirely brown infuscate.

ABDOMEN (♂+♀). T1 with fine, long black setae.

FEMALE ABDOMEN. T1+2 ~1.8 × length of T3. Abdominal pleuron pale grey, P1 light brown, dorsal half of P2–P4 dark brown. Posterior margin of T2 ~1.5 × as wide as T1 dorsally. Oviscape dark brown, white microtrichose on anterior 1/2, ~3.0–4.0 × length of T6. Paired and single spermathecal ducts arising independently from bursa copulatrix. Paired spermathecal duct narrow, short (1.0–2.0 × length of paired spermathecae, but paired spermathecae large in this species), with apical bulb-like swelling. Paired spermathecal stems very short; paired spermathecae cylindrical, with finger-like tubercles. Single spermathecal duct narrow, 1/2 diameter and 2/3 length of paired duct. Single spermatheca like paired spermathecae but much smaller.

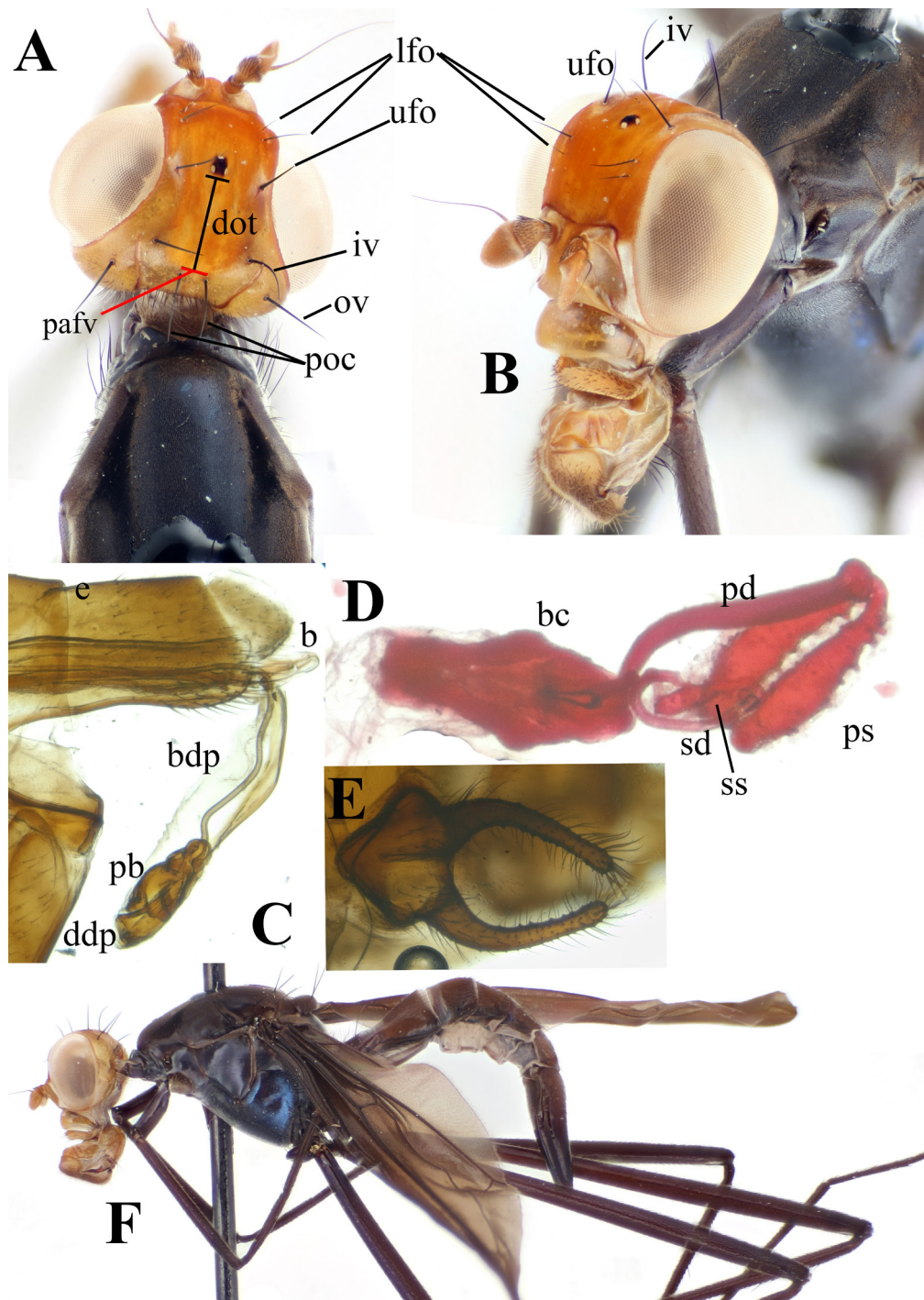


Fig. 66. *Scipopus (Phaeopterina) rufilabris* (Enderlein, 1922), Mexico, non-type. **A.** Head, ♀, dorsal view (IEXA). **B.** Head, ♀, anterolateral view (IEXA). **C.** Male terminalia, left lateral view (basal distiphallus overcleared, inconspicuously broad) (USNM). **D.** Female spermathecae and associated structures (IEXA). **E.** Male genital fork, ventral view (USNM). **F.** Habitus, ♀, Mexico (IEXA). Abbreviations: b = basiphallus; bc = bursa copulatrix; bdp = basal distiphallus; ddp = distal distiphallus; dot = distance between ocellar triangle and apex of frontal vitta; e = epandrium; iv = inner vertical seta; lfo = lower fronto-orbital seta; ov = outer vertical seta; pafv (in red) = posterior apex of the frontal vitta; pb = phallic bulb; pd = paired spermathecal duct; poc = postocellar seta; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca; ufo = upper fronto-orbital seta.

MALE ABDOMEN. Pleuron of available specimen discoloured. T2–6 with short black setulae. Posterior margin of T2 $\sim 1.5\times$ as wide as T1 dorsally. T1+2 $\sim 2.5\times$ length of T3. T6 short, genital fork small, $1.5\times$ length of T6. Genital fork with arms converging, inner basal process absent. Epandrium stout (length $1.5\times$ height), short setose posteroventrally. Basiphallus projecting far beyond junction with distiphallus, frame-like. Basal distiphallus long (\approx length to epandrium), broad, ending in phallic bulb. Phallic bulb large, elongate (length $3.0\times$ height), irregular and complex, with multiple chambers and terminating in either tube-like opening or very short, broad distal distiphallus. Phallapodeme and hypandrium not observed.

Remarks

The male of this species is unusual in having a basiphallus that projects outwards, far beyond the junction with the distiphallus.

Distribution

Mexico.

Scipopus (Phaeopterina) sexguttatus Enderlein, 1922

Fig. 67

Scipopus sexguttatus Enderlein, 1922: 209.

Phaeopterina sexguttatus – Hennig 1934: 321 (key); 1935: 27 (diagnosis). — Marshall *et al.* 2016 (catalog).

Phaeopterinus sexguttatus – Aczél 1949: 344 (catalog). — Steyskal 1968: 48.15 (catalog).

Scipopus sexguttatus – Schumann 1988: 108 (catalog).

Differential diagnosis

Scipopus (Phaeopterina) sexguttatus resembles *S. (Ph.) musculosus* sp. nov. and *S. (Ph.) brunneus* sp. nov. in having three subapical hyaline spots on the wing and an at least partially white first fore tarsomere but differs by the white setae on T1 and the partially white first hind tarsomere.

Type material examined

Syntypes (examined and photographed in Berlin, 2002)

VENEZUELA • 2 ♀♀; Sammlung H. Loew; ZMHB.

Other material examined

VENEZUELA • 1 ♀; Aragua, Henri Pittier Nat. Park, Pico Periquito; 1680 m a.s.l.; 15–30 Nov. 1997; T. Pape leg.; debu01089022/MYCRO603-19 sequenced for COI-5'; ZMUC (dissected and photographed, Fig. 67A–D) • 1 ♀; Ar. Portachuelo Pass; 17 Aug. 1967; R.W. Poole leg.; USNM.

Description

LENGTH. 12 mm.

HEAD. Palpus orange, pale microtrichose and black setulose, narrow (length $4.2\times$ height). Clypeus orange, very short, width $\sim 2.7\times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose, tapered posteriorly. Epicephalon light brown and/or orange, shiny, white microtrichose, wide (width $\frac{2}{3}$ or more of upper frontal vittal width at inner verticals), clearly delineated from upper frontal vitta. Paracephalon light brown. Postocellar seta absent; all other head chaetotaxy well-developed.

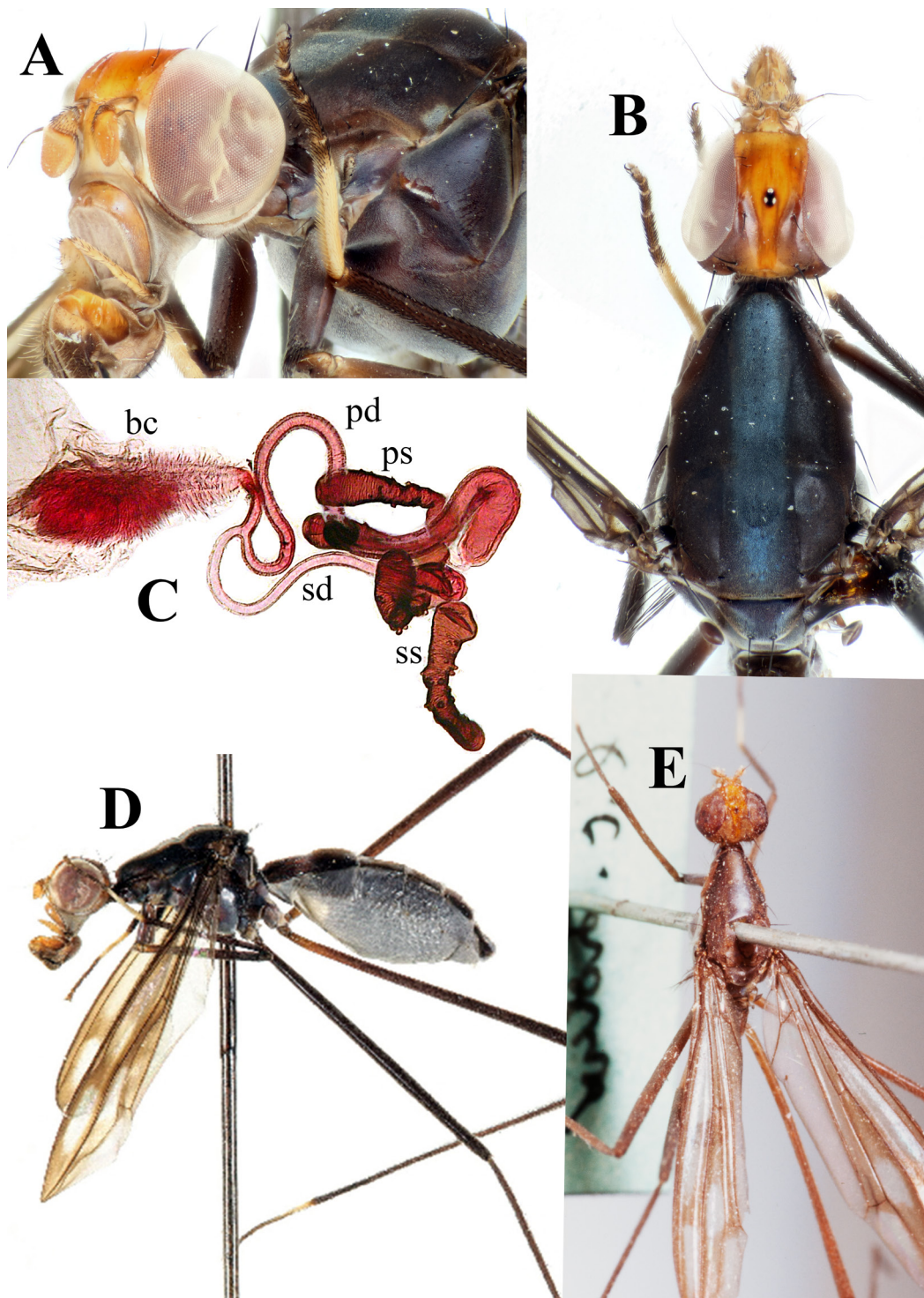


Fig. 67. *Scipopus (Phaeopterina) sexguttatus* Enderlein, 1922. **A.** Head, ♀, anterolateral view, Venezuela, non-type (ZMUC). **B.** Head and thorax, ♀, dorsal view, Venezuela, non-type (ZMUC). **C.** Female spermathecae and associated structures, Venezuela, non-type (ZMUC). **D.** Habitus, ♀, (oviscape removed), Venezuela, non-type (ZMUC). **E.** ♀, dorsal view, Venezuela, syntype (ZMHB). Abbreviations: bc = bursa copulatrix; pd = paired spermathecal duct; ps = paired spermatheca; sd = “single” spermathecal duct; ss = “single” spermathecae.

THORAX. Scutum black-brown with wide, silvery-blue median sheen. Female cervical sclerite slightly swollen posteriorly. Postpronotal lobe black-brown, setulose anteriorly. Notopleuron black-brown with anteroventral silvery spot of microtrichosity (Fig. 67A). Thorax black-brown, entirely silvery microtrichose except small bare spot on anterior margin of anepisternum. Legs dark brown, paler brown on basal mid and hind femur; first fore tarsomere almost entirely white; first hind tarsomere white anterodorsally. Wing black-brown infuscate on r_1 , distal $\frac{1}{2}$ and apex, three hyaline window-like spots in m_1 , r_{2+3} , r_{3+4} .

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron of female pale grey, dorsal half of P2–5 dark brown. T1+2 $\sim 2.0 \times$ length of T3, posterior margin of T2 $\sim 1.9 \times$ as wide as T1. Oviscape black-brown, black setulose, white microtrichose on anterior $\frac{1}{2}$, $\sim 3.3 \times$ length of T6. Common duct short, smooth, not delineated from paired duct. Paired spermathecal duct long ($\sim 3.0 \times$ length of paired spermathecae, but paired spermathecae uncharacteristically large in this species), narrow basally, swollen distally. Paired spermathecal stems narrow, shorter than spermathecae, inornate. Paired spermathecae elongate, slightly wider distally, with sparse tubercles and apical indentations. “Single” spermathecal duct (terminating in two spermathecae) arising from base of paired duct. “Single” spermathecal duct and spermathecae similar to paired.

MALE ABDOMEN. Not observed.

Remarks

See *S. (Ph.) musculosus* sp. nov. for discussion.

Distribution

Venezuela, Colombia (Steyskal 1968).

Scipopus (Phaeopterina) stigmatica (Hennig, 1935) comb. nov.

Fig. 68

Pseudeurybata stigmatica Hennig, 1935: 28.

Pseudeurybata stigmatica – Aczél 1949c: 345 (catalog). — Steyskal 1968: 48. 13 (catalog). — Marshall 2016: 264, figs 38–44.

Differential diagnosis

Scipopus (Phaeopterina) stigmatica is easily distinguished from congeners by the undulate thoracic dorsum, the apically infuscate wing and the apically black femora.

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for species description and figures.

Distribution

Costa Rica, Panama.



Fig. 68. *Scipopus (Phaeopterina) stigmatica* (Hennig, 1935), living, ♀, Costa Rica, non-type.

Scipopus (Phaeopterina) turgidus sp. nov.

[urn:lsid:zoobank.org:act:87933FA3-C177-4A64-89C4-4329C51FE3A9](https://zoobank.org/act:87933FA3-C177-4A64-89C4-4329C51FE3A9)

Fig. 69

Differential diagnosis

Scipopus (Phaeopterina) turgidus sp. nov. resembles *S. (Ph.) noturgidus* sp. nov. in having dark brown tarsi, uniformly brown infusate wings and a wide epicephalon, but differs by the presence of the postocellar seta, the strongly convex posterior cervical sclerite, the swollen T2, and the anteriorly setulose postpronotal lobe.

Etymology

The species name, from the Latin adjective for ‘swollen’, refers to both the swollen posterior female cervical sclerite and the swollen anterior margin of T2.

Type material examined

Holotype

COLOMBIA • 1 ♀; Amazonas, PNN Amacayacu San Martin; 3°46' S, 70°18' W; 150 m a.s.l.; 2–16 Apr. 2001; D. Chota leg.; Malaise; M. 1612; debu01089020/MYCRO605-19 unsuccessfully sequenced for CO1; IAVH.

Paratypes

COLOMBIA • 1 ♀; same collection data as for holotype; debu01089397/MYCRO824-20 sequenced for CO1–5'; IAVH • 1 ♀; same collection data as for holotype; Malaise; M. 1613; debu01089396/MYCRO821-20 sequenced for CO1–5'; IAVH (dissected and photographed, Fig. 69A–D).

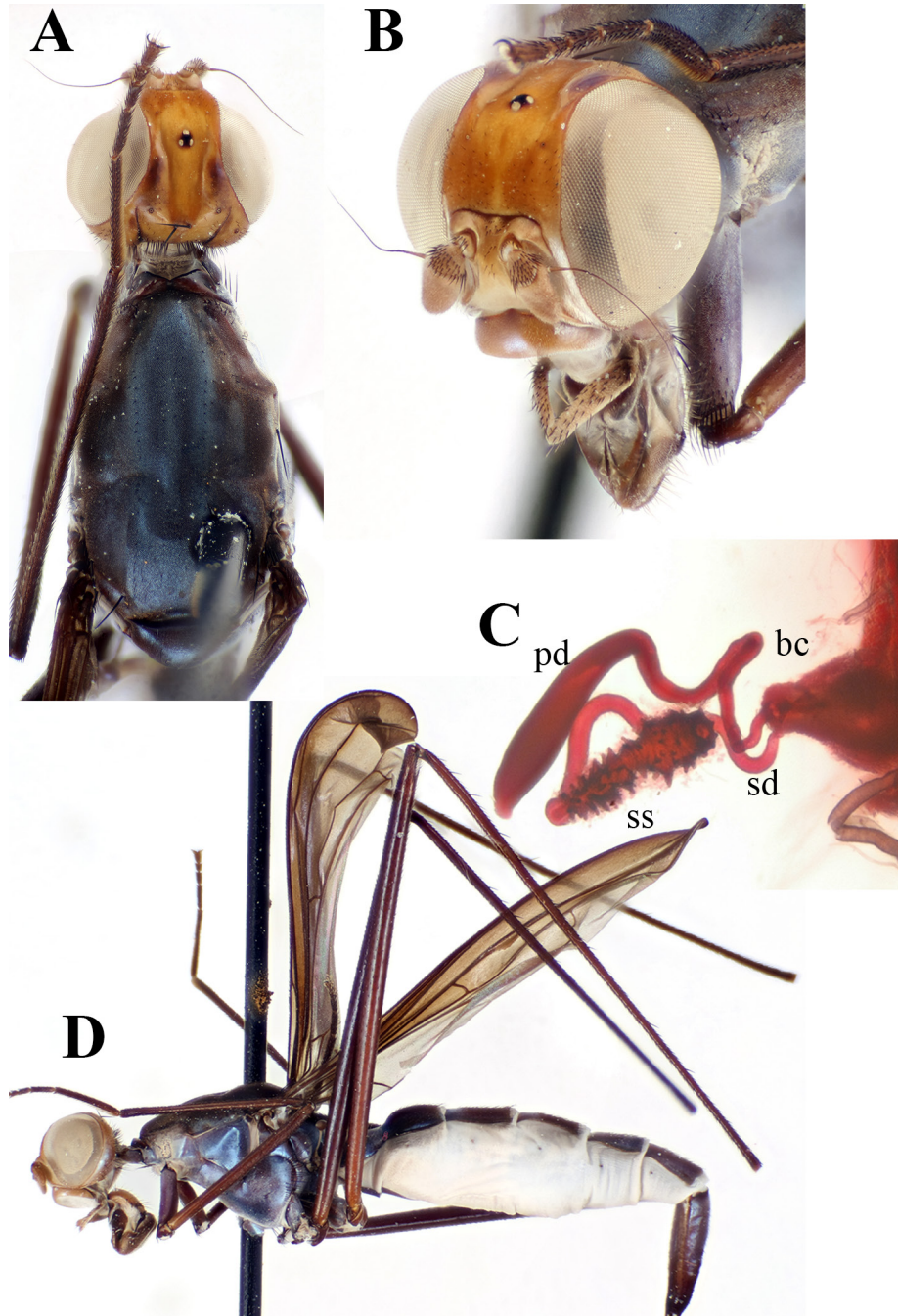


Fig. 69. *Scipopus* (*Phaeopterina*) *turgidus* sp. nov., ♀, Colombia, paratype (IAVH). **A.** Head and thorax, dorsal view. **B.** Head, anterolateral view. **C.** Female spermatheca and associated structures. **D.** Habitus. Abbreviations: bc = bursa copulatrix; pd = paired spermathecal duct; sd = single spermathecal duct; ss = single spermatheca.

Description

LENGTH. 12–13 mm.

HEAD. Palpus orange, light brown basally, pale microtrichose and black setulose, narrow (length $4.5 \times$ height). Clypeus orange, width $\sim 2.5 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon mostly orange, sometimes brown medially, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. Upper fronto-orbital seta absent or present; one lower fronto-orbital seta absent, all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, brown microtrichose, with a wide, indistinct silvery-blue median sheen. Female cervical sclerite strongly convex on posterior half. Postpronotal lobe black-brown, densely setulose on anterior point. Notopleuron black-brown, indistinct pale microtrichosity surrounding anterior notopleural seta and ventral margin. Thorax black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown; first fore and hind tarsomere dark brown with ventral golden fringe. Wing brown infusate.

FEMALE ABDOMEN. T1 with fine, long, white setae. Pleuron pale grey, faded in available specimens, but apparently darker on dorsal margin of P2–5. T1+2 $\sim 1.5 \times$ length of T3; anterior margin of T2 swollen, posterior margin of T2 $\sim 1.9 \times$ as wide as T1. Oviscape dark brown, black setulose, white microtrichose on anterior $\frac{2}{3}$, $\sim 2.5 \times$ length of T6. Paired and single spermathecal ducts arising separately from bursa copulatrix. Paired spermathecal duct short ($5.0 \times$ length of typical paired spermathecae), narrow basally, wide distally. Paired spermathecal stems and paired spermathecae apparently absent. Single spermathecal duct narrow, equal in length and diameter to paired duct at base, with apical swollen bulb. Single spermatheca large, elongate, with numerous jagged tubercles and an apical indentation.

MALE ABDOMEN. Not observed.

Remarks

All three females available for examination were dissected and apparently lacked paired spermathecae, which may have been lost during dissection. However, the distal end of the paired duct is present and blunt on all three specimens and there seems to be no evidence of snapped off stems, suggesting a loss of the paired (primary) spermathecae in this species.

Distribution

Colombia.

Scipopus (Phaeopterina) uniformis sp. nov.

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Fig. 70

Differential diagnosis

Scipopus (Phaeopterina) uniformis sp. nov. resembles *S. (Ph.) guatemalensis* and *S. (Ph.) quetzal* sp. nov. in having a brown median stripe on the otherwise orange clypeus. *Scipopus (Ph.) uniformis* is distinctive for its brown first fore tarsomere, bare clypeus, uniformly brown femur and relatively flat female cervical sclerite. All three species overlap in distribution.

Etymology

The species name, from the Latin adjective for ‘uniform’ refers to the uniformly brown legs, which distinguish this species from other similar species.

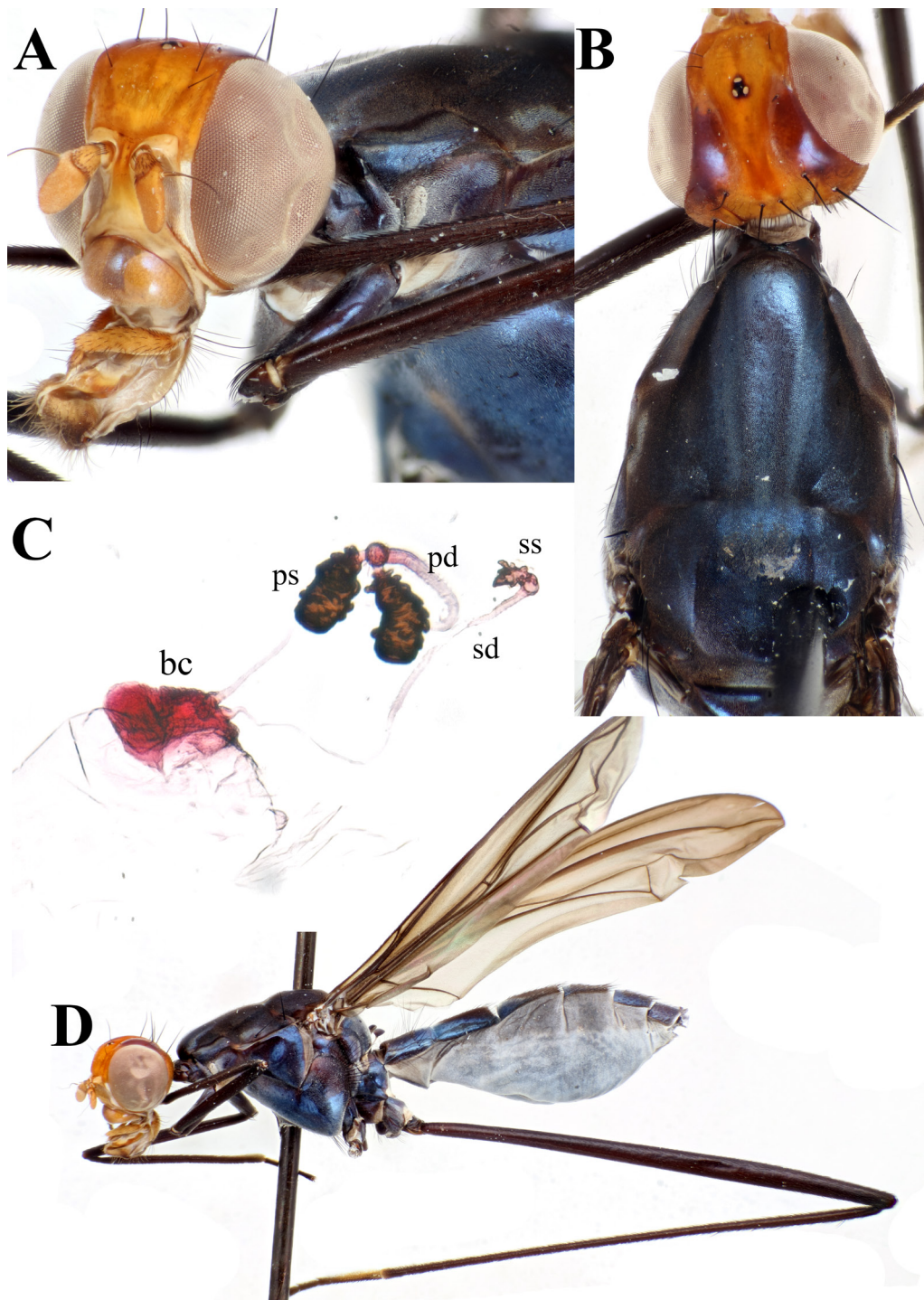


Fig. 70. *Scipopus* (*Phaeopterina*) *uniformis* sp. nov, ♀, Mexico, holotype (DEBU). **A.** Head, anterolateral view. **B.** Head and thorax, dorsal view. **C.** Female spermathecae and associated structures. **D.** Habitus. Abbreviations: bc = bursa copulatrix; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca.

Type material examined

Holotype

MEXICO • 1 ♀; Chiapas, Nahá; 16°57'48" N, 91°35'34" W; 980 m a.s.l.; 9–13 Jun. 2008; mesophil forest; Malaise trap; DEBU (dissected and photographed, Fig. 70A–D).

Paratypes

HONDURAS • 1 ♀; Cusco National Park, Guanales; 15.4886° N, 88.2358° W; 1219 m a.s.l.; M. D'Souza leg.; 7–10 Feb. 2014; BIOUG19236-H06/GMHJL457-15 sequenced for CO1–5'; BIOUG • 1 ♀; same collection data as for preceding; BIOUG19238-G07/GMHJM382-15 sequenced for CO1–5'; BIOUG • 1 ♀; same collection data as for preceding; BIOUG19237-F09/GMHJJ539-15 sequenced for CO1–5'; BIOUG.

Description

LENGTH. 15 mm.

HEAD. Palpus orange, pale microtrichose and setulose, narrow (length $4.8 \times$ height). Clypeus orange, brown medially, width $\sim 1.6 \times$ height, silvery microtrichose on entire surface. Frontal vitta dull, orange, microtrichose. Epicephalon light brown, shiny, wide (width $\frac{2}{3}$ or more of upper frontal vittal width), clearly delineated from upper frontal vitta. Paracephalon orange. 1–2 pairs of lower fronto-orbital setae; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with a wide, shiny, silvery-blue median sheen. Female cervical sclerite relatively flat. Postpronotal lobe black-brown, bare. Pleuron black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown; fore and hind tarsomere 1 dark brown with ventral golden fringe. Wing entirely brown infuscate.

MALE ABDOMEN. Not observed.

FEMALE ABDOMEN. T1 with fine, long, dark brown or black setae. Pleuron pale grey, P1 and dorsal half of P2–5 dark grey. Posterior margin of T2 $\sim 1.5 \times$ as wide as T1 dorsally. T1+2 $\sim 2 \times$ length of T3. Oviscape black, white microtrichose on anterior ventral and lateral $\frac{1}{2}$, dorsomedian $\frac{1}{4}$, $4.0 \times$ length of T6. Paired and single spermathecal ducts arising independently from bursa copulatrix. Paired duct short ($5.0 \times$ length of paired spermathecae), very narrow basally, slightly wider distally, swollen apically. Paired spermathecal stems very short. Paired spermathecae narrow basally, wider distally, with prominent tubercles, especially basally. Single spermathecal duct narrow, equal in length and diameter to paired duct. Single spermatheca very small, pointed, with prominent tubercles.

Distribution

Mexico, Honduras.

Scipopus (Phaeopterina) vee sp. nov.

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Fig. 71

Differential diagnosis

Scipopus (Phaeopterina) vee sp. nov. is easily distinguished from consubgenera by the white first fore tarsomere, the basally yellow femur and the brown infuscate wing.

Etymology

The species name, from the English word for the letter V, is a noun in apposition referring to the V-shaped single spermatheca of the species.

Type material examined

Holotype

PERU • 1 ♀; Cock of the Rock Lodge; 13°03'21" S, 71°32'46" W; ~1380 m a.s.l.; 8–20 Oct. 2006; J. Skevington leg.; Malaise Trap; CNC (dissected and photographed, Fig. 71A, C–D, G).

Paratype

PERU • 1 ♂; same collection data as for holotype; CNC Diptera #96407/MYCRO601-19 sequenced for CO1; CNC (dissected and photographed, Fig. 71B, E, H).

Description

LENGTH. 9–10 mm.

HEAD. Palpus orange, pale microtrichose and setulose on entire surface, broad (length $3.8 \times$ height). Clypeus pale orange, width $\sim 1.9 \times$ height, bare. Frontal vitta dull, orange, microtrichose. Epicephalon light brown, shiny, bare, wide (width $\frac{2}{3}$ or more of upper frontal vitta width at inner verticals), clearly delineated from upper frontal vitta. One pair of lower fronto-orbital setae absent; all other head chaetotaxy well-developed.

THORAX. Scutum black-brown, dark brown microtrichose, with a wide, silvery-blue median sheen. Female cervical sclerite strongly pointed posteriorly. Postpronotal lobe black-brown, some setulae on vertical margin. Notopleuron black-brown with spot of pale microtrichia outlining anterior notopleural seta. Thorax black-brown with blue sheen, entirely silvery microtrichose. Legs dark brown, mid and hind tibia yellow on basal $\frac{1}{3}$ to $\frac{1}{2}$, gradually fading to dark brown apically; fore tarsomere 1 almost entirely white; hind tarsomere 1 dark brown. Wing brown infusate.

ABDOMEN (♂+♀). T1 with fine, long, white setae. Relative width of T2 to T1 unknown (abdomen of both types misshapen).

FEMALE ABDOMEN. Pleuron pale grey, P1–2 grey, dorsal and ventral third of P3–5 darker grey, forming indistinct convex pale band across pleuron (not evident in Fig. 71G). T1+2 $\sim 1.9 \times$ length of T3. Oviscape dark brown, white microtrichose an anterior $\frac{1}{2}$, $\sim 2.8 \times$ length of T6. Posterior margin of T2 $1.5 \times$ as wide as T1 dorsally. Paired and single spermathecal ducts arising separately from bursa copulatrix. Paired spermathecal duct short ($6.0 \times$ length of paired spermathecae), parallel-sided, swollen distally and apically. Paired spermathecal stems narrow, slightly sinuate. Paired spermathecae apically rounded, inornate. Single spermathecal duct narrow, of same diameter and length as paired duct, swollen apically. Single spermatheca bifurcate, V-shaped, wider apically, with scattered tubercles.

MALE ABDOMEN. Pleuron pale grey, P1–2 darker grey. T1–5, T1+2 $\sim 1.9 \times$ length of T3. Genital fork $1.4 \times$ as long as T6, arms converging; inner basal process absent. Epandrium stout, (length $\sim 1.2 \times$ height), posterior margin pointed, posteroventral margin setose. Basiphallus frame-like, extending beyond junction with distiphallus. Basal distiphallus long (\approx length to epandrium), ending in phallic bulb. Phallic bulb short (length \approx height), approximately round, upper chamber with rounded posterior projection, lower chamber rounded. Distal distiphallus of available specimen narrow, apparently long but broken off near phallic bulb. Phallapodeme very broad and expanded apically, length \approx height. Anterior hypandrium expanded and broad.

Distribution

Peru.

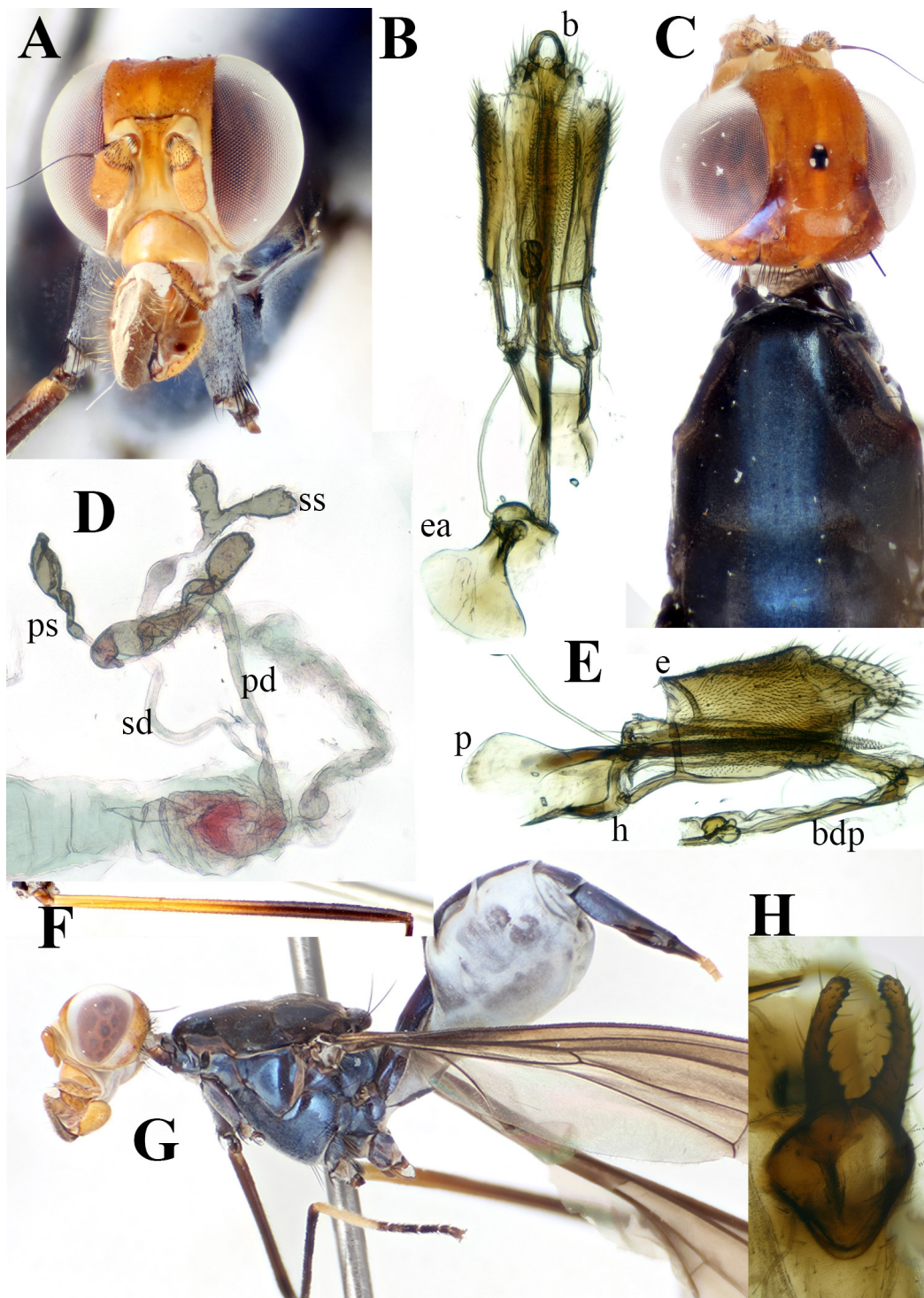


Fig. 71. *Scipopus (Phaeopterina) vee* sp. nov. (CNC). **A.** Head, anterior view, ♀, Peru, holotype. **B.** Male terminalia, ventral view, Peru, paratype. **C.** Head and thorax, dorsal view, holotype. **D.** Female spermathecae and associated structures, holotype. **E.** Male terminalia, lateral view, paratype. **F.** Hind femur, paratype. **G.** Habitus, holotype. **H.** Male genital fork, ventral view, paratype. Abbreviations: b = basiphallus; bdp = basal distiphallus; e = epandrium; ea = ejaculatory apodeme; h = hypandrium; p = phallapodeme; pd = paired spermathecal duct; ps = paired spermatheca; sd = single spermathecal duct; ss = single spermatheca.

Scipopus (Phaeopterina) zeta (Marshall, 2016) comb. nov.

Fig. 72

Pseudeurybata zeta Marshall, 2016: 266, figs 45–52.

Differential diagnosis

Scipopus (Phaeopterina) zeta resembles *S. (Ph.) argentum* sp. nov. and *S. (Ph.) noturgidus* sp. nov. in having a brown first fore tarsomere, brown infusate wing and no postocellar seta, but differs by the tall anterior face of the clypeus (width $1.4 \times$ height) and the partially or entirely white first hind tarsomere.

Material examined

See Marshall (2016).

Remarks

See Marshall (2016) for additional figures.

Distribution

Ecuador, Colombia, Brazil.



Fig. 72. *Scipopus (Phaeopterina) zeta* (Marshall, 2016), living, ♀, Brazil, non-type.



Fig. 73. *Scipopus* (*Phaeopterina*), undescribed species, ♂, living, with pleural sac very enlarged, Honduras. Photo credit: Matthew T. Hamer. Retrieved from <https://www.inaturalist.org/observations/80611607>



Fig. 74. An undescribed species of *Scipopus* (*Phaeopterina*) in copula, displaying sexual dimorphism. The male has orange-banded femora and the female has uniformly black femora. Veracruz, Mexico. Photo credit: Santiago Jaume. Retrieved from <https://www.inaturalist.org/observations/28671476>

Undescribed species of Scipopus (Phaeopterina)

Two photos (Figs 73–74) from iNaturalist appear to represent undescribed species of *Scipopus* (*Phaeopterina*). One is a male similar to *S. (Ph.) vee* sp. nov. that shows a fully everted pleural sac; it differs from *S. (Ph.) vee* by the hind femur, which is only pale on the basal 1/8 or less. The other photo shows a pair in copula. This species shows unusual sexual dimorphism, as the female resembles *S. (Ph.) uniformis* sp. nov. in having a uniformly black hind femur, but differs by the white first tarsomere, while the male resembles *S. (P.) metallicus* sp. nov., but differs by the preapical orange stripe on the hind femur.

Discussion

The primary objective of this paper was to provide a stable generic classification for *Scipopus* and to provide diagnostic tools for its component subgenera and known species. This group of subgenera, previously known as separate genera of the ‘*Scipopus* group’, was recognized from the outset as a difficult clade with unusually high homoplasy in most potentially diagnostic characters. We started this work with the expectation that careful study of complex male and female characters would resolve the group as four genera and would probably circumscribe further distinctive monophyletic subgroups. Surprisingly, this was not the case. The lack of congruence between different characters suggests a high level of homoplasy, even in unusual and complex internal genitalic characters, and the remarkable discordance between strongly supported multi-gene phylogenies and morphological characters seems to suggest that the long-standing difficulties with this group reflect a genuinely intractable morphological taxonomy. We therefore settled on a generic concept supported primarily by morphology, with subgenera primarily supported by molecular data, to avoid defining genera using conflicting morphological synapomorphies. The resultant genus is relatively broad and diverse but can be diagnosed by a combination of characters. The three subgenera, including one newly described and one newly defined to combine two previously described genera, can also be defined by a combination of characters and by taking into account a few species in which diagnostic characters are reversed or convergently developed. Subgenera and species are treated in the same key, so known exceptions are easily treated, but the key is based on known species, which are in turn based to a large extent on relatively few collection events. This indicates that more extensive collections of Neotropical Micropezidae will yield many new species, a prediction already borne out by the recognition of a number of undescribed species from online images.

The decision to base subgeneric concepts on molecular evidence despite conflicting morphological evidence followed from the unusual level of homoplasy in morphological characters, not from an assumption that molecular data are necessarily superior to morphological data. We note that other recently revised micropezid genera, such as *Mesoconius* (Marshall 2019) and *Cardiacephala* Macquart, 1843 (Ferro & Marshall 2018) seem to be based on robust morphological evidence, yet include a few species that are widely separated from the rest of the genus in molecular analyses. In each case the generic and subgeneric concepts represent a balance of diagnosability and phylogenetic hypotheses, both open to improvement and testing as more species are described and sequenced.

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APPENDIX 1 (continued on next seven pages)List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)							BIN (BOLD:)
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S		
<i>Scipopus (Scipopus) belzebul</i> (Schiner)	MYCRO551-19	debu01088997	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEA6259
	MYCRO528-19	debu01088988	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEA6259
<i>Scipopus (Scipopus) brikelos</i> sp. nov.	MYCRO560-19	debu00206321	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ADL7722
	MYCRO549-19	debu01089003	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ADL7722
	GMCCE108-17	BIOUG36554-D09	589[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ADL7722
<i>Scipopus (Scipopus) calocephalus</i> (Bigot)	MYCRO554-19	debu00332183	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACO1049
	MYCRO552-19	debu01088998	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACO1049
	MYCRO529-19	debu01088989	658[0n]	n/a	611[0n]	550[0n]	593[1n]	n/a	n/a	ACO1049
	MYCRO513-19	debu00138137	658[1n]	n/a	n/a	n/a	n/a	n/a	n/a	ACO1049
	TAE044-14	TAE112	1488[28n]	n/a	n/a	n/a	n/a	n/a	373[0n]	ACO1049
	MYCRO029-15	UGIC128-15	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACV1535
	MYCRO814-20	DEBU00380052	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACV1535
	MYCRO644-20	debu00138349	0	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO563-19	debu00138356	0	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO556-19	debu00379474	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEA6261
<i>Scipopus (Scipopus) cartaboensis</i> Cresson	MYCRO530-19	debu00280298	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEA6261
	MYCRO171-15	UGIC270-15	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACW6270
<i>Scipopus (Scipopus) chalybeus</i> Hennig	MYCRO647-20	debu01089060	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACW1416
	MYCRO820-20	DEBU00402373	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACW1416
	MYCRO646-20	debu01089059	658[1n]	n/a	n/a	n/a	n/a	n/a	n/a	AEC9078
	MYCRO645-20	debu00289616	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AED0318
	MYCRO822-20	DEBU00281719	640[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AED0318
	MYCRO825-20	DEBU00282029	639[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AED0318

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)						BIN (BOLD:)
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S	
<i>SCIPOPUS</i> s. str.	MYCRO550-19	debu01088996	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6506
	MYCRO527-19	debu01088987	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6506
	MYCRO534-19	debu00379841	658[0n]	n/a	611[0n]	530[0n]	n/a	341[1n]	AEA5019
	TAE043-14	TAE111	1495[21n]	n/a	n/a	n/a	n/a	364[0n]	ACO1162
<i>Scipopus (Scipopus) chalybeus</i> Hennig	MYCRO165-15	UGIC264-15	635[0n]	n/a	n/a	n/a	n/a	n/a	ACW1416
	MYCRO558-19	debu00339811	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO809-20	DEBU00402608	658[0n]	n/a	n/a	n/a	n/a	n/a	AEH1824
	MYCRO819-20	DEBU00402582	658[0n]	n/a	n/a	n/a	n/a	n/a	AEH1981
<i>Scipopus (Scipopus) convexus</i> sp. nov.	MYCRO520-19	debu01088991	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7437
	MYCRO519-19	debu01089002	658[0n]	761[0n]	606[0n]	549[0n]	544[0n]	523[0n]	AEA7437
	MYCRO518-19	debu00281750	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7764
	MYCRO517-19	debu00281553	658[0n]	n/a	607[0n]	551[0n]	586[0n]	523[0n]	AEA7764
<i>Scipopus (Scipopus) diversus</i> (Schiner)	MYCRO640-20	debu01089056	658[3n]	n/a	n/a	n/a	n/a	n/a	AED0524
	MYCRO559-19	debu00280301	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO535-19	debu00302943	658[1n]	n/a	583[0n]	422[0n]	n/a	n/a	ACA9995
	MYCRO524-19	debu00280300	658[0n]	n/a	n/a	n/a	n/a	n/a	ACA9995
	MYCRO523-19	debu00303021	658[0n]	n/a	n/a	n/a	n/a	n/a	ACA9995
	ASNOR3440-12	BIOUG01561-A08	658[0n]	n/a	n/a	n/a	n/a	n/a	ACA9995
	MYCRO521-19	debu01088992	658[0n]	n/a	497[0n]	433[4n]	n/a	168[2n]	AEA4100
	MYCRO562-19	debu01089000	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA4100
	MYCRO032-15	UGIC131-15	407[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO031-15	UGIC130-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV0379
MYCRO639-20	debu00282054	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV0379	

APPENDIX 1 (continued)List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)						BIN (BOLD:)
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>SCIPOPUS</i> s. str.	MYCRO522-19	debu00281543	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV0379
	MYCRO537-19	debu01088990	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA3950
	MYCRO536-19	debu00289647	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA5018
	MYCRO532-19	debu00179103	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA3950
	MYCRO531-19	debu00339648	658[0n]	364[0n]	611[0n]	507[0n]	554[0n]	221[3n]	AEA3950
	MYCRO557-19	USNM00053933	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO533-19	USNM00053927	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO541-19	debu00280292	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA4157
	MYCRO540-19	debu01015708	658[0n]	n/a	611[0n]	538[0n]	574[0n]	523[1n]	AEA7438
	MYCRO823-20	DEBU00179098	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7438
<i>Scipopus</i> (<i>Scipopus</i>) <i>erythrocephalus</i> (Fabricius)	MYCRO544-19	debu00282040	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7438
	MYCRO543-19	debu00281552	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7438
	MYCRO567-19	debu00256946	572[0n]	n/a	n/a	n/a	n/a	n/a	AEA4157
	MYCRO542-19	debu01088993	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO643-20	debu00138373	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO538-19	debu00312073	658[0n]	n/a	611[0n]	550[0n]	594[1n]	n/a	AEA6258
	MYCRO566-19	debu00312075	658[1n]	n/a	n/a	n/a	n/a	n/a	AEA3951
	MYCRO553-19	debu01088999	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO561-19	debu00242010	0	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO555-19	debu00294650	658[0n]	n/a	611[0n]	547[0n]	n/a	n/a	ACV1384
<i>Scipopus</i> (<i>Scipopus</i>) <i>nigripennis</i> (Hendel)	MYCRO545-19	debu00294649	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV1384
	GMPAC015-18	BIOUG38734-H07	654[0n]	n/a	n/a	n/a	n/a	n/a	ACV1384
	MYCRO030-15	UGIC129-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV1384

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)							BIN (BOLD:)
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>SCIPOPUS</i> s. str.	MYCRO162-15	UGIC261-15	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACV1384
	MYCRO547-19	debu01088995	658[0n]	757[0n]	612[0n]	531[0n]	554[0n]	209[0n]	ADB0299	
	MYCRO546-19	debu00260110	658[0n]	n/a	n/a	n/a	n/a	n/a	ADB0299	
	MYCRO514-19	debu00138141	658[0n]	n/a	n/a	n/a	n/a	n/a	ADB0299	
	JICBC001-16	BIOUG28360-B05	591[0n]	n/a	n/a	n/a	n/a	n/a	ADB0299	
	MYCRO033-15	UGIC132-15	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN	
	JCCCS055-16	BIOUG30035-B05	588[0n]	n/a	n/a	n/a	n/a	n/a	ADB0299	
	MYCRO642-20	debu01089057	0	n/a	n/a	n/a	n/a	n/a	No BIN	
	MYCRO641-20	debu01089058	0	n/a	n/a	n/a	n/a	n/a	No BIN	
	<i>Scipopus (Scipopus) nitidus</i> sp. nov.	MYCRO564-19	debu01089001	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Scipopus) planus</i> sp. nov.	MYCRO548-19	debu01088994	658[0n]	n/a	611[0n]	565[1n]	n/a	n/a	AEA7004	
	MYCRO516-19	debu00281539	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6262	
	MYCRO515-19	debu00289615	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6262	
	MYCRO638-20	debu00281540	0	n/a	n/a	n/a	n/a	n/a	No BIN	
<i>Scipopus (Scipopus)</i> <i>souzalopesi</i> Albuquerque	MYCRO526-19	debu01088986	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA7058	
	MYCRO525-19	debu01088985	658[0n]	n/a	610[1n]	n/a	n/a	n/a	AEA7058	
<i>Scipopus (Scipopus)</i> <i>wokomung</i> sp. nov.	MYCRO539-19	debu00379410	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6260	
	MYCRO565-19	debu00379786	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA6260	

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)						BIN (BOLD:)
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Parascipopus)</i> <i>alturas</i> sp. nov.	DEBU084-06	DEBU0084	658[0n]	n/a	n/a	n/a	n/a	n/a	AAF8553
	MYCRO172-15	UGIC271-15	658[0n]	n/a	610[0n]	164[0n]	534[1n]	501[0n]	AAF8553
<i>Scipopus (Parascipopus)</i> <i>fenestratus</i> sp. nov.	MYCRO045-15	UGIC144-15	658[0n]	767[0n]	610[0n]	589[0n]	592[0n]	131[0n]	ACU6911
	MYCRO015-15	UGIC114-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACU6911
<i>Scipopus (Parascipopus)</i> <i>kubus</i> sp. nov.	MYCRO579-19	debu00206289	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO568-19	debu00206315	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Parascipopus)</i> <i>manifestus</i> (Wulp)	DEBU074-06	DEBU0074	381[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO044-15	UGIC143-15	658[1n]	208[0n]	614[0n]	546[0n]	460[0n]	524[0n]	ACU6815
	MYCRO019-15	UGIC118-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACU6815
<i>Scipopus (Parascipopus)</i> <i>nigriscapus</i> sp. nov.	DEBU085-06	DEBU0085	281[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO017-15	UGIC116-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV1259
	MYCRO161-15	UGIC260-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV1259
	MYCRO159-15	UGIC258-15	658[0n]	n/a	610[0n]	410[0n]	n/a	520[0n]	ACV1259
	MYCRO581-19	INBIO000442497	658[0n]	n/a	n/a	n/a	n/a	n/a	ACV1259
<i>Scipopus (Parascipopus)</i> <i>otisi</i> sp. nov.	MYCRO582-19	debu00118191	658[0n]	n/a	n/a	n/a	n/a	n/a	AAF8547
	MYCRO606-19	debu00118591	658[0n]	n/a	610[4n]	593[0n]	n/a	n/a	AAF8547
	DEBU072-06	DEBU0072	654[0n]	n/a	n/a	n/a	n/a	n/a	AAF8547
	MYCRO813-20	DEBU00118590	658[0n]	n/a	n/a	n/a	n/a	n/a	AAF8547
	MYCRO818-20	DEBU00118190	658[0n]	n/a	n/a	n/a	n/a	n/a	AAF8547
	MYCRO018-15	UGIC117-15	658[0n]	470[0n]	610[0n]	567[1n]	602[0n]	520[0n]	ACU6907
<i>Scipopus (Parascipopus)</i> <i>savegre</i> sp. nov.	MYCRO091-15	UGIC190-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACU6909
	MYCRO090-15	UGIC189-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACU6909
	MYCRO158-15	UGIC257-15	658[0n]	n/a	610[0n]	398[0n]	n/a	530[0n]	ACU6909
<i>Scipopus (Parascipopus)</i> <i>tico</i> sp. nov.	MYCRO580-19	INBIO0003330662	658[0n]	n/a	n/a	n/a	n/a	n/a	AEA5026
<i>Scipopus (Parascipopus)</i> <i>monteverde</i> sp. nov.	MYCRO170-15	UGIC269-15	658[0n]	n/a	n/a	385[0n]	n/a	520[0n]	ACW1880
	MYCRO166-15	UGIC265-15	658[0n]	n/a	n/a	n/a	n/a	n/a	ACW1880

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)						BIN (BOLD:)
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>PHAEOPTERINA</i>									
<i>Scipopus (Phaeopterina)</i> <i>alces</i> (Marshall)	DEBU082-06 GMCCA090-17 MYCRO013-15 MYCRO160-15 MYCRO028-15 MYCRO572-19 MYCRO570-19 MYCRO812-20	DEBU0082 BIOUG33277-B09 UGIC112-15 UGIC259-15 UGIC127-15 debu00339716 debu00177942 DEBU00178908	600[0n] 591[0n] 658[0n] 658[0n] 637[0n] 658[0n] 658[0n] 658[0n]	n/a n/a n/a n/a n/a 750[0n] n/a n/a	n/a n/a n/a 610[0n] n/a 611[0n] n/a n/a	n/a n/a n/a 621[0n] n/a 523[0n] n/a n/a	n/a n/a n/a 630[0n] n/a 536[0n] n/a n/a	n/a n/a n/a 520[0n] 519[0n] 520[0n] n/a n/a	AAG0876 AAG0876 AAG0876 AAG0876 ACV1350 AEA6719 AEA6719 AEA6719
<i>Scipopus (Phaeopterina)</i> <i>argentum</i> sp. nov.	GMCW019-17 GMCDX049-17 DEBUA517-19 MYCRO014-15	BIOUG32925-B11 BIOUG32925-F04 CCDB-33184-F08 UGIC113-15	642[0n] 592[0n] 0 0	n/a 519[0n] n/a n/a	610[0n] 610[0n] n/a n/a	620[0n] 620[0n] n/a n/a	631[0n] 507[0n] n/a n/a	522[0n] 522[1n] n/a n/a	ADH4336 ADH4336 No BIN No BIN
<i>Scipopus (Phaeopterina)</i> <i>brunneus</i> sp. nov.	MYCRO600-19	debu01089018	658[0n]	n/a	612[0n]	524[0n]	362[1n]	n/a	AEA7467
<i>Scipopus (Phaeopterina)</i> <i>dasyogon</i> (Marshall)	MYCRO574-19	debu01089006	0	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i> <i>fraudator</i> sp. nov.	MYCRO578-19 MYCRO577-19	debu01089008 debu01089007	307[0n] 658[0n]	n/a n/a	n/a 610[0n]	n/a 614[0n]	n/a 608[0n]	n/a 366[0n]	No BIN AEA7683
<i>Scipopus (Phaeopterina)</i> <i>gorgonae</i> (Hennig)	MYCRO102-15	UGIC201-15	658[0n]	482[0n]	611[0n]	567[0n]	555[0n]	523[0n]	ACW1546
<i>Scipopus (Phaeopterina)</i> <i>guatemalensis</i> (Marshall)	MYCRO576-19 MYCRO575-19 MYCRO815-20 GMHDI250-13	debu00311886 debu00334713 DEBU00398213 BIOUG05051-C05	658[0n] 658[0n] 658[0n] 611[0n]	n/a n/a n/a n/a	n/a n/a n/a n/a	n/a n/a n/a n/a	n/a n/a n/a n/a	n/a n/a n/a n/a	AEA4350 AEA4350 AEA4350 ACF8884

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)						BIN (BOLD:)
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S	
<i>PHAEOPTERINA</i>									
	GMHLJ010-15	BIOUG25277-G09	555[0n]	n/a	n/a	n/a	n/a	n/a	ACF8884
	GMHJB616-15	BIOUG18839-G04	576[0n]	n/a	n/a	n/a	n/a	n/a	ACF8884
<i>Scipopus (Phaeopterina)</i>	GMHJL457-15	BIOUG19236-H06	567[0n]	n/a	n/a	n/a	n/a	n/a	ACS8475
<i>guatemalensis</i> (Marshall)	GMHDD150-13	BIOUG05051-H01	622[0n]	n/a	n/a	n/a	n/a	n/a	ACF8884
	GMHKA501-15	BIOUG19609-G02	576[0n]	n/a	n/a	n/a	n/a	n/a	ACF8884
<i>Scipopus (Phaeopterina)</i>	DEBU083-06	DEBU0083	656[0n]	n/a	n/a	n/a	n/a	n/a	AAAY2462
<i>heteropus</i> Frey	MYCRO156-15	UGIC255-15	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i>	MYCRO157-15	UGIC256-15	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>lineatus</i> sp. nov.	MYCRO133-15	UGIC232-15	0	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i>	MYCRO571-19	debu01089004	658[0n]	n/a	611[0n]	414[0n]	148[0n]	288[3n]	AEA6712
<i>melaneuris</i> (Cresson)	MYCRO602-19	debu01089019	658[0n]	n/a	611[0n]	559[3n]	n/a	521[0n]	AEA6174
<i>Scipopus (Phaeopterina)</i>	MYCRO810-20	DEBU00399728	658[0n]	n/a	n/a	n/a	n/a	n/a	AEH3194
<i>narupa</i> sp. nov.	MYCRO811-20	DEBU00399675	658[0n]	n/a	n/a	n/a	n/a	n/a	AEH3194
<i>Scipopus (Phaeopterina)</i>	MYCRO816-20	DEBU00399732	658[0n]	n/a	n/a	n/a	n/a	n/a	AEH3194
<i>noturgidus</i> sp. nov.	MYCRO569-19	debu01089017	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i>	MYCRO604-19	debu01089021	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i>	MYCRO607-19	debu00334712	658[0n]	754[0n]	611[0n]	398[0n]	232[0n]	521[0n]	AEA5832
<i>quetzal</i> sp. nov.	MYCRO603-19	debu01089022	307[0n]	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i>	TAE031-14	TAE095	1492[15n]	n/a	n/a	n/a	n/a	544[0n]	ACO1153
<i>sexguttatus</i> (Enderlein)	DEBU081-06	DEBU0081	621[0n]	n/a	n/a	n/a	n/a	n/a	AAAY2455
<i>Scipopus (Phaeopterina)</i>	MYCRO016-15	UGIC115-15	658[0n]	772[0n]	611[0n]	540[0n]	588[1n]	n/a	ACU6908
<i>stigmatica</i> (Hennig)									

APPENDIX 1 (continued)

List of sequenced material in the *Scipopus* group from dataset DS-SCIPOPUS on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)							BIN (BOLD:)
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>PHAEOPTERINA</i>										
<i>Scipopus (Phaeopterina)</i> <i>turgidus</i> sp. nov.	MYCRO605-19	debu01089020	0	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO821-20	DEBU01089369	307[0n]	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
	MYCRO824-20	DEBU01089397	307[0n]	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i> <i>uniformis</i> sp. nov.	GMHJ539-15	BIOUG19237-F09	564[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACS8475
	GMHJM382-15	BIOUG19238-G07	564[0n]	n/a	n/a	n/a	n/a	n/a	n/a	ACS8475
<i>Scipopus (Phaeopterina)</i> <i>vee</i> sp. nov.	MYCRO601-19	CNC Diptera #96407	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEA7468
	MYCRO155-15	UGIC254-15	0	n/a	n/a	n/a	n/a	n/a	n/a	No BIN
<i>Scipopus (Phaeopterina)</i> <i>zeta</i> (Marshall)	DEBUA518-19	CCDB-33184-F09	658[0n]	n/a	611[0n]	424[0n]	n/a	n/a	520[0n]	ADW1304
	MYCRO817-20	DEBU00402570	658[0n]	n/a	n/a	n/a	n/a	n/a	n/a	AEH0559

APPENDIX 2 (continued on next 2 pages)

Taxa used in part to generate the multi-gene phylogeny from the DS-SCIP2020 database on BOLD.

Taxon	Process ID	Sample ID	Gene sequence length (bp)							
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>Amapeza affinis</i> (Hennig)	MYCRO584-19	debu00150394	658[0n]	0[n]	620[0n]	519[0n]	567[0n]	244[1n]		
<i>Amapeza amazonica</i> Marshall	MYCRO609-20	debu00178880	658[0n]	0[n]	613[0n]	371[0n]	0[n]	521[0n]		
<i>Amapeza camelina</i> Marshall	MYCRO142-15	UGIC241-15	658[0n]	0[n]	578[0n]	527[0n]	555[1n]	521[0n]		
<i>Amapeza uniformis</i> Marshall	MYCRO583-19	debu01089009	658[0n]	499[0n]	484[1n]	503[0n]	0[n]	521[0n]		
<i>Catolphen</i> sp.	GMCCB738-17	BIOUG36435-B09	592[0n]	668[0n]	604[0n]	517[0n]	560[1n]	519[0n]		
<i>Catolphen</i> sp. 11A	MYCRO485-18	debu00149742	658[0n]	0[n]	610[0n]	521[0n]	171[0n]	518[4n]		
<i>Catolphen nigrifrons</i> ms name	MYCRO006-15	UGIC105-15	658[0n]	0[n]	610[0n]	523[0n]	570[0n]	519[0n]		
<i>Nudopeza arcuata</i> sp. group	MYCRO123-15	UGIC222-15	625[4n]	0[n]	606[0n]	514[0n]	536[0n]	518[0n]		
<i>Nudopeza arcuata</i> (Hennig)	MYCRO494-18	debu01088975	658[0n]	0[n]	606[0n]	516[0n]	519[0n]	521[0n]		
<i>Nudopeza cegex</i> ms name	MYCRO083-15	UGIC182-15	658[0n]	0[n]	606[0n]	515[0n]	556[1n]	521[0n]		
<i>Nudopeza cura</i> ms name	MYCRO143-15	UGIC242-15	658[0n]	0[n]	606[0n]	508[0n]	554[0n]	520[0n]		
<i>Nudopeza varifrons</i> ms name	MYCRO005-15	UGIC104-15	658[0n]	0[n]	606[0n]	509[0n]	570[0n]	520[0n]		
<i>Grallipeza abeja</i> ms name	MYCRO595-19	debu01089014	658[0n]	0[n]	603[0n]	564[0n]	0[n]	383[2n]		
<i>Grallipeza bilineata</i> ms name	MYCRO140-15	UGIC239-15	658[0n]	703[0n]	604[0n]	545[0n]	587[0n]	519[0n]		
<i>Grallipeza collaris</i> ms name	MYCRO137-15	UGIC236-15	658[0n]	0[n]	606[0n]	547[0n]	595[0n]	346[4n]		
<i>Grallipeza elegans</i> Hennig	MYCRO131-15	UGIC230-15	658[0n]	0[n]	646[0n]	534[0n]	0[n]	519[0n]		
<i>Grallipeza gracilis</i> Hennig	MYCRO486-18	debu00150676	658[1n]	0[n]	604[0n]	520[0n]	359[0n]	518[1n]		
<i>Grallipeza nebulosa</i> (Loew)	DIPUS074-10	10BBDDIP-0074	658[0n]	741[0n]	607[0n]	518[0n]	546[0n]	518[0n]		
<i>Grallipeza nigrinotata</i> group	MYCRO588-19	debu01089011	658[0n]	730[0n]	530[1n]	528[0n]	551[0n]	523[0n]		
<i>Grallipeza pseudosimplex</i> (Hennig)	MYCRO802-20	DEBU00402487	658[0n]	825[0n]	607[0n]	405[0n]	537[1n]	490[0n]		
<i>Grallipeza quadritheca</i> ms name	MYCRO586-19	debu01089010	658[0n]	0[n]	610[0n]	518[0n]	388[0n]	521[0n]		
<i>Grallipeza spinuliger</i> (Cresson)	DEBUA299-17	BIOUG31901-E03	658[0n]	0[n]	605[0n]	534[0n]	269[0n]	518[0n]		
<i>Mesoconius bipleuron</i> Marshall	MYCRO071-15	UGIC170-15	658[2n]	0[n]	626[0n]	524[1n]	306[1n]	520[0n]		
<i>Mesoconius garyi</i> Marshall	MYCRO337-18	Sample-demo15	633[0n]	723[0n]	621[0n]	389[0n]	570[0n]	520[0n]		
<i>Scipopus (Parascipopus) alturas</i> sp. nov.	MYCRO116-15	UGIC215-15	628[0n]	0[n]	621[0n]	552[1n]	0[n]	520[0n]		
<i>Scipopus (Parascipopus) fenestratus</i> sp. nov.	MYCRO172-15	UGIC271-15	658[0n]	0[n]	610[0n]	164[0n]	534[1n]	501[0n]		
<i>Scipopus (Parascipopus) manifestus</i> (Wulp)	MYCRO045-15	UGIC144-15	658[0n]	767[0n]	610[0n]	589[0n]	592[0n]	131[0n]		
<i>Scipopus (Parascipopus) monteverde</i> sp. nov.	MYCRO044-15	UGIC143-15	658[1n]	208[0n]	614[0n]	546[0n]	460[0n]	524[0n]		
<i>Scipopus (Parascipopus) nigriscapus</i> sp. nov.	MYCRO170-15	UGIC269-15	658[0n]	0[n]	0[n]	385[0n]	0[n]	520[0n]		
<i>Scipopus (Parascipopus) nigriscapus</i> sp. nov.	MYCRO159-15	UGIC258-15	658[0n]	0[n]	610[0n]	410[0n]	0[n]	520[0n]		

APPENDIX 2 (continued)

Taxa used in part to generate the multi-gene phylogeny from the DS-SCIP2020 database on BOLD

Taxon	Process ID	Sample ID	Gene sequence length (bp)							
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>Scipopus (Parascipopus) otisi</i> sp. nov.	MYCRO018-15	UGIC117-15	658[0n]	470[0n]	610[0n]	567[1n]	602[0n]	520[0n]		
	MYCRO606-19	debu00118591	658[0n]	0[n]	610[4n]	593[0n]	0[n]	0[n]		
<i>Scipopus (Parascipopus) savegre</i> sp. nov.	MYCRO158-15	UGIC257-15	658[0n]	0[n]	610[0n]	398[0n]	0[n]	530[0n]		
<i>Parasphen amazonicus</i> Enderlein	DEBUA309-17	BIOUG31901-F01	658[0n]	767[0n]	611[0n]	510[0n]	481[0n]	472[0n]		
<i>Scipopus (Phaeopterina) alces</i> (Marshall)	MYCRO160-15	UGIC259-15	658[0n]	0[n]	610[0n]	621[0n]	630[0n]	520[0n]		
<i>Scipopus (Phaeopterina) argentum</i> sp. nov.	MYCRO572-19	debu00339716	658[0n]	750[0n]	611[0n]	523[0n]	536[0n]	520[0n]		
	GMCDW019-17	BIOUG32925-B11	642[0n]	0[n]	610[0n]	620[0n]	631[0n]	522[0n]		
<i>Scipopus (Phaeopterina) brownii</i> (Marshall)	GMCDX049-17	BIOUG32925-F04	592[0n]	519[0n]	610[0n]	620[0n]	507[0n]	522[1n]		
<i>Scipopus (Phaeopterina) brunneus</i> sp. nov.	MYCRO600-19	debu01089018	658[0n]	0[n]	612[0n]	524[0n]	362[1n]	0[n]		
<i>Scipopus (Phaeopterina) fraudator</i> sp. nov.	MYCRO577-19	debu01089007	658[0n]	0[n]	610[0n]	614[0n]	608[0n]	366[0n]		
<i>Scipopus (Phaeopterina) gorgonae</i> (Hennig)	MYCRO102-15	UGIC201-15	658[0n]	482[0n]	611[0n]	567[0n]	555[0n]	523[0n]		
	MYCRO571-19	debu01089004	658[0n]	0[n]	611[0n]	414[0n]	148[0n]	288[3n]		
<i>Scipopus (Phaeopterina) melaneuris</i> (Cresson)	MYCRO602-19	debu01089019	658[0n]	0[n]	611[0n]	559[3n]	0[n]	521[0n]		
<i>Scipopus (Phaeopterina) quezatal</i> sp. nov.	MYCRO607-19	debu00334712	658[0n]	754[0n]	611[0n]	398[0n]	232[0n]	521[0n]		
<i>Scipopus (Phaeopterina) stigmaticea</i> (Hennig)	MYCRO016-15	UGIC115-15	658[0n]	772[0n]	611[0n]	540[0n]	588[1n]	0[n]		
<i>Scipopus (Phaeopterina) zeta</i> (Marshall)	DEBUA518-19	CCDB-33184-F09	658[0n]	0[n]	611[0n]	424[0n]	0[n]	520[0n]		
<i>Ptilosphen albibasis</i> Enderlein	UGIC082-08	DEBU0552	657[0n]	724[0n]	611[1n]	520[0n]	565[1n]	521[0n]		
<i>Ptilosphen enderleini</i> Cresson	DEBUA291-17	BIOUG31901-D07	658[0n]	687[0n]	613[0n]	425[0n]	418[0n]	520[0n]		
<i>Ptilosphen dellorum</i> ms name	MYCRO181-15	UGIC280-15	658[0n]	746[0n]	541[0n]	407[0n]	397[0n]	520[0n]		
<i>Ptilosphen mimicus</i> Cresson	DEBUA292-17	BIOUG31901-D08	658[2n]	0[n]	613[0n]	530[0n]	452[0n]	520[1n]		
	MYCRO283-16	CCDB-29054-E08	658[1n]	0[n]	613[0n]	399[0n]	0[n]	520[0n]		
<i>Rainieriella</i> sp. 1	MYCRO107-15	UGIC206-15	658[0n]	0[n]	609[0n]	518[0n]	548[0n]	191[0n]		
<i>Rainieriella</i> sp. 2	MYCRO105-15	UGIC204-15	623[1n]	0[n]	608[0n]	515[0n]	560[0n]	520[2n]		
<i>Rainieriella</i> sp. 4	MYCRO093-15	UGIC192-15	658[0n]	0[n]	609[1n]	618[2n]	569[0n]	521[0n]		
<i>Rainieriella</i> sp. 5	ASNOR1870-11	BIOUG01855-H06	632[0n]	761[1n]	609[0n]	517[0n]	548[0n]	519[0n]		
<i>Rainieriella</i> sp. 6	MYCRO111-15	UGIC210-15	658[0n]	0[n]	609[0n]	515[0n]	561[0n]	519[0n]		
<i>Rainieriella</i> sp. 8	MYCRO163-15	UGIC262-15	658[0n]	0[n]	609[0n]	515[0n]	548[0n]	519[0n]		
<i>Rainieriella</i> sp. 9	MYCRO164-15	UGIC263-15	658[3n]	0[n]	605[0n]	505[0n]	0[n]	0[n]		
<i>Rainieriella</i> sp. 10	MYCRO182-15	UGIC281-15	658[0n]	752[0n]	608[0n]	509[0n]	500[0n]	521[0n]		
<i>Rainieriella</i> sp. 11	GMHGH397-13	BIOUG08479-G07	658[0n]	746[0n]	395[0n]	509[0n]	490[0n]	463[0n]		

APPENDIX 2 (continued)

Taxa used in part to generate the multi-gene phylogeny from the DS-SCIP2020 database on BOLD

Taxon	Process ID	Sample ID	Gene sequence length (bp)							
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>Rainieriella</i> sp. 12	MYCRO127-15	UGIC226-15	658[0n]	770[0n]	609[0n]	458[0n]	543[1n]	521[0n]		
	MYCRO068-15	UGIC167-15	658[0n]	772[0n]	609[0n]	471[0n]	536[0n]	521[0n]		
<i>Rainieriella</i> sp. 14	MYCRO020-15	UGIC119-15	658[0n]	723[0n]	499[1n]	518[0n]	559[0n]	494[1n]		
<i>Rainieriella</i> sp. 15	GMHDL1280-13	BIOUG05051-D09	612[0n]	0[n]	612[0n]	532[0n]	573[0n]	520[0n]		
	MYCRO024-15	UGIC123-15	658[0n]	0[n]	612[0n]	532[0n]	466[0n]	0[n]		
<i>Rainieriella</i> sp. 16	MYCRO103-15	UGIC202-15	658[0n]	0[n]	612[0n]	344[0n]	532[1n]	519[0n]		
<i>Rainieriella</i> sp. 17	MYCRO106-15	UGIC205-15	601[0n]	0[n]	612[0n]	494[0n]	0[n]	467[1n]		
<i>Rainieriella</i> sp. 18	MYCRO021-15	UGIC120-15	658[0n]	737[0n]	606[0n]	528[0n]	524[0n]	518[0n]		
<i>Scipopus (Scipopus) calocephalus</i> (Bigot)	MYCRO529-19	debu01088989	658[0n]	0[n]	611[0n]	550[0n]	593[1n]	0[n]		
<i>Scipopus (Scipopus) chalybeus</i> Hennig	MYCRO534-19	debu00379841	658[0n]	0[n]	611[0n]	530[0n]	0[n]	341[1n]		
<i>Scipopus (Scipopus) convexus</i> sp. nov.	MYCRO519-19	debu01089002	658[0n]	761[0n]	606[0n]	549[0n]	544[0n]	523[0n]		
	MYCRO517-19	debu00281553	658[0n]	0[n]	607[0n]	551[0n]	586[0n]	523[0n]		
<i>Scipopus (Scipopus) diversus</i> (Schiner)	MYCRO535-19	debu00302943	658[1n]	0[n]	583[0n]	422[0n]	0[n]	0[n]		
	MYCRO521-19	debu01088992	658[0n]	0[n]	497[0n]	433[4n]	0[n]	168[2n]		
	MYCRO531-19	debu00339648	658[0n]	364[0n]	611[0n]	507[0n]	554[0n]	221[3n]		
<i>Scipopus (Scipopus) erythrocephalus</i> (Fabricius)	MYCRO540-19	debu01015708	658[0n]	0[n]	611[0n]	538[0n]	574[0n]	523[1n]		
<i>Scipopus (Scipopus) fureifer</i> Hennig	MYCRO538-19	debu00312073	658[0n]	0[n]	611[0n]	550[0n]	594[1n]	0[n]		
<i>Scipopus (Scipopus) nigripennis</i> (Hendel)	MYCRO555-19	debu00294650	658[0n]	0[n]	611[0n]	547[0n]	0[n]	0[n]		
	MYCRO547-19	debu01088995	658[0n]	757[0n]	612[0n]	531[0n]	554[0n]	209[0n]		
<i>Scipopus (Scipopus) planus</i> sp. nov.	MYCRO548-19	debu01088994	658[0n]	0[n]	611[0n]	565[1n]	0[n]	0[n]		
<i>Systemlapha digifurca</i> Marshall	MYCRO592-19	debu00398226	658[0n]	0[n]	570[0n]	508[0n]	533[0n]	521[0n]		
<i>Systemlapha ornatifemur</i> Marshall	MYCRO593-19	debu00398225	658[0n]	0[n]	611[0n]	485[0n]	502[1n]	520[0n]		
Undescribed genus sp. 8	MYCRO089-15	UGIC188-15	658[0n]	0[n]	618[0n]	528[0n]	253[0n]	521[0n]		
Undescribed genus sp.	MYCRO108-15	UGIC207-15	658[0n]	0[n]	615[0n]	402[0n]	0[n]	520[0n]		
Undescribed genus sp. 7	MYCRO174-15	UGIC273-15	631[2n]	0[n]	611[0n]	526[0n]	572[0n]	454[1n]		
Undescribed genus sp.	MYCRO484-18	debu00178715	658[0n]	0[n]	615[0n]	513[0n]	494[0n]	332[4n]		

APPENDIX 3

MrBayes block nexus file.

```
#NEXUS
BEGIN mrbayes;
set precision = 15 seed=12345 scientific=yes autoclose=yes nowarnings=yes;
  charset mol1 = 1-545;
  charset mol2 = 546-1240;
  charset mol3 = 1241-1932;
  charset mol4 = 1933-2609;
  charset mol5 = 2610-3391;
  charset mol6 = 3392-4292;
  charset twostates = 4295-4306 4308-4310 4312-4319;
  charset threestates = 4293 4294 4307 4311;
partition combined=8:mol1, mol2, mol3, mol4, mol5, mol6, twostates, threestates;
set partition=combined;
  lset applyto = (1,2,3,4,5,6) nst=6 rates=gamma;
  lset applyto=(7,8) rates=gamma coding=variable;
  prset applyto = (1,2,3,4,5,6) revmatpr = dirichlet (1, 1, 1, 1, 1, 1) statefreqpr = dirichlet (1, 1, 1, 1);
  prset applyto = (all) ratepr=variable;
  unlink shape = (all) statefreq = (all) revmat = (all);
  mcmc ngen = 2000000 nruns = 2 printfreq = 1000 samplefreq = 1000 nchain = 4 diagnfreq = 1000 savebrlens = yes;
  sumt relburnin = yes burninfrac = 0.25 contype = halfcompat conformformat = simple;
  sump relburnin = yes burninfrac = 0.25;
end;
```

APPENDIX 4 (continued on next 8 pages)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number							
			COI-5'	COI-3'	28S-5	28S-3	28S-2	12S		
<i>Amapeza affinis</i> (Hennig)	MYCRO584-19	debu00150394	OP721288	X	OP721425	OP721463	OP721323	OP721501		
<i>Amapeza amazonica</i> Marshall	MYCRO609-20	debu00178880	OP721276	X	X	OP721450	X	OP721488		
<i>Amapeza camelina</i> Marshall	MYCRO142-15	UGIC241-15	OP721299	X	OP721436	OP721474	OP721331	OP721512		
<i>Amapeza uniformis</i> Marshall	MYCRO583-19	debu01089009	OP721286	OP821729	OP721423	OP721461	X	OP721499		
<i>Calosphen</i> sp.	GMCCB738-17	BIOUG36435-B09	OP721310	OP821736	OP721447	OP721485	OP721341	OP721523		
<i>Calosphen</i> sp. 11A	MYCRO485-18	debu00149742	OP721298	X	OP721435	OP721473	X	OP721511		
<i>Calosphen nigrifrons</i> ms name	MYCRO006-15	UGIC105-15	OP721275	X	OP721411	OP721449	OP721312	OP721487		
<i>Cllobata</i> sp. 3	MYCRO095-15	UGIC194-15	OP575771	X	X	X	X	X		
	MYCRO599-19	debu01089016	OP575685	X	X	X	X	X		
<i>Grallipeza abeja</i> ms name	MYCRO595-19	debu01089014	OP721302	X	OP721439	OP721477	X	OP721515		
<i>Grallipeza bilineata</i> ms name	MYCRO140-15	UGIC239-15	OP721292	OP821730	OP721429	OP721467	OP721326	OP721505		
<i>Grallipeza collaris</i> ms name	MYCRO137-15	UGIC236-15	OP721281	X	OP721418	OP721456	OP721317	OP721494		
<i>Grallipeza elegans</i> Hennig	MYCRO131-15	UGIC230-15	OP721289	X	OP721426	OP721464	X	OP721502		
<i>Grallipeza gracilis</i> Hennig	MYCRO486-18	debu00150676	OP721309	X	OP721446	OP721484	OP721340	OP721522		
<i>Grallipeza nebulosa</i> (Loew)	DIPUS074-10	10BBDIP-0074	X	OP821726	OP721417	OP721455	OP721316	OP721493		
<i>Grallipeza nigrinotata</i> group	MYCRO588-19	debu01089011	OP721283	OP821727	OP721420	OP721458	X	OP721496		
<i>Grallipeza pseudosimplex</i> (Hennig)	MYCRO802-20	DEBU00402487	OP721306	OP821735	OP721443	OP721481	OP721337	OP721519		
<i>Grallipeza quadritheca</i> ms name	MYCRO586-19	debu01089010	OP721291	X	OP721428	OP721466	OP721325	OP721504		
<i>Grallipeza spinuliger</i> (Cresson)	DEBUA299-17	BIOUG31901-E03	OP721279	X	OP721415	OP721453	OP721315	OP721491		
<i>Mesoconius bipleuron</i> Marshall	MYCRO071-15	UGIC170-15	OP721311	X	OP721448	OP721486	OP721342	OP721524		
<i>Mesoconius garyi</i> Marshall	MYCRO337-18	Sample-demo15	OP721293	OP821731	OP721430	OP721468	OP721327	OP721506		
	MYCRO116-15	UGIC215-15	OP721294	X	OP721431	OP721469	X	OP721507		
<i>Nudopeza arcuata</i> sp. group	MYCRO123-15	UGIC222-15	OP721307	X	OP721444	OP721482	OP721338	OP721520		
<i>Nudopeza arcuata</i> (Hennig)	MYCRO494-18	debu01088975	OP721287	X	OP721424	OP721462	OP721322	OP721500		

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOUS and DS-SCIP2020 datasets on **BOLD** and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number					
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S
<i>Nudopeza cege</i> ms name	MYCRO083-15	UGIC182-15	OP721304	OP806981	OP721441	OP721479	OP721335	OP721517
<i>Nudopeza cura</i> ms name	MYCRO143-15	UGIC242-15	OP721282	X	OP721419	OP721457	OP721318	OP721495
<i>Nudopeza varifrons</i> ms name	MYCRO005-15	UGIC104-15	OP721295	X	OP721432	OP721470	OP721328	OP721508
<i>Parasphen amazonicus</i> Enderlein	BIOUG31901-F01	DEBUA309-17	OP721297	OP821733	OP721434	OP721472	OP721330	OP721510
<i>Ptilosphen albibasis</i> Enderlein	UGIC082-08	DEBU0552	OP721285	OP821728	OP721422	OP721460	OP721321	OP721498
<i>Ptilosphen dellorum</i> ms name	MYCRO181-15	UGIC280-15	OP721296	OP821732	OP721433	OP721471	OP721329	OP721509
<i>Ptilosphen enderleini</i> Cresson	DEBUA291-17	BIOUG31901-D07	OP721278	OP821725	OP721414	OP721452	OP721314	OP721490
	DEBUA292-17	BIOUG31901-D08	OP721301	X	OP721438	OP721476	OP721333	OP721514
<i>Ptilosphen mimicus</i> Cresson	MYCRO283-16	CCDB-29054-E08	OP721280	X	OP721416	OP721454	X	OP721492
<i>Rainierietta</i> sp. 1	MYCRO107-15	UGIC206-15	OP575740	X	OP575524	OP575440	OP575400	X
<i>Rainierietta</i> sp. 2	MYCRO105-15	UGIC204-15	OP575695	X	OP575508	OP575424	OP575385	OP575468
<i>Rainierietta</i> sp. 4	MYCRO093-15	UGIC192-15	OP575714	X	OP575514	OP575430	OP575390	OP575473
<i>Rainierietta</i> sp. 5	ASNOR1870-11	BIOUG01855-H06	OP721277	OP821724	OP721413	OP721451	OP721313	OP721489
<i>Rainierietta</i> sp. 6	MYCRO111-15	UGIC210-15	OP575736	X	OP575522	OP575438	OP575398	OP575480
<i>Rainierietta</i> sp. 7	MYCRO110-15	UGIC209-15	OP575645	X	X	X	X	X
<i>Rainierietta</i> sp. 8	MYCRO163-15	UGIC262-15	OP575799	X	OP575538	OP575454	OP575408	OP575490
<i>Rainierietta</i> sp. 9	MYCRO164-15	UGIC263-15	OP575741	X	OP575525	X	X	X
<i>Rainierietta</i> sp. 10	MYCRO182-15	UGIC281-15	OP575756	X	OP575528	OP575444	OP575402	X
<i>Rainierietta</i> sp. 11	GMHGH397-13	BIOUG08479-G07	OP721303	OP821734	OP721440	OP721478	OP721334	OP721516
	MYCRO127-15	UGIC226-15	OP575649	OP806972	X	X	X	OP575457
<i>Rainierietta</i> sp. 12	MYCRO068-15	UGIC167-15	OP575761	OP806983	OP575530	OP575446	OP575404	OP575485
<i>Rainierietta</i> sp. 14	MYCRO020-15	UGIC119-15	OP575677	OP806975	OP575503	OP575420	OP575383	OP575464
	GMHDL1280-13	BIOUG05051-D09	OP721284	X	OP721421	OP721459	OP721320	OP721497
<i>Rainierietta</i> sp. 15	MYCRO024-15	UGIC123-15	OP575657	X	OP575495	OP575412	OP575379	X

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number							
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S		
<i>Rainierietta</i> sp. 16	MYCRO103-15	UGIC202-15	OP575694	X	OP575507	OP575423	OP575384	OP575467		
<i>Rainierietta</i> sp. 17	MYCRO106-15	UGIC205-15	OP575669	X	OP575502	OP575419	X	OP575463		
<i>Rainierietta</i> sp. 18	MYCRO021-15	UGIC120-15	OP575783	OP806985	OP575532	OP575448	OP575406	OP575487		
	DEBU082-06	DEBU0082	OP575674	X	X	X	X	X		
<i>Scipopus (Phaeopterina) alces</i> (Marshall)	GMCCA090-17	BIOUG33277-B09	OP575718	X	X	X	X	X		
	MYCRO013-15	UGIC112-15	OP575787	X	X	X	X	X		
	MYCRO160-15	UGIC259-15	OP575732	X	OP575519	OP575435	OP575395	OP575477		
	MYCRO028-15	UGIC127-15	OP575742	X	OP575494	OP575411	OP575378	OP575482		
<i>Scipopus (Phaeopterina) argentum</i> sp. nov.	MYCRO572-19	debu00339716	OP575663	OP806974	OP575499	OP575416	OP575381	OP575460		
	MYCRO570-19	debu00177942	OP575729	X	X	X	X	X		
	MYCRO812-20	DEBU00178908	OP575646	X	X	X	X	X		
<i>Scipopus (Phaeopterina) brownii</i> (Marshall)	GMCDW019-17	BIOUG32925-B11	OP575667	X	OP575500	OP575417	OP575382	OP575461		
	GMCDX049-17	BIOUG32925-F04	OP575769	OP806984	OP575531	OP575447	OP575405	OP575486		
<i>Scipopus (Phaeopterina) brunneus</i> sp. nov.	MYCRO600-19	debu01089018	OP575748	X	OP575527	OP575443	OP575401	X		
<i>Scipopus (Phaeopterina) fraudator</i> sp. nov.	MYCRO578-19	debu01089008	OP575692	X	X	X	X	X		
	MYCRO577-19	debu01089007	OP575737	X	OP575523	OP575439	OP575399	OP575481		
<i>Scipopus (Phaeopterina) gorgonae</i> (Hennig)	MYCRO102-15	UGIC201-15	OP575801	OP806987	OP575539	OP575455	OP575409	OP575491		
	MYCRO576-19	debu00311886	OP575728	X	X	X	X	X		
	MYCRO575-19	debu00334713	OP575672	X	X	X	X	X		
<i>Scipopus (Phaeopterina)</i> <i>guatemalensis</i> (Marshall)	MYCRO815-20	DEBU00398213	OP575708	X	X	X	X	X		
	GMHDI250-13	BIOUG05051-C05	OP575768	X	X	X	X	X		
	GMHLJ010-15	BIOUG25277-G09	OP575664	X	X	X	X	X		
	GMHJB616-15	BIOUG18839-G04	OP575653	X	X	X	X	X		

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number							
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S		
<i>Scipopus (Phaeopterina) guatemalensis</i> (Marshall)	GMHJL457-15 GMHDD150-13 GMHKA501-15	BIOUG19236-H06 BIOUG05051-H01 BIOUG19609-G02	OP575782 OP575659 OP575680	X X X	X X OP721412	X X X	X X X	X X X	X X X	
<i>Scipopus (Phaeopterina) heteropus</i> Frey	DEBU083-06 MYCRO156-15	DEBU0083 UGIC255-15	OP575684 OP575647	X X	X X	X X	X X	X X	X X	
<i>Scipopus (Phaeopterina) lineatus</i> sp. nov.	MYCRO157-15	UGIC256-15	OP575796	X	X	X	X	X	X	
<i>Scipopus (Phaeopterina) melaneuris</i> (Cresson)	MYCRO571-19 MYCRO602-19	debu01089004 debu01089019	OP575662 OP575688	X X	OP575498 OP575505	OP575415 OP575421	X X	X X	OP575459 OP575465	
<i>Scipopus (Phaeopterina) narupa</i> sp. nov.	MYCRO810-20 MYCRO811-20 MYCRO816-20	DEBU00399728 DEBU00399675 DEBU00399732	OP575722 OP575763 OP575773	X X X	X X X	X X X	X X X	X X X	X X X	
<i>Scipopus (Phaeopterina) noturgidus</i> sp. nov.	MYCRO569-19 MYCRO604-19	debu01089017 debu01089021	OP575776 OP575755	X X	X X	X X	X X	X X	X X	
<i>Scipopus (Phaeopterina) quetzal</i> sp. nov.	MYCRO607-19	debu00334712	OP575699	OP806976	OP575511	OP575427	OP575387	OP575470		
<i>Scipopus (Phaeopterina) sexguttatus</i>	MYCRO603-19 DEBU081-06	debu01089022 DEBU0081	OP575800 OP575713	X X	X X	X X	X X	X X	X X	
<i>Scipopus (Phaeopterina) stigmatuca</i> (Hennig)	MYCRO016-15 MYCRO821-20 MYCRO824-20	UGIC115-15 DEBU01089369 DEBU01089397	OP575798 OP575738 OP575676	OP806986 X X	OP575537 X X	OP575453 X X	OP575407 X X	X X X		
<i>Scipopus (Phaeopterina) uniformis</i> sp. nov.	GMHJ539-15 GMHJM382-15	BIOUG19237-F09 BIOUG19238-G07	OP575746 OP575726	X X	X X	X X	X X	X X	X X	
<i>Scipopus (Phaeopterina) vee</i> sp. nov.	MYCRO601-19	CNC Diptera #96407	OP575715	X	X	X	X	X	X	

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number						
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Phaeopterina) zeta</i> (Marshall)	DEBUA518-19	CCDB-33184-F09	OP575689	X	OP575506	OP575422	X	OP575466	
	MYCRO817-20	DEBU00402570	OP575705	X	X	X	X	X	
<i>Scipopus (Parascipopus) alturas</i> sp. nov.	DEBU084-06	DEBU0084	OP575792	X	X	X	X	X	
	MYCRO172-15	UGIC271-15	OP575707	X	OP575512	X	OP575388	OP575471	
<i>Scipopus (Parascipopus) fenestratus</i> sp. nov.	MYCRO045-15	UGIC144-15	OP575712	OP806977	OP575513	OP575429	OP575389	X	
	MYCRO015-15	UGIC114-15	OP575739	X	X	X	X	X	
<i>Scipopus (Parascipopus) kubus</i> sp. nov.	MYCRO579-19	debu00206289	OP575671	X	X	X	X	X	
	MYCRO568-19	debu00206315	OP575779	X	X	X	X	X	
<i>Scipopus (Parascipopus) manifestus</i> (Wulp)	DEBU074-06	DEBU0074	OP575786	X	X	X	X	X	
	MYCRO044-15	UGIC143-15	OP575733	OP806980	OP575520	OP575436	OP575396	OP575478	
	MYCRO019-15	UGIC118-15	OP575743	X	X	X	X	X	
	MYCRO170-15	UGIC269-15	OP575709	X	X	OP575428	X	OP575472	
<i>Scipopus (Parascipopus) monteverde</i> sp. nov.	MYCRO166-15	UGIC265-15	OP575747	X	X	X	X	X	
	DEBU085-06	DEBU0085	OP575724	X	X	X	X	X	
<i>Scipopus (Parascipopus) nigriscapus</i> sp. nov.	MYCRO017-15	UGIC116-15	OP575656	X	X	X	X	X	
	MYCRO161-15	UGIC260-15	OP575701	X	X	X	X	X	
	MYCRO159-15	UGIC258-15	OP575668	X	OP575501	OP575418	X	OP575462	
	MYCRO581-19	INBIO000442497	OP575679	X	X	X	X	X	
<i>Scipopus (Parascipopus) otisi</i> sp. nov.	MYCRO582-19	debu00118191	OP575760	X	X	X	X	X	
	MYCRO606-19	debu00118591	OP575744	X	OP575526	OP575442	X	X	
	DEBU072-06	DEBU0072	OP575762	X	X	X	X	X	
	MYCRO813-20	DEBU00118590	OP575765	X	X	X	X	X	
MYCRO818-20	DEBU00118190	OP575749	X	X	X	X	X		
MYCRO018-15	UGIC117-15	OP575730	OP806978	OP575517	OP575433	OP575393	OP575475		

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number						
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Parascipopus) savegre</i> sp. nov.	MYCRO091-15	UGIC190-15	OP575682	X	X	X	X	X	X
	MYCRO090-15	UGIC189-15	OP575775	X	X	X	X	X	X
	MYCRO158-15	UGIC257-15	OP575802	X	OP575540	OP575456	X	X	OP575492
<i>Scipopus (Parascipopus) tico</i> sp. nov.	MYCRO580-19	INBIO0003330662	OP575673	X	X	X	X	X	X
<i>Scipopus (Scipopus) belzebul</i> (Schiner)	MYCRO551-19	debu01088997	OP575641	X	X	X	X	X	X
	MYCRO528-19	debu01088988	OP575711	X	X	X	X	X	X
	MYCRO560-19	debu00206321	OP575704	X	X	X	X	X	X
<i>Scipopus (Scipopus) brikelos</i> sp. nov.	MYCRO549-19	debu01089003	OP575767	X	X	X	X	X	X
	GMCCE108-17	BIOUG36554-D09	OP575693	X	X	X	X	X	X
	MYCRO554-19	debu00332183	OP575665	X	X	X	X	X	X
<i>Scipopus (Scipopus) calocephalus</i> (Bigot)	MYCRO552-19	debu01088998	OP575794	X	X	X	X	X	X
	MYCRO529-19	debu01088989	OP575642	X	OP575493	OP575410	OP575377	X	X
	MYCRO513-19	debu00138137	OP575734	X	X	X	X	X	X
	MYCRO029-15	UGIC128-15	OP575650	X	X	X	X	X	X
	MYCRO814-20	DEBU00380052	OP575643	X	X	X	X	X	X
<i>Scipopus (Scipopus) cartaboensis</i> Cresson	MYCRO556-19	debu00379474	OP575725	X	X	X	X	X	X
	MYCRO530-19	debu00280298	OP575696	X	X	X	X	X	X
	MYCRO171-15	UGIC270-15	OP575700	X	X	X	X	X	X
<i>Scipopus (Scipopus) chalybeus</i> Hennig	MYCRO647-20	debu01089060	OP575691	X	X	X	X	X	X
	MYCRO820-20	DEBU00402373	OP575687	X	X	X	X	X	X
	MYCRO646-20	debu01089059	OP575759	X	X	X	X	X	X

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number						
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Scipopus) chalybeus</i> Hennig	MYCRO645-20	debu00289616	OP575780	X	X	X	X	X	X
	MYCRO822-20	DEBU00281719	OP575772	X	X	X	X	X	X
	MYCRO825-20	DEBU00282029	OP575774	X	X	X	X	X	X
	MYCRO550-19	debu01088996	OP575791	X	X	X	X	X	X
	MYCRO527-19	debu01088987	OP575720	X	X	X	X	X	X
	MYCRO534-19	debu00379841	OP575795	X	OP575536	OP575452	X	X	OP575489
	MYCRO165-15	UGIC264-15	OP575654	X	X	X	X	X	X
	MYCRO809-20	DEBU00402608	OP575670	X	X	X	X	X	X
	MYCRO819-20	DEBU00402582	OP575778	X	X	X	X	X	X
	MYCRO320-19	debu01088991	OP575661	X	X	X	X	X	X
<i>Scipopus (Scipopus) convexus</i> sp. nov.	MYCRO519-19	debu01089002	OP575660	OP806973	OP575497	OP575414	OP575380	OP575458	
	MYCRO518-19	debu00281750	OP575716	X	X	X	X	X	
	MYCRO517-19	debu00281553	OP575698	X	OP575510	OP575426	OP575386	OP575469	
	MYCRO640-20	debu01089056	OP575710	X	X	X	X	X	
	MYCRO559-19	debu00280301	OP575648	X	X	X	X	X	
<i>Scipopus (Scipopus) diversus</i> (Schiner)	MYCRO535-19	debu00302943	OP575697	X	OP575509	OP575425	X	X	
	MYCRO524-19	debu00280300	OP575752	X	X	X	X	X	
	MYCRO523-19	debu00303021	OP575754	X	X	X	X	X	
	ASNOR3440-12	BIOUG01561-A08	OP575764	X	X	X	X	X	
	MYCRO521-19	debu01088992	OP575658	X	OP575496	OP575413	X	X	
	MYCRO562-19	debu01089000	OP575644	X	X	X	X	X	
MYCRO032-15	UGIC131-15	OP575703	X	X	X	X	X		
MYCRO031-15	UGIC130-15	OP575785	X	X	X	X	X		

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPUS and DS-SCIP2020 datasets on **BOLD** and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number						
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Scipopus) diversus</i> (Schiner)	MYCRO639-20	debu00282054	OP575655	X	X	X	X	X	X
	MYCRO522-19	debu00281543	OP575652	X	X	X	X	X	X
	MYCRO537-19	debu01088990	OP575750	X	X	X	X	X	X
	MYCRO536-19	debu00289647	OP575793	X	X	X	X	X	X
	MYCRO532-19	debu00179103	OP575753	X	X	X	X	X	X
	MYCRO531-19	debu00339648	OP575731	OP806979	OP575518	OP575434	OP575394	OP575476	
	MYCRO541-19	debu00280292	OP575651	X	X	X	X	X	X
	MYCRO540-19	debu01015708	OP575719	X	OP575515	OP575431	OP575391	OP575474	
	MYCRO823-20	DEBU00179098	OP575717	X	X	X	X	X	X
	MYCRO544-19	debu00282040	OP575797	X	X	X	X	X	X
<i>Scipopus erythrocephalus</i> (Fabricius)	MYCRO543-19	debu00281552	OP575803	X	X	X	X	X	X
	MYCRO567-19	debu00256946	OP575678	X	X	X	X	X	X
	MYCRO538-19	debu00312073	OP575721	X	OP575516	OP575432	OP575392	X	X
	MYCRO566-19	debu00312075	OP575686	X	X	X	X	X	X
<i>Scipopus (Scipopus) fuscifer</i> Hennig	MYCRO555-19	debu00294650	OP575784	X	OP575533	OP575449	X	X	X
	MYCRO545-19	debu00294649	OP575702	X	X	X	X	X	X
	GMPAC015-18	BIOUG38734-H07	OP575681	X	X	X	X	X	X
	MYCRO030-15	UGIC129-15	OP575675	X	X	X	X	X	X
	MYCRO162-15	UGIC261-15	OP575727	X	X	X	X	X	X
	MYCRO547-19	debu01088995	OP575758	OP806982	OP575529	OP575445	OP575403	OP575484	
<i>Scipopus (Scipopus) nigripennis</i> (Hendel)	MYCRO546-19	debu00260110	OP575789	X	X	X	X	X	X
	MYCRO514-19	debu00138141	OP575757	X	X	X	X	X	X
	JICBC001-16	BIOUG28360-B05	OP575723	X	X	X	X	X	X

APPENDIX 4 (continued)

Material sequenced available on the DS-SCIPOPOPUS and DS-SCIP2020 datasets on BOLD and associated GenBank accession numbers. X = no sequence available.

Taxon	Process ID	Sample ID	GenBank Accession Number						
			CO1-5'	CO1-3'	28S-5	28S-3	28S-2	12S	
<i>Scipopus (Scipopus) nigripennis</i> (Hendel)	MYCRO033-15 JCCCS055-16	UGIC132-15 BIOUG30035-B05	OP575751 OP575781	X X	X X	X X	X X	X X	X X
<i>Scipopus (Scipopus) nitidus</i> sp. nov.	MYCRO564-19	debu01089001	OP575745	X	X	X	X	X	X
	MYCRO548-19	debu01088994	OP575788	X	OP575534	OP575450	X	X	X
<i>Scipopus (Scipopus) planus</i> sp. nov.	MYCRO516-19	debu00281539	OP575777	X	X	X	X	X	X
	MYCRO515-19	debu00289615	OP575770	X	X	X	X	X	X
<i>Scipopus (Scipopus) souzalopesi</i> Albuquerque	MYCRO526-19	debu01088986	OP575666	X	X	X	X	X	X
	MYCRO525-19	debu01088985	OP575683	X	OP575504	X	X	X	X
<i>Scipopus (Scipopus) wokomung</i> sp. nov.	MYCRO539-19	debu00379410	OP575766	X	X	X	X	X	X
	MYCRO565-19	debu00379786	OP575706	X	X	X	X	X	X
<i>Systemlapha digifurca</i> Marshall	MYCRO592-19	debu00398226	OP721308	X	OP721445	OP721483	OP721339	OP721521	
<i>Systemlapha ornatifemur</i> Marshall	MYCRO593-19	debu00398225	OP721290	X	OP721427	OP721465	OP721324	OP721503	
Undescribed genus sp. 8	MYCRO089-15	UGIC188-15	OP721300	X	OP721437	OP721475	OP721332	OP721513	
Undescribed genus sp.	MYCRO108-15	UGIC207-15	OP575790	X	OP575535	OP575451	X	OP575488	
Undescribed genus sp. 7	MYCRO174-15	UGIC273-15	OP575735	X	OP575521	OP575437	OP575397	OP575479	
Undescribed genus sp.	MYCRO484-18	debu00178715	OP721305	X	OP721442	OP721480	OP721336	OP721518	