



This work is licensed under a Creative Commons Attribution License (CC BY 4.0).

Research article

urn:lsid:zoobank.org:pub:E4615884-F227-4551-AB5A-A60482E8DE37

Darwin wasps of the genus *Seticornuta* Morley, 1913 (Ichneumonidae: Metopiinae) in the Neotropical region, with a key to species

Mabel ALVARADO 

Departamento de Entomología, Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Av. Arenales 1256 Jesús María, Lima 14, Perú and Bosque Llaqta, Avenida Confraternidad Internacional Este N° 364, Huaraz, Perú.
Email: malvaradog@unmsm.edu.pe

urn:lsid:zoobank.org:author:969AA574-A398-4087-BCF9-98CB8ABDC91F

Abstract. The genus *Seticornuta* Morley, 1913 currently comprises nine described species; here, nine new species are described: *S. anchanchu* sp. nov., *S. carinata* sp. nov., *S. cuckoo* sp. nov., *S. curupira* sp. nov., *S. flava* sp. nov., *S. muqui* sp. nov., *S. nigroflava* sp. nov., *S. quilmes* sp. nov., and *S. rufa* sp. nov. The genus is redescribed to encompass the features found in Neotropical species and distinctions between the species in the New World and Old World are presented. The genus is recorded for the first time for Argentina, Bolivia, Ecuador, Guatemala and Peru.

Keywords. Ichneumonoidea, parasitoids, taxonomy, wasps.

Alvarado M. 2022. Darwin wasps of the genus *Seticornuta* Morley, 1913 (Ichneumonidae: Metopiinae) in the Neotropical region, with a key to species. *European Journal of Taxonomy* 839: 149–175. <https://doi.org/10.5852/ejt.2022.839.1939>

Introduction

Seticornuta Morley, 1913 is a small group of Darwin parasitoid wasps comprising nine known species, with a disjunct distribution. Three described species are known from the Indo-Australian and Eastern Palearctic regions (Porter 1988; Choi & Lee 2017): the type species of the genus, *S. albopilosa* (Cameron, 1907), and two recently described species of dubious taxonomic status (*S. koreana* Lee & Choi, 2015 was synonymized under *S. nigra* Sheng & Sun, 2013 (Watanabe 2015) and posteriorly resurrected from synonymy by Choi & Lee (2017)). Meanwhile, six species are known from the New World: two in the Nearctic region, *S. apicalis* (Cresson, 1864) and *S. terminalis* (Ashmead, 1896), and four in the Neotropical region, *S. altamirae* Gauld & Sithole, 2002 and *S. cryptica* Gauld & Sithole, 2002 from Costa Rica, *S. cortesi* Porter, 1998 from Chile, and *S. jacutinga* Araujo & Pentead-Dias, 2012 from Brazil (Araujo & Pentead-Dias 2012).

Wasps of this genus are parasitoids of Pyralidae (Lepidoptera). There are no host records for the Neotropical species; the Nearctic species were reared from several species of *Acrobasis* Zeller, 1839 (Townes & Townes, 1959) and species of *Nephoteryx* Hübner, 1825 (Doerksen & Neunzig 1976);

and an Australian undetermined species was reared from an unidentified pyralid feeding on *Acacia decurrens* Willd. (Fitton 1984).

The aim of this paper is to review the Neotropical fauna of the genus. I redescribe the genus to encompass the morphological diversity found in the Neotropical region, describe and illustrate nine new species, provide a key for the Neotropical species, and register for the first time *Seticornuta* for Argentina, Bolivia, Ecuador, Guatemala and Peru. Additionally, morphological distinctions between the species in the New World and Old World are presented.

Material and methods

Specimens studied herein are deposited in the Canadian National Collection of Insects, Arachnids and Nematode, Ottawa, Canada (CNC); Museo Nacional de Costa Rica, Santo Domingo de Heredia, Costa Rica (MNCR), San Marcos Natural History Museum, Lima, Peru (MUSM), the Natural History Museum, London, United Kingdom (NHMUK), Snow Entomological Museum Collection, Kansas, USA (SEMC), United States National Museum, Washington D.C., USA (USNM), and Utah State University, Logan, Utah, USA (USUC). Type material of *S. cortesi* Porter, 1998 deposited in USUC (formerly in the American Entomological Institute, USA (AEIC)), and *S. altamirae* Gauld & Sithole, 2002 and *S. cryptica* Gauld & Sithole, 2002 deposited in MNCR (formerly Instituto Nacional de la Biodiversidad, Costa Rica (INBio)) was examined. Type material of *S. jacutinga* was not examined as the original description is sufficient (Araujo & Pentado-Dias 2012).

Morphological terminology generally follows Broad *et al.* (2018) and the format for descriptions follows Alvarado (2020). Microphotographs were prepared using a Canon 7D digital camera attached to an Infinity K-2 long-distance microscope lens, in the laboratories of the SEMC. Distribution maps were prepared using SimpleMappr (Shorthouse 2010), based on specimen labels data.

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Superfamily Ichneumonoidea Latreille, 1802
Family Ichneumonidae Latreille, 1802
Subfamily Metopiinae Förster, 1969

Genus *Seticornuta* Morley, 1913

Megatrema Cameron, 1907: 468, (type species: *Megatrema albopilosa* Cameron, by monotypy. [Junior homonym of *Megatrema* Leach, 1925]).

Seticornuta Morley, 1913: 310, (type species *Seticornuta albicarcar* Morley (= *albopilosa* Cameron), by original designation.

Diagnosis

Seticornuta can be distinguished from all other genera of Metopiinae Förster, 1969 by the combination of the following characters: (1) upper part of face weakly projected between bases of antennae, not reaching the frons; (2) toruli dorsally surrounded by a carina; (3) sculpture between the toruli and compound eyes similar to the rest of the frons; (4) fore wing with an enclosed areolet; (5) protibial spur antero-dorsally with comb and postero-dorsally with velum; (6) laterotergite II 0.4–0.7 × as wide as long, generally overlapping mid-ventrally.

Redescription

HEAD. Mandibles weakly tapering towards apex, ventrally straight, not twisted, with upper tooth longer than lower tooth; without ventral flange; labrum conspicuously exposed or not when mandible closed; palp formula 5:4, maxillary palpomeres slender; clypeus transverse, its apical margin weakly concave, straight or rarely convex; face+clypeus moderately convex (tentorial pit not located in an elevation); upper part of face produced upwards into a small tooth between bases of antennae (this projection not reaching median ocellus), dorsally not forming a crest medially; frons with a carina surrounding toruli, next to toruli, laterally, without striations; occipital carina complete, ventrally absent or dorsally present, if incomplete ventrally not curved inwards; postgenal bridge not projecting.

MESOSOMA. Pronotum polished with band of setae along dorsal margin, with a longitudinal concavity parallel to anterior margin, upper edge without a shallow submarginal groove, with a ventral pronotal pit, epomia absent; propleuron not swollen; mesoscutum weakly convex, without notauli, without a concavity next to lateral margin; scutoscuteellar groove broad and smooth; scutellum tapering towards posterior end, with lateral carinae only reaching over prescutellar ridge; mesopleuron moderately swollen without sternaulus; epicnemial carina complete, laterally convergent with anterior margin of pleuron until near upper end, where it is sharply turned forwards to reach margin almost at level at subalar prominence, rarely interrupted preapically; subalar prominence convex to weakly flattened (not forming a carina-like projection or a horn); mesopleural suture discernible, smooth below speculum; posterior transverse carina present laterally and centrally (absent in front of coxae); metapleuron almost flat, polished, glabrous, with a narrow concavity along dorsal margin, ventrally with a weak submetapleural carina which expands into a small lobe anteriorly. Propodeum with lateral longitudinal carina weak but discernible, absent anterior to spiracle, rarely evenly absent or complete; lateromedian longitudinal carinae strong, parallel, back to posterior transverse carina converging to form a single carina that joins margin of propodeal insertion; anterior transverse carina absent; posterior transverse carina generally complete, sometimes weak, and rarely absent; propodeal spiracle oval to elliptical. Pro- and mesotrochantellus undifferentiated, rarely protrochantellus distinctly differentiated; protibial spur antero-dorsally with comb and postero-dorsally with velum; protarsomeres 2–4 wider than long; pretarsal claws simple; mesotibia with two spurs, outer spur slightly longer than inner spur; metatibia without a comb on inner margin, with two spurs, outer spur shorter than inner spur; metatarsomere 5 without a hooked lobe on inner side of distal metatarsomeres of female. Fore wing with enclosed areolet, petiolate; cu-a far distal to base of Rs&M; 2m-cu with one bulla. Hind wing with distal abscissa of Cu1 joining cu-a closer to 1A than to M.

METASOMA. Tergite I with lateral and lateromedian longitudinal carinae quite well developed, spiracle $0.3\text{--}0.4 \times$ of way along tergum; sternum I short, ending anterior to spiracle; laterotergite II $0.4\text{--}0.7 \times$ as wide as long; laterotergite III $0.5\text{--}0.8 \times$ as wide as long; laterotergites of metasomal segments III and IV of female and male separated by crease; metasomal terga VI–VIII without setae on distal margin; metasomal tergite VIII of female entirely flat; female with sterna IV–VI weakly sclerotized with membranous areas; female with sternum VI slightly longer than wide and posteriorly more or less straight; male with metasomal tergites VIII+IX medially divided; male with sternum VIII wider than long, lateral margins converging distally, distal end projecting centrally; paramere distally flat, in lateral view more or less diagonal; apodemes of aedeagus shorter than aedeagus.

Remarks

Seticornuta is most similar to *Leurus* Townes, 1946; some species of *Leurus* have an enclosed areolet and laterotergites wide and overlapping mid-ventrally, as in *Seticornuta*. They can be distinguished by the number of labial palp segments, four in *Seticornuta* and three in *Leurus* (Alvarado 2018), and the shape of the mandible as several species of *Leurus* have a conspicuous ventral flange that is absent in *Seticornuta*.

It should be noted that the New World species assigned to *Seticornuta* differ markedly from those in the Old World. The Old World species were referred to as the *albopilosa* species group by Gauld & Sithole (2002), on the basis of the difference of the labrum exposed or enclosed. Additionally, the Old World species differ from the New World in the following: pronotum with wrinkles projecting upwards from ventral pronotal pit to the epomia (vs smooth), with epomia present (vs absent); hind wing without basal hamulus (vs with one hamulus); metapleuron with rugae below and parallel to juxtacoxal carina (vs smooth); and antenna with 40–50 flagellomeres (vs 21–34). Illustrations for the Old World species can be found in Choi *et al.* (2015). In general, Old World species are larger, for example, the length of the fore wing length 1.0–1.1 mm (vs 3.6–6.7 mm); also, they are predominantly black (Fitton 1984) while the New World species, especially the Neotropical ones, present a wide variety of colors as is found in the species described here.

Key to species of *Seticornuta* Morley, 1913 occurring in the Neotropical region

1. Labrum not exposed when mandibles closed (Fig. 10A); metapleuron with dorsal margin evenly declivous (Fig. 10C–E) or if dorsal margin weakly declivous, posteriorly evenly declivous, so is curved (Fig. 10F–H) 2
 - Labrum exposed when mandibles closed (Figs 1B, 4B, 5C); metapleuron with dorsal margin weakly declivous, posteriorly abruptly down-turned, forming an angle (Fig. 10I–K) 8
2. Predominantly metallic blue (Fig. 3A); antenna with 21 flagellomeres *Seticornuta cuckoo* sp. nov.
 - Various colors but never with metallic gloss; antenna with 26–34 flagellomeres 3
3. Mesoscutum yellow or tawny with three black vittae (Figs 7C, 9A); face+clypeus yellow (Figs 7B, 9B) 4
 - Mesoscutum homogeneously black; face+clypeus entirely black (Figs 2C, 6B, 8C) or black with upper half of face yellow (Fig. 10A) 5
4. Pronotum with upper half yellow; propodeum without posterior transverse carina (Fig. 7C); epicnemial carina interrupted subapically *S. nigroflava* sp. nov.
 - Pronotum with upper half tawny; propodeum with posterior transverse carina (Fig. 9A); epicnemial carina complete *S. rufa* sp. nov.
5. Metasomal tergites entirely black, tergite I with lateromedian carinae extending more than 0.9 × length of tergite 6
 - Metasomal tergites II–IV black, laterally yellow; tergite I with lateromedian carinae extending 0.2–0.3 × length of tergite 7
6. Occipital carina incomplete, present only dorsally; malar space 0.5 × as long as basal mandibular width *S. quilmes* sp. nov.
 - Occipital carina complete; malar space 0.7 × as long as basal mandibular width *S. carinata* sp. nov.
7. Lower face black with a yellowish spot (Fig. 10A); gena predominantly black with orbit yellowish red (Fig. 10B); propodeum with posterior transverse carina present between lateral and lateromedian longitudinal carinae *S. cortesi* Porter, 1998
 - Lower face black (Fig. 6B); gena entirely black (Fig. 6A); propodeum with posterior transverse carina absent between lateral and lateromedian longitudinal carinae *S. muqui* sp. nov.
8. Metasoma black with tergites VI+ reddish brown; frons centrally reddish brown *S. cryptica* Gauld & Sithole, 2002

- Metasomal tergites black; frons centrally black or yellow 9
- 9. Mesoscutum homogeneously tawny (Figs 1C, 4C); gena light yellow, posterodorsally black (Figs 1A, 4A) 10
 - Mesoscutum yellowish with three brownish black vittae (Fig. 5B); gena entirely yellow (Fig. 5B) 11
- 10. Scape ventrally off-white (Fig. 1B); pronotum antero-ventrally black and postero-dorsally off-white (Fig. 1A); tergite I $0.7 \times$ as long as posteriorly wide *S. anchanchu* sp. nov.
 - Scape black (Fig. 4B); pronotum predominantly tawny (Fig. 4C); tergite I $0.9 \times$ as long as posteriorly wide *S. curupira* sp. nov.
- 11. Propodeum, metapleuron and metatibia black; malar space $0.2 \times$ as long as basal mandibular width *S. altamirae* Gauld & Sithole, 2002
 - Propodeum, metapleuron and metatibia yellow; malar space $0.6 \times$ as long as basal mandibular width 12
- 12. Metasomal tergites black; interocellar area black (Fig. 5A–B); propodeum with posterior transverse carina strong and complete *S. flava* sp. nov.
 - Metasomal tergites brown; interocellar area yellowish; propodeum with posterior transverse carina weak and incomplete *S. jacutinga* Araujo & Pentead-Dias, 2012

Seticornuta altamirae Gauld & Sithole, 2002

Fig. 11A

Seticornuta altamirae Gauld & Sithole, 2002: 219.

Diagnosis

This species can be recognized by this combination of features: antenna with 25 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.1:1.1; epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous, posteriorly abruptly down turned, postero-dorsally curved forming an obtuse angle; propodeum with lateral longitudinal carina strong (absent anterior to spiracle), posterior transverse carina strong; metasomal tergite I $0.8 \times$ as long as posteriorly wide, lateromedian carinae extending $0.8 \times$ length of tergite.

Material examined

Holotype

COSTA RICA • ♀; “Estación Altamira, 1 Km. S. Del Cerro Biolley, Puntarenas, Costa Rica. 1452 m, 25 MAR–25 ABR 1996. R. Villalobos de Luz”; MNCR.

Seticornuta anchanchu sp. nov.

urn:lsid:zoobank.org:act:8EF1FE21-4438-444D-83F0-FF5CC38EDAF8

Figs 1, 10J, 11A

Diagnosis

This species can be recognized by this combination of features: mesoscutum tawny, pronotum anteroventrally black and posterodorsally off-white, and metapleuron rectangular.

Etymology

The specific epithet ‘anchanchu’ is in reference to a demon from the Aymara mythology which haunts isolated places and caves. It is treated as a noun in apposition.

Material examined

Holotype

BOLIVIA • ♀; “BOLIVIA: Santa Cruz: Los Volcanos field stn: S18°6' W63°36': 1000m: 2.xi–12. xii.2004: Malaise Mendel & Barclay: BMNH(E) 2005-55”; NHMUK.

Description

Female

MEASUREMENTS. Body length 7.7 mm. Fore wing length 5.9 mm.

HEAD. Face+clypeus $1.0 \times$ as wide as long; labrum exposed when mandibles closed; malar space $0.7 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $0.5 \times$ ocellar diameter; distance between ocelli $1.1 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle



Fig. 1. Details of *Seticornuta anchanchu* sp. nov., ♀, holotype (NHMUK). **A.** Habitus, lateral view. **B.** Facial view. **C.** Head, mesoscutum, propodeum and first three metasomal tergites. Scale bar = 1 mm.

concave; gena on lateral view $0.7 \times$ as long as compound eyes; occipital carina complete; antenna with 27 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.2:1.2, subapical flagellomere elongate, $1.4 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous posteriorly, abruptly down turned, postero-dorsally curved forming an obtuse angle, glabrous; submetapleural carina smooth, anteriorly expanded into a conspicuous triangular lobe. Propodeum with lateromedian longitudinal carina strong, parallel; lateral longitudinal carina strong, absent anterior to spiracle; posterior transverse carina present. Fore wing with Cu1a between Cu1b and 2m-cu $1.6 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 sclerotized throughout, abscissa of M faint.

METASOMA. Metasoma with tergite I $0.7 \times$ as long as posteriorly wide, lateromedian carinae extending $0.9 \times$ length of tergite; tergite II $0.7 \times$ as long as posteriorly wide; laterotergite II $0.6 \times$ as long as wide, wedge-shaped, mesal edge concave; laterotergite III $0.9 \times$ as long as wide, semicircular.

COLOR. Head extensively off-white, frons, interocellar area, vertex, upper posterior half of gena, pedicel, and antennomeres black; scape dorsally and palpi brown. Mesosoma predominantly off-white except for pronotum anteroventrally, mesosternum, metapleuron ventro-anteriorly dark brown; mesoscutum tawny; scutellum black, posteriorly off-white; propodeum black. Fore leg off-white, coxa dorsally, femur latero-externally centrally, tarsomeres dark brown; tibia grading distally to brown. Mid leg off-white; coxa ventrally and femur ventro-laterally light brown; tibia ventrally and laterally, tarsomeres dark brown. Hind leg off-white, coxa ventrally, femur latero-externally, tibia ventrally and with distal margin, metatarsomere 1 with distal quarter, tarsomeres 2–5 brown; wings faintly infuscate; metasomal tergites black.

Male

Unknown.

Remark

This represents the first record of *Seticornuta* for Bolivia (Fig. 11A).

Seticornuta carinata sp. nov.

urn:lsid:zoobank.org:act:6ADE5707-809F-4E76-8C35-FE48725B228B

Figs 2, 10E, 11A

Diagnosis

This species can be recognized by this combination of features: pronotum and mesoscutum black, and metapleuron three-sided with the dorsal margin evenly declivous.

Etymology

The specific epithet '*carinata*' means 'keeled' in Latin.

Material examined

Holotype

BRAZIL • ♀; "S.J. [São José do] Barreiro, Serra da Bocaina Braz. [Brazil]1650m XI-68 Alvarenga & Seabra"; USUC.

Description

Female

MEASUREMENTS. Body length 9.7 mm. Fore wing length 6.7 mm.

HEAD. Face+clypeus $1.1 \times$ as wide as long; labrum not exposed when mandibles closed; malar space $0.7 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $1.5 \times$ ocellar diameter; distance between ocelli $2.0 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle concave; gena, in lateral view, $0.7 \times$ as long as compound eye; occipital carina complete; antenna with 29 flagellomeres, ratio of length from second to fourth flagellomeres: 1.1:0.9:0.9, subapical flagellomere $1.0 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous and posteriorly evenly declivous, polished with few isolated setae; submetapleural carina smooth, anteriorly expanded into a conspicuous rounded lobe. Propodeum with lateromedian longitudinal carina strong, parallel; lateral longitudinal carina faint, complete; posterior transverse carina complete. Fore wing with

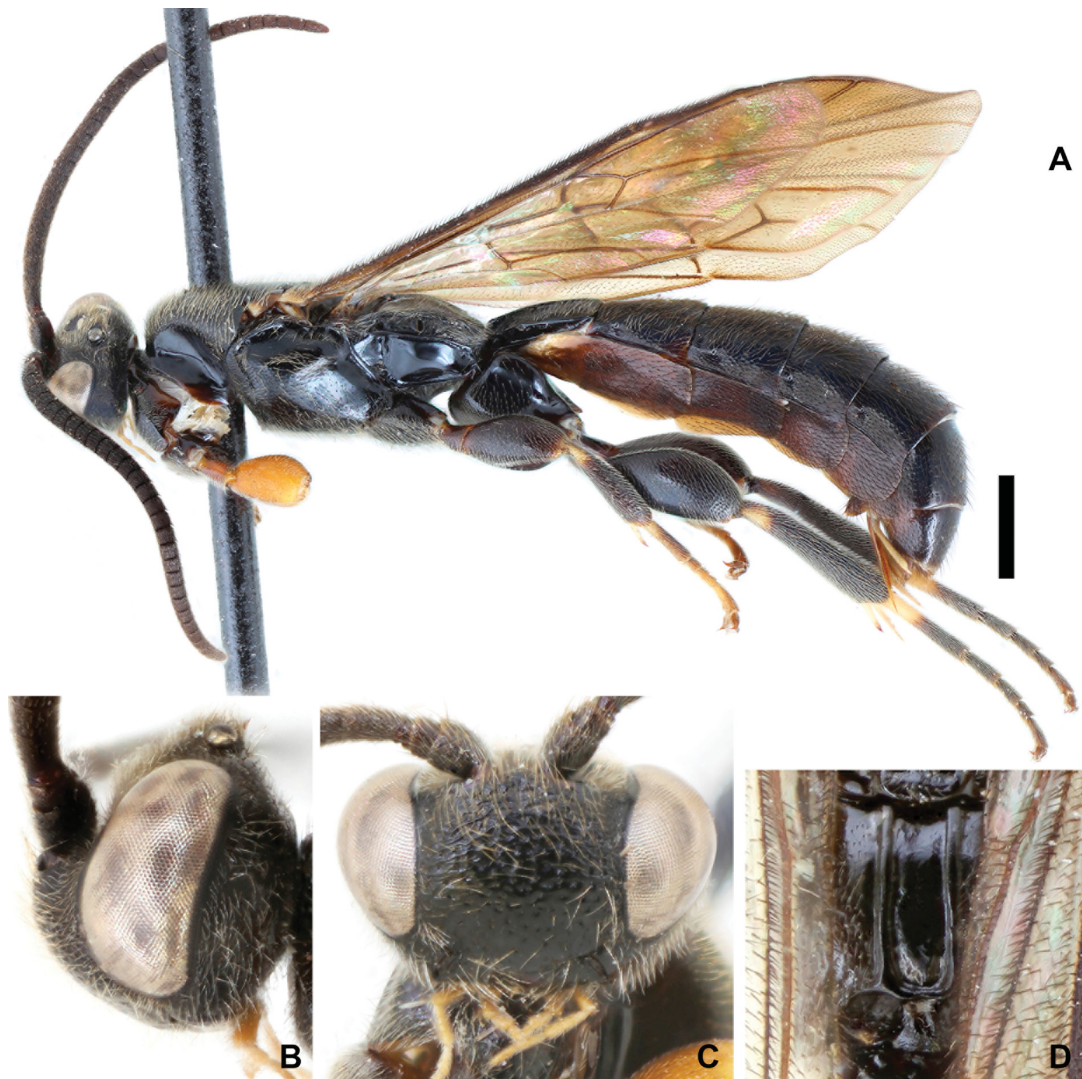


Fig. 2. Details of *Seticornuta carinata* sp. nov., ♀, holotype (USUC). **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Facial view **D.** Propodeum. Scale bar = 1 mm.

Cu1a between Cu1b and 2m-cu $1.2 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 sclerotized throughout.

METASOMA. Metasoma with tergite I $1.0 \times$ as long as posteriorly wide, lateromedian carinae extending along length of tergite; tergite II $0.9 \times$ as long as posteriorly wide; laterotergite II $0.7 \times$ as long as wide, wedge-shaped, mesal edge convex; laterotergite III $0.8 \times$ as long as wide, semicircular.

COLOR. Predominantly black except palpi, anterior third of tegula, meso- and metatibia basally, a band on basal quarter of mesobasitarsus, a band on basal third of metabasitarsus, and spurs of meso- and metatibia off-white; mesotarsomeres (except basal quarter of mesobasitarsus) testaceous; and proleg (except coxa) tawny; wings slightly infusate.

Male

Unknown.

Remarks

This species was collected in the Brazilian state of São Paulo (Fig. 11A), at the same locality and date as *S. rufa* sp. nov.

Seticornuta cortesi Porter, 1998
Figs 10A–B, 11A

Seticornuta cortesi Porter, 1998: 80.

Diagnosis

This species can be recognized by this combination of features: antenna with 30 flagellomeres, ratio of length from second to fourth flagellomeres: 1.6:1.6:1.6; epicnemial carina complete; metapleuron with dorsal margin evenly declivous, with wrinkle ventro-distally; propodeum with lateral longitudinal carina strong (absent anterior to spiracle), posterior transverse carina faint between lateral and lateromedian longitudinal carinae; metasomal tergite I $1.3 \times$ as long as posteriorly wide, lateromedian carinae extending $0.2 \times$ length of tergite.

Material examined

Paratypes

CHILE • 1 ♂; “Puyehue Natl. Pk. Osorno, Chile II.1–20.1979 600m. Luis Peña; USUC • 1 ♀; “Terao, Chile Feb. 21, 1988 G.B. Edwards”; USUC.

Other material

CHILE • 1 ♀; “CHILE: Chiloe Isl. Ahoni Alto; XI.1988 L.E. Peña”; USUC • 1 ♀; “Pucatrihue, Chile IV.12.68 Luis Peña”; USUC • 1 ♀; “Dalcahue Chiloé IV.1–4.68 Luis Peña”; USUC.

Remark

Seticornuta cortesi was collected in a *Nothofagus* forest (Porter 1998), in the Chilean region Los Lagos (Fig. 11A).

Seticornuta cryptica Gauld & Sithole, 2002
Fig. 11B

Seticornuta cryptica Gauld & Sithole, 2002: 219.

Diagnosis

This species can be recognized by this combination of features: antenna with 22 flagellomeres, ratio of length from second to fourth flagellomeres: 1.1:1.0:1.0; epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous posteriorly, abruptly down-turned, forming an obtuse angle; propodeum with lateral longitudinal carina strong (absent anterior to spiracle), posterior transverse carina strong; metasomal tergite I $0.8 \times$ as long as posteriorly wide, lateromedian carinae extending $0.5 \times$ length of tergite.

Material examined

Holotype

COSTA RICA • ♂; “Est. Pitilla, 9 km S Santa Cecilia, Prov. Guana, [Guanacaste], COSTA RICA. 700 m. Jul 1994, C. Moraga, L N 330200_380200 #3158”; MNCR.

Seticornuta cuckoo sp. nov.

urn:lsid:zoobank.org:act:2EE83C67-1E3F-4BE4-8EF1-7608DB430623

Figs 3, 10C, 11A

Diagnosis

This species is distinctive among its congeners, it is the only one extensively metallic blue.

Etymology

The specific epithet ‘cuckoo’ is in reference to the blue metallic color of the Cuckoo Wasp. It is treated as a noun in apposition.

Material examined

Holotype

ECUADOR • ♀; “Ascazubi/ Pito 2600m. Ecuador I.16.1971 Luis E. Peña”; USUC.

Description

Female

MEASUREMENTS. Body length 5.9 mm. Fore wing length 3.9 mm.

HEAD. Face+clypeus $1.0 \times$ as long as wide; labrum not exposed when mandibles closed; malar space $0.7 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $1.3 \times$ ocellar diameter; distance between ocelli $1.3 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle flat; gena, on lateral view $1.0 \times$ as long as compound eyes; occipital carina incomplete, present only dorsally; antenna with 21 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.2:1.2, subapical flagellomere $1.3 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron with dorsal margin evenly declivous and postero-dorsally curved, polished, glabrous with few setae at dorsal margin; submetapleural carina smooth, anteriorly expanded into a conspicuous digitiform lobe. Propodeum with lateromedian longitudinal carina strong, slightly closer centrally; lateral longitudinal carina absent; posterior transverse carina complete. Fore wing with Cu1a between Cu1b and 2m-cu $1.6 \times$ as long as Cu1 between Rs&M and 1m-cu; Hind wing with distal abscissa of Cu1 and M not discernible.

METASOMA. Metasoma with tergite I $1.1 \times$ as long as posteriorly wide, lateromedian carinae extending $0.3 \times$ length of tergite; tergite II $1.0 \times$ as long as posteriorly wide; laterotergite II $0.4 \times$ as long as wide, subrectangular; laterotergite III $0.6 \times$ as long as wide, subrectangular.

COLOR. Extensively metallic blue except antennae, protibia dorsally and protarsomeres brownish black, ovipositor valvae and metatibial outer spur brown, protibia ventrally and protibial spur yellowish,

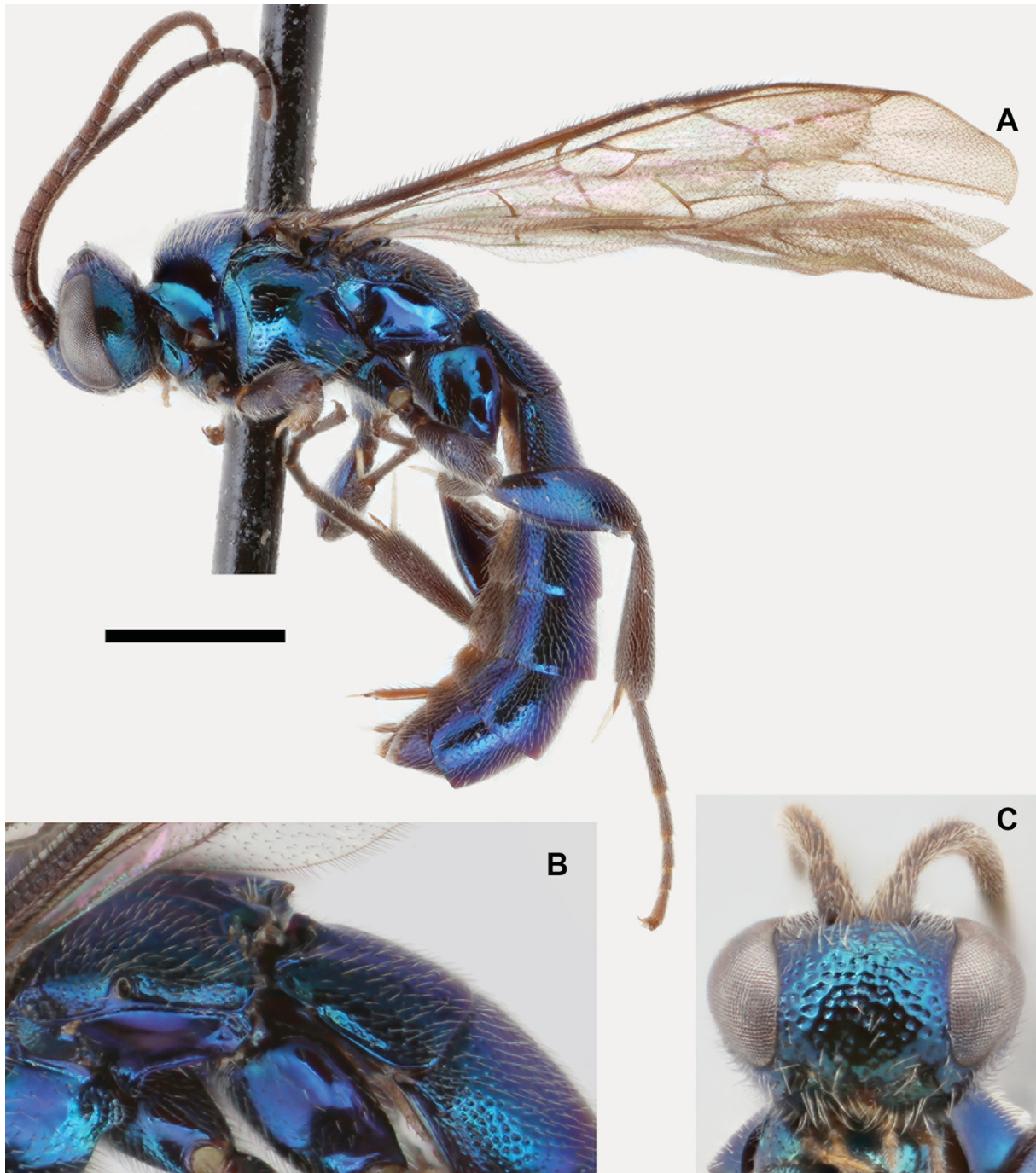


Fig. 3. Details of *Seticornuta cuckoo* sp. nov., ♀, holotype (USUC). **A.** Habitus, lateral view. **B.** Propodeum and first metasomal tergite, laterodorsal view. **C.** Facial view. Scale bar = 1 mm.

mesofemur, metafemur, mesotarsomeres and metatarsomeres black, and mesotibial spur and inner metatibial spurs white; wings slightly infuscate.

Male

Unknown.

Remark

This represents the first record of *Seticornuta* from Ecuador (Fig. 11A).

Seticornuta curupira sp. nov.

urn:lsid:zoobank.org:act:52C58F37-4DD0-4171-8484-F611DB5A7601

Figs 4, 10I, 11A

Diagnosis

This species can be recognized by this combination of features: pronotum and mesoscutum tawny, and metapleuron rectangular.

Etymology

The specific ‘curupira’ is in reference to the mythological creature that lives in Brazilian forests. It is treated as a noun in apposition.

Material examined

Holotype

BRAZIL • ♀; “Nova Teutonia Santa Caterina Nov. 1970 Brazil Fritz Plaumann”; USUC.

Paratypes

BRAZIL • 1 ♂; “BRAZIL: Nova Teutonia 27°11’B 52°23’L. 15.iii.1937. Flitz Plaumann. B.M. 1937-424.”; NHMUK • 1 ♂; “Nova Teutonia 27°11’S 52°23’W BRAZIL, 300–500m 9-viii-1948 Fritz Plaumann [CNC493240]”; CNC • 1 ♀; “Nova Teutonia 27°11’S 52°23’W Brazil, 300–500m Jan.1968 Fritz Plaumann [CNC493239]”; CNC • 1 ♀; “Nova Teutonia Santa Caterina Jan. 1971 Brazil Fritz Plaumann”; USUC • 1 ♀; “Nova Teutonia Brazil XI-1-1942 F. Plaumann”; USUC.

Description

Female

MEASUREMENTS. Body length 8.3 mm. Fore wing length 6.5 mm.

HEAD. Face+clypeus $1.0 \times$ as wide as long; labrum exposed when mandibles closed; malar space $0.8 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $0.8 \times$ ocellar diameter; distance between ocelli $1.5 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle concave; gena, on lateral view $0.7 \times$ as long as compound eyes; occipital carina complete; antenna with 30 flagellomeres, ratio of length from second to fourth flagellomeres: 1.1:1.0:1.0, subapical flagellomere elongate, $1.4 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina interrupted subapically; metapleuron rectangular, dorsal margin weakly declivous posteriorly, abruptly down-turned, postero-dorsally curved forming an obtuse angle, glabrous; submetapleural carina smooth, anteriorly expanded into conspicuous triangular lobe. Propodeum with lateromedian longitudinal carina strong, parallel; lateral longitudinal carina strong, absent anterior to spiracle; posterior transverse carina present. Fore wing with *Cu*_{1a} between *Cu*_{1b} and 2m-cu $1.5 \times$ as

long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 sclerotized throughout, abscissa of M faint.

METASOMA. Metasoma with tergite I $0.9 \times$ as long as posteriorly wide, lateromedian carinae extending $0.5 \times$ length of tergite; tergite II $0.8 \times$ as long as posteriorly wide; laterotergite II $0.5 \times$ as long as wide, wedge-shaped, mesal edge concave; laterotergite III $0.8 \times$ as long as wide, semicircular.

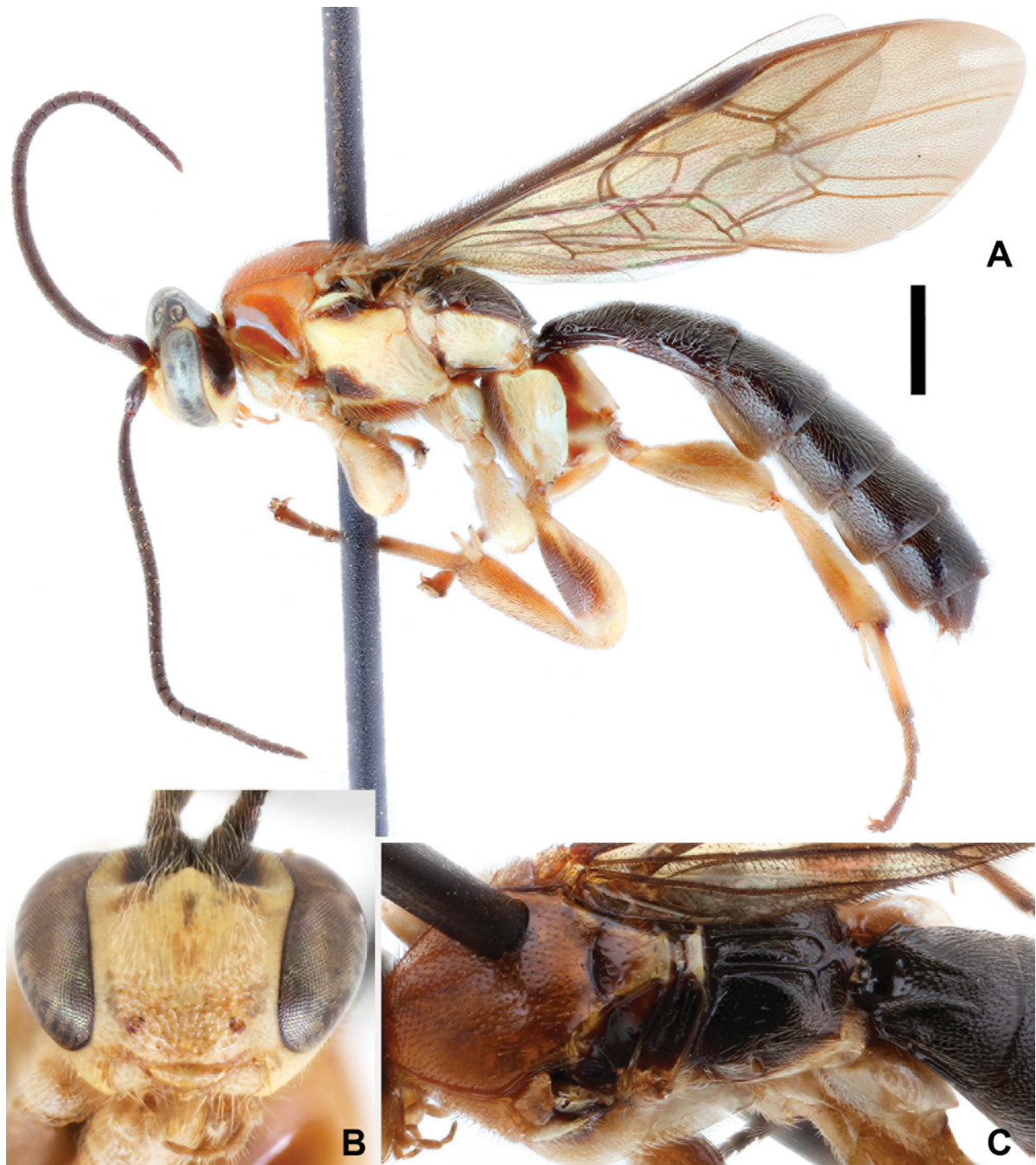


Fig. 4. Details of *Seticornuta curupira* sp. nov. **A.** ♀, holotype (USUC), habitus, lateral view. **B.** ♀, paratype (USUC), facial view. **C.** ♀, paratype (USUC), mesosoma and first metasomal tergite, dorsal view. Scale bar = 1 mm.

COLOR. Head extensively light yellow, frons, interocellar area, vertex, and upper posterior half of gena black, orbits light yellow, palpi brown, antenna black; pronotum and mesoscutum tawny; scutellum brown, grading posteriorly to yellow; propodeum black; mesopleuron predominantly light yellow, surrounding area of subalar prominence, spot at mid epicnemial carina brown; mesosternum brownish; metapleuron light yellow, submetapleural carina brownish; prosternum light yellow; mesosternum light brown; fore leg light yellow, coxa dorsally, femur and tibia laterally light brown, tarsomeres brown; mid leg light yellow, coxa ventrally, femur and tibia latero-ventrally light brown, tarsomeres brown; hind leg light yellow, coxa ventrally, trochanter ventrally, femur latero-externally centrally, metatarsomere 1 with distal third grading to brown, tarsomeres 2–5 brown; tibia ventrally light brown; wings faintly infusate; metasomal tergites black.

VARIATION. The paratypes differ from the holotype in the following: fore wing length 6.5–7.0 mm; lateral ocellus separated from compound eye by $0.7\text{--}0.8 \times$ ocellar diameter; distance between ocelli $1.3\text{--}1.5 \times$ its own maximum diameter; ratio of length from second to fourth flagellomeres: 1.0–1.1:1.0:1.0, subapical flagellomere elongate, $1.3\text{--}1.4 \times$ as long as centrally wide; fore wing with Cu1a between Cu1b and 2m-cu $1.4\text{--}1.5 \times$ as long as Cu1 between Rs&M and 1m-cu; metasomal tergite I $0.9 \times$ as long as posteriorly wide, lateromedian carinae extending $0.5\text{--}0.7 \times$ length of tergite; laterotergite II $0.5\text{--}0.6 \times$ as long as wide; laterotergite III $0.7 \times$ as long as wide.

Male

The paratypes differ from the holotype in the following: fore wing length 6.2–6.3 mm; malar space $0.6 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $0.6 \times$ ocellar diameter; distance between ocelli $1.2\text{--}1.5 \times$ its own maximum diameter; gena, on lateral view $0.8 \times$ as long as compound eyes; antenna with 31 flagellomeres, ratio of length from second to fourth flagellomeres: 1.4–1.5:1.2–1.5:1.2–1.4, subapical flagellomere elongate, $1.3\text{--}1.4 \times$ as long as centrally wide; fore wing with Cu1a between Cu1b and 2m-cu $1.3\text{--}1.5 \times$ as long as Cu1 between Rs&M and 1m-cu; laterotergite II $0.6 \times$ as long as wide. There is variation in the coloration compared to females: procoxa and meso- and metatibia entirely light yellow.

Remark

This species was collected in the Brazilian state of Santa Catarina (Fig. 11A), at the same locality as *S. flava* sp. nov.

***Seticornuta flava* sp. nov.**

urn:lsid:zoobank.org:act:B85C054C-3F42-4466-8155-42592020ECBA

Figs 5, 10K, 11B

Diagnosis

This species can be recognized by this combination of features: pronotum yellow, mesoscutum yellow with three longitudinal brownish black vittae, and metapleuron rectangular.

Etymology

The specific epithet '*flava*' is from the Latin, meaning 'yellow', in reference to the predominantly yellow mesosoma of this species.

Material examined

Holotype

BRAZIL • ♀; “BRAZIL: Sta. Cata Nova Teutonia 28.4.1949 F. Plaumann Coll B.M. 1957–341”; NHMUK.

Paratype

BRAZIL • 1 ♀; “Brasilien Nova Teutonia 27°11'B 52°23'L, 300–500m 30.v.1952 Fritz Plaumann [CNC493238]”; CNC.

Description

Female

MEASUREMENTS. Body length 8.4 mm. Fore wing length 5.3 mm.



Fig. 5. Details of *Seticornuta flava* sp. nov., ♀, paratype (CNC). A. Habitus, lateral view. B. Head, lateral view and mesoscutum C. Facial view. Scale bar = 1 mm.

HEAD. Face+clypeus $0.9 \times$ as wide as long; labrum exposed when mandibles closed; malar space $0.5 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $0.7 \times$ ocellar diameter; distance between ocelli $1.5 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle concave; gena, on lateral view $0.8 \times$ as long as compound eyes; occipital carina complete; antenna with 28 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.2:1.2, subapical flagellomere $1.3 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous posteriorly, abruptly down-turned, postero-dorsally curved forming obtuse angle, glabrous; submetapleural carina smooth, anteriorly expanded into a conspicuous triangular lobe. Propodeum with lateromedian longitudinal carina strong, parallel; lateral longitudinal carina strong, absent anterior to spiracle; posterior transverse carina strong. Fore wing with Cu1a between Cu1b and 2m-cu $1.6 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 sclerotized throughout, abscissa of M faint.

METASOMA. Metasoma with tergite I $0.8 \times$ as long as posteriorly wide, lateromedian carinae extending $0.8 \times$ length of tergite; tergite II $0.8 \times$ as long as posteriorly wide; laterotergite II $0.5 \times$ as long as wide, wedge-shaped, mesal edge convex; laterotergite III $0.7 \times$ as long as wide, semicircular.

COLOR. Head extensively light yellow with interocellar area black and area behind interocellar area (between posterior ocelli) brownish; antennae black; meso- and metatarsomeres with a distal band brownish; mesoscutum light yellow with three longitudinal brownish black vittae; wings hyaline; metasoma black.

VARIATION. The paratype differs from the holotype in the following: malar space $0.6 \times$ as long as basal mandibular width; distance between ocelli $1.3 \times$ its own maximum diameter; occipital carina complete, angled before reaching to hypostomal carina (at about $0.7 \times$ as long as basal mandibular width); antenna with 29 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.1:1.1; fore wing with Cu1a between Cu1b and 2m-cu $1.5 \times$ as long as Cu1 between Rs&M and 1m-cu; metasoma with tergite I $0.9 \times$ as long as posteriorly wide, lateromedian carinae extending $0.7 \times$ length of tergite; tergite II $0.7 \times$ as long as posteriorly wide; laterotergite II $0.6 \times$ as long as wide; laterotergite III $0.8 \times$ as long as wide.

Male

Unknown.

Remark

This species was collected in the Brazilian state of Santa Catarina (Fig. 11B), at the same locality as *S. curupira* sp. nov.

Seticornuta jacutinga Arauco & Pentead-Dias, 2012

Fig. 11B

Seticornuta jacutinga Arauco & Pentead-Dias, 2012: 417.

Diagnosis

This species can be recognized by this combination of features: antenna with 25–27 flagellomeres; epicnemial carina complete; metapleuron rectangular, dorsal margin weakly declivous posteriorly, abruptly down-turned, forming an obtuse angle; propodeum with lateral longitudinal carina strong (absent anterior to spiracle), posterior transverse carina strong; metasomal tergite I $1.3 \times$ as long as posteriorly wide, lateromedian carinae extending $0.7 \times$ length of tergite.

Remark

This species was collected in a dry forest fragment near coffee plantations and pasture, and in a very wet area of riparian forest, in areas between 1000–1500 m altitude (Arauco & Pentead-Dias 2012).

Seticornuta muqui sp. nov.

urn:lsid:zoobank.org:act:89DC4237-A8C6-4065-BED2-57EC655B8856

Figs 6, 10H, 11B

Diagnosis

This species can be recognized by this combination of features: pronotum and mesoscutum black, and metapleuron three-sided with the dorsal margin evenly down-curved. It is quite similar to *S. cortesi* but it can be differentiated by the ventrally tawny metafemur (vs entirely black) and tergite II tawny (vs black centrally and laterally yellow).

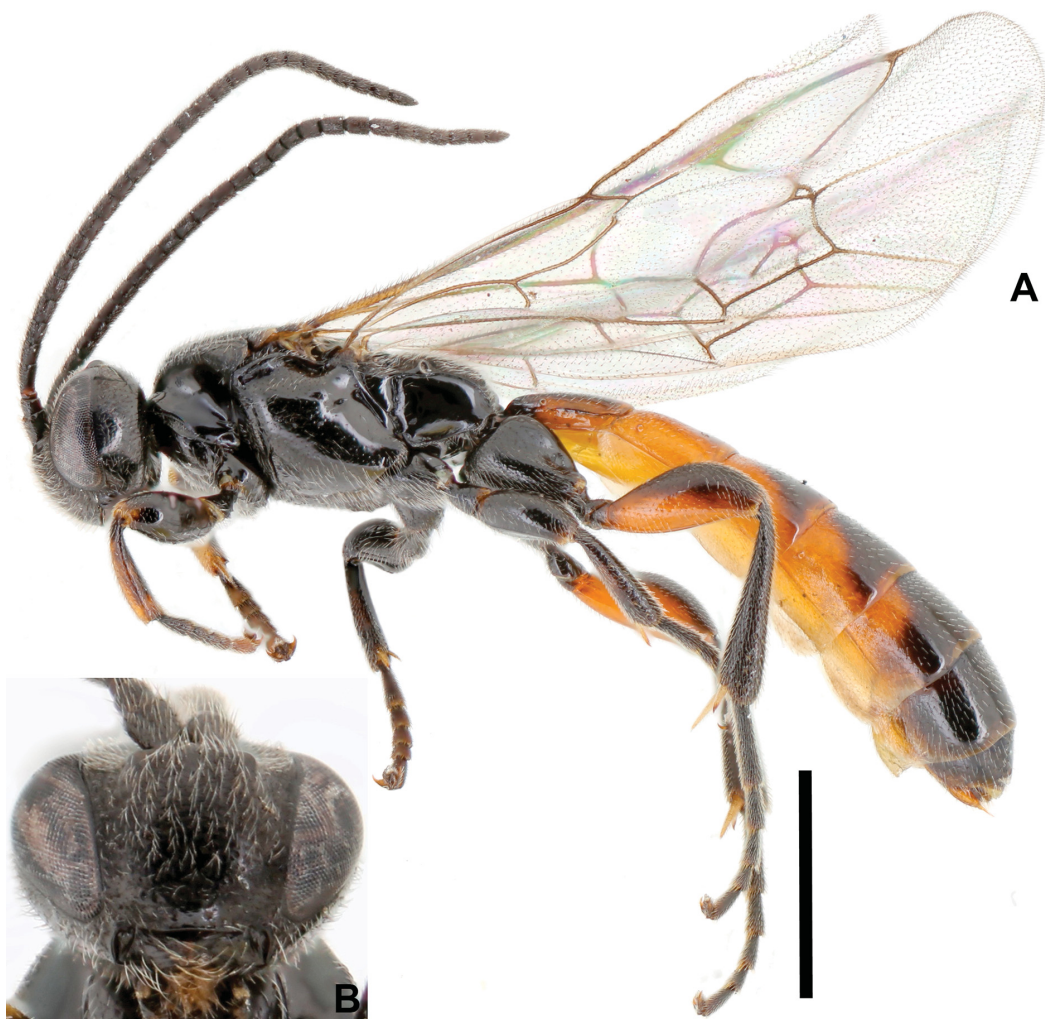


Fig. 6. Details of *Seticornuta muqui* sp. nov., ♀, holotype (MUSM). **A.** Habitus, lateral view. **B.** Facial view. Scale bar = 1 mm.

Etymology

The specific epithet ‘muqui’ is in reference to the mythological creature from the central Andes, that is believed to be a miner. It is treated as a noun in apposition.

Material examined

Holotype

PERU • ♀; “PERU, AP. Mina Las Bambas, Sector Saqrapaña 14°4'37.24"S/ 72°18'33"W 4265m 24.iv–03.v.2017 L. Figueroa”; MUSM.

Description

Female

MEASUREMENTS. Body length 5.1 mm. Fore wing length 3.6 mm.

HEAD. Face+clypeus $1.0 \times$ as wide as long; labrum not exposed when mandibles closed; malar space $0.7 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $1.7 \times$ ocellar diameter; distance between ocelli $2.0 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle flat; gena, on lateral view, $1.1 \times$ as long as compound eyes; occipital carina incomplete, present only dorsally; antenna with 27 flagellomeres, ratio of length from second to fourth flagellomeres: 1.4:1.3:1.3, subapical flagellomere $1.5 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron with dorsal margin evenly declivous, polished, glabrous; submetapleural carina smooth, anteriorly expanded into a conspicuous lobular lobe. Propodeum with lateromedian longitudinal carina strong, slightly closer subbasally; lateral longitudinal carina strong, absent anterior to spiracle; posterior transverse carina absent. Fore wing with Cu1a between Cu1b and 2m-cu $1.5 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 faint but discernible, distal abscissa of M absent.

METASOMA. Metasoma with tergite I $1.3 \times$ as long as posteriorly wide, lateromedian carinae extending $0.2 \times$ length of tergite; tergite II $0.9 \times$ as long as posteriorly wide; laterotergite II $0.4 \times$ as long as wide, subrectangular; laterotergite III $0.6 \times$ as long as wide, subrectangular.

COLOR. Head and mesosoma black, distal yellow spot on profemur; protibia anteroventrally and femur ventrally tawny; wings hyaline; metasoma black, tergite I laterally and posteriorly, tergite II, tergites III–IV anteriorly, laterally and posteriorly, tergite V laterally tawny.

Male

Unknown.

Remarks

Seticornuta muqui sp. nov. occurs in Puna grasslands. It is the first species of *Seticornuta* to be found in Peru and is the species found at the highest elevation (Fig. 11B). The individual described here was captured in areas where Las Bambas copper mine has a restoration program for the endemic shrub *Nototriche armeriifolia* A.W. Hill (Malvaceae Juss.); this area was surveyed three times a year (2017–2021) with a protocol that included pan traps, Malaise traps and pitfall traps. During this time only the one specimen of *S. muqui* sp. nov. was collected, suggesting that this species occurs at a low density.

Seticornuta nigroflava sp. nov.

urn:lsid:zoobank.org:act:5293728A-9434-4967-8709-4DD333EB0F5E

Figs 7, 10D, 11A

Diagnosis

This species can be recognized by this combination of features: pronotum yellow but centrally black, mesoscutum yellow with three black vittae, and metapleuron three-sided with the margin evenly declivous.

Etymology

The specific epithet '*nigroflava*' is from the Latin '*nigra*', meaning 'black', and '*flava*', meaning 'yellow', in reference to the entirely black and yellow body of this species.

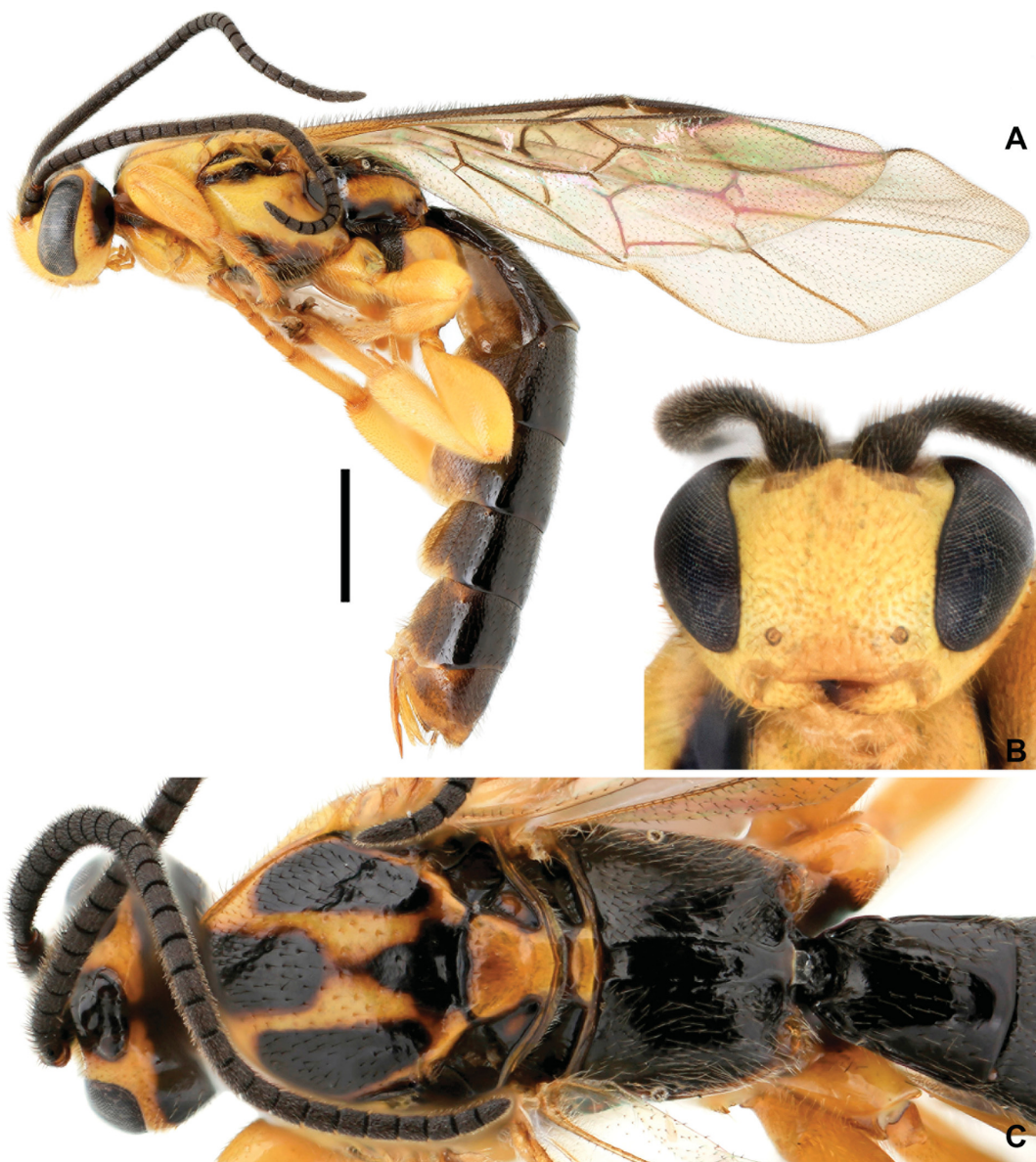


Fig. 7. Details of *Seticornuta nigroflava* sp. nov., ♀, holotype (SEMC). **A.** Habitus, lateral view. **B.** Facial view. **C.** Head dorsally, mesoscutum, propodeum and first metasomal tergite.

Material examined

Holotype

GUATEMALA • ♀; “GUATEMALA: Huehuetenango: Puerta del Cielo 3400m 15.55307-91.60338 14-VI-2015 ZHFalin ex. *Eryngium guatemalense* flowers in forest GUAT1F15 123/ SEMC1461629”; SEMC.

Description

Female

MEASUREMENTS. Body length 7.3 mm. Fore wing length 6 mm.

HEAD. Face+clypeus $0.9 \times$ as wide as long; labrum not exposed when mandibles closed; malar space $0.8 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $1.1 \times$ ocellar diameter; distance between ocelli $1.2 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle concave; gena, on lateral view $1.1 \times$ as long as compound eyes; occipital carina complete; antenna with 28 flagellomeres, ratio of length from second to fourth flagellomeres: 1.3:1.2:1.2, subapical flagellomere $1.3 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina interrupted subapically; metapleuron rectangular, dorsal margin weakly declivous and posteriorly evenly declivous, polished, glabrous; submetapleural carina smooth, anteriorly expanded into a conspicuous rounded lobe. Propodeum with lateromedian longitudinal carina strong, slightly closer subbasally; lateral longitudinal absent; posterior transverse carina absent between lateral and lateromedian longitudinal carinae. Fore wing with Cu1a between Cu1b and 2m-cu $1.5 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 sclerotized throughout, abscissa of M faint.

METASOMA. Metasoma with tergite I $1.2 \times$ as long as posteriorly wide, lateromedian carinae extending $0.2 \times$ length of tergite; tergite II $0.9 \times$ as long as posteriorly wide; laterotergite II $0.5 \times$ as long as wide, wedge-shaped, mesal edge convex; laterotergite III $0.5 \times$ as long as wide, semicircular.

COLOR. Head extensively yellow, frons centrally, interocellar area, vertex posteriorly, upper posterior of gena black, and antennae black; mesosoma predominantly yellow, pronotum centrally, mesoscutum with three longitudinal vittae, area below subalar prominence, mesosternum, metapleuron antero-ventrally, propodeum black; metasomal tergites I–VII black, tergites VIII–IX dark brown; wings hyaline.

Male

Unknown.

Remarks

Of all the Neotropical species, this is the only one that has some data about its biology: it was collected while visiting flowers of *Eryngium guatemalense* Hemsley (Apiaceae). This represents the first record of the genus for Guatemala (Fig. 11A).

Seticornuta quilmes sp. nov.

urn:lsid:zoobank.org:act:93875A51-9F10-4574-8F31-1CFC731853E5

Figs 8, 10F, 11B

Diagnosis

This species can be recognized by this combination of features: pronotum and mesoscutum black, and metapleuron three-sided with the dorsal margin evenly down-curved.

Etymology

The specific epithet ‘quilmes’ is in reference to the archaeological site in the Calchaquí Valleys, Tucumán Province, Argentina.

Material examined

Holotype

ARGENTINIA • ♀; “R.A. Tucuman Dpto: Tafi 18.XII.50 Coll: Golbach”; USNM.

Description

Female

MEASUREMENTS. Body length 6.6 mm. Fore wing length 4.7 mm.

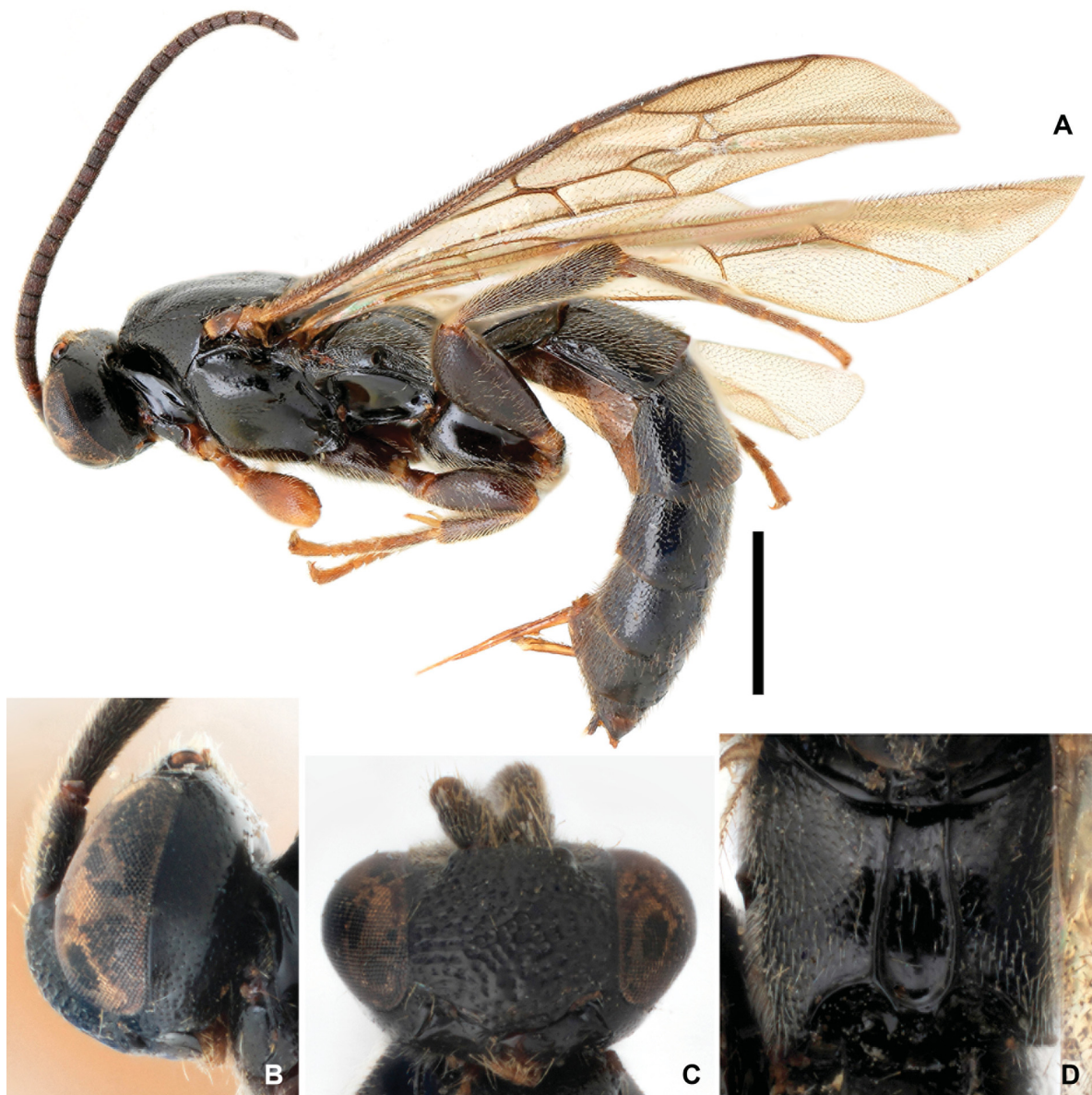


Fig. 8. Details of *Seticornuta quilmes* sp. nov., ♀, holotype (USNM). A. Habitus, lateral view. B. Head, lateral view C. Facial view D. Propodeum. Scale bar = 1 mm.

HEAD. Face+clypeus $1.2 \times$ as wide as long; labrum not exposed when mandibles closed; malar space $0.5 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $1.2 \times$ ocellar diameter; distance between ocelli $1.7 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle flat; gena, on lateral view $0.8 \times$ as long as compound eyes; occipital carina incomplete, present only dorsally; antenna with 26 flagellomeres, ratio of length from second to fourth flagellomeres: 1.2:1.2:1.2, subapical flagellomere $1.3 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron with dorsal margin evenly declivous, polished with setae along the concavity; submetapleural carina smooth, anteriorly expanded into a conspicuous triangular lobe. Propodeum with lateromedian longitudinal carina strong, slightly closer subbasally; lateral longitudinal carina faint, complete; posterior transverse carina strong. Fore wing with Cu1a between Cu1b and 2m-cu $1.4 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 and M not discernible.

METASOMA. Metasoma with tergite I $1.1 \times$ as long as posteriorly wide, lateromedian carinae extending $0.9 \times$ length of tergite; tergite II $1.0 \times$ as long as posteriorly wide; laterotergite II $0.5 \times$ as long as wide, subrectangular; laterotergite III $0.5 \times$ as long as wide, subrectangular.

COLOR. Head, mesosoma, and metasoma black; tegula anteriorly yellow, distally brown; meso- and metatibia basally off-white; foreleg, meso- and metatarsomeres brown; wings slightly infuscate.

Male

Unknown.

Remark

This represents the first record of the genus for Argentina (Fig. 11B).

Seticornuta rufa sp. nov.

urn:lsid:zoobank.org:act:DB887CFB-BCC2-4049-BAED-AC257A7F1A79

Figs 9, 10G, 11B

Diagnosis

This species can be recognized by this combination of features: pronotum ventrally black and dorsally tawny, mesoscutum tawny with three black vittae, and metapleuron three-sided with the dorsal margin evenly down-curved.

Etymology

The specific epithet '*rufa*' means 'red' in Latin, in reference to the mesosoma color of this species.

Material examined

Holotype

BRAZIL • ♀; "S.J. [São José do] Barreiro, Serra da Bocaina Braz. [Brazil]1650m XI-68 Alvarenga & Seabra"; USUC.

Description

Female

MEASUREMENTS. Body length 8.8 mm. Fore wing length 6.2 mm.

HEAD. Face+clypeus $1.0 \times$ as wide as long; labrum not exposed when mandibles closed; malar space $0.6 \times$ as long as basal mandibular width; lateral ocellus separated from compound eye by $0.9 \times$ ocellar diameter, distance between ocelli $1.5 \times$ maximum ocellar diameter; head posteriorly behind ocellar triangle flat; gena, on lateral view $1.0 \times$ as long as compound eyes; occipital carina absent ventrally; antenna with 34 flagellomeres, ratio of length from second to fourth flagellomeres: 1.2:1.1:1.1, subapical flagellomere $1.3 \times$ as long as centrally wide.

MESOSOMA. Epicnemial carina complete; metapleuron with dorsal margin evenly declivous, polished with isolated setae; submetapleural carina smooth, anteriorly expanded into a conspicuous lobular lobe. Propodeum with lateromedian longitudinal carina strong, slightly closer subbasally; lateral longitudinal carina weak but discernible, absent anterior to spiracle; posterior transverse carina complete. Fore wing with Cu1a between Cu1b and 2m-cu $1.7 \times$ as long as Cu1 between Rs&M and 1m-cu. Hind wing with distal abscissa of Cu1 weakly sclerotized.



Fig. 9. Details of *Seticornuta rufa* sp. nov., ♀, holotype (USUC). **A.** Habitus, lateral view. **B.** Facial view **C.** Head, lateral view. Scale bar = 1 mm.

METASOMA. Metasoma with tergite I $1.3 \times$ as long as posteriorly wide, lateromedian carinae extending $0.3 \times$ length of tergite; tergite II $0.8 \times$ as long as posteriorly wide; laterotergite II $0.4 \times$ as long as wide, subrectangular; laterotergite III $0.5 \times$ as long as wide, subrectangular.

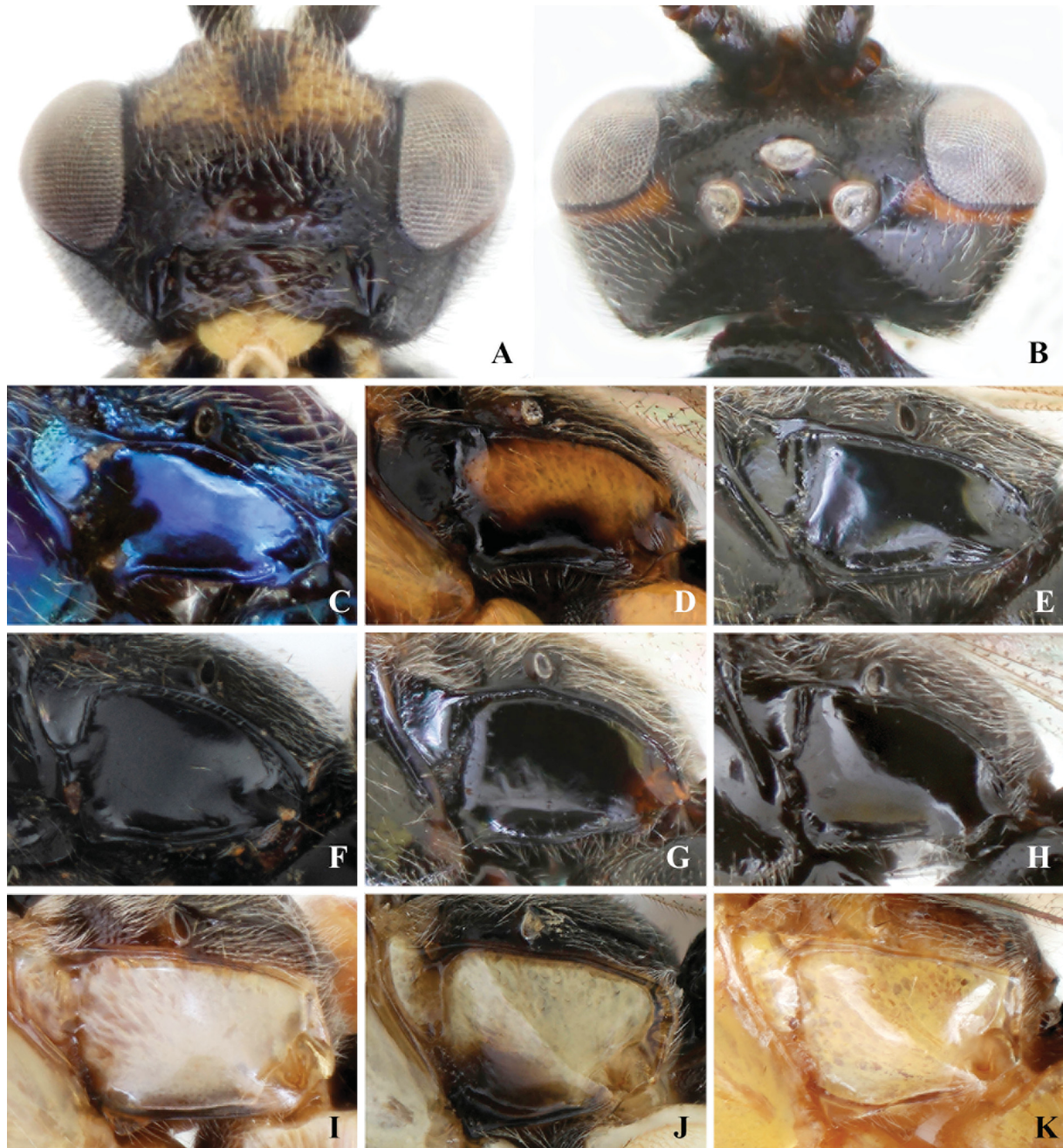


Fig. 10. *Seticornuta* spp. **A–B.** *S. cortesi* Porter, 1998, head. **A.** Facial view, head ventrally. **B.** Facial view, head dorsally. **C.** *S. cuckoo* sp. nov., ♀, holotype (USUC), metapleuron. **D.** *S. nigroflava* sp. nov., ♀, holotype (SEMC), metapleuron. **E.** *S. carinata* sp. nov., ♀, holotype (USUC), metapleuron. **F.** *S. quilmes* sp. nov., ♀, holotype (USNM). **G.** *S. rufa* sp. nov., ♀, holotype (USUC), metapleuron. **H.** *S. muqui* sp. nov., ♀, holotype (MUSM). **I.** *S. curupira* sp. nov., ♀, holotype (USUC), metapleuron. **J.** *S. anchanchu* sp. nov., metapleuron. **K.** *S. flava* sp. nov., ♀, holotype (NHMUK), metapleuron.

COLOR. Head extensively black except palpi and face+clypeous yellow and tawny orbits from posterior ocelli to gena. Mesosoma predominantly black except propodeum dorsally, mesoscutum (except three brownish black vittae) and scutellum reddish tawny (except anteriorly brownish); tegula yellowish; prolegs brownish black except trochanter distally, femur basally and distally, tibia, and, tibial spur yellowish, and tarsomeres (except, distal third of basitarsomere, and tarsomeres 2–4 yellowish brown) yellowish; mesoleg brownish black except trochanter distally, femur basally and distally, and tibia dorsally yellow; mesotibia ventrally and mesotarsomeres brownish yellow; metaleg brownish black except reddish tawny spot posteriorly in coxa, femur basally and distally, and tibia dorsally yellow; meso- and metatibial spur whitish; and, ovipositor valvae testaceous; wings slightly infusate; metasoma brownish black with tergites grading posteriorly and laterally to reddish brown.

Male

Unknown.

Remark

This species was collected in the Brazilian state of São Paulo (Fig. 11B), at the same locality and date as *S. carinata* sp. nov.

Discussion

Several collections were examined in the search for specimens of *Seticornuta* and I found that the bulk of the diversity of *Seticornuta* is in the Neotropical region, with the newly species described here, 13 species are known from this region. Five species are found in Brazil, restricted to the Atlantic Forest, while the other species are distributed in the mountainous areas of Central and South America (Fig. 11).

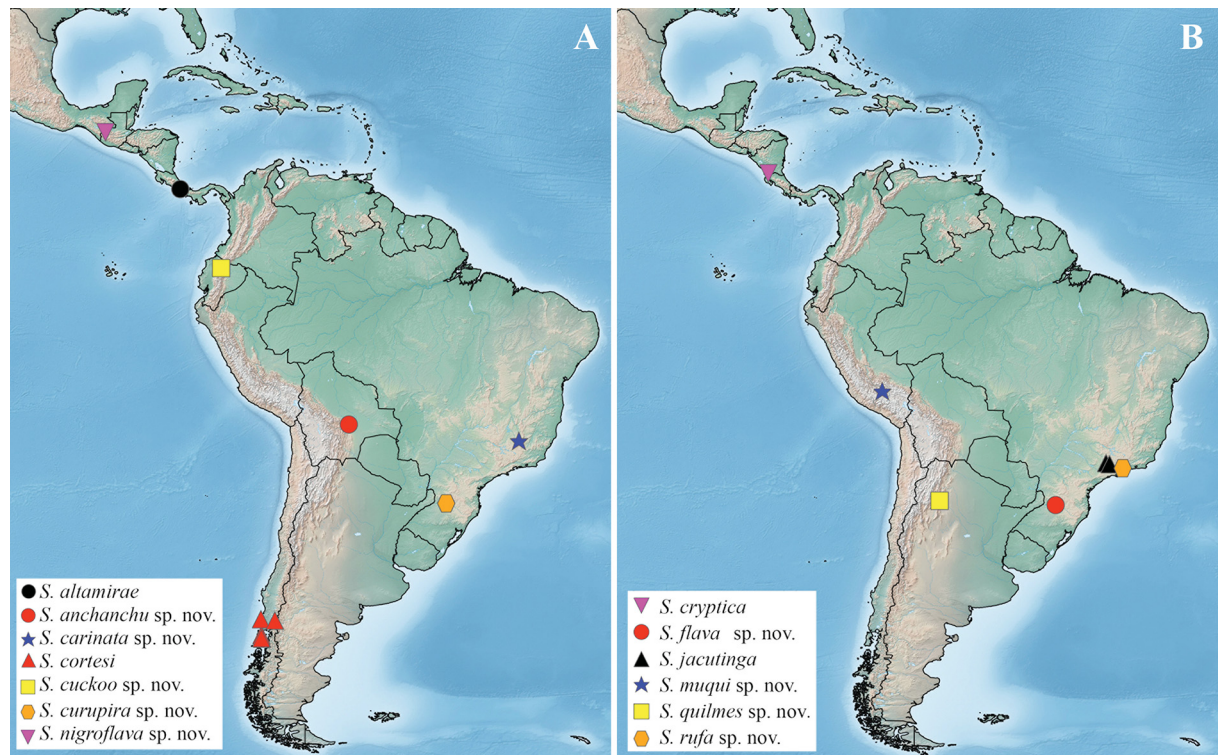


Fig. 11. Geographic distribution of species of *Seticornuta* Morley, 1913 in the Neotropical region.

Most of the species described here are based on a single or a few specimens. A similar situation was found for other Neotropical species (Porter 1998; Gauld & Sithole 2002; Araujo & Pentead-Dias 2012). Despite the intensive sampling in Costa Rica, only three individuals were collected (Gauld & Sithole 2002) and only one individual of *Seticornuta muqui* sp. nov. was found after several collections carried out in the type locality. This scarcity suggests that the species are genuinely low density.

The Nearctic species were not included in this study, but their taxonomic status should be reviewed as the purported diagnostic features for the two taxa (Townes & Townes 1959) are not mutually exclusive (color of the orbits and hind femur and the number of antennomeres). These traits seem to form a continuum between both species, indicating that they might simply represent variability within a single species.

Most of the morphological diversity is found in the Neotropical region, for example the presence and development of the lateral longitudinal carina of the propodeum and the occipital carina varies among species. Gauld & Sithole (2002) proposed the species group of *S. apicalis* Gauld & Sithole, 2002 for the New World species, considering the Nearctic and Costa Rican species, but ignoring the Chilean species *S. cortesi*. They also suggested that the apomorphic feature of *Seticornuta* was the exposed labrum, but this feature is only present in the species group of *apicalis*. In this study, within the New World two groups of species are found. One group is formed by the Nearctic species, *S. apicalis* and *S. terminalis*, and the Neotropical species *S. altamirae*, *S. anchanchu* sp. nov., *S. cryptica*, *S. curupira* sp. nov., *S. flava* sp. nov., and *S. jacutinga*, that are characterized by the exposed labrum and the rectangular metapleuron; this group of species can be referred to as the species group of *apicalis*, as was proposed by Gauld & Sithole (2002). The second group is formed by the Neotropical species *S. carinata* sp. nov., *S. cortesi*, *S. cuckoo* sp. nov., *S. muqui* sp. nov., *S. nigroflava* sp. nov., *S. quilmes* sp. nov., and *S. rufa* sp. nov., which are characterized by having the labrum not exposed and the metapleuron three-sided.

The New World species were suggested to be a separate genus from the Old World species by Gauld & Sithole (2002), but they refrained from naming a new genus until a cladistic analysis for the subfamily was undertaken. To elucidate the status of the genus requires additional information, including more species, both sexes, and other sources of evidence, such as molecular characters.

Acknowledgments

The author is grateful to Andrew Bennett (CNC), Dave Wahl (USUC), Gerardo Lamas (MUSM), Guisella Chávez Guevara (MNCR), Gavin Broad (NHMUK), and Michael Engel (SEMC) for permitting examination of material; to Bernardo Santos for his comments and suggestions that improved the manuscript; to two anonymous reviewers for their comments and suggestions that improved the manuscript. MA was supported by a fellowship from the Fondo para la Innovación, Ciencia y Tecnología, Peru.

References

- Alvarado M. 2018. *Phylogeny of the Wasp Subfamily Metopiinae and Patterns of Speciation in the Exochus albiceps Species-group*. PhD thesis, University of Kansas, United States.
- Alvarado M. 2020. The parasitoid wasps *Synosis* Townes 1959 (Hymenoptera: Ichneumonidae: Metopiinae) in Neotropical region, with a key to species. *The Canadian Entomologist* 152 (5): 601–612. <https://doi.org/10.4039/tce.2020.23>
- Araujo C.R. & Pentead-Dias A.M. 2012. First record of *Seticornuta* Morley (Hymenoptera, Ichneumonidae, Metopiinae) from Brazil and description of a new species. *Brazilian Journal of Biology* 72 (2): 414–418. <https://doi.org/10.1590/S1519-69842012000200025>

- Broad G.R., Shaw M.R., Fitton M.G. 2018. Ichneumonid wasps (Hymenoptera: Ichneumonidae): their classification and biology. *Handbooks for the Identification of British Insects* 7 (12):1–418
- Choi J.K. & Lee J.W. 2017. Checklist of South Korean Metopiinae Förster, 1869 (Hymenoptera, Ichneumonidae) with new South Korean species and a note on *Seticornuta koreana*. *Journal of Asia-Pacific Biodiversity* 10 (1): 1–19. <https://doi.org/10.1016/j.japb.2016.09.006>
- Choi J.K., Kolarov J. & Lee J.W. 2015. A new species of the genus *Seticornuta* Morley (Hymenoptera, Ichneumonidae, Metopiinae) from South Korea. *ZooKeys* 478: 139–146. <https://doi.org/10.3897/zookeys.478.9048>
- Doerksen G.P. & Neunzig H.H. 1976. Biology of some immature *Nephoterix* in the eastern United States (Lepidoptera: Pyralidae: Phycitinae). *Annals of the Entomological Society of America* 69 (3): 423–431. <https://doi.org/10.1093/aesa/69.3.423>
- Fitton M.G. 1984. Subfamily Metopiinae. In: Gauld I.D. (ed.) *An Introduction to the Ichneumonidae of Australia*: 353–363. British Museum (Natural History), London.
- Gauld I.D. & Sithole R. 2002. Subfamily Metopiinae. In: Gauld I.D., Godoy C. & Ugalde Gomez J.A. (eds) *The Ichneumonidae of Costa Rica 4. Memoirs of the American Entomological Institute* 66: 11–262.
- Porter C.C. 1998. Guía de los géneros de Ichneumonidae en la región neantártica del sur de Sudamérica. *Opera Lilloana* 42: 1–234.
- Shorthouse D.P. 2010. SimpleMappr, an online tool to produce publication-quality point maps. Available from <https://www.simplemappr.net> [accessed 23 Mar. 2021].
- Townes H. & Townes M. 1959. Ichneumon-flies of America North of Mexico pt. 1: Subfamily Metopiinae. *Bulletin of the United States National Museum* 216. <https://doi.org/10.5479/si.03629236.216.1>
- Watanabe K. 2015. Discovery of the genus *Seticornuta* Morley, 1913 from Japan (Hymenoptera: Ichneumonidae: Metopiinae). *Japanese Journal of Systematic Entomology* 21: 59–60.

Manuscript received: 27 January 2022

Manuscript accepted: 6 September 2022

Published on: 10 October 2022

Topic editor: Tony Robillard

Section editor: Gavin Broad

Desk editor: Eva-Maria Levermann

Printed versions of all papers are also deposited in the libraries of the institutes that are members of the *EJT* consortium: Muséum national d'histoire naturelle, Paris, France; Meise Botanic Garden, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Royal Belgian Institute of Natural Sciences, Brussels, Belgium; Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Leibniz Institute for the Analysis of Biodiversity Change, Bonn – Hamburg, Germany; National Museum, Prague, Czech Republic.