

QL
1
R454
NH

ANNALES

de la
SOCIÉTÉ SUISSE DE ZOOLOGIE
et du
MUSÉUM D'HISTOIRE NATURELLE
de la Ville de Genève

tome 120
fascicule 3
2013

SWISS JOURNAL OF ZOOLOGY

REVUE SUISSE DE ZOOLOGIE



GENÈVE SEPTEMBRE 2013 ISSN 0035 - 418 X

REVUE SUISSE DE ZOOLOGIE

TOME 120— FASCICULE 3

Publication subventionnée par:
ACADÉMIE SUISSE DES SCIENCES NATURELLES (SCNAT)
VILLE DE GENÈVE
SOCIÉTÉ SUISSE DE ZOOLOGIE

Comité de rédaction

JACQUES AYER

Directeur du Muséum d'histoire naturelle de Genève

ALICE CIBOIS, PETER SCHUCHERT

Chargés de recherche au Muséum d'histoire naturelle de Genève

Comité de lecture

A. Cibois (oiseaux), G. Cuccodoro (coléoptères), S. Fisch-Muller (poissons), B. Merz (insectes, excl. coléoptères), J. Mariaux (invertébrés excl. arthropodes), M. Ruedi (mammifères), A. Schmitz (amphibiens, reptiles), P. Schwendinger (arthropodes excl. insectes).

Le comité soumet chaque manuscrit pour évaluation à des experts d'institutions suisses ou étrangères selon le sujet étudié.

La préférence sera donnée aux travaux concernant les domaines suivants: taxonomie, systématique, faunistique, phylogénie, évolution, morphologie et anatomie comparée.

Administration

MUSÉUM D'HISTOIRE NATURELLE
1211 GENÈVE 6

Internet: <http://www.ville-ge.ch/musinfo/mhng/page/rsz.htm>

PRIX DE L'ABONNEMENT:

SUISSE Fr. 225.—

UNION POSTALE Fr. 250.—
(en francs suisses)

Les demandes d'abonnement doivent être adressées
à la rédaction de la *Revue suisse de Zoologie*,
Muséum d'histoire naturelle, C.P. 6434, CH-1211 Genève 6, Suisse

ANNALES

de la
SOCIÉTÉ SUISSE DE ZOOLOGIE
et du
MUSÉUM D'HISTOIRE NATURELLE
de la Ville de Genève

tome 120
fascicule 3
2013



REVUE SUISSE DE ZOOLOGIE

TOME 120— FASCICULE 3

Publication subventionnée par:
ACADÉMIE SUISSE DES SCIENCES NATURELLES (SCNAT)
VILLE DE GENÈVE
SOCIÉTÉ SUISSE DE ZOOLOGIE

Comité de rédaction

JACQUES AYER
Directeur du Muséum d'histoire naturelle de Genève

ALICE CIBOIS, PETER SCHUCHERT
Chargés de recherche au Muséum d'histoire naturelle de Genève

Comité de lecture

A. Cibois (oiseaux), G. Cuccodoro (coléoptères), S. Fisch-Muller (poissons),
B. Merz (insectes, excl. coléoptères), J. Mariaux (invertébrés excl. arthropodes),
M. Ruedi (mammifères), A. Schmitz (amphibiens, reptiles), P. Schwendinger
(arthropodes excl. insectes).

Le comité soumet chaque manuscrit pour évaluation à des experts d'institutions suisses ou étrangères selon le sujet étudié.

La préférence sera donnée aux travaux concernant les domaines suivants: taxonomie, systématique, faunistique, phylogénie, évolution, morphologie et anatomie comparée.

Administration

MUSÉUM D'HISTOIRE NATURELLE
1211 GENÈVE 6

Internet: <http://www.ville-ge.ch/musinfo/mhng/page/rsz.htm>

PRIX DE L'ABONNEMENT:

SUISSE Fr. 225.—

UNION POSTALE Fr. 250.—
(en francs suisses)

Les demandes d'abonnement doivent être adressées
à la rédaction de la *Revue suisse de Zoologie*,
Muséum d'histoire naturelle, C.P. 6434, CH-1211 Genève 6, Suisse

Description of a new species of *Stepanovia* Kostjukov (Hymenoptera: Eulophidae) from Bulgaria

Peter S. BOYADZHIEV¹ & Ivaylo A. TODOROV²

¹ Department of Zoology, University of Plovdiv, 24 Tsar Asen Str., Plovdiv, Bulgaria.
E-mail: boyadz@uni-plovdiv.bg

² Institute of Biodiversity and Ecosystem Research, BAS, 1 Tsar Osvoboditel Bld.,
Sofia, Bulgaria. E-mail: i.todorov@abv.bg (corresponding author)

Description of a new species of *Stepanovia* Kostjukov (Hymenoptera: Eulophidae) from Bulgaria. - A new distinctive species of the genus *Stepanovia* Kostjukov (Hymenoptera: Eulophidae: Tetrastichinae), *Stepanovia rosae* Boyadzhiev & Todorov, sp. n. is described and illustrated. The new species was reared from galls of *Diplolepis rosae* (Linnaeus) (Cynipidae) on *Rosa dumalis* Bechstein, *R. agrestis* (Savi), *R. micrantha* Smith and *R. canina* Linnaeus (Rosaceae). A key to the species of genus *Stepanovia* is presented.

Keywords: Tetrastichinae – *Stepanovia rosae* – taxonomy – *Diplolepis rosae* – Cynipidae – Bulgaria.

INTRODUCTION

Genus *Stepanovia* Kostjukov, 2004 was erected for a few species of the genus *Aprostocetus* Westwood, 1833 that have a malar sulcus with a moderate-sized triangular fovea which extends about 0.3-0.5 length of gena, wider flagellar segments of antenna, at least 1.7 times as wide as pedicellus, and a host range of Cynipoidea (Hymenoptera) and Diptera (Kostjukov, 2004). Kostjukov (2004) did not clearly indicate for which species group of genus *Aprostocetus* he erected *Stepanovia*, although the description of the new genus agrees in many aspects with members of the *aurantiacus* species group (after Graham, 1987) and the host ranges of both taxa overlap. Genus *Stepanovia* is palearctic and includes five species: *S. aspectabilis* Kostjukov, 1995, *S. aurantiaca* (Ratzeburg, 1852), *S. avetjanae* (Kostjukov, 1978), *S. eurytomae* (Nees, 1834) and *S. kubanica* Kostjukov, 2009 (Noyes, 2013). Cynipid wasps of genus *Diplolepis*, gall inducers on *Rosa* spp. (Rosaceae), are hosts of four species but the host range of the type species of the genus (*S. aspectabilis* Kostjukov, 1995) is unknown (Noyes, 2013).

Here we diagnose, describe and illustrate a new, distinctive species of *Stepanovia* that was reared from galls of *Diplolepis rosae* (Linnaeus, 1758) on *Rosa* spp.

MATERIAL AND METHODS

Besides with *D. rosae*, the species described below was reared along with *Periclistus brandtii* (Ratzeburg, 1831) (Cynipidae), *Eurytoma rosae* Nees, 1834

(Eurytomidae), *Orthopelma mediator* (Thunberg, 1824) (Ichneumonidae), *Caenacis inflexa* (Ratzeburg, 1848) and *Pteromalus bedeguaris* (Thomson, 1878) (Pteromalidae), *Glyphomerus stigma* (Fabricius, 1793) and *Torymus bedeguaris* (Linnaeus, 1758) (Torymidae) in the laboratory (Todorov *et al.*, 2012). The host galls were collected by the junior author at altitudes between 1006 and 1374 m on Vitosha Mountain, Bulgaria. The reared specimens were fixed in 100% alcohol, air dried with isopropanol or HMDS, and mounted on card-points or slides. The slide-mounted specimens were examined under a Leica DM1000 compound microscope and photographed using a Leica DFC-295 digital still camera. The other specimens were examined under an Olympus SZ51 stereomicroscope. The holotype was photographed with reflected light under a Carl Zeiss Amplitival microscope using a Canon PowerShot SD990 IS digital camera and micromanipulator (after Boyadzhiev *et al.*, 2012). The paratype was photographed with an Olympus Color View 1 camera mounted on an Olympus SZ61 stereomicroscope. Morphological terminology and abbreviations follows Graham (1987) and Kostjukov *et al.* (2009); terminology of female genitalia follows Efremova (1996) and Gibson (1997). The examined specimens are deposited in the collections indicated by the following acronyms: MHNG, Muséum d'histoire naturelle, Geneva, Switzerland; PUPB, Department of Zoology, University of Plovdiv "Paisii Hilendarski", Plovdiv, Bulgaria; IBER, Institute of Biodiversity and Ecosystem Research, Sofia, Bulgaria; ZISP, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

RESULTS

Stepanovia rosae Boyadzhiev & Todorov, sp. n.

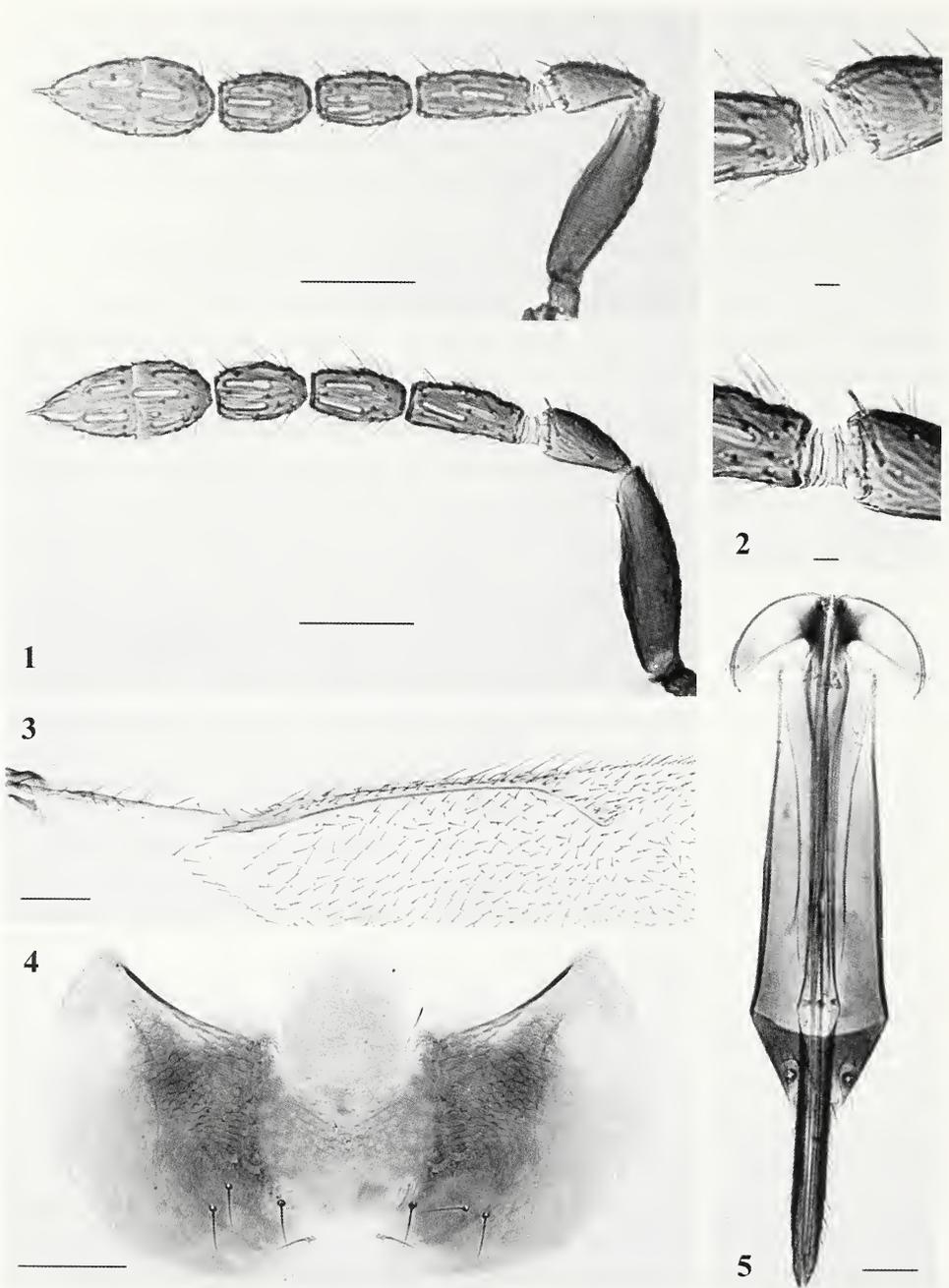
Stepanovia sp. near *eurytomae*, Todorov *et al.* (2012).

TYPE MATERIAL: **Holotype:** female; BULGARIA, Vitosha Mt., near "Shevovitsa" area, 42°32'35"N/23°20'54"E, 1249 m; 16.XI.2011; emerged 01-10.I.2012, from galls of *Diplolepis rosae* (Linnaeus, 1758), on *Rosa dumalis* Bechstein 1810 (MHNG). **Paratypes:** 2 females; Vitosha Mt., "Shevovitsa" area, 42°32'08"N/23°21'02"E, 1162 m; 16.XI.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *Rosa agrestis* (Savi 1798) (MHNG).- 30 females and 1 male; Vitosha Mt., "Elovitsa" area, 42°29'31"N/23°15'50"E, 1251 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. agrestis* (IBER).- 31 females and 5 males; Vitosha Mt., "Elovitsa" area, 42°29'08"N/23°16'07"E, 1133 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *Rosa micrantha* Smith, 1812 (MHNG).- 28 females and 2 males; Vitosha Mt., "Smilyo" area, 42°29'39"N/23°15'41"E, 1277 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *Rosa canina* Linnaeus, 1753 (PUPB).- 2 females and 1 male; Vitosha Mt., "Smilyo" area, 42°29'38"N/23°15'30"E, 1300 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. canina* (IBER).- 21 females and 1 male; Vitosha Mt., "Smilyo" area, 42°29'45"N/23°14'47"E, 1335 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. canina* (PUPB).- 4 females; Vitosha Mt., near "Terziyski dol" area, 42°33'26"N/23°21'00"E, 1121 m; 16.XI.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. dumalis* (MHNG).- 2 females, 2 males; Vitosha Mt., near "Terziyski dol" area, 42°33'26"N/23°21'00"E, 1121 m; 16.XI.2011; emerged 11-20.I.2012, from galls of *D. rosae*, on *R. dumalis* (PUPB).- 1 male; Vitosha Mt., near "Terziyski dol" area, 42°33'26"N/23°21'00"E, 1121 m; 16.XI.2011; emerged 11-20.I.2012, from galls of *D. rosae*, on *R. dumalis* (ZISP).- 1 female; Vitosha Mt., near "Shevovitsa" area, 42°32'35"N/23°20'54"E, 1249 m; 16.XI.2011; emerged 11-20.I.2012, from galls of *D. rosae*, on *R. dumalis* (ZISP).- 1 female; Vitosha Mt., near "Shevovitsa" area, 42°32'35"N/23°20'54"E, 1249 m; 16.XI.2011; emerged 01-10.I.2012, from galls of *D. rosae*, on *R. dumalis* (ZISP).- 2 females; Vitosha Mt., near "Dain kladenets" spring, 42°32'46"N/23°13'56"E, 1374 m; 05.11.2011; emerged 01-31.V.2012, from galls of *Diplolepis rosae* (Linnaeus, 1758), on *Rosa canina* (ZISP).

OTHER MATERIAL: 1 female; Vitosha Mt., "Elovitsa" area, 42°29'08"N/23°16'07"E, 1133 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. micrantha* Smith, 1812 (PUPB).- 1 female, 1 male; Vitosha Mt., "Smilyo" area, 42°29'38"N/23°15'33"E, 1286 m; 30.X.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. canina* (PUPB).- 3 females; Vitosha Mt., near "Terziyski dol" area, 42°33'26"N/23°21'00"E, 1121 m; 16.XI.2011; emerged 01-31.V.2012, from galls of *D. rosae*, on *R. dumalis* (PUPB).- 3 females, 1 male; Vitosha Mt., near "Shevovitsa" area, 42°32'35"N/23°20'54"E, 1249 m; 16.XI.2011; emerged 11-20.I.2012, from galls of *D. rosae*, on *R. dumalis* (PUPB).

DIAGNOSIS: Close to *Stepanovia eurytomae* (Nees, 1834) but differing in having longer gaster and ovipositor (in *rosae* gaster 2.8-4 times as long as broad, ovipositor sheaths plus postcercal 0.66-0.69 length of hind tibia, sheaths 1.0-1.14 length of postcercal; in *eurytomae* gaster 2.0-2.6 times as long as broad, ovipositor sheaths plus postcercal 0.4-0.55 length of hind tibia, sheaths 0.5-0.8 length of postcercal); male antenna with ventral plaque situated about in the middle third of scape (in *eurytomae* situated hardly above middle of scape), body darker, head with U-shaped yellow stripe on lower face, gaster entirely brownish (in *eurytomae* head with at most mouth edge yellowish, gaster dorsally reddish at base, ventrally more or less yellowish).

Female: Head 1.1-1.33 times as broad as mesoscutum, 1.89-2.0 times as broad as long; temples 0.13-0.17 length of eyes; POL about 1.31-1.43 OOL, OOL about 2.0-2.33 OD. Eyes about as long as broad, 1.23-1.31 times as high as wide, separated by 1.29-1.32 times their height and about 1.56 their length. Malar space approximately 0.75 length of eye and 0.57-0.63 height of eye, sulcus with triangular fovea extending about 0.4-0.42 length of gena. Mouth 1.33-1.5 malar space. Sides of face, near malar sulcus, with large punctures (Fig. 8). Vertex with numerous dark setae whose length is 0.52-0.68 about 0.7 OD. Head in front view 0.86-0.88 times as height as wide. Antenna (Fig. 1) with scape 3.13-3.5 as long as broad, 0.94-1.07 length of eye and 0.79-0.83 height of eye, not quite reaching median ocellus; pedicellus plus flagellum 1.18-1.29 breadth of mesoscutum; with four anelli (Fig. 2); pedicellus 1.81-1.84 times as long as broad and 0.79-0.82 as long as FI; funicle proximally somewhat stouter than pedicellus, its segments decreasing in length, FI 2.13-2.36 times, F2 about 1.56-0.69 times, F3 1.3-1.53 times as long as broad; clava broader than F3, 2.14-2.4 times as long as broad, about as long as F2 plus F3, with C1 as long as broad, C2 hardly shorter, C3 shorter than C2, spine about 0.33-0.4 length of C3 with apical seta about as long as spine; sensilla not numerous, irregularly biseriate, moderately long, decumbent. Thorax 1.35-1.44 times as long as broad; propodeal slope about 45°. Pronotum extremely short, 0.2 as long as mesoscutum, crescentic, with a row of setae near hind margin, these 0.71-0.83 as long as scutellar setae. Mid lobe of mesoscutum 0.85 as long as broad, convex and relatively dull; median line virtually absent, sometimes obscurely indicated by weaker reticulation of mesoscutum; 4 adnotaular setae on each side, hindmost about as long as first pair of scutellar setae. Scutellum 1.24-1.26 times as broad as long, about 0.77 as long as mesoscutum; submedian lines slightly nearer to sublateral lines than to each other, enclosing a space 2.4-2.6 times as long as broad; setae subequal, hindmost setae slightly greater than distance between submedian lines, anterior pair placed slightly before middle. Dorsellum 2.2 times as broad as long, hind edge curved; about 3.4 times shorter than scutellum. Propodeum medially about as



FIGS 1-5

Stepanovia rosae sp. n. (female). (1) Antennae. (2) Antennal anelli. (3) Forewing venation. (4) Hypopygium. (5) Genitalia. Scale lines = 0.01 mm for Fig. 2; for others = 0.1 mm.

long as dorsellum, moderately shiny, with fine, very slightly raised reticulation; median carina thin; callus with 2-3 setae. Legs of medium length; hind coxae oblique, about twice as long as broad, with hind edge curved; hind femora about 4.22 times as long as broad; spur of mid tibia about as long as or slightly shorter than basitarsus, fourth tarsomere 0.83-0.88 times shorter than basitarsus. Forewing (Figs 3, 10) about 2.29-2.36 times as long as broad, reaching tip of postercalca; costal cell shorter than M, 10 times as long as broad, distally with row of 4-5 setae on lower surface; SM with 3-4 dorsal setae; M rather thin, 4 times length of ST, its front edge with 12 setae; ST at about 45°, thin proximally and expanding a little distally to form poorly defined stigma; PM a distinct stub; speculum small, hardly extended below parastigma, closed below; wing beyond it moderately thickly pilose, more so distad; with extremely small bare spot just beyond stigma; cilia 0.25-0.29 length of ST. Hindwing (Fig. 6) narrowly rounded at apex; cilia 0.25-0.28 breadth of wing. Gaster (Figs 6, 9) lanceolate, acuminate, 2.0-2.15 times longer than thorax; 1.5-1.65 times longer than head plus thorax, about as broad as thorax, 2.8-4.0 times as long as broad; last tergite acuminate and forming a sublinear postercalca, 1.15-1.21 times as long as broad; ovipositor sheaths plus postercalca 0.66-0.69 length of hind tibia, sheaths 1.0-1.14 length of postercalca; longest seta of each cercus about 1.83-1.92 length of next longest, slightly sinuate or kinked; tip of hypopygium (Fig. 4) situated distinctly before half length of gaster. Genitalia (Fig. 5): outer plates of ovipositor (T_9+T_{10}) 3.4 times as long as broad, 1.15 times as long as inner plates of ovipositor, and 1.7 times as long as ovipositor sheaths.

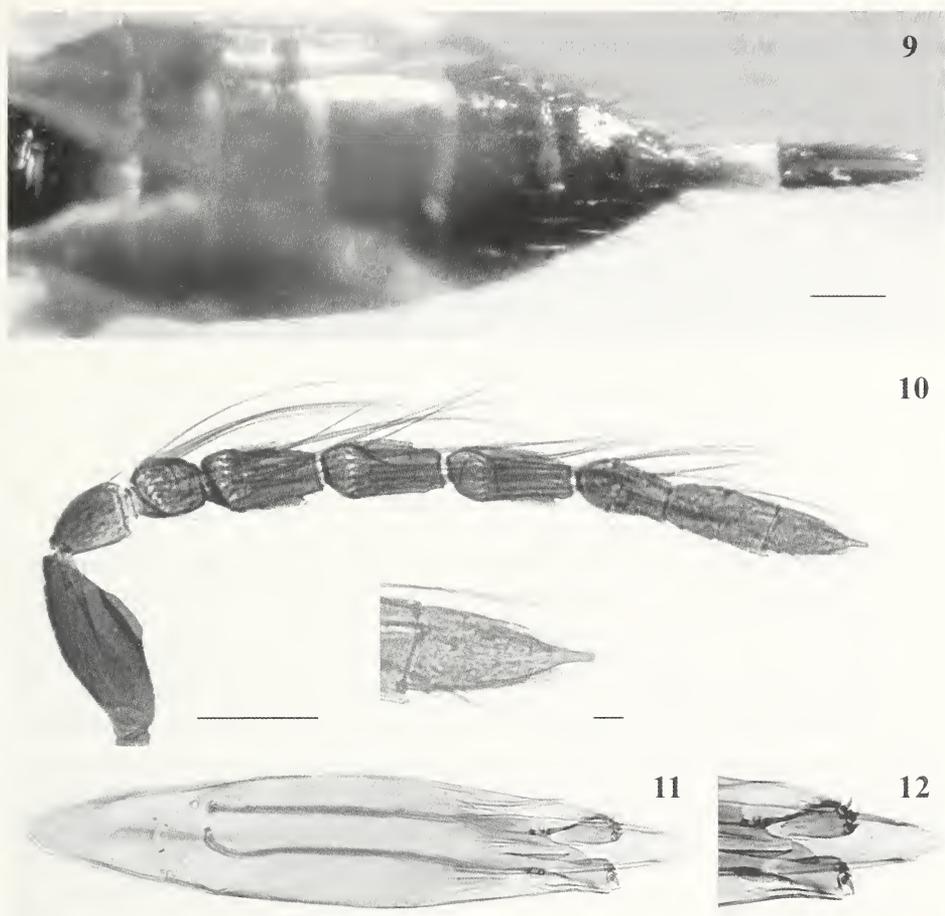
Colour: Head and thorax black with hardly perceptible metallic tinge; gaster entirely brownish; mouth edge, upper angle of mesopleuron, tegulae, dorsellum and antennae fuscous or brownish testaceous. Following parts yellow or fuscous: U-shaped stripe above clypeus to lateral parts of antennal torulli (Fig. 7), suture of frons just in front of median ocellus, mesothoracic spiracles, sometimes a small rhomboidal spot on lateral panel of pronotum above fore coxa, sutures of lateral part of mesothorax and distal sutures of scapular flange. Legs yellowish or very lightly fuscous with blackish coxae; dorsolateral surface of basal third of fore femur, dorsolateral surface of basal half of mid femur and up to two thirds of hind femur brownish; fore tarsi fuscous, fourth segment of mid and hind tarsi brownish or dark fuscous. Wings hyaline, venation yellowish. Length 1.48-2.2 mm.

Male: Differing from female as follows: POL 1.67 OOL. Antenna (Fig. 10) with scape 2.34-2.68 times as long as broad, its ventral plaque about 0.3 length of scape and placed about in the middle third; pedicellus plus flagellum 1.81 breadth of meso-scutum; with three anelli; pedicellus 1.33-1.75 as long as broad, slightly longer than F1; funicle proximally as wide as pedicellus, filiform or tapering very slightly distad; F1 0.63 as long as F2, 1.1 times as long as broad; F2 to F4 subequal in length, 1.83-2.0 as long as broad; clava 6 times as long as broad, 1.24 times longer than F3 plus F4; whorled setae moderately long, decreasing in length distally, those of F1 reaching tip of F3, that of C3 3.75 times longer than apical seta of terminal spine (Fig. 10, inset). Propodeum slightly longer than dorsellum. Gaster elliptic, 1.18 longer than thorax, 0.89 shorter than head plus thorax, 0.77 narrower than thorax, with ventral plica. Genitalia usually with two moderate-sized digital spines, but sometimes one digitus have three spines (Figs 12-13). Length 1.2-1.49 mm.



FIGS 6-8

Stepanovia rosae sp. n. (female). (6) Lateral view of body (paratype). (7) Fronto-lateral view of head (paratype). (8) Punctures on lower face near malar sulcus (holotype). Scale lines = 0.1 mm.



FIGS 9-12

Stepanovia rosae sp. n. (9) Dorsal view of gaster (holotype). (10) Male antenna. (11) Male genitalia. (12) Paramere, digitus and aedeagus. Scale lines = 0.01 mm for Fig. 12 and for inset of Fig. 10; for others = 0.1 mm.

HOST: Probably *Diplolepis rosae* (Hymenoptera, Cynipidae). More detailed information about relationships on the gall community of *D. rosae* is given in Todorov *et al.* (2012).

ETYMOLOGY: Named after the host plant.

DISCUSSION

Based on the generic diagnosis of *Stepanovia* given by Kostjukov (2004) and descriptions of species of the *aurantiacus* species group of genus *Aprostocetus* (after Graham, 1987), we can assume that the following species most likely belong to *Stepanovia*: *Aprostocetus lacunatus* Graham, 1987, *A. dauci* Graham, 1987, *A. grandii*

(Domenichini, 1966) and *A. deobensis* Graham, 1987. Further study of the type material and comparative morphological analyses will help to solve this problem.

The new species is closely related to *S. eurytomae* (Nees, 1834), but differs in having a different combination of characters (given in the key below, couplet 5).

KEY TO SPECIES

(Males of *aspectabilis* and *avetjanae* are unknown.)

- 1 Gaster 1.25-1.7 times as long as broad, short-ovate, acute but not acuminate, from about as long as thorax, to nearly as long as head plus thorax. Also with following combination of characters: antenna with F1 1.4-1.7 longer than broad; forewing 2.1 times as long as broad; M 3.8-4.2 ST; callus with 4-6 setae; propodeum as long as or slightly longer than dorsellum. Body black, with extremely weak bluish tinge, tibiae yellowish. Body length 1.1-1.6 mm (♀ ♀) *Stepanovia aurantiaca* (Ratzeburg, 1852)
- Gaster 2-3 times as long as broad, acuminate 2
- 2 Scape reaching at least level of median ocellus. Femora yellow or fuscous . . 3
- Scape not quite reaching level of median ocellus. Femora usually narrowly to broadly brownish or blackish proximally 4
- 3 POL 1.3 OOL. Scape reaching about level of vertex, 1.1-1.2 times longer than maximal diameter of eye; F1 1.5-1.6 times longer than pedicel, F1 3.4-3.9 times as long as broad, F2 3.4-3.7 times as long as broad, F3 2.7-2.9 times as long as broad; clava 3.8-4.2 times as long as broad; pedicellus plus flagellum 1.4 breadth of mesoscutum. Scutellum 1.2-1.25 times as long as broad; propodeum 1.3 times shorter than dorsellum; callus with 2 setae. Gaster 2.6-2.9 times longer than thorax; ovipositor sheaths plus postercala 1.1-1.2 length of hind tibia. Body black; length 2.1-2.5 mm (♀ ♀) *Stepanovia aspectabilis* Kostjukov, 1995
- POL 1.05-1.15 OOL. Scape reaching level of median ocellus, about as long as maximal diameter of eye; Pedicel 2.05-2.4 times as long as broad, slightly shorter than or as long as F1, F1 2.1-2.6 times as long as broad, F2 1.7-1.9 times as long as broad, F3 1.25-1.6 times as long as broad as long as broad; clava 2.7-2.9 times as long as broad. Scutellum 1.1-1.2 times as long as broad; propodeum medially about as long as dorsellum; callus with 2-3 setae. Gaster distinctly longer than thorax; ovipositor sheaths plus postercala 0.4-0.6 length of hind tibia. Body black, sometimes with extremely weak bluish tinge, with following parts yellow or yellowish: mouth edge, genae, face and frons, vertex, anterior angle and posterior part of mid lobe of mesoscutum and tegulae proximally. Body length: 2.1-2.4 mm (♀ ♀), 1.0-1.1 mm (♂ ♂) *Stepanovia kubanica* Kostjukov, 2009
- 4 POL about equal OOL. Scutellum as long as broad. Forewing 2.1 times as long as broad. Body length 2.2-2.6 mm (♀ ♀) *Stepanovia avetjanae* (Kostjukov, 1978)

- POL 1.3-1.5 OOL. Scutellum 1.1-1.26 as broad as long. Forewing 2.2-2.33 times as long as broad. Body length 1.1-2.5 mm (♀ ♀) 5
5. POL about 1.31-1.43 OOL, OOL 2.0-2.33 OD. Female: pedicellus 1.81-1.84 times as long as broad, 0.79-0.82 as long as F1, clava 2.14-2.4 times as long as broad, gaster lanceolate, 2.8-4 times as long as broad, ovipositor sheaths plus postcercale 0.66-0.69 length of hind tibia, sheaths 1.0-1.14 length of postcercale. Head blackish with U-shaped yellow stripe on lower face, gaster entirely brownish. Male antenna with ventral plaque situated about in middle third of scape. Body length: 1.5-2.2 mm (♀ ♀), 1.2-1.5 mm (♂ ♂) *Stepanovia rosae* sp. n.
- POL 1.5 OOL, OOL 1.5 times OD. Female: pedicellus 2.1-2.4 times as long as broad, slightly shorter than or as long as F1, clava 2.7-2.8 times as long as broad, gaster elongate-ovate to sublanceolate, 2.0-2.6 times as long as broad, ovipositor sheaths plus postcercale 0.4-0.55 length of hind tibia, sheaths 0.5-0.8 length of postcercale. Head blackish with at most mouth edge pale, gaster dorsally reddish at base (sometimes up to the middle of its length), ventrally more or less yellowish. Male antenna with ventral plaque situated hardly above middle of scape. Body length: 1.1-2.5 mm (♀ ♀), 1.0-1.5 mm (♂ ♂) *Stepanovia eurytomae* (Nees, 1834)

ACKNOWLEDGEMENTS

We thank referees Dr. J. La Salle (The Atlas of Living Australia, Canberra, Australia) and Dr. Z. Yefremova (Department of Zoology, Ul'yanovsk State Pedagogical University, Ul'yanovsk, Russia) for critical reading and useful remarks, to Dr. A. Stojanova (Department of Zoology, University of Plovdiv, Plovdiv, Bulgaria) for her help in preparing the manuscript, and to Dr. P. Mitov and Dr. B. Zlatkov (Department of Zoology and Anthropology, Faculty of Biology, University of Sofia, Bulgaria) for their help in preparing of some images.

This research was done with the support of project "CEBDER" (financed by the National Science Fund at the Ministry of Education, Youth and Science of the Republic of Bulgaria).

REFERENCES

- BOYADZHIEV, P., GETCHEV, T. & DONEV, A. 2012. A universal microscope manipulator. *Revista Brasileira de Entomologia* 56(1): 125-129.
- EFREMOVA, Z. 1996. The ovipositor of Eulophinae (Hymenoptera, Eulophidae), its evolution and taxonomic significance. *Entomologicheskoe Obozrenie* 75(4): 888-902.
- GRAHAM, M. W. R. DE V. 1987. A reclassification of the European Tetrastichinae (Hymenoptera: Eulophidae), with a revision of certain genera. *Bulletin of the British Museum (Natural History) (Entomology)* 55(1): 1-392.
- GIBSON, G. A. P. 1997. Chapter 2. Morphology and terminology (pp. 16-44). In: GIBSON, G. A. P., HUBER, J. T. & WOOLLEY, J. B. (eds). Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera). *NRC Research Press, Ottawa, Ontario, Canada*, 794 pp.
- KOSTJUKOV, V. V. 2004. About status of the genus *Aprostocetus* Westwood, 1833 (Hymenoptera, Eulophidae, Tetrastichinae), with description of *Stepanovia*, gen. n. In: NADIKTI, V. D., ISMAILOVA, V.Y., LEVASHOVA, G.I. & SUGONJAEV, E.S. (eds). *Biologicheskaya Zashchita rasteniy – osnova stabilizatsii agrozkosistem, Krasnodar* 1: 36-44.

- KOSTJUKOV, V. V., GOKHMAN, V. E. & MIKHAILENKO, A. P. 2009. Description and karyotype of a new species of *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae). *Russian Entomological Journal* 17(4): 413-415.
- NOYES, J. S. 2013. Universal Chalcidoidea Database, World Wide Web electronic publication. *The Natural History Museum, London*. <http://www.nhm.ac.uk/chalcidoids>
- TODOROV, I., STOJANOVA, A., PARVANOV, D. & BOYADZHIEV, P. 2012. Studies on the gall community of *Diplolepis rosae* (Hymenoptera: Cynipidae) in Vitosha Mountain, Bulgaria. *Acta zoologica bulgarica*, Supplementum 4: 27-37.

***Bryocamptus (Bryocamptus) gauthieri* (Roy, 1924):
a Mediterranean edaphic specialist
(Crustacea: Copepoda: Harpacticoida)**

Frank FIERS

Royal Belgian Institute of Natural Sciences, Vautierstraat 29, B-1000 Brussels,
Belgium (current address) and “Emil Racoviță” Institute of Speology, Clinicilor 5,
P.O. Box 58, 400006 Cluj-Napoca, Romania.

E-mail: frank.fiers@naturalsciences.be

***Bryocamptus (Bryocamptus) gauthieri* (Roy, 1924): a Mediterranean edaphic specialist (Crustacea: Copepoda: Harpacticoida).** - *Bryocamptus (Bryocamptus) gauthieri* (Roy, 1924), previously known from two localities in the Maghreb only, is now reported from several localities in the East-Mediterranean region: Lebanon, Cyprus and Greece. The specimens were found in material from Berlese extractions of soil samples and moss. The type material appears to be lost, but specimens assumed to originate from the initial collection were located in the Chappuis collection at Cluj (Romania). *B. gauthieri* is redescribed and the original description is corrected and amended. The variability of the leg armature and ornamentation is emphasized. Within the current systematic outline of the genus *Bryocamptus* s. str., *B. gauthieri* takes an intermediary position between the *pygmaeus* and the *typhlops* species sub-groups.

Keywords: Canthocamptidae - redescription - variability - Berlese extractions - Algeria - Lebanon - Cyprus - Greece.

INTRODUCTION

Despite the many contributions to the continental copepod fauna of the Mediterranean region (see references in Dussart & Defaye, 1990; Ustaoglu, 2004) and of North-Africa in particular (Mouelhi *et al.*, 2000), *Bryocamptus (Bryocamptus) gauthieri* is known from two localities only: Baba-Ali near Algiers (Algeria), the type locality, and Azrou in Morocco (Kiefer, 1928). The narrow known geographical distribution, confined to the Maghreb, and the apparent absence of records of the species in other Mediterranean subregions tempted to conjecture *B. gauthieri* as a species endemic to the Atlas Mountain region (Dumont, 1979).

In the course of a study on copepods extracted from soil samples and preserved at the Natural History Museum of Geneva (Switzerland), specimens of *B. gauthieri* were identified in a number of soil samples gathered in Lebanon, Cyprus and Greece. All but one sample examined came from leaf litter samples (hemi-epidaphic). In one case were specimens extracted from mosses and thus found in circumstances comparable with the previous reports.

The material examined is compared with specimens which are assumed to originate from the original series studied by Roy and now kept in the collection of P. A. Chappuis, hosted at the "Emil Racoviță" Institute of Speleology in Cluj (Romania). Although the original description is well documented, the exact nature of several details of leg armature and ornament remained vague and confusing. The present re-description of *Bryocamptus gauthieri* clarifies these uncertainties and visualizes the considerable variability of the setal armature of certain legs within and between different populations.

METHODS

Animals from hand collected samples of the upper layers of the soil (epi- and hemi-epidaphic layers) were extracted in Berlese funnels. Extraction was performed either during the field campaigns or at the MHNG. Copepods found in the extractions were preserved in 75% ethyl alcohol. Specimens were mounted in glycerol for examination, dissected ones on permanent slides, whole specimens on temporary slides. The latter afterwards preserved in an ethyl alcohol-glycerol mixture. Specimens from Lebanon, Greece and Cyprus are deposited in the collections of the MHNG, the specimens from Algiers are preserved at the "Emil Racoviță" Institute of Speleology at Cluj (Romania). Systematics of the genus *Bryocamptus* Chappuis, 1928 followed herein is in accordance with the outline presented in Wells (2007). Abbreviations used: Aesth, aesthetasc; Apo, apophysis; EXO, END, exopodite, endopodite, respectively; MHNG, Natural History Museum of Geneva, Switzerland

SYSTEMATIC PART

Family Canthocamptidae Brady, 1880

Bryocamptus (Bryocamptus) gauthieri (Roy, 1924)

Figs 1-6

Canthocamptus Gauthieri - Roy, 1924: 461-468, figs 1-19.

Canthocamptus Gauthieri Roy, 1924 - Roy & Gauthier, 1927: 571; Kiefer, 1928: 90, 91, 107; Chappuis, 1928: 127 [key].

Bryocamptus Gauthieri Roy, 1924 [sic] - Rose & Vaissière, 1952: 134.

Bryocamptus (s. str.) *Gauthieri* (Roy, 1924) - Chappuis, 1929a: 44; Chappuis, 1929b: 479.

Bryocamptus (Bryocamptus) gauthieri (Roy, 1924) - Chappuis, 1944: 385, 390-391 [key]; Lang, 1948: 1064-1065 [key], 1084, fig. 431(1); Wells, 2007: 46, 294, 295 [key].

Bryocamptus (Rheocamptus) gauthieri (Roy, 1924) - Borutzky, 1952: 172, 199 [key]; Borutzky, 1964: 154, 180-181 [key]; Dussart & Defaye, 1990: 160; Mouelhi *et al.*, 2000: 740.

TYPE LOCALITY: Algeria, Baba-Ali, south of Algiers; among humid moss (Roy, 1924).

MATERIAL EXAMINED: (1) Lebanon. Sieving of roots and leaf litter collected at the bottom of a rock wall in a small oak forest near the mouth of the river Nahr Damour; leg. Cl. Besuchet, 4 April 1975 (sample Lebanon 17c, Berlese extraction at MHNG): 8♀, 2♂ (2♀, 1♂ dissected, remaining specimens preserved);

(2) Cyprus. Besparmaklar (= Pentadactylos), Daglari chain, east of Kantara Castle, in residue of sieved mosses, leg. S. Vit, 11 April 1998 (sample Chypre 98-12B): 2♀, 1♂ (1♀ dissected, remaining specimens preserved);

(3) Cyprus. Besparmaklar (= Pentadactylos), Daglari chain, along route east of Buffaventa Castle, depression at 600 m a.s.l., among *Certatria* leaf litter, leg. S. Vit, 13 April 1998 (sample Chypre 98 17B): 3♀, 1 copepodid (1♀ dissected, remaining specimens preserved);

- (4) Cyprus. Besparmaklar (= Pezntadactylos), Daglari chain, east of Kantara Castle, leaf litter below *Arbutus* hedge row, leg. S. Vit, 10 April 1998 (sample Chypre 118): 1 ♀ (preserved undissected);
- (5) Greece, Samos (Island). Along route Platanakia (east of Aghios Konstantinos) to Manolates, "Nightingale" valley below Manolates, forest along brook along road, 80 m a.s.l., soil sample from inside hollow *Platanus*, leg. B. Hauser, 26 November 1991 (sample ZS-91/61, Berlese extraction at MHNG): 1 ♀, 1 copepodid (♀ dissected, copepodid preserved);
- (6) Greece, Epiru. Near Meniaion (south of Arta in Epirus region), sieved remnants of maquis litter collected in a humid canyon, leg. S. Vit, 29 March 1978 (sample Greece 12): 1 ♀, 1 copepodid (both preserved).

Specimens featuring in Roy's (1924) description are not available anymore (Defaye, *in litt.* Aug. 2012). Neither are any voucher specimens left that were identified by Kiefer (1928) in the samples obtained at Azrou (Franke, 1989; pers. obs. in 2008). Two slides labelled "*C. gauthieri* Algiers" with a female and a male specimen, respectively, and a vial labelled "*C. gauthieri* Roy" containing 6 ♀ and 3 ♂, were localized in the Chappuis collection at Cluj (Romania). It is assumed that these specimens originate from the series examined by Roy and were obtained by Chappuis in the course of his revision of the Canthocamptidae (Chappuis, 1929a,b). Unfortunately, no formal confirmation of an exchange between Roy and Chappuis is available (neither in Cluj, pers. obs., nor in Paris, D. Defaye, *in litt.*). The status of the specimens cannot be ascertained, but they are highly eligible to be the syntypes because in the process of evaluating and cataloguing the Chappuis collection at Cluj it became apparent that a lively exchange between Chappuis and his colleagues existed.

The following description is primarily based on examination of the material from Lebanon. Variability observed within the Lebanese population and among the specimens from other localities is dealt with where appropriate. Particularities observed in the specimens from the Chappuis collection (hereafter indicated: Algiers) are emphasized and illustrated separately.

DESCRIPTION: *Female*. Habitus (Fig. 1A): body fusiform in dorsal view; prosome and urosome equally long, with distinct principal body articulation; cephalothorax rather short, less long than metasome, with dorso-median keyhole-shaped integumental window; metasomites without lateral integumental windows; integument of cephalothorax and metasomites devoid of integumental ornamentation; hyaline fringes of cephalothorax and pedigerous somites straight, of genital double-somite and urosomites 4-5 minutely indented; body length 450-470 µm (Algiers 370-435 µm).

Genital double-somite (Fig. 2A) approximately 1.3 times wider than long, with divergent lateral margins and faint medial constriction; without remnants of ancestral subdivision; integument smooth except for postero-lateral row of narrow spinules; number of spinules variable, ranging between 4 and 15, often unequal in number on either side of a specimen (see arrows in Fig. 1D); postero-ventral margin (Fig. 2A) and ventral half of postero-lateral margin (Fig. 1D) of urosomites 4 and 15 set with long spinules, interrupted mid-ventrally on urosomite 4, uninterrupted on urosomite 5; anal somite without ornamentation along postero-dorsal border; postero-lateral and postero-ventral border with spinules, both series well separated from each other by distinct gap; medial spinules of postero-ventral series shortest; anal operculum with smooth cres-

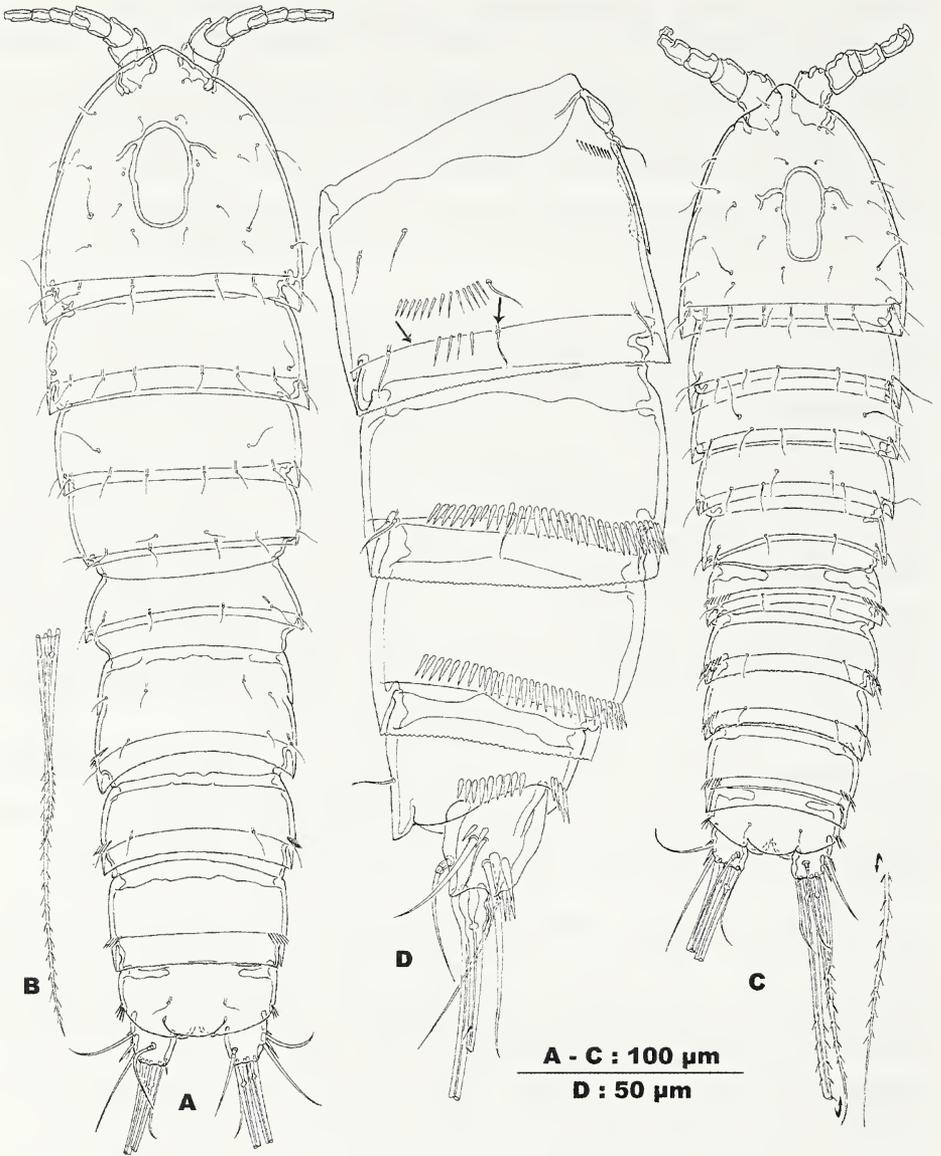


FIG. 1

Bryocamptus (B.) gauthieri (Roy, 1924); Lebanese specimens. (A) Female habitus, dorsal view. (B) Principal setae of caudal rami. (C) Male habitus, dorsal view. (D) Female abdomen, lateral view (alternative spinule ornamentation on genital double-somite inserted, see arrows).

centic border, moderately expanded, but not reaching beyond caudal margin of anal sinus; dorsal surface of anal operculum smooth.

Caudal rami (Figs 1A, D, 2A, 6A, B) sub-rectangular, about 1.25 times longer than wide, without particular modifications on dorsal surface; both antero-lateral setae

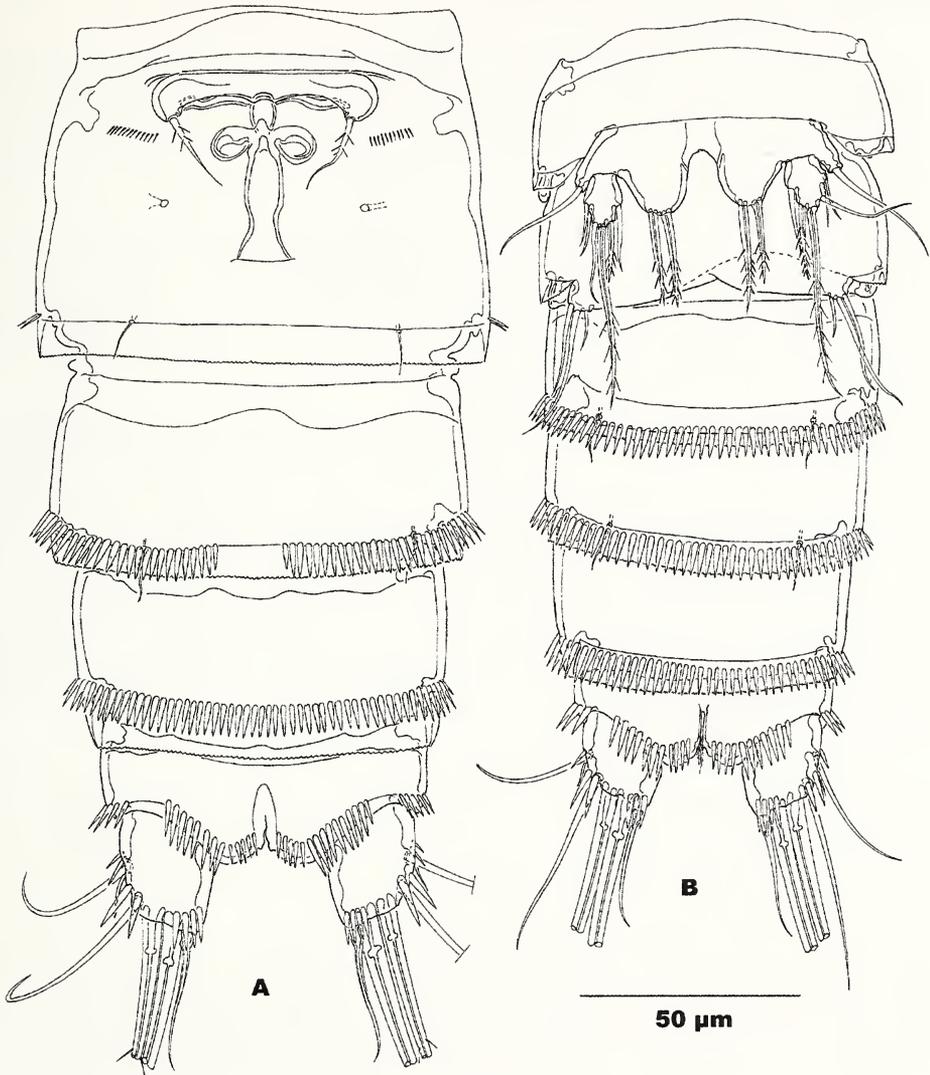


FIG. 2

Bryocamptus (B.) gauthieri (Roy, 1924); Lebanese specimens. (A) Female abdomen, ventral view. (B) Male urosome, ventral view.

inserted half-way on outer margin, accompanied with 2 minute spinules near insertion; postero-lateral seta inserted close to outer distal corner, distinctly longer (about 1.4-1.5 times) than longest antero-lateral one, and accompanied with 2 large spinules near insertion; principal terminal setae with breaking plane and ornamented with short and stiff hairs; outer terminal seta half as long as inner one; medial seta longer (about 1.5 times) than ramus, with short cylindrical expanded proximal part and inserted on

inner ventro-medial edge of ramus; insertion and expansion of medial element hidden behind 4-5 large spinules; dorsal seta articulating on short basal part.

Antennule (Figs 3A, 6C): 8-segmented, with following armature (proximal to distal segment): 1(1)-2(9)-3(6)-4(2+Aesth)-5(2)-6(3)-7(2)-8(7+Aesth); principal aesthetasac (on segment 4) wide, linguiform and reaching distal margin of segment 7; terminal aesthetasc slender, tubiform and about 1.5 times longer than segment 8; integument of segments smooth except for short spinule row in proximal half of frontally directed margin of segment 1.

Antenna (Fig. 3B, C): coxal pedestal large and naked; allobasis with 2 abexopodal setae and 2-segmented exopodite; endopodite segment with 3 lateral elements (2 spines, 1 seta) and 6 terminal ones (2 spines, 3 geniculate seta, 1 dwarfed seta); abexopodal margin of endopodite segment with 3-4 robust spinules; exopodite with 1 and 3 setae on proximal and distal segment, respectively; spinules near articulation between proximal and distal segment present.

Mandible (Fig. 3D): gnathobasis with multi-cuspidate teeth; palp one-segmented, cylindrical, twice as long as wide and bearing 2 terminal setae. Maxillule (Fig. 3E): arthrite with 6 median spines, 2 lateral setae, and 2 long narrow surface elements; coxal endite with 2 medial elements; basis with 2 medial and 2 subterminal setae; rami obsolete, represented by 3 setae; integument of maxillule naked. Maxille (Fig. 3F): syncoxal endites cylindrical, bearing 3 distal elements (1 with long setules along stem); basis claw-shaped, with few weak teeth and 2 setae; endopodite vestigial, represented by 3 setae. Maxilliped (Fig. 3G): syncoxa with short medial tuft of spinules and single medial pinnate element; medial margin of basis set with comb of rigid spinules; outer margin of basis with 3 clusters of spinules; claw serrate in distal half and accompanied with slender seta.

Leg 1 (Figs 4A, B, 6D): intercoxal sclerite wide, naked, with concave distal border; coxa with frontal and caudal combs of spinules; basis with ornamentation on frontal surface only; outer and inner element on basis spiniform, both with terminal flagellum; outer element naked, medial one serrate; exopodite 3-segmented, endopodite 2-segmented; armature distribution given in Table 1; endopodite, composed of two equally long segments, reaching only half-way terminal exopodite segment; medial element on second exopodite segment long and pectinate; terminal medial elements on third exopodite segment geniculated; proximal endopodite segment with or without medial spinule and lacking medial element; medial margin of distal endopodite segment with one or two medial spinules, terminal claw moderately long.

Legs 2-4 (Figs 4C, 5A, 5G, respectively): pre-coxal fold unadorned; intercoxal sclerite with narrow crescentic depression mid-distally; coxa and basis with row of spinules near outer frontal border, with additional spinule row near medial frontal border in leg 2 (Fig. 4C); outer element on basis of leg 2 spiniform with terminal flagellum; outer element on basis of legs 3 and 4 setiform; exopodites 3-segmented, endopodites 2-segmented; armature distribution given in Table 1; medial element(s) on second and third exopodite segment in each leg pectinate; leg 2 endopodite reaching beyond articulation between second and third exopodite segment, leg 3 and leg 4 endopodites shorter; leg 2 with variable armature and ornamentation: proximal segment either with (Fig. 4I, J) or without seta (Figs 4C, E-H, K, 6F), with (Figs 4C-H, 6F) or without (Fig. 4H-J) medial spinule; distal segment with 2 medial short setae (Fig. 4C,

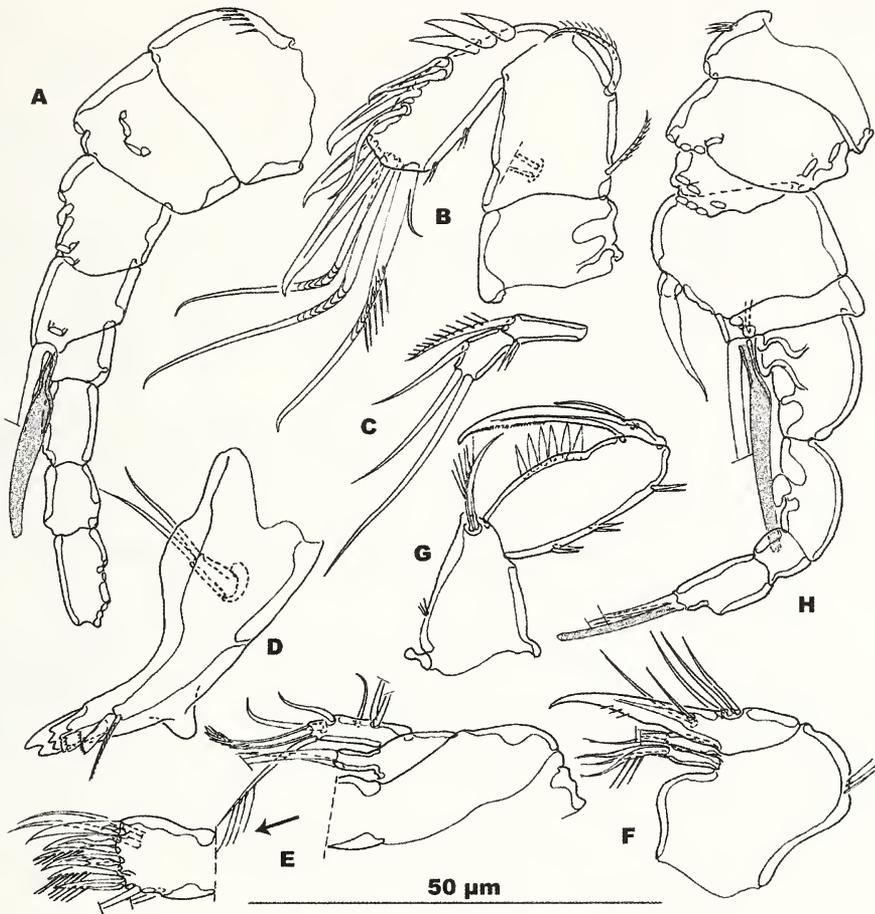


FIG. 3

Bryocamptus (B.) gauthieri (Roy, 1924); female (A-G), male (H); Cypriot specimens (E-F), Lebanese specimens (A-D, G-H). (A) Antennule contour with principal aesthetasc, ventral view. (B) Antenna, inner view, exopodite omitted. (C) Antennary exopodite. (D) Mandible. (E) Maxillule (precoxal arthrite detached). (F) Maxille. (G) Maxilliped. (H) Antennule contour with aesthetascs and modified seta on segment 4, ventral view.

6F) or 2 dwarfed elements (Fig. 4K), 1 normal seta (Fig. 4E, H) or 1 dwarfed one (Fig. 4F, J), or without armature (Fig. 4G, I) and a variable (from 0 to 2) number of spinules; leg 3 endopodite generally with medial seta on proximal segment (Figs 5A-C, E-F, 6G) rarely without (Fig. 5D); distal leg 3 endopodite segment with 2 medial elements, inserted in distal third of medial margin (Figs 5A-C, F-E, 6G), rarely widely separated from each other (Fig. 5D); proximal endopodite segment of leg 4 short and narrow; inner armature element on second endopodite segment long and pectinate: apical setae long, outer one shorter than inner one; leg 4 endopodite (Figs 5G, 6E) slender, with spinule in distal half of outer margin of distal segment, unadorned along medial margin.

TABLE 1. Leg armature distribution.

	EXO ♀ and ♂	END ♀	END ♂
Leg 1	I,0 - I,1 - II,2,0	0,0 - I,1,1	idem
Leg 2	I,0 - I,1 - II,2,1	0,0/0,1 - I,2,0/I,2,1/I,2,2	0,0 - 0,2,0
Leg 3	I,0 - I,1 - II,2,2	0,0/0,1 - I,2,2	0,1 - Apo - 0,2,0
Leg 4	I,0 - I,0 - II,2,2	0,0 - I,2,1	0,0 - 0,2,0

Leg 5 (Fig. 5J, K): baseoendopodite prominent, reaching beyond exopodite, bearing 6 setae on linguiform expanded endopodite lobe; distal margin of baseoendopodite with 3 blunt expansions along caudal border (see Fig. 5J); exopodite ovate, 1.5 times longer than wide, bearing 5 elements; setae on both rami sparsely pinnate, except for smooth outer distal seta of exopodite segment; surface of segments smooth; intercoxal sclerite well defined, with convex distal margin.

Leg 6 (Fig. 2A): vestige slightly protruded caudally, bearing single long, sparsely pinnate element; remnants of both medial traces minute, hardly discernable, with hyaline appearance; surface of vestige smooth; lateral combs of spinules near leg 6 vestige present; genital complex with long and wide, caudally directed copulatory funnel with entrance mid-ventrally in caudal third of genital double-somite; pore orifice at each side of copulatory funnel, situated half-way funnel length.

Male. Habitus (Fig. 1C): body fusiform in dorsal view, with obvious principal body articulation; length 355-360 μm (Algiers 295-300 μm), widest near posterior margin of cephalothorax; medio-dorsal integumental window on cephalothorax less wide than in female; integument of prosomites and first urosomite devoid of ornamentation, hyaline fringes straight; urosomites 2-5 with serrate hyaline fringe; urosomite 2 (leg 6 pediger) with short dorsolateral spinule row along posterior border (visible in dorsal and lateral view only); urosomites 3-5 with uninterrupted row of spinules along postero-dorsal and postero-lateral margin (Fig. 2B); anal somite (incl. operculum) and caudal rami as in the female.

Antennule (Fig. 3H): 9-segmented, haplocer, with first and second segment as in female (bearing 1 and 9 setae, respectively); segment 4 with robust, inflated and unarmed mid-lateral element on inner side; principal aesthetasc wide and linguiform, fused with seta at basis; terminal aesthetasc slender, tubiform and little longer than terminal segment; inner margin of segments 5-6 with large ovate cushion-shaped elements; penultimate and ultimate segment unmodified; exact armature number on segments 3-7 not observed (broken or clustered and covered by dirt). Mouthparts as in female.

Leg 1 as in female; protopodite and exopodite of legs 2-4 as in female; proximal endopodite segment of leg 2 (Fig. 4D) with medial spinule, lacking medial element; distal segment tapering apically, with pore orifice in proximal half of medial border (associated with a spinule), and subapically on outer margin; terminal elements setiform; leg 3 endopodite 3-segmented (Fig. 5H); proximal segment short, with medial seta; middle segment with long (2.5 times longer than terminal segment length), nearly straight apophysis; tip of apophysis half-arrow-shaped; third segment rather long (3-3.5 times longer than wide), with subdistal depression (with short tubular pore

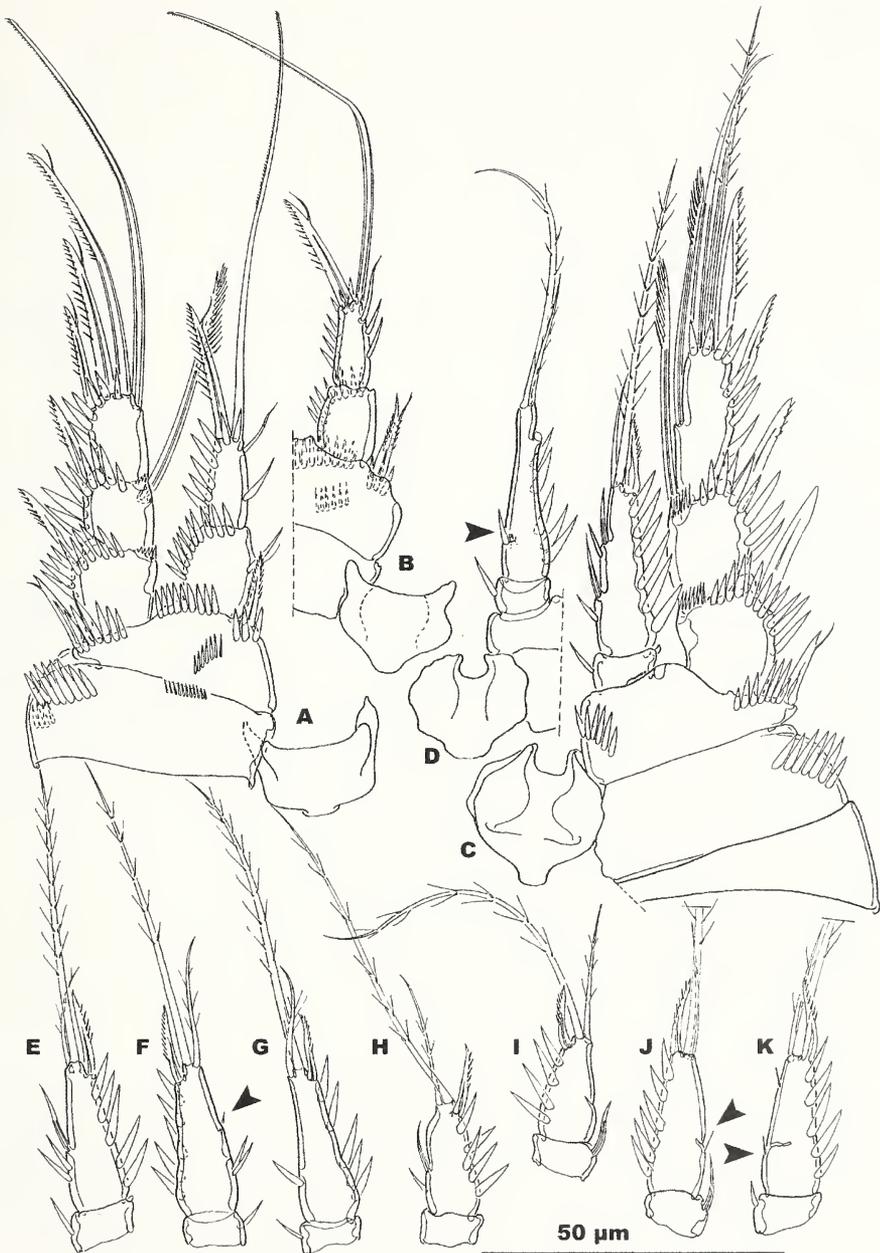


FIG. 4

Bryocamptus (B.) gauthieri (Roy, 1924); female (A, C, E-K), male (B, D); Lebanese specimens (A-G); Cypriot specimens (H-K). (A) Leg 1, frontal view. (B) Leg 1, medial region, caudal view. (C) Leg 2, frontal view. (D) Leg 2, medial region, caudal view. (E-K) Leg 2 endopodite variability in Lebanese specimens (E-G) and Cypriot specimens (H-K).

orifice), and 2 pinnate apical setae; leg 4 endopodite (Fig. 5I) shorter than in female, its second segment with 2 stiff terminal elements (outer one shorter than inner one) and with a single spinule in distal half of outer margin.

Leg 5 (Fig. 2B): opposite legs confluent midventrally; endopodite lobe prominent, linguiform, bearing 2 distal elements; endopodite spines either equally long, or medial one slightly longer than outer one; exopodite 1.5 times longer than wide, reaching beyond endopodite lobe, bearing 6 elements: 2 medial, 2 apical and 2 outer ones; outer apical and outer lateral ones smooth, inner apical and medial ones pinnate; integument of both rami naked.

Leg 6 (Fig. 2B): left one functional, right one not; both with 3 elements: outer and middle one long, medial one short (about 1/3 of middle one); surface of valves smooth.

VARIABILITY: The body length of most specimens from Algiers appears to be considerably shorter than that of animals from the other localities. The Algerian specimens are, however, compacted probably as a result of fixation. Roy (1924) already noted the wide range of the body lengths (0.40-0.62 mm for females, 0.36-0.53 mm for males) in the original sample.

Ornamentation of the urosomal somites observed is consistent with the pattern given in the original description. The spinule row along the posterolateral margin of the genital double-somite in the female may be composed of only a few spinules, but is in most cases a well defined row with up to 15 spinules present. The anal operculum of all specimens examined, including those from Algiers, is devoid of ornamentation on the dorsal surface (except for the usual pair of sensilla). The transverse rows of spinules (1 in the female, 2 in the male) emphasized in the original description are in reality located along the border of the anal sinus at the ventral surface of the operculum and are visible depending on the transparency of the anal operculum. The presence of anal operculum ornamentation has been used as a diagnostic feature (Lang, 1948; Borutzky, 1952, 1964) but that has to be ignored. Adornment of the endopodite segments of legs 1-4 shows variability and may be different on both sides of the same pair of legs. Variation is particularly noticeable on the medial margin of the endopodite segments on which spinules may be present. In most cases, however, the medial margin is unadorned.

The variation of the endopodite armature of leg 2, and to a lesser degree of leg 3, is summarized in Table 1. The armature of leg 1 and leg 4, as well as the structure and setal armament of leg 5, appear to be constant, but whereas the armature of legs 4 and 5 coincide completely with the original description, that of leg 1 differs in the absence of an inner distal element on the proximal endopodite segment. Roy (1924) clearly mentioned the presence of a seta and illustrated a strikingly short and filiform structure arising from the medial distal corner of the segment. The uncommon nature of this structure, compared to the habitual morphology of this element in other species of the genus, has been noticed by Lang (1948: 910: footnote to tab. 16). Moreover, the extreme distal insertion of this structure as illustrated by Roy is odd and is in contradiction to the habitual subdistal position of a medial element. Lang's remark, the aberrant position and the fact that a comparable structure has not been observed among

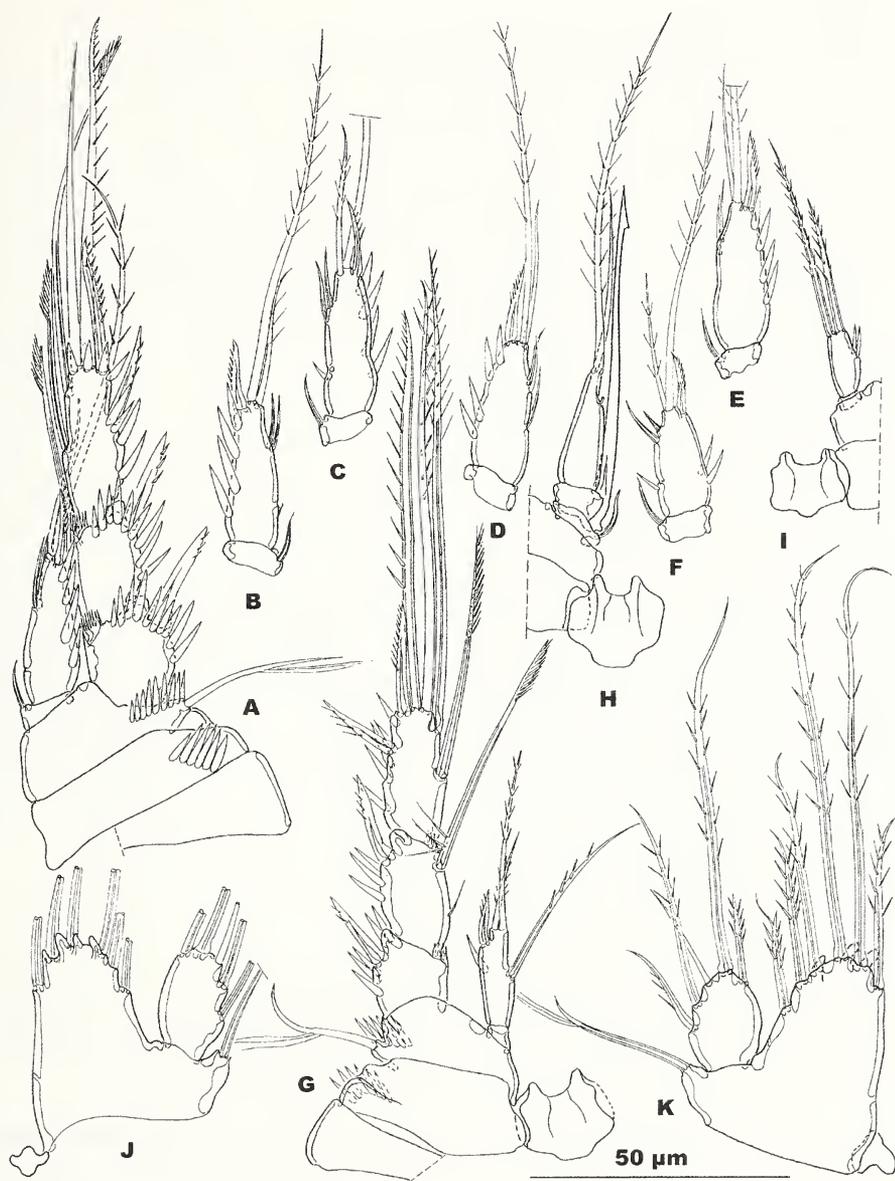


FIG. 5

Bryocamptus (B.) gauthieri (Roy, 1924); female (A-G, J-K), male (H-I); Lebanese specimens (A-C, G-I, J), Cypriot specimens (D-F, K). (A) Leg 3, frontal view. (B-F) Leg 3 endopodite variability in Lebanese specimens (B-C) and Cypriot specimens (D-F). (G) Leg 4, caudal view. (H) Leg 3 medial part, frontal view. (I) Leg 4 medial region, frontal view. (J) Leg 5 contour, caudal view. (K) Leg 5, frontal view.

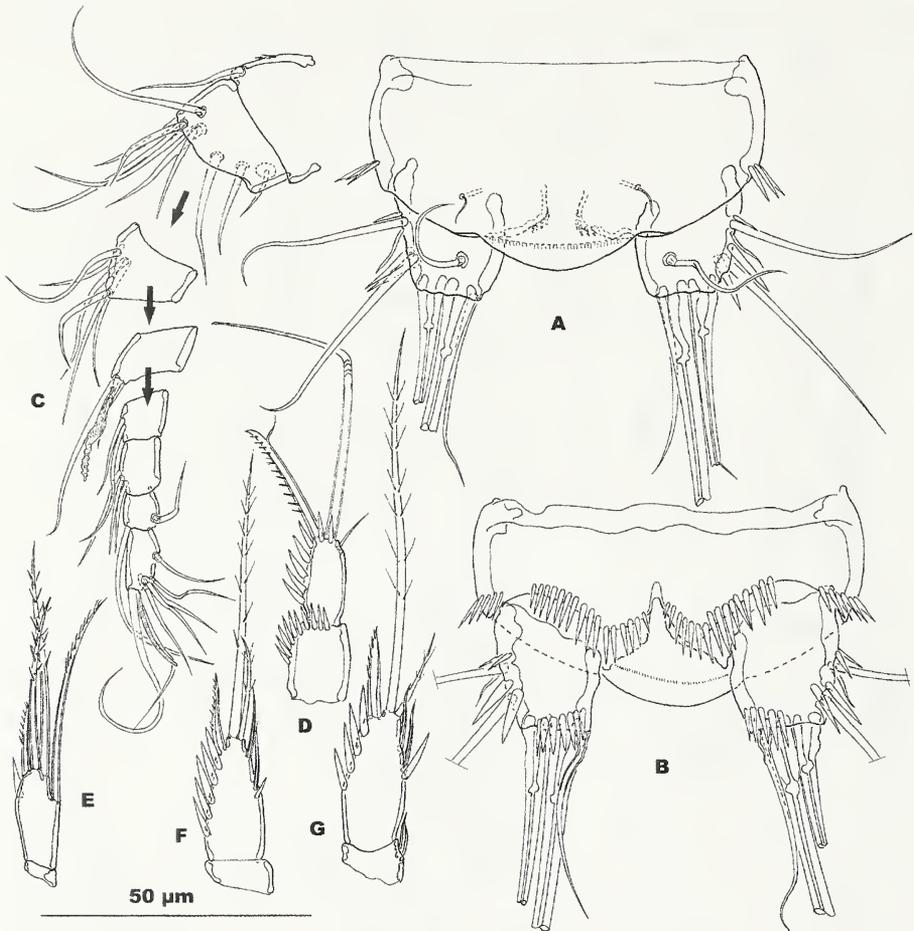


FIG. 6

Bryocamptus (B.) gauthieri (Roy, 1924), female specimen from Algiers from Chappuis collection. (A) Anal somite and caudal rami, dorsal view. (B) Idem, ventral view. (C) Antennule, partially exploded, ventral view. (D) Leg 1 endopodite, frontal view. (E) Leg 4 endopodite, caudal view. (F) Leg 2 endopodite, frontal view. (G) Leg 3 endopodite, frontal view.

the specimens examined indicate that the leg 1 endopodite of *B. gauthieri* lacks a medial armature element. The structure described by Roy is either a spinule or is based on an erroneous observation.

One female from Algiers has an aberrant antennule in which segments 4-8 are deformed into a single short square segment bearing a few setae and a terminal aesthetasc. Segments 1-3 possess a normal morphology and setal armature. The principal aesthetascs on the female antennules of some Algerian specimens are shorter (reaching only the distal margin of segment 6) and less wide than those observed in the other populations. The irregular and undulated shape in the distal half of the aesthetascs (Fig. 6C) is presumably due to fixation.

DISCUSSION

Continental canthocamptids are notorious for morphological variability of body ornamentation and leg armament. The current controversial generic and subgeneric division of the family, and in particular that of the genus *Bryocamptus*, is undoubtedly a consequence of that (Wells, 2007). The addition of several new species described on the basis of a limited number of specimens from a single locality appears to be inappropriate (Cottarelli *et al.*, 2012). Re-examination, when possible, of type material and observations on additional material is a fundamental requisite to initiate a sound phylogenetic analysis of the continental canthocamptids (Hamond, 1987; Wells, 2007). In the present contribution *B. gauthieri* is assigned to the subgenus *Bryocamptus* *sensu* Lang, 1948 and in accordance with the systematic outline of the genus in Wells (2007). *B. gauthieri* is a member of the *pygmaeus*-group (Lang, 1948). Together with *B. stillae* Cottarelli *et al.*, 2012, *B. gauthieri* takes an intermediary position between the “*B. pygmaeus*” sub-group [with *B. pygmaeus* (Sars, 1863), *B. subarcticus* (Willey, 1925), *B. dentatus* Chappuis, 1937, *B. balcanicus* Petkovski, 1956] and the “*B. typhlops*” sub-group [with *B. typhlops* (Mrázek, 1893), *B. weberi* (Kessler, 1914), *B. tauricus* Borutzky, 1930, *B. unisaetosus* Kiefer, 1930, *B. aquaductus* Borutzky, 1934, *B. pirogos* Apostolov, 1969, *B. borus* Karanovic & Bobic, 1998]. *B. gauthieri* and *B. stillae* are characterized by their 2-segmented leg 4 endopodite and the absence of an armature element on the proximal segment of the leg 1 endopodite. They differ from the *pygmaeus* sub-group which is characterized by their 2-segmented leg 4 endopodite and the presence of an armature element on the proximal segment of the leg 1 endopodite. The *typhlops* sub-group, in contrast, has a 1-segmented leg 4 endopodite and lacks the medial element on the proximal endopodite segment of leg 1. Whether the sub-grouping mirrors the phylogenetic relationships of this branch of the genus *Bryocamptus* remains to be clarified.

Among soil inhabitants, harpacticoid copepods belong to the lower compartment of the body size category “mesofauna” (Bardgett, 2005) but are seldom mentioned in studies of soil fauna. Although numerous reports of copepods living among mosses and in leaf litter carpets have been published (Fiers & Ghenne, 2000; Reid, 2001; and references therein) their presence is generally conceived by limnologists and soil biologists as a coincidence.

Various methods have been developed to extract the biological component from soil samples (Murphy, 1962). The animals studied herein have been extracted by a dry funnel method (Berlese extraction) in which the effects of desiccation and temperature require the active migration of the animals as a reaction to the repellent stimuli. This technique is in general successful to extract the larger part of the biotic soil component (Acari, Collembola, etc.) but appears to be less efficient for others (i.e. Enchytraeidae, Protura, the microfauna, etc.). Apparently copepods belong to the second group and the very few encountered in extractions are statistically insignificant, thus ignored in diversity analyses of soil biota. Certain soil types, however, may harbour considerable numbers of copepods (up to 3% of all specimens: Battigelli *et al.*, 1992).

The fact that *B. gauthieri* was never reported from lentic or lotic systems but solely from moss and leaf litter carpets, and taking in consideration that the species

shows a much wider distribution area than previously anticipated, are both strong indications that *B. gauthieri* as a canthocamptid is particularly well adapted to moist edaphic habitats.

ACKNOWLEDGEMENTS

I am most indebted to Dr. Peter J. Schwendinger and Dr. Bernd Hauser, curators of the Department of Arthropodology and Entomology (I) of the Museum of Natural History of Geneva, for giving me the possibility to study the rich and diverse collection of copepods from Berlese extractions, and to Dr. Diana M. P. Galassi (University of l'Aquila, Italy) for her constructive review.

REFERENCES

- APOSTOLOV, A. 1969. Copepoda Harpacticoida von Bulgarien. *Crustaceana* 16: 311-320.
- BARGETT, R. D. 2005. The biology of soil. A community and ecosystem approach. *Oxford University Press Inc., New York*, 242 pp.
- BATTIGELLI, J. P., BERCH, S. M. & MARSHALL, V. 1992. Soil fauna communities in Cedar-Hemlock and Hemlock-Amabilis fir forest types on northern Vancouver Island, B.C. *Northwestern Environmental Journal* 8: 213-214.
- BORUTZKY, V. E. 1930. Material zur Fauna der unterirdischen Gewässer. *Bryocamptus tauricus* sp. n. (Copepoda - Harpacticoida). *Zoologischer Anzeiger* 88: 154-157.
- BORUTZKY, V. E. 1934. Zur Harpacticoidenfauna des Kaukasus. *Zoologischer Anzeiger* 107: 263-269.
- BORUTZKY, V. E. 1952. Fauna of U.S.S.R. Crustacea 3(4). Freshwater Harpacticoida. *Academy of Sciences of the U.S.S.R., Moscow-Leningrad*, 425 pp. [in Russian].
- BORUTZKY, V. E. 1964. Fauna of U.S.S.R. Crustacea 3(4). Freshwater Harpacticoida. *Academy of Sciences of the U.S.S.R., Moscow-Leningrad*, 396 pp. [English translation, 1964, Israel Program for Scientific Translation.]
- BRADY, G. S. 1880. Free and semi-free Copepoda of the British Islands, Vol. II. *The Ray Society, London*, 182 pp.
- CHAPPUIS, P. A. 1928. Tableaux dichotomiques des genres et espèces d'Harpacticoides des eaux douces d'Europe et remarques critiques sur deux travaux parus en 1927. *Archives de Zoologie expérimentale et générale*, 67 *Notes et Revue* 1(12): 114-128.
- CHAPPUIS, P. A. 1929a. Révision du genre *Canthocamptus* Westwood (Note préliminaire). *Buletinul Societății de Științe din Cluj* 4(3): 41-50.
- CHAPPUIS, P. A. 1929b. Die Unterfamilie der Canthocamptinae. *Archiv für Hydrobiologie* 20: 471-516.
- CHAPPUIS, P. A. 1937. Subterranean Harpacticoiden aus Nord-Spanien. *Buletinul Societății de Științe din Cluj* 8: 556-571.
- CHAPPUIS, P. A. 1944. Die harpacticoiden Copepoden der europäischen Binnengewässer. *Archiv für Naturgeschichte* 12: 351-433.
- COTTARELLI, V., BRUNO, M. C., SPENA, M. T. & GRASSO, R. 2012. Studies on subterranean Copepods from Italy, with descriptions of two new epikarst species from a cave in Sicily. *Zoological Studies* 51: 556-582.
- DUMONT, H. J. 1979. Limnologie van Sahara en Sahel. *Thesis, University of Ghent*, 557 pp.
- DUSSART, B. H. & DEFAYE, D. 1990. Répertoire mondial des crustacés Copépodes des eaux intérieures. III. Harpacticoides. *Crustaceana* supplement 16: 1-384.
- FIERS, F. & GHENNE, V. 2000. Cryptozoic copepods from Belgium: diversity and biogeographic implications. *Belgian Journal of Zoology* 130: 11-19.
- FRANKE, U. 1989. Katalog zur Sammlung limnischer Copepoden von Prof. Dr. Friedrich Kiefer. *Carolina Beiheft* 5: 1-433.

- HAMOND, R. 1987. Non-marine Harpacticoid Copepods of Australia. I. Canthocamptidae of the genus *Canthocamptus* Westwood s. lat. and *Fibulacamptus*, gen. nov., and including the description of a related new species of *Canthocamptus* from New Caledonia. *Invertebrate Taxonomy* 1: 1023-1247.
- KARANOVIC, T. & BOBIC, M. 1998. Two new species of Copepoda Harpacticoida from east Serbia (Balkan Peninsula): *Parastenocaris serbica* sp. n. and *Bryocamptus* (R.) *borus* sp. n. *Crustaceana* 71: 281-292.
- KESSLER, E. 1914. Zur Kenntnis der Harpacticiden-fauna Deutschlands. *Canthocamptus weberi* n. sp. *Zoologischer Anzeiger* 44: 474-479.
- KIEFER, F. 1928. Beitrag zur Kenntnis der freilebenden Copepoden Marokkos. *Bulletin de la Société des Sciences Naturelles du Maroc* 8: 87-108.
- KIEFER, F. 1930. Neue höhlenbewohnende Ruderfusskrebse. *Zoologischer Anzeiger* 87: 222-228.
- LANG, K. 1948. Monographie der Harpacticiden, vols I & II. *Nordiska Bokhandeln, Stockholm*, 1682 pp.
- MOUEHI, S., BALVAY, G. & KRAÏEM, M. M. 2000. Branchiopodes (Cténopodes et Anomopodes) et Copépodes des eaux continentales d'Afrique du Nord: inventaire et biodiversité. *Zoosystema* 22: 731-748.
- MRÁZEK, A. 1893. Beitrag zur Kenntnis der Harpacticidenfauna des Süßwassers. *Zoologische Jahrbücher. Abteilung für Systematik, Geographie und Biologie der Thiere* 7: 88-130, pl. 4-7.
- MURPHY, P. W. 1962. Progress in soil zoology. *Butterworths, London*, 398 pp.
- PETKOVSKI, T. 1956. Über zwei harpacticoiden Copepoden, *Pseudameira kunzi* n. sp. und *Bryocamptus pygmaeus* (Sars) f. *balcanica* n. f. aus Jugoslawien. *Folia Balcanica, Skopje* 1: 9-13.
- REID, J. W. 2001. A human challenge: discovering and understanding continental copepod habitats. *Hydrobiologia* 453/454: 201-226.
- ROSE, M. & VAISSIÈRE, R. 1952. Catalogue préliminaire des Copépodes de l'Afrique du Nord. *Bulletin de la Société naturelle de l'Afrique du Nord* 43: 113-136, 164-176.
- ROY, J. 1924. Sur un nouvel harpacticide muscicole: *Canthocamptus Gauthieri* nov. sp. *Bulletin de la Société de Zoologie de France* 49: 461-468.
- ROY, J. & GAUTHIER, H. 1927. Sur les copépodes d'Algérie et Tunisie (eaux douces et saumâtres). *Bulletin de la Société de Zoologie de France* 52: 558-575.
- SARS, G. O. 1863. Oversigt af de indenlandske ferskvandscopepoder. *Christiania videnskabs-selskabets Forhandling* 1862: 210-263.
- USTAOLU, R. M. 2004. A check-list for zooplankton of Turkish inland waters. *E.U. Journal of Fisheries and Aquatic Sciences* 21: 191-199.
- WELLS, J. B. J. 2007. An annotated checklist and keys to the species of Copepoda Harpacticoida (Crustacea). *Zootaxa* 1568: 1-872.
- WILLEY, A. 1925. Northern Cyclopidae and Canthocamptidae. *Transactions of the royal Society of Canada (serie 3)* 19: 137-158.

Synopsis of the Neotropical mantid genus *Pseudacanthops* Saussure, 1870, with the description of three new species (Mantodea: Acanthopidae)

Francesco LOMBARDO¹, Salvatrice IPPOLITO¹ & Julio RIVERA²

¹Department of Biological, Geological and Environmental Sciences, Division Animal Biology “M. La Greca”, University of Catania, via Androne 81, 95124 Catania, Italy. E-mail; lombafra@unict.it; ippolito@unict.it

²University of Toronto, Department of Ecology and Evolutionary Biology, Toronto, Ontario, Canada. Mailing address: Royal Ontario Museum, Department of Natural History (Entomology), 100 Queen’s Park, M5S 2C6, Toronto, ON, Canada. E-mail: julior@rom.on.ca.

Synopsis of the Neotropical mantid genus *Pseudacanthops* Saussure, 1870, with the description of three new species (Mantodea: Acanthopidae). - The constitutive members of the genus *Pseudacanthops* Saussure are re-examined. The genus now includes six species: *P. caelebs* (Saussure) (Mexico, Belize, Honduras, Guatemala), *P. spinulosus* (Saussure) (French Guyana, Guyana, Venezuela), *P. lobipes* La Greca & Lombardo (Peru, Bolivia, Brazil), *P. centralis* n. sp. (Nicaragua, Panama), *P. clorindae* n. sp. (Peru) and *P. huaoranius* n. sp. (Ecuador). The species *Pseudacanthops angulata* (Lichtenstein) is considered an objective synonym of *Acanthops fuscifolia* (Olivier). A key to species of *Pseudacanthops* (males) is also provided.

Keywords: Acanthopidae - Acanthopinae - *Pseudacanthops* - new species - Neotropic area.

INTRODUCTION

The genus *Pseudacanthops* Saussure, 1870 is exclusively found in the Neotropical region and is distributed in warm and humid environments between the 18°N and 16°S parallels. *Pseudacanthops* has received little taxonomic treatment in the past; the number of species reported in the literature varies from three (Otte & Spearman 2005) to four (Ehrmann 2002) and despite of this reduced number of described species, they are very difficult to distinguish. Giglio-Tos (1927) recognized and keyed three valid species: *P. angulata* (Lichtenstein, 1802), *P. caelebs* (Saussure, 1869), *P. spinulosus* (Saussure, 1870). Travassos (1945) and Terra (1995) reduced the number of the species to two, because they considered *P. angulata* as a synonym for *Acanthops falcataria* (Goeze, 1778). La Greca & Lombardo (1997) provided general remarks on the species included in this genus, considering *P. angulata* as a valid species; in the same article they described the new species *P. lobipes*. Agudelo Rondón *et al.* (2007) listed the following four species and their distribution: *P. angulata*

(Surinam); *P. caelebs* (Belize, Bolivia, Brazil, Costa Rica, French Guyana, Mexico, Nicaragua, Venezuela); *P. lobipes* (Bolivia); *P. spinulosus* (Bolivia, Brazil, Ecuador, French Guyana).

Among all the above species, *P. angulata* is the one with the most complicated taxonomic history and its taxonomic status has always been a matter of debate. Some authors often referred to *P. angulata* as a synonym of *Acanthops falcataria* (e.g. Charpentier, 1843; Kirby, 1904; Travassos, 1945; Terra, 1995; Lombardo & Ippolito, 2004) whereas some others recognized this species as valid (e.g. Saussure, 1871; Westwood, 1889; Kirby, 1904; Giglio-Tos, 1927; La Greca & Lombardo, 1997; Ehrmann, 2002; Agudelo Rondón *et al.*, 2007). This ambiguity originated because, in an initial publication, Stoll (1787) depicted and described (in both Dutch and French) 68 species in 18 colour plates without providing Latin names for any species. Later on, Olivier (1792) provided Latin names for some of these species, among them, "*La Mante Feuille*" (shown in figure 14), naming it as *Mantis fuscifolia*. Subsequently, Lichtenstein (1802) provided Latin names for the remaining figured species and, when referring to Stoll's figure 14, he named it as *Mantis angulata*. In the meanwhile, Stoll had died (1795), leaving his unpublished papers to M. Houuttuyn, who published them in 1813. This updated publication included 32 figures in 7 supplementary plates for the corresponding descriptions (pages 57 to 74), always in Dutch and French, with scientific names for all of these species (pages 75-79). Houuttuyn provided the name *Mantis sinuata* for the mantid seen in figure 14, thus not conforming to the names previously given by Olivier and Lichtenstein. Consequently, Stoll's figure 14 received three successive names that clearly represent objective synonyms: *Mantis fuscifolia* Olivier, 1792, *M. angulata* Lichtenstein, 1802, and *M. sinuata* Stoll, 1813. The oldest name is the valid one, which is *Acanthops fuscifolia* (Olivier, 1792) as established by Lombardo & Ippolito (2004). Thus, the valid species for the genus *Pseudacanthops* are: *P. caelebs*, *P. spinulosus* and *P. lobipes*.

In this paper, we review the species belonging to the genus *Pseudacanthops* and describe three new species: *P. centralis* n. sp., *P. clorindae* n. sp. and *P. huaorianus* n. sp.

MATERIAL AND METHODS

This study is based on the holotypes of *P. caelebs* deposited at the Muséum d'histoire naturelle de Genève (MHNG), *P. lobipes*, deposited at the Zoologische Staatssammlung München (ZSM) and additional specimens deposited in the following collections: Academy of Natural Sciences of Philadelphia (ANSP); Department of Biological, Geological and Environmental Sciences of Catania (MDAB); Instituto Nacional de Pesquisas da Amazônia (INPA-Manaus); Muséum National d'Histoire Naturelle, Paris (MNHN); Zoologische Staatssammlung München (ZSM); Museo de Entomologia Klaus Raven Büller, Universidad Nacional Agraria La Molina (UNALM).

The study of morphology was carried out using a stereoscopic microscope Leica MZ 12, with a micrometric ocular and a camera lucida attached. Images of the relevant structures were obtained via a stereoscopic microscope Leica MZ 205A (equipped with the software auto-montage pro, Syncroscopy).



FIG. 1

Mantis sinuata Stoll, 1813 (Stoll, 1787, fig. 14).

Anatomical terminology follows Snodgrass (1935), except for the copulatory apparatus that follows La Greca (1954). Spination formula of the fore femora follows Rivera (2010), where: **F**=Femur; **T**=Tibia; **ES**=External Spines; **IS**=Inner Spines; **DS**= Discoidal Spines, with values indicating the corresponding number of spines for each series (the genicular spines of the femora and the apical spur of the tibia are not included in the spination formula).

TAXONOMIC TREATMENT

Genus *Pseudacanthops* Saussure, 1870

Pseudacanthops Saussure, 1870: 243; type species: *Hymenopus caelebs* Saussure, 1869.

Paracanthops Saussure, 1870: 243.

Pseudocanthops Kirby, 1904: 283, Chopard, 1912: 335.

DIAGNOSIS: *Pseudacanthops* is related to *Acanthops* Serville, 1831 but can be separated from it by the presence of an elevated squarish process on the fastigium of vertex (Figs 2-7).

DESCRIPTION: Male and female morphologically show a marked sexual dimorphism as concerns the wings shape (Figs 46-47, 62-63).

Colouration: chestnut, dark to light brown or ochre, females can also be green when alive; abdomen exhibiting large, shiny black areas on tergites.

Body length: 35-50 mm.

Body texture: Males have a smooth body with very few scattered granulations. Females are completely covered by conspicuous tubercles and granulations of different sizes.

Head: Fastigium of vertex markedly concave and bearing an elevated, squarish process; eyes ovoid with a conical spine; frontal shield bidentate.

Thorax: Pronotum elongated, slender in males and stouter in females; metazone with two brown sub-circular spots on both sides. Fore coxae with one or two spine-like tubercles at their base (more developed in females); internal apical lobes contiguous. Fore femora with proximal lobe on their dorsal margin. Middle and hind legs rather short, markedly hairy in males; femora bearing a proximal lobe ventrally; tibiae thinner on their distal halves, each exhibiting a small swelling near its base and on its middle section, a small lobe is also present at the apex of each tibia; metatarsi shorter than all the other segments together. Male wings: mesothoracic wings with costal margin exhibiting a double sinuosity, costal area with proximal section dilated, tapering towards the tip of the wing until it disappears at about 2/3 of wing length; apical, rounded lobe present; metathoracic wings similar to mesothoracic wings. Female wings: mesothoracic wings reduced in size, opaque and with apex falcated; metathoracic wings small and non functional, yellow in color with brown pigment on cells.

Abdomen: Slightly flattened and exhibiting lateral lobes on 5th and 6th urotergites; last joint of cerci bilobed.

NOTE: Based on article 30.1.4.3 of the ICZN, a genus-group name ending in *-ops* is to be treated as masculine.

KEY TO SPECIES (MALES)

- 1a Pronotum with multiple granulations but without distinct tubercles 2
 1b Pronotum exhibiting multiple granulations and with two more distinct conical tubercles on metazone below supracoxal sulcus (Nicaragua, Panama) *P. centralis* n. sp.
 2a Mesothoracic wing mostly subhyaline, evenly pigmented from dark brown to yellowish brown, sometimes exhibiting scattered, dark spots 3
 2b Mesothoracic wings colorless and hyaline; distal half and costal area darkly pigmented and opaque (Peru) *P. clorindae* n. sp.
 3a Internal margin of eyes with one or more spine 4
 3b Internal margin of eyes without spines (Mexico, Belize, Honduras, Guatemala) *P. caelebs*
 4a Inner margin of eyes with one tubercle clearly more developed than the others 5
 4b Inner margin of eyes with similarly-sized tubercles (Peru, Bolivia, Brazil) *P. lobipes*
 5a Lateral process of the ventral fallomere exhibiting a sinuous outer margin (Ecuador) *P. huaoranius* n. sp.
 5b Lateral process of the ventral fallomere with uniformly curved outer margin (Guyana, French Guyana, Venezuela) *P. spinulosus*

Pseudacanthops caelebs (Saussure, 1869)

Figs 2, 8-15, 23, 27-33, 95

Hymenopus caelebs Saussure, 1869: 73.

Paracanthops (Hymenopus) caelebs. – Saussure, 1870: 243.

Pseudacanthops caelebs. – Saussure, 1870: 243. – Saussure, 1871: 148. – Saussure, 1872: 279. – Saussure & Zehntner, 1894: 182. – Kirby, 1904: 283. – Chopard, 1913: 60. –



FIGS 2-7

Head in frontal view of males: (2) *Pseudocanthops caelebs*. (3) *P. centralis* (typus). (4) *P. huaoarianana*, typus. (5) *P. clorindae*, typus. (6) *P. lobies*. (7) *P. spinulosus*. Scale = 0.5 cm.

Giglio-Tos, 1927: 515. – Beier, 1934: 4. – Travassos, 1945: 217 (partim Mexico). – Cerdà, 1993: 135 (partim Mexico, Belize). – Terra, 1995: 30. – La Greca & Lombardo, 1997: 53. – Jantsch, 1999: 78 (partim Mexico). – Ehrmann, 2002: 291 (partim Mexico, Belize). – Battiston *et al.*, 2005: 213 (Mexico). – Agudelo Rondón *et al.*, 2007: 115 (Mexico).

Acanthops caelebs. – Stål, 1877.

TYPICAL MATERIAL EXAMINED: Holotype ♂ of *P. caelebs* from MEXICO; Orizaba (MHNG).

ADDITIONAL MATERIAL EXAMINED: BELIZE; Rio Grande 1935, 2 ♂ (ANSP). – GUATEMALA; Plan Grande (15°49'54.93 N; 88° 48' 08.70 W), 2 ♂ (ANSP). – HONDURAS; Atlántida, Massif Pico Bonito, El Pino 200 m, 5.04.1995, 1 ♂ (T. Porion & A. Grange leg.) (MNHN).

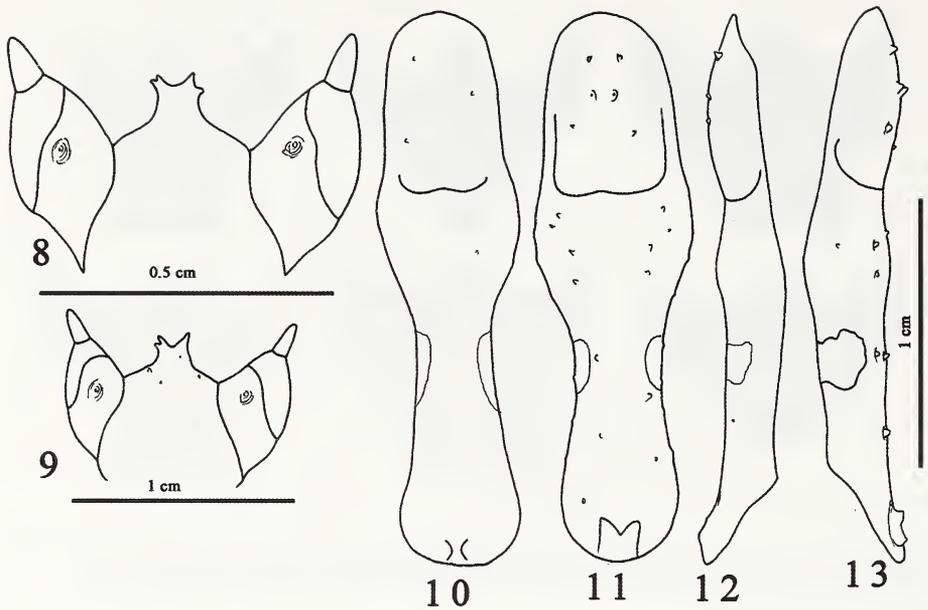
DIAGNOSIS: Body about 45-48 mm in size, eyes oblong with a well distinct apical ocular spine, postgene with two flattened tubercles; pronotum with or without small granulations on dorsal surface; middle and hind tibiae enlarged in their proximal half and with a poorly developed medial lobe.

Female unknown.

DESCRIPTION

Colouration: Body chestnut to ochre. Head ochraceous and exhibiting a dark strip between the compound eyes. Coxae ochraceous. Fore femora with two black bands on their inner side, medial surface with two black strips; bigger internal spines blackish. Mesothoracic wings ochraceous. Metathoracic wings with costal area ochraceous, anal veins with small ochraceous spots. Abdominal tergites ochraceous with black distal edges.

Head (Figs 2, 8-9): With some sparse small granules and about 1.42 times as wide as the pronotum supracoxal dilatation; vertex fastigium projecting upward in a squarish concave process at the apex where four small tubercles are present; frons near



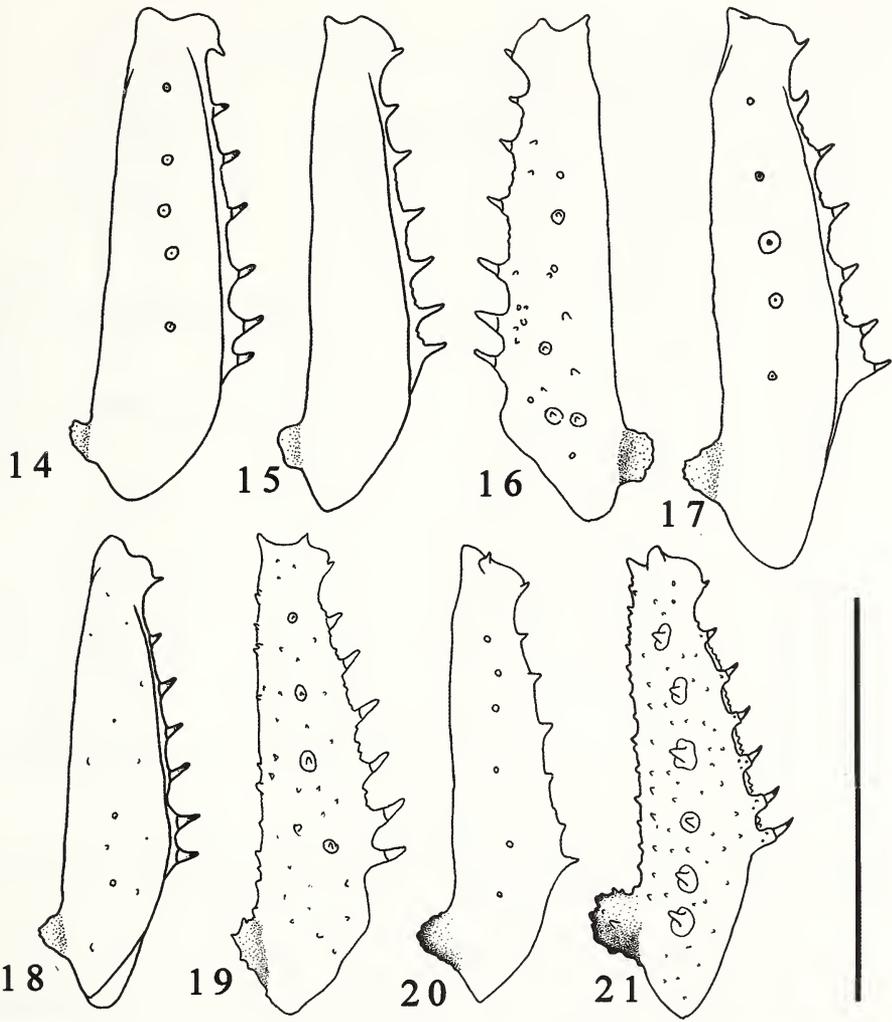
FIGS 8-13

Pseudacanthops caelebs male: (8-9) Head; 8 typus, 9 from Honduras. (10-13) Pronotum; 10-12 typus, 11-13 from Honduras.

ocular suture bearing 2-3 small spines, these are absent in the holotype; eyes oblong with a big ocular apical spine (approximately 1.3 as long as diameter of one ocellus); occiput with a flattened conical process on each side; post-frontal suture with two triangular spines opposite upper ocelli. Frontal shield transverse pentagonal, about twice as broad as high; vertex with two parallel contiguous small teeth.

Thorax (Figs 10-13): Pronotum 2.81 times as long as its maximum width; metazone slightly but notoriously constricted on its distal half; disc of pronotum exhibiting some scattered granulations in the holotype (Figs 10, 12), whereas these are more numerous and larger in specimens from Honduras (Figs 11, 13), two conical tubercles are present near to distal margin; lateral margins of metazone denticulated; ratio metazone/prozone 2.02; supracoxal dilatation distinct.

Legs: Fore coxae about 0.77 times as long as pronotum; anterior margin with minute spines; posterior margin smooth; posterior surface exhibiting numerous small, ivory calluses; inner apical lobes contiguous. Fore femora (Figs 14-15) 0.97 times as long as pronotum and 4.42 times as long as their maximum width; dorsal margin smooth, basal lobe distinct with crenulated margin; external surface smooth in the holotype and in the specimens from Guatemala, with 7-8 tubercles on its median line in the specimens from Honduras. Tibiae half as long as femora. Spination formula: F=6ES/13-14IS/4DS and T=19-20ES/15IS. Middle and hind femora shortened with long hairs; external surface with 3-4 ivory and robust tubercles; medial margin with a basal lobe; tibiae (Fig. 23) covered with minute hairs; basal half thicker than distal half

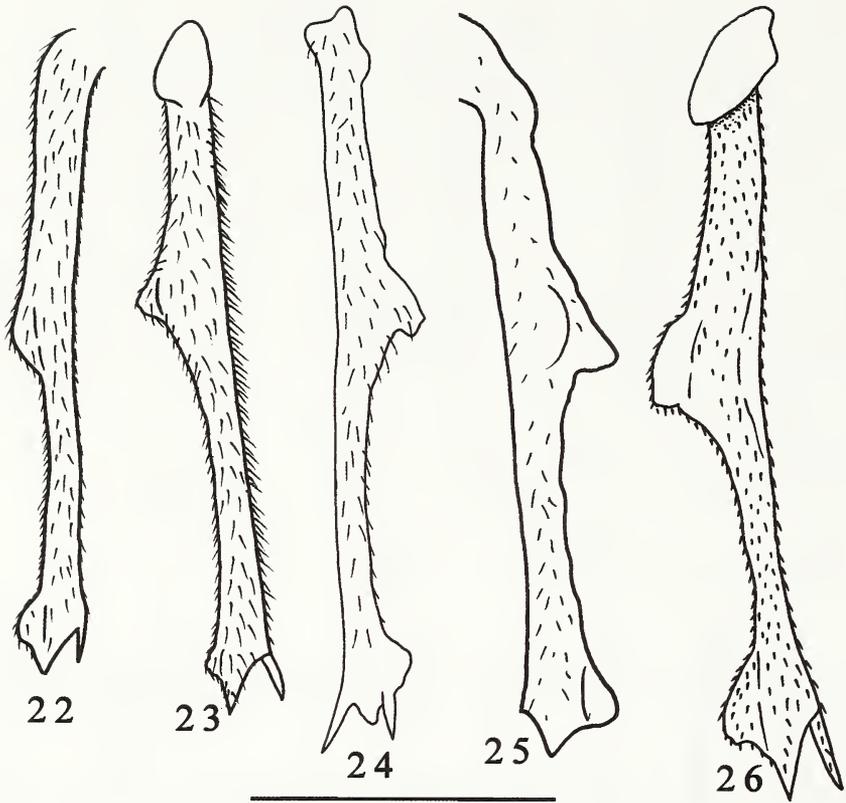


FIGS 14-21

Fore femora of: (14-15) *Pseudacanthops caelebs*; 14 from Honduras. 15 typus. (16) *P. centralis*. (17) *P. clorindae*, typus. (18-19) *P. spinulosus* (20-21) *P. huaoraniana*, typus and female para-typus. Scale = 1 cm.

and with a medial lobated swelling; apex of tibiae with a distinct lobe. Metatarsus shorter than the remaining segments together.

Wings: extending well beyond the tip of the abdomen. Mesothoracic wing (Fig. 27) ratio total length/maximum width 4; anterior margin sinuous with a wide excavation and distinctly rounded apical lobe; anterior half and apex opaque chestnut, posterior half hyaline; costal area proximally wide about 1.5 times as length of prozona; stigma dark brown and rounded. Metathoracic wing with costal and subcostal area and entire apical area opaque with scattered darker spots.



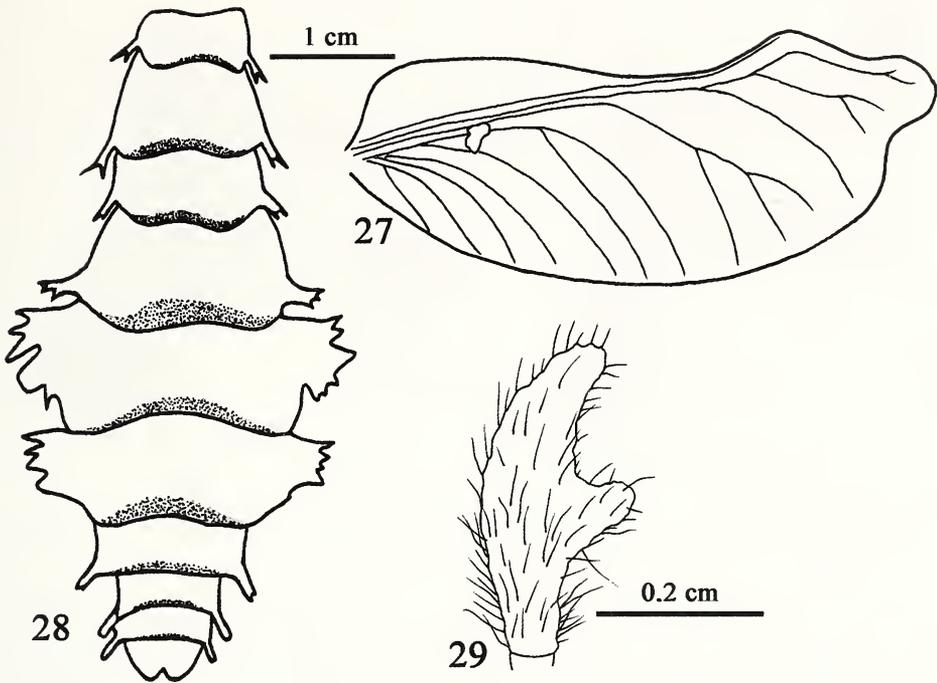
FIGS 22-26

Male middle tibiae of: (22) *Pseudacanthops spinulosus*. (23) *P. caelebs*, from Honduras. (24) *P. huaoraniana*, *typus*. (25) *P. centralis*, *typus*. (26) *P. clorindae*, *typus*. Scale = 1 cm.

Abdomen (Fig. 28): slightly flattened; lateral margins of urotergites 2-4 and 7-9 exhibiting slender lobes on their postero-lateral corners; 5-6 with leaf-like, irregularly-edged lobes. Urosternites with a longitudinal median carina, flanked by 2-3 short crests near the distal margin. Cerci (Fig. 29) extending beyond the subgenital plate and covered with sparse, long hairs; last segment enlarged and flattened, lateral margins irregularly sinuous and apex deeply incised, forming unequal terminal lobes. Subgenital plate longer than broad with incised apex, styles small; supranal plate short with rounded apex.

External male genitalia: Ventral phallomere (Fig. 32) about twice as long as its width; short, arcuated distal process; lateral process elongated, with its apical outer margin sinuous and denticulated. Left phallomere (Figs 30-31) well sclerotized; ventral lamina with elongated distal process; anterior process stocky; phalloid apophysis membranous with numerous small spines.

Measurements (millimeters): Head width 6.2-6.5; pronotum supracoxal dilatation width 4.4-4.5; prozone length 4.1-4.2; metazone length 8.3-8.5; anterior coxae length 9.4-9.8; anterior femora length 12-12.3; tegminae length 44-47.



FIGS 27-29

Pseudacanthops caelebs: (27) Mesothoracic wing. (28) Abdomen. (29) Last segment of cercus.

DISTRIBUTION: We had the opportunity to examine material from Bolivia, Brasil, Costa Rica, French Guyana, Nicaragua, and Venezuela and none of these specimens is referable to *P. caelebs*. Consequently, we believe that all records of *P. caelebs* from these countries are misidentifications, as this species seems to be restricted to southern Mexico, Belize, Honduras and Guatemala (Fig. 95).

***Pseudacanthops centralis* Ippolito & Lombardo n. sp.** Figs 3,16, 25, 34-45, 95

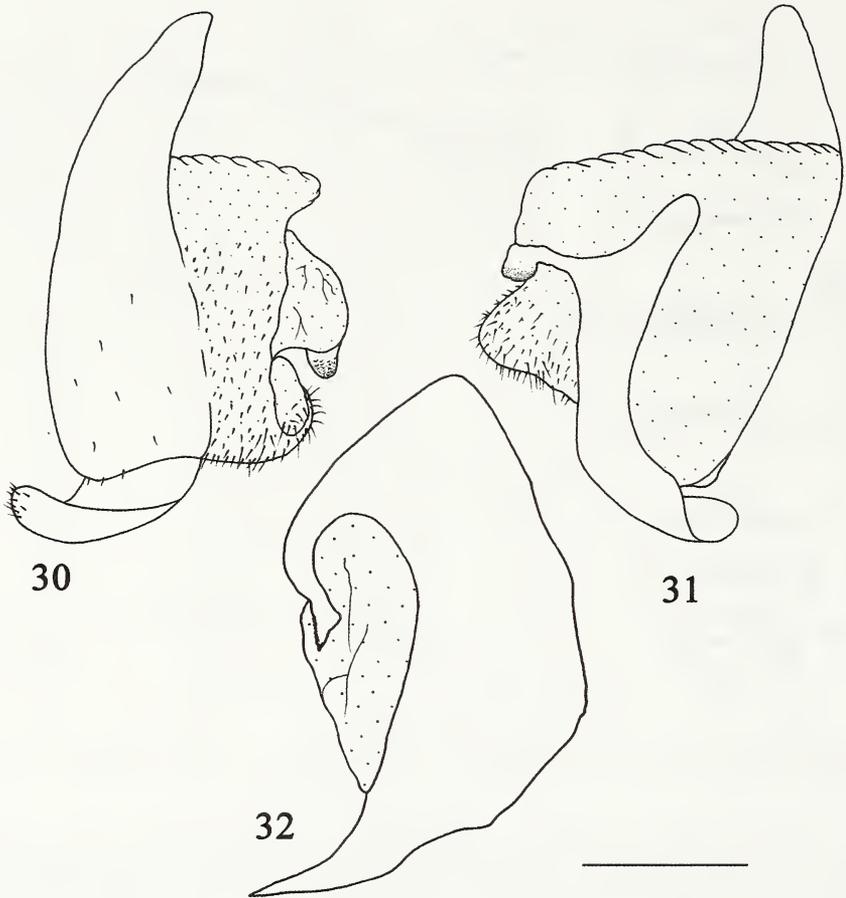
Pseudoacanthops caelebs. – Cerdá, 1993 (partim Nicaragua). – Ehrmann, 2002: 291 (partim Nicaragua). – Agudelo Rondón *et al.*, 2007: 115 (partim Nicaragua).

TYPE MATERIAL: Holotype: NICARAGUA; ♂, Great Falls, Pis Pis River, 10 miles NW of Eden 24.V.1922 (Wharton Huber leg.) (ANSP). – Paratypes: NICARAGUA; 1 ♂, same locality as holotype but 1.VIII.1922 (J.S. Mc Kenzie leg.) (ANSP), Eden, 2 ♂, 28.VIII.1922 (J.S. Mc Kenzie leg.) (ANSP). – PANAMA; (Veraguas), 1 ♂, Rte. de Santa Fé a Rio Luis 600 m, 26.IV.2003 (J. Barbut leg.) (MNHN).

ETYMOLOGY: The new species is named after the distribution in central America.

DIAGNOSIS: Body about 43-45 mm in size, eyes ochre with an apical ocular spine very developed; vertex with a bifide process; occiput with two conical processes with small sparse botchs. Pronotum with sparse tubercles. Anterior wings with a weakened excavation.

Female unknown.



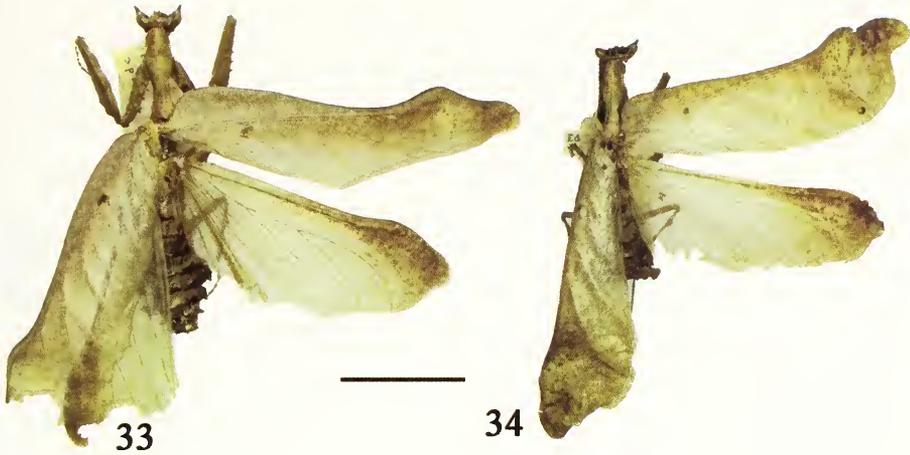
FIGS 30-32

External copulatory of *Pseudacanthops caelebs*: (30-31) Left phallomere, dorsal and ventral view. (32) ventral phallomere. Scale = 1 mm.

DESCRIPTION MALE

Colouration: General coloration ochre. Head ochraceous with frons and genes blackish. Coxae ochraceous with irregularly dotted ivory spots on external surface. Internal surface of femora with two black bands. Tegminae variegated brown-ochraceous. Metathoracic wings opaque ochraceous, anal veins with small ochraceous spots. Abdominal tergites with a black apical narrow strip.

Head (Fig 3, 35): About 1.61 times as wide as pronotum supracoxal dilatation, with numerous spines and small sparse tubercles; process of vertex (Figs 3, 36-37) similar to *P. caelebs* but shorter; eyes oblong with a big ocular apical spine (approximately 1.7 as long as diameter of one ocellus); ocular suture with two or three conical tubercles; frontal ridge similar to *P. caelebs*; occiput with a tuberculated conical processes on each side above the eyes and area near the eye suture with two tubercles, the posterior one clearly more developed and often bearing apical granulations; frontal



FIGS 33-34

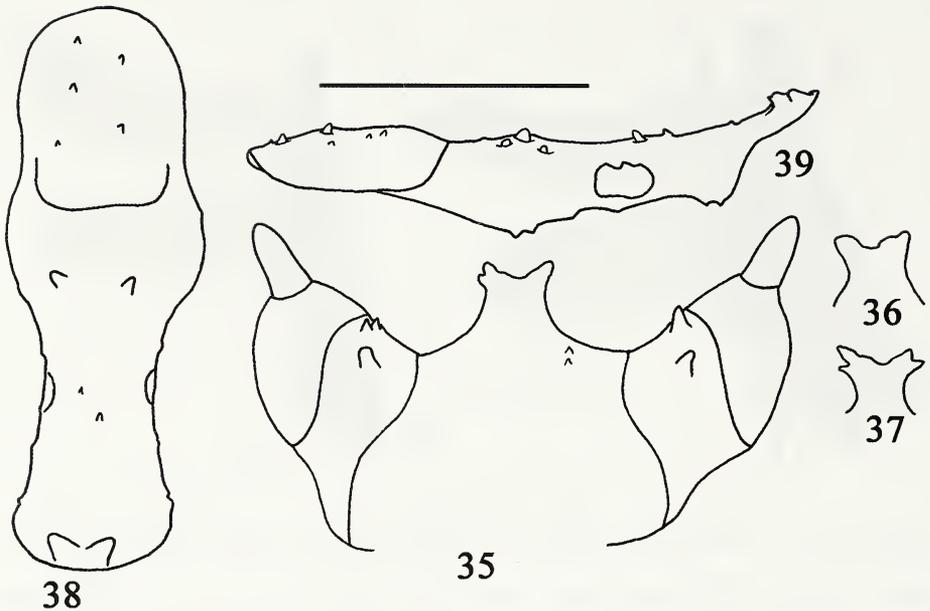
Habitus of: (33) *Pseudacanthops caelebs*, from Honduras. (34) *P. centralis*, typus. Scale = 1 cm.

shield transverse pentagonal, about twice as broad as high, vertex with two parallel contiguous short teeth (Fig. 3).

Thorax: Pronotum (Figs 38-39) 2.94 times as long as its maximum width, disc of prozone with numerous sparse small tubercles; disc of metazone below the supra-coxal sulcus with a stocky pair of tubercles, other two tubercles with an apical spine are present near posterior margin (Fig. 39); lateral margins denticulated only on the metazone; ratio metazone/prozone 1.91. Fore coxae about 0.77 times as long as pronotum; anterior and posterior margins spinulated; posterior surface with numerous ivory conical tubercles; internal surface with numerous sparse ivory calluses; internal distal lobes contiguous. Fore femora (Fig. 16) 0.98 times as long as pronotum and 4.44 times as long as their maximum width; upper margin smooth; basal lobe distinct with denticulated free margin (more developed than *P. caelebs*); external surface with 7-8 tubercles along median line. Tibiae half the length of femora. Formula spination $F=6ES/14-15IS/4DS$ and $T=20-22ES/14-16IS$. Middle and hind femora shortened with short hairs; external surface with 3-4 ivory and robust tubercles; medial margin with a basal lobe. Tibiae (Fig. 25) covered with minute hairs; basal half thicker than distal half and with a medial lobated swelling; apex of tibiae with a distinct lobe; apex with a small lobe. Metatarsus length less than the total length of all the other segments together.

Wings well developed, extending well beyond the abdomen apex. Mesothoracic wing (Fig. 41) ratio total length/maximum width 3.8; opaque only in its costal field and its apex; costal area not well dilated at base with an attenuate excavation; stigma small and rounded. Metathoracic wing with costal and subcostal area and entire apical area opaque.

Abdomen (Fig. 40): Slightly flattened; lateral margins of 2nd, 3rd, 4th, 7th and 8th urotergites with a small bilobate lobe; 5th and 6th with a leafy dentate lobe; 9th with elongated lobe. Urosternites similar to *P. caelebs*. Cerci (Fig. 42) extend beyond



FIGS 35-39

Pseudacanthops centralis: (35) Head, posterior view. (36-37) Process of vertex. (38-39) Pronotum. Scale = 0.5 cm.

the subgenital plate with sparse long hairs; last segment very large, flattened and dilated, lateral margins irregularly sinuous and deeply incised at apex, forming unequal terminal lobes. Subgenital plate longer than broad with incised apex, styles small; supranal plate short with incised apex.

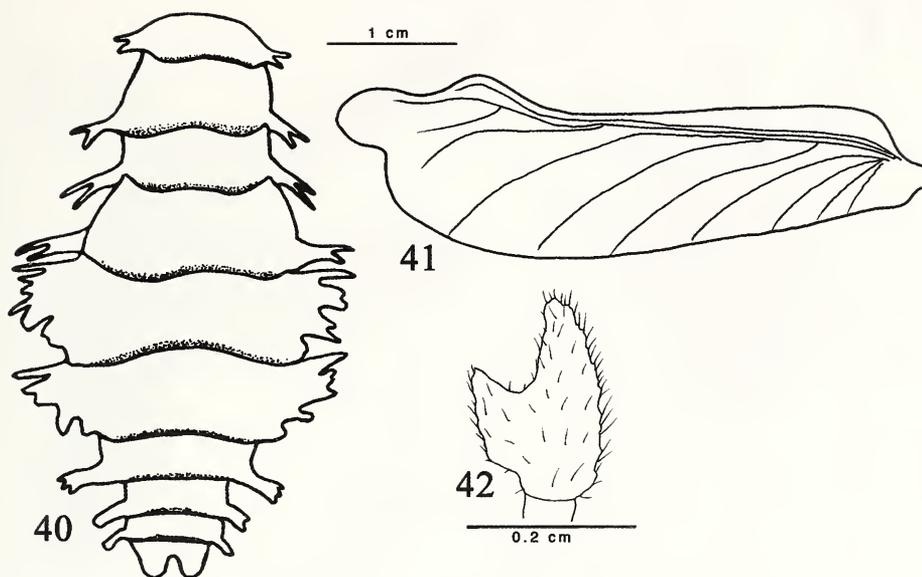
Male genitalia: Ventral phallomere (Fig. 45) about twice as long as its width; distal process elongated, arcuated; lateral process elongated with smooth external margin. Left phallomere (Figs 43-44) well sclerotized; ventral lamina with sinuous elongated distal process; anterior process acute; phalloid apophysis membranous with numerous small spines.

Measurements (millimeters): Head width 5.5-5.8; pronotum supracoxal dilatation width 3.3-3.7; prozone length 3.4-3.7; metazone length 6.5-6.9; anterior coxae length 7.8-8.2; anterior femora length 9.6-10.6; tegminae length 39-45.

COMMENTS: This new species is near to *P. caelebs*, but it has the following distinguishing features: head and pronotum more tuberculated; costal margin of mesothoracic wings with less accentuate excavation; supranal plate with incised apex; ventral phallomere much longer and more arcuated; apical process of left phallomere slender.

DISTRIBUTION: Known from Nicaragua and Panama (Fig. 95).

Pseudacanthops huaoranius Lombardo & Ippolito **n. sp.** Figs 4, 20-21, 24, 46-61, 96
Pseudacanthops spinulosa. – Terra, 1995: 30 (partim Ecuador). – Jantsch, 1999: 78 (Ecuador).
 – Ehrmann 2002: 291 (partim Ecuador). – Agudelo Rondón *et al.*, 2007: 115 (partim Ecuador).



FIGS 40-42

Pseudacanthops centralis: (40) Abdomen. (41) Mesothoracic wing. (42) Last segment of cercus.

TYPE MATERIAL: Holotype, ECUADOR; Napo Prov.: ♂, Yasuni, E.C.Y. 250 m, 4. XII.1997, (leg. G. Onore) (MDAB). – Paratypes; ECUADOR; Napo Prov.: 1 ♀, Avila viejo, 500 m, 10.IV.1997 (leg. Ekohn) (MDAB). – ECUADOR; 1 ♂, Yasuni, 29.IX.1995 (leg. F. Lombardo) (MDAB).

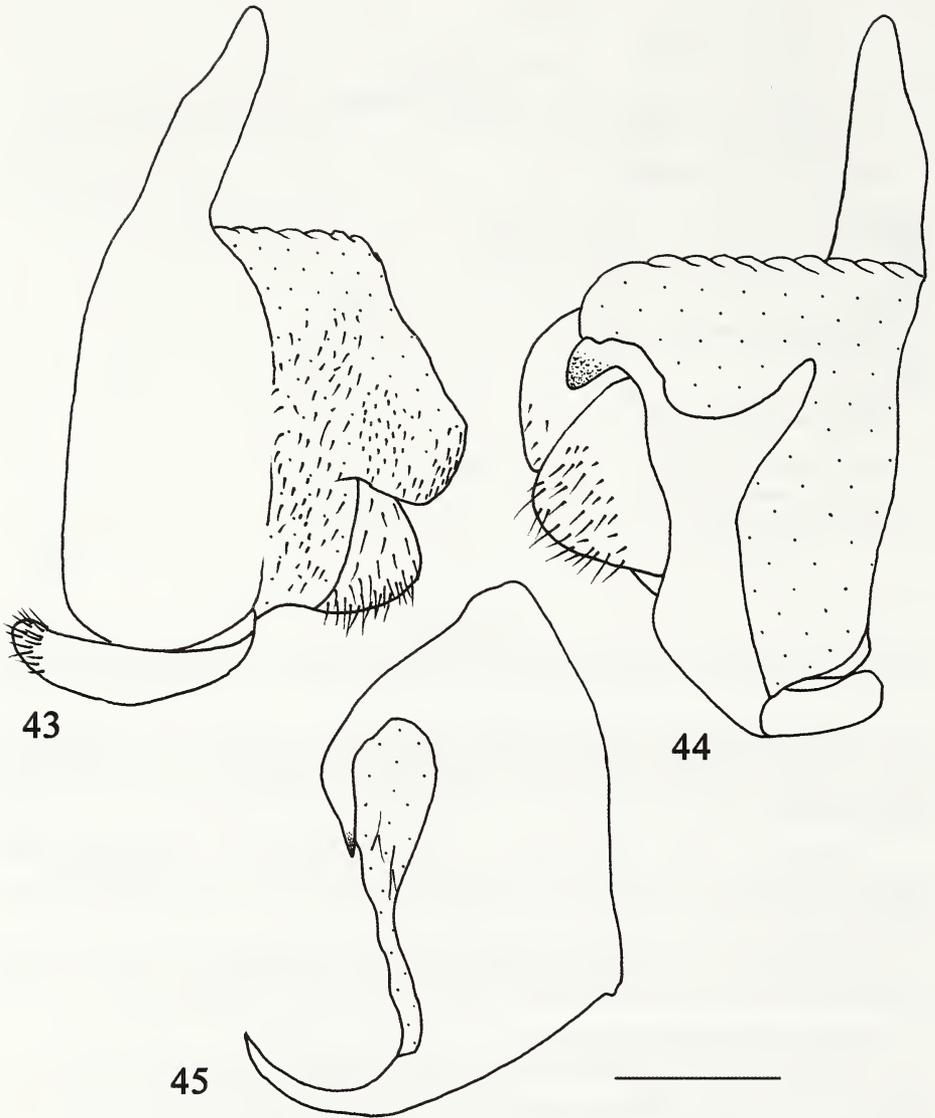
ETYMOLOGY: This new species is named *huaoranianus* in homage to the Huaorani indigenous people living in Amazonian Region of Ecuador (Napo, Orellana and Pastaza Provinces).

DIAGNOSIS: Male 38-43mm, female 38 mm in size; darkish chestnut in colour; eyes oblong with a robust apical spine; vertex with a short bidentate process.

DESCRIPTION MALE HOLOTYPE

Colouration: Body darkish chestnut; frons blackish; fore coxae chestnut with irregularly dotted ivory calluses on internal surface; fore femora with external ochraceous spines with black apex; discoidal spines and bigger internal spines black. Meso- and metathoracic wings chestnut. Male urotergites with a black apical band; female abdomen with a large shiny black spot comprises between the 2nd and 4th urotergites.

Head (Figs 4, 48-49): About 1.59 times as wide as pronotum supracoxal dilatation; process of vertex squarish with an apical small tubercle to four edges (Fig. 4); eyes oblong with a big ocular apical spine (approximately 1.5 as long as diameter of one ocellus); Frontal ridge with two small triangular processes behind the upper ocelli; occiput with one small acuminate tubercle on both sides. Frontal shield transverse, twice as broad as high, upper margin with two teeth separated by a deep incisure (Fig. 4).



FIGS 43-45

External copulatory of *Pseudacanthops centralis*: (43-44) Left phallomere, dorsal and ventral view. (45) Ventral phallomere. Scale = 1 mm.

Thorax: Pronotum (Figs 51, 53) elongated 3.09 times as long as its maximum width; slightly narrowed in the distal half metazone; lateral margins of metazone with small teeth; dorsal surface with few small granules, two flattened tubercles are present near posterior margin (Fig. 53); supracoxal dilatation well distinct with rounded lateral margins; ratio metazone/prozone 1.93. Fore coxae about 0.72 times as long as pronotum; anterior margin with minute spines; internal surface with ivory calluses;



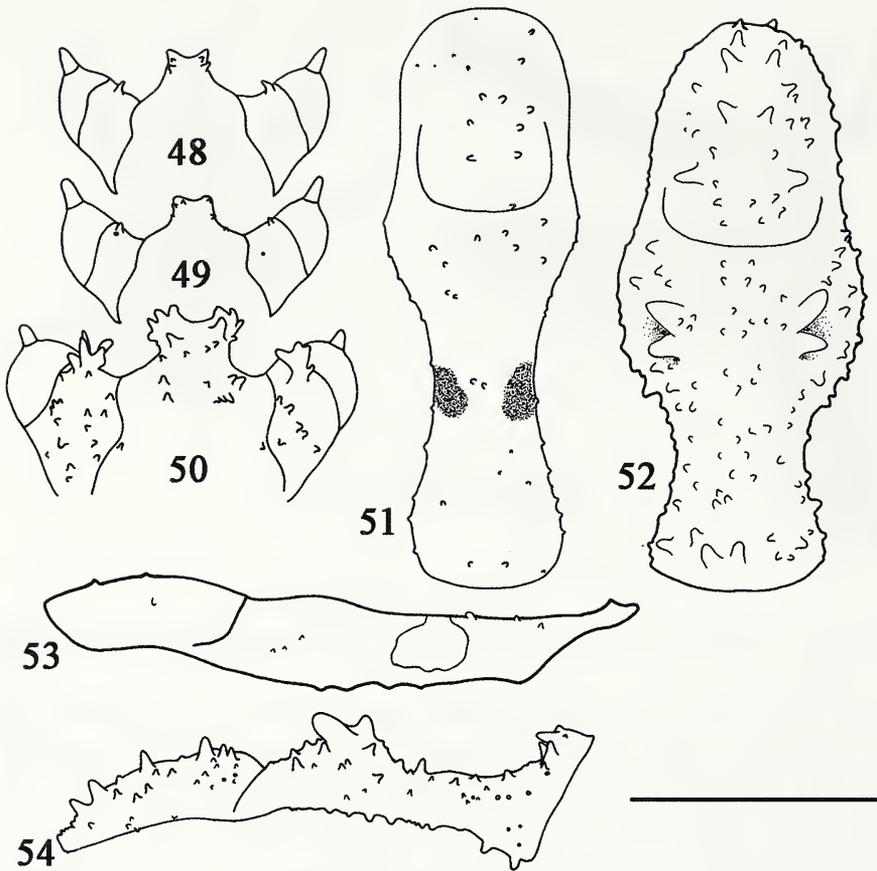
FIGS 46-47

Habitus of *Pseudacanthops huaoraniana*: (46) Typus. (47) Female paratypus. Scale = 1 cm.

posterior surface with sparse small tubercles; internal distal lobes contiguous. Fore femora (Fig. 20) 0.95 times as pronotum length and 4.54 times as long as its maximum width; upper margin with some minute granules; basal lobe well developed with irregularly free margin; external surface with 6-7 small median tubercles. Tibiae with external margin with 2-3 tubercles. Formula spination $F=6ES/14IS/4DS$ and $T=18-19ES/15-16IS$. Middle and hind legs covered with long hairs. Femora with 5 tubercles on external surface and with a rounded basal lobe on the medial external margin. Tibiae (Fig. 24) basal half thicker than distal half and with a medial lobated swelling; apex with a small lobe. Metatarsi length less than the total length of all the other segments together. Wings well developed, extending well beyond the tip of abdomen. Mesothoracic wing (Fig. 57) ratio total length/maximum width 4; costal area opaque not well dilated at base with an attenuate excavation; discoidal field opaque in its anterior half and at the apex, hyaline in its posterior half. Metathoracic wing with costal area subopaque and discoidal area hyaline.

Abdomen (Fig. 55): Slightly flattened; lateral margins of 5th and 6th urotergites with a leafy dentate lobe, 7th similar to previous but with a smaller lobe; 1st-4th with a slender lobe with two tips; 8th-9th only with elongate lobe. Urosternites with a longitudinal median carina bilaterally flanked by two or three short crests near the distal margin.

Cerci extend beyond the subgenital plate with sparse long hairs; last segment very large and flattened, lateral margins irregularly sinuous and deeply incised at apex, forming unequal terminal lobes. Supranal plate short deeply incised at apex. Subgenital plate is longer than broad, incised at apex and with two small styles.



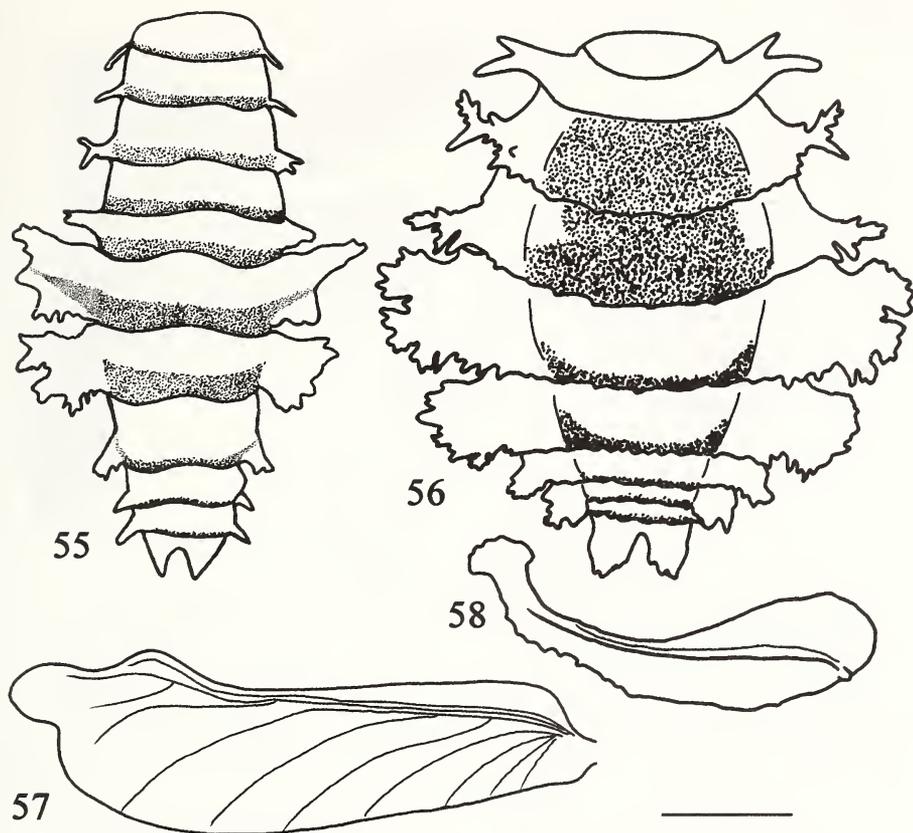
FIGS 48-54

Pseudacanthops huaoraniana: (48-49) Head, typus and male paratypus. (50) Head, female paratypus. (51, 53) Pronotum, typus. (52, 54) Pronotum, paratypus female. Scale = 0.5 cm.

External male genitalia: Ventral phallomere (Fig. 61) twice times as long as broad; distal process triangular ending in an acuminate tip; sinuous lateral process with acute apex. Left phallomere (Figs 59-60) with a long distal process; phalloid apophysis membranous; ventral lamina with apical right process.

Measurements (millimeters): Head width 5.5-5.85; pronotum supracoxal dilatation width 3.4-3.7; prozone length 3.5-4; metazone length 6.8-7.7; anterior coxae length 7.4-8.5; anterior femora length 9.9-11; tegminae length 37-43.

DESCRIPTION FEMALE: More robust than male; head (Fig. 50), pronotum (Figs 52, 54) and legs (Fig. 21) with numerous big tubercles. Wings not well developed, anterior margin sinuous, apical lobe well rounded, posterior margin crenulated; costal field and discoidal area opaque, chestnut. Metathoracic wing opaque with chestnut concentric spots. Abdomen (Fig. 56) enlarged with a big black spot comprises from 1st-3rd urotergites; 4th, 5th and 6th urotergites with a narrow black apical streep.



FIGS 55-58

Pseudacanthops huaoraniana: (55-56) Abdomen, typus and paratypus female. (57-58) Mesothoracic wing, typus and paratypus female. Scale = 1 cm.

Measurements (millimeters): Head width 6.7; pronotum supracoxal dilatation width 4.7; prozone length 4.5; metazone length 6.6; fore coxae length 9.8; fore femora length 12.9; tegminae length 25.

COMMENTS: This new species is related to *P. spinulosus* but the most substantial differences concern the genitalia: the apical process of the ventral plate of the left phallosome of *P. huaoranianus* is more prolonged and the distal process of the ventral phallosome is shorter.

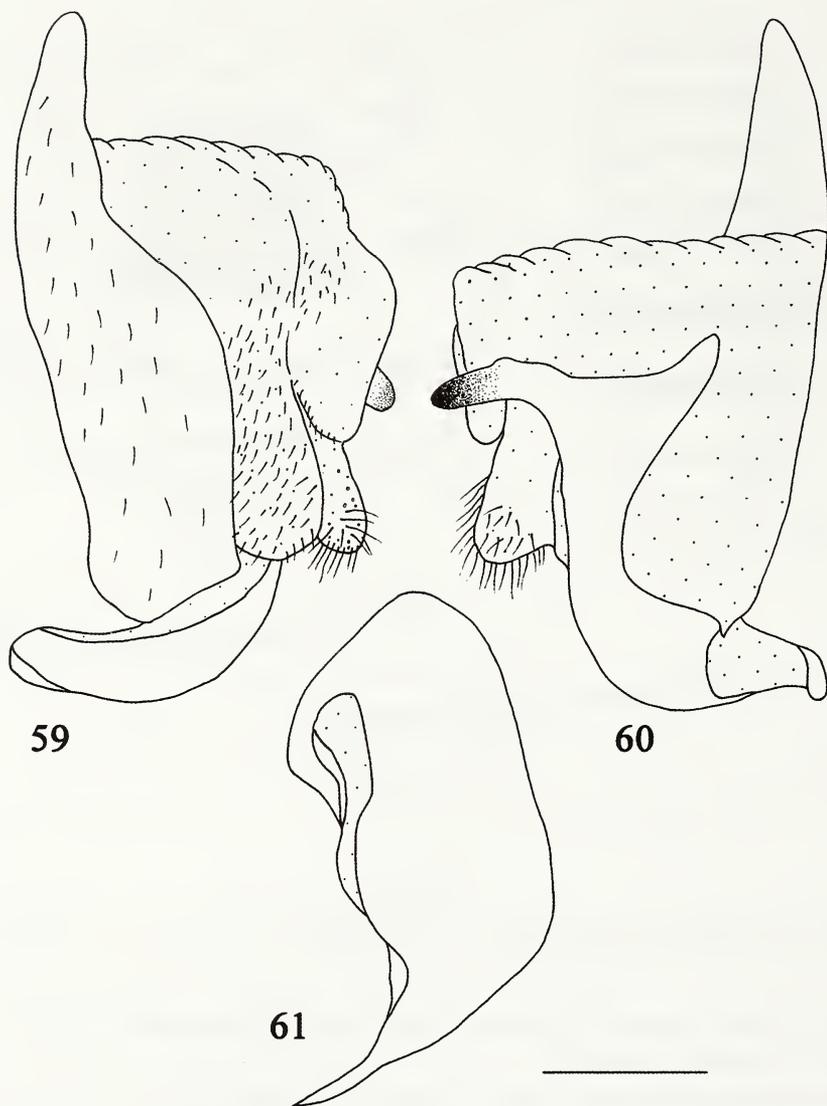
DISTRIBUTION: Known from Ecuador (Fig. 96).

Pseudacanthops spinulosus (Saussure, 1870)

Figs 7, 18-19, 22, 62-85, 96

Paracanthops spinulosa Saussure, 1870: 243-244.

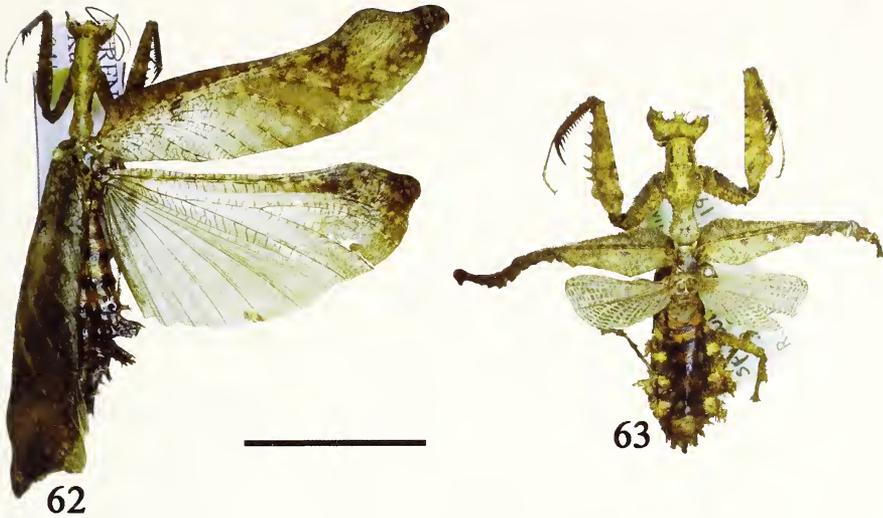
Pseudacanthops spinulosa. – Saussure, 1871: 150. – Kirby, 1904: 283. – Chopard, 1913: 335. – Chopard, 1916: 182. – Giglio-Tos, 1927: 515. – Beier, 1934: 4. – Terra, 1995: 30 (partim French Guyana). – Jantsch, 1999: 78 (partim French Guyana). – Ehrmann, 2002: 291 (partim French Guyana). – Agudelo Rondón *et al.*, 2007: 115.



FIGS 59-61

External copulatory of *Pseudacanthops huaoraniana*, typus: (59-60) Left phallomere, dorsal and ventral view. (61) Ventral phallomere. Scale = 1 mm.

MATERIAL EXAMINED: FRENCH GUYANA; 3 ♂, Belizon, V.2001 (MDAB). – 1 ♀, French Guyana 5.VII.1977 (Descampe leg.) (MNHN). – 2 ♂, Kaw, IV.2001 (MDAB). – 1 ♀, Piste de Kaw, 24.VII.1993 (Roubaud leg.) (MNHN). – 1 ♂, Saut Dalles, 11.V.1994 (P. Peters leg.) (MNHN). – 1 ♂, St. Jean du Maroni, Plateau des Mines 17.VII.1933 (L. Sénécaux leg.) (MNHN). – ENGLISH GUYANA; 1 ♀, Demerara (MDAB). – VENEZUELA; 1 ♂, Bolivar-Kanarakuni, 450 m, 3.II.1967 (F. Fernandez Y. A. D. Asco leg.) (ANSP).



FIGS 62-63

Habitus *Pseudacanthops spinulosus*: (62) Male. (63). Female. Scale = 1 cm.

NOTE

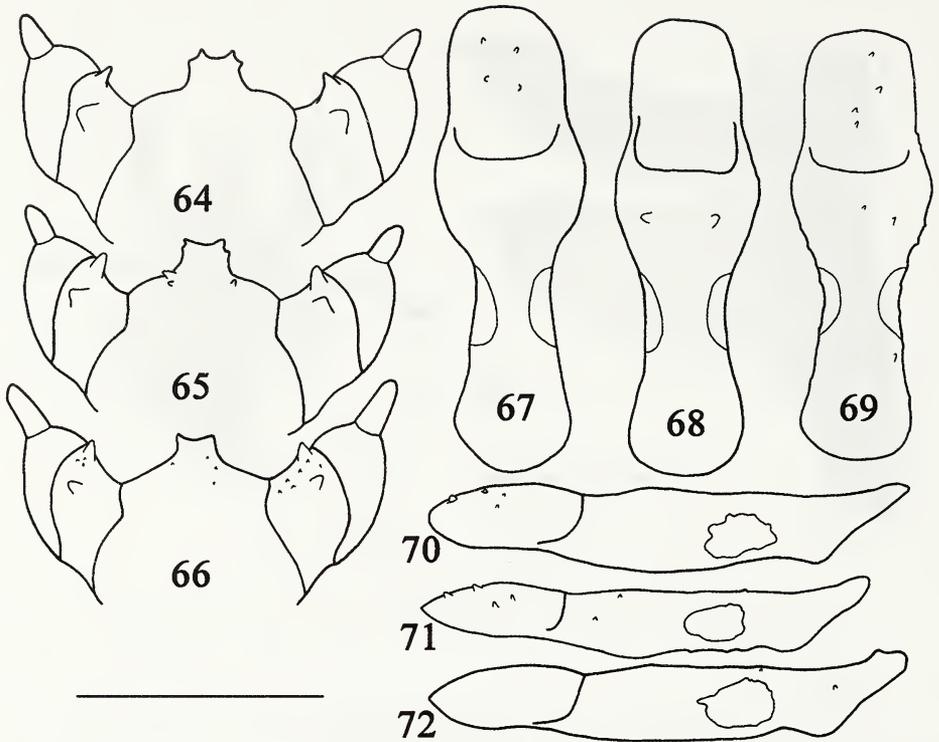
Based on article 30.1.4.3 of the ICZN, a genus-group name ending in *-ops* is to be treated as masculine and it is thus necessary to replace *P. spinulosa* with *P. spinulosus*.

REDESCRIPTION MALE

Colouration: General colouration brown. Head brown with frons blackish and ocelli black. Fore coxae brown with irregularly dotted ivory spots on internal surface. Internal surface of fore femora with two black bands. Tegminae variegated brown. Metathoracic wings hyaline and smoked with apex opaque and brown. Tergites ochraceous with apical shiny black band; sternites, mid and posterior legs blackish.

Head (Figs 7, 64-66): About 1.63 times as wide as a pronotal supracoxal dilatation; process of vertex squarish not well developed with two small spines in the apex; eyes oblong with a big ocular apical spine (approximately 1.5 as long as diameter of one ocellus). Frontal ridge behind the upper ocelli rises to form a small triangular process. Occiput with one conical process on both sides. Frontal shield transverse, about twice as broad as high, pentagonal with bidentate apex (Fig. 7).

Thorax: Pronotum (Figs 67-72) 3.13 times as long as its maximum width; it is narrowed in the distal half of metazone; lateral margins weakly subdentate; disc with some sparse granules, two flattened processes are present near posterior margin; pronotal supracoxal dilatation distinct and with rounded lateral margins. Fore coxae about 0.74 times as long as pronotum; lateral margins with small granules; internal surface with ivory calluses; posterior surface with sparse small tubercles; internal distal lobes contiguous. Fore femora (Fig. 18) 0.95 times as long as pronotum length and 4.59 times as long as its maximum width; upper margin with numerous small granules,

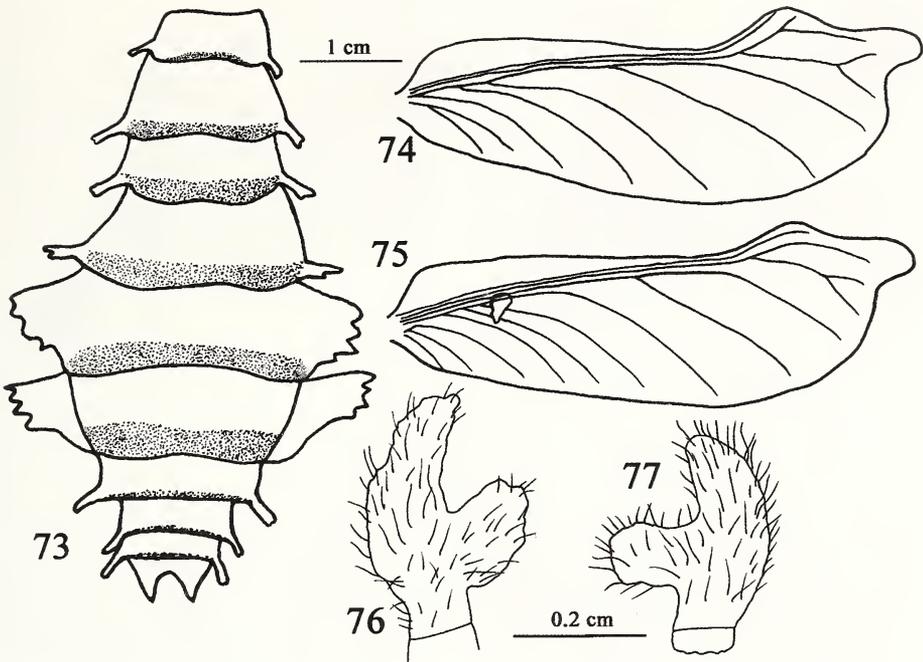


FIGS 64-72

Pseudacanthops spinulosus (male): (64-66) Head, 64 from Suriname, 65 from Venezuela, 66 from French Guyana. (67-72) Pronotum, 67 & 70 from Suriname, 68 & 71 from French Guyana, 69 & 72 from Venezuela. Scale = 0.5 cm.

basal lobe distinct with regular free margin; external surface with 5-6 small tubercles on the median line. Tibiae half the length of the femora. Formula spination $F=6ES/14IS/4DS$ and $T=18-21ES/16-17IS$. Middle and hind legs covered with long hairs. Femora with 2-3 tubercles on external surface and with a rounded basal lobe on the medial external margin. Tibiae (Fig. 22) basal half thicker than distal half and with a medial lobated swelling; apex with a small lobe. Metatarsi length less than the total length of all the other segments together. Wings well developed, extending well beyond the tip of abdomen. Mesothoracic wing (Figs 74-75) ratio total length/maximum width 4; costal area opaque not well dilated at base with an attenuate excavation; discoidal field opaque in its anterior half and at the apex, hyaline in its posterior half. Metathoracic wing with costal area subopaque and discoidal area hyaline.

Abdomen (Fig. 73): Cylindrical, slightly flattened, lateral margins of urotergites 5th and 6th with a leafy dentate lobe. Lobes of 2nd, 3rd, 4th and 7th similar to previous but smaller. 8th and 9th with a slender lobe. Urosternites with a longitudinal median carina bilaterally flanked by two or three short crests near the distal margin. Subgenital plate longer than broad with incised apex, styli small. Supranal plate short,



FIGS 73-77

Pseudacanthops spinulosus (male): (73) Abdomen. (74-75) Mesothoracic wing from Suriname and French Guyana. (76-77) Last segment of cercus from French Guyana and Suriname.

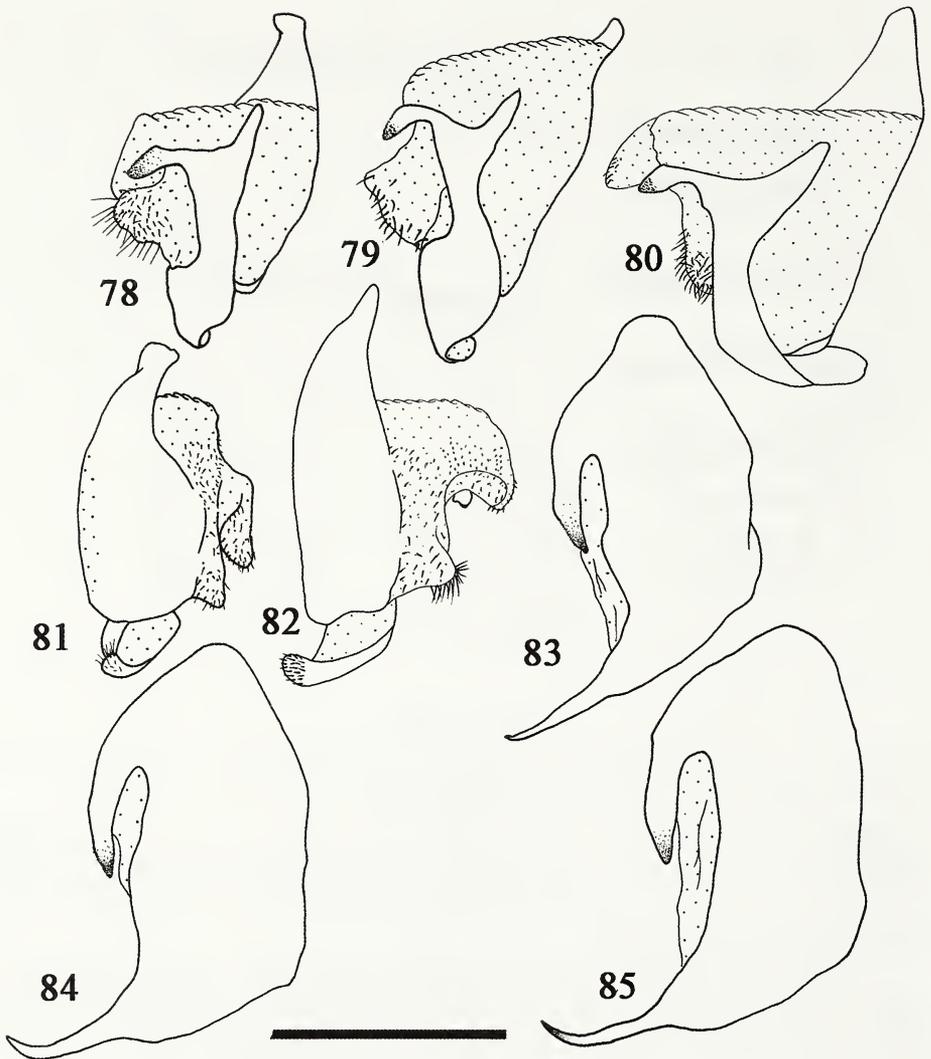
deeply incised at apex. Cerci extend beyond the subgenital plate with long hairs, last segment (Figs 76-77) very large, flattened, lateral margins sinuous and incised at apex, forming unequal terminal lobes.

Male external genitalia: Ventral phallomere (Figs 83-85) 2.5 times as long as its width, distal process elongate ending in an acuminate apex; lateral process elongate with dentate lateral margin. Left phallomere (Figs 78-82) well sclerotized; ventral lamina with distal process dilated; anterior process elongate and with small teeth on upper margin.

Measurements (millimeters): Head width 5.5-5.9; pronotum supracoxal dilatation width 3.4-3.6; prozone length 3.4-3.7; metazone length 6.8-7.6; fore coxae length 7.8-8.5; fore femora length 10.1-10.6; tegminae length 38-40.

FEMALE

Head about 1.53 times as wide as supracoxal pronotal dilatation, with numerous, various in size, tubercles. Pronotum more robust of male, narrower at centre of metazone with numerous tubercles more or less developed on the disc; lateral margins of metazone dentate. Posterior margin with two big processes. Legs more robust of the male and more tuberculated; Wings not well developed and opaque. Mesothoracic wing with a long narrow apical lobe originating about its half way.



FIGS 78-85

External copulatory of *Pseudacanthops spinulosus*: (78-82) Left phallomere, 78 & 81 from French Guyana (in ventral and dorsal view), 79 & 82 from Venezuela (in ventral and dorsal view), 80 from Suriname (in ventral view). (83-85) Ventral phallomere, 83 from French Guyana, 84 from Suriname, 85 from Venezuela. Scale = 1 mm.

Anterior margin sinuous; posterior margin crenulated. Metathoracic wing opaque with chestnut concentric spots.

Abdomen similar to those described in the male but lateral lobes more developed.

DISTRIBUTION: This species occurs from Venezuela to French Guyana (Fig. 96).



FIGS 86-87

Habitus of: (86) *Pseudacanthops clorindae*, *typus*. (87) *P. lobipes*, from Peru. Scale = 1 cm.

***Pseudacanthops clorindae* Rivera & Lombardo n. sp.** Figs 5, 17, 26, 86, 88-94, 96

TYPE MATERIAL: Holotype, PERU; ♂, Cuzco, La Convencion, Distrito de Echarate, 28.IV.1998, (DBUC). – Paratypes, PERU; 2♂ same data as holotype but 5.VIII.1998 (R. Acosta leg.) (UNALM), all collected at light. – BRAZIL. Amazonas prov.: 1♂, Ipixuna, Rio Gregorio, Lago Grande (07°10'11.7" S; 70°49'10.3" W), (J.A. Rafael, A. Agudelo Rondón & R. Andreaeze leg.) (INPA-Manaus).

ETYMOLOGY: this new species is named after Prof. Clorinda Vergara, head curator of the Klaus Raven Büller Entomological Museum (UNALM) and former advisor of JR.

DIAGNOSIS: Small in size, head with ocular spines not very developed; vertex with a bifide process not well developed. Pronotum smooth. Wings hyaline with chestnut opaque spots on apical area.

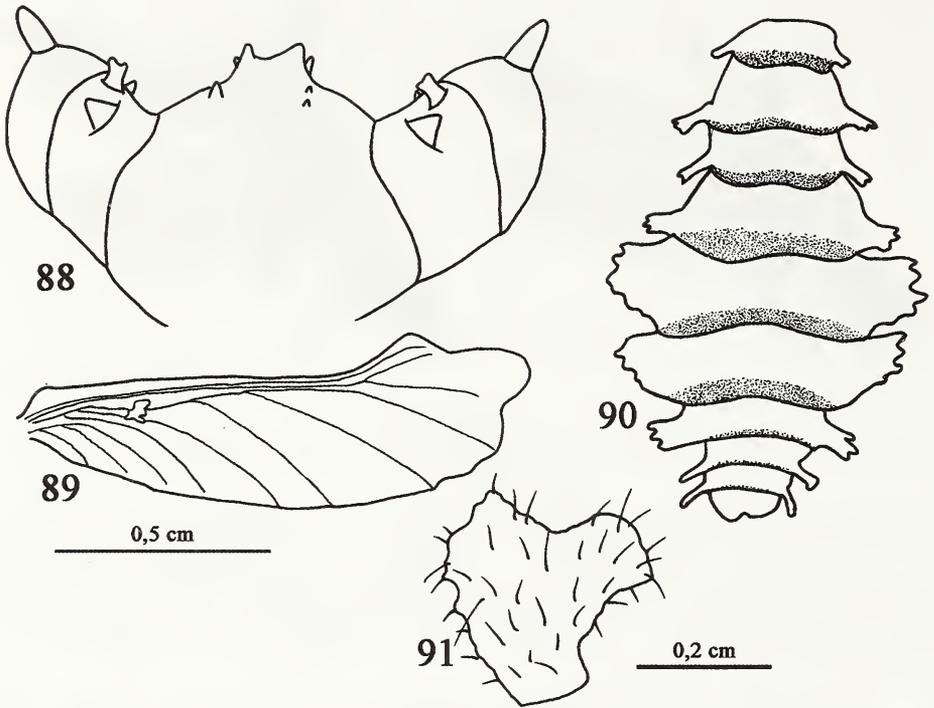
Female unknown.

DESCRIPTION MALE

Colouration: Dark to light brown. Head ochraceous with frons and ocelli blackish. Fore coxae ochraceous. Fore femora with two blackish bands on their inner and medial surfaces; larger internal spines blackish with a black, basal spot. Trochanter blackish. Wings hyaline exhibiting opaque, chestnut brown spots apically. Tergites and sternites abdominal with a black apical strip.

Head (Fig. 5, 88): About 1.61 times as wide as pronotum supracoxal dilatation, with sparse small tubercles; process of vertex not well developed, only slightly more elevated than ocelli and bearing 2-4 pointy tubercles apically; frontal ridge smooth; eyes oblong, ocular spine short (approximately as long as the diameter of one ocellus); occiput with a tuberculated conical processes on each side above the eyes and area near the eye suture with two tubercles, the posterior one clearly more developed and often bearing apical granulations; middle portion of vertex with four small tubercles describing a square; frontal shield transverse pentagonal, about twice as broad as high.

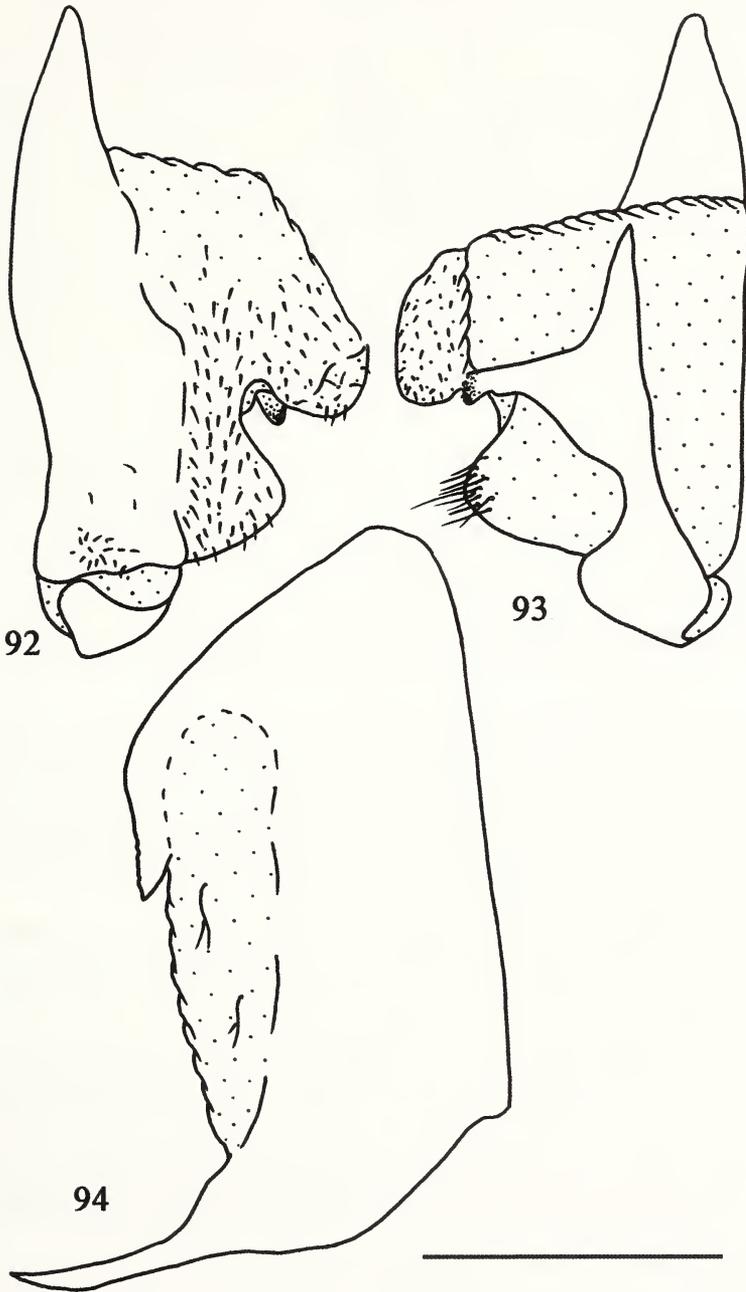
Thorax: Pronotum 2.58 times as long as its maximum width, disc of prozone smooth with some small tubercles distally; supracoxal dilatation widely rounded;



FIGS 88-91

Pseudacanthops clorindae, typus: (88) Head. (89) Mesothoracic wing. (90) Abdomen. (91) Last segment of cercus.

lateral margins exhibiting small, scattered denticles, those on the postero-lateral margins flattened and more developed; ratio metazone/prozone 1.65. Fore coxae about 0.80 times as long as pronotum, margins smooth; internal distal lobes contiguous. Fore femora (Fig. 17) 1.12 times as long as pronotum and 4.56 times as long as its maximum width; dorsal margin smooth, with rounded proximal lobe; external surface exhibiting several tubercles, specially on its medial axis, the one tubercle located at the level of the forth external spines is conical in shape and much more developed. Fore tibiae as long as half the length of the femora. Spination formula: F=6ES/14IS/4DS and T=16-20ES/14-15IS. Middle and hind femora shortened, covered with long, conspicuous hairs and with a rounded basal lobe on medial external margin. Tibiae (Fig. 26) covered with minute hairs (4-5 times shorter than those on femora); basal half thicker than distal half and with a medial lobated swelling; apex of tibia with a distinct lobe. Metatarsus shorter than remaining segments together. Wings extending well beyond the tip of abdomen. Mesothoracic wing as in Fig. 89, ratio total length/maximum width 3.9; distal portion of mesothoracic wing (from one third to half) and whole costal area chestnut brown with hyaline spots, remaining of wing hyaline and largely unpigmented (small dark spots might occur along the longitudinal veins), stigma dark brown and conspicuous.



FIGS 92-94

External copulatory of *Pseudacanthops clorindae*, *typus*: (92-93) Left phallomere, dorsal and ventral view. (94) Ventral phallomere. Scale = 1 mm.



FIG. 95

Geographic distribution of: black circle = *Pseudacanthops caelebs*; black triangle = *P. centralis*.

Abdomen: Slightly cylindrical (Fig. 90); ventral surface densely covered with long hairs; urotergites 1-4 and 8-9 with a small, elongated, postero-lateral lobes; lateral margins urotergites 5-7 exhibiting leaf-like, dentated lobes (smaller on the 7th urotergite). Urotergites exhibiting a medial carina which forms a leafy extension towards the distal margin of each urite, such extensions are bilaterally flanked by two shorter and similar extensions and several much smaller ones.

Cerci extend beyond the subgenital plate with long hairs; last segment (Fig. 91) very large, flattened and dilated, weakly incised at apex, forming two equal lobes. Subgenital plate longer than wide and with an incised apex; styles small; supranal plate short with incised apex.

External male genitalia: Ventral phallomere (Fig. 94) about twice as long as its width; distal process elongate, arcuated; lateral process elongated with acute apex. Left phallomere (Figs 92-93) well sclerotized; ventral lamina with stocky distal process; anterior process short; phalloid apophysis membranous with numerous small spines.

Measurements (millimeters): Head width 5.8; pronotum supracoxal dilatation width 3.6; prozone length 3.5; metazone length 5.8; fore coxae length 7.5; fore femora length 10.5; tegminae length 43.

COMMENTS: This new species is very different from other known species; the more important differences regard the wings that in this species are hyaline, the costal margin little excavate and the shape of copulatory apparatus.

DISTRIBUTION: Known from southeastern Peru and Southwest Brazil (Fig. 96).

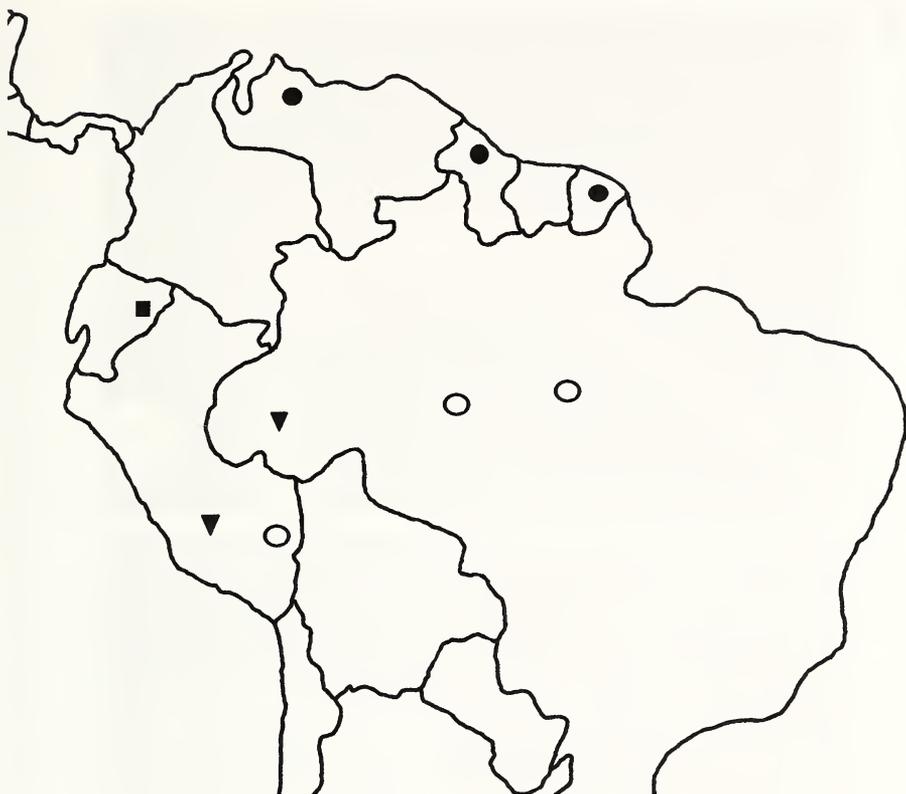


FIG. 96

Geographic distribution of: black square = *Pseudacanthops huaoraniana*; open circle = *P. lobipes*; black triangle = *P. clorindae*; black circle = *P. spinulosus*.

Pseudacanthops lobipes La Greca & Lombardo, 1997

Figs 6, 87, 96, 97, 98

Pseudacanthops lobipes La Greca & Lombardo, 1997: 49.

Paracanthops caelebs. – Rehn, 1904: 571 (Bolivia).

Pseudacanthops caelebs. – Travassos, 1945: 217 (partim Bolivia). – Cerdà, 1993: 140 (partim Bolivia). – Ehrmann, 2002: 291 (partim Bolivia).

Pseudacanthops spinulosa. – Terra, 1995: 30 (partim Bolivia). – Jantsch, 1999: 78 (Bolivia). – Ehrmann, 2002: 291 (partim Bolivia). – Agudelo Rondón *et al.*, 2007: 115 (partim Bolivia).

MATERIAL EXAMINED: BOLIVIA; Sara Prov.: 1 ♂, 350 m (J. Steinbach leg.) (ANSP). – 1 ♂, Santa Cruz, 600 m, 17.XI.1960 (Zischka leg.) (MDAB). – 1 ♂, Guanay, Coroico, XI.1996 (Coll. Lombardo) (MDAB). – 1 ♂, “Bolivia, South Amer”. – PERU; Distrito de Echarate: 1 ♂, Cuzco, La Convencion, 21.V.1998 (MDAB), – 1 ♂, La Convencion, 2.III.1998 (R. Acosta leg.) (UNALM). – 1 ♂, La Convencion, 2.V.1998 (UNALM). – 1 ♂, Madre de Dios, Manu National Park, 1.XI.1991 (R. Medina leg.) (UNALM). – BRAZIL; 1 ♂, Rio Madeira-Mamore (Stanford expedition) (Mann & Baker leg.) (ANSP). – 1 ♂, Nova Olinda, Rio Purus, V.1922 (S.M. Klages leg.) (ANSP).

DESCRIPTION: A full description of this species is provided by La Greca & Lombardo (1997).



FIGS 97-98

Living specimens of *Pseudacanthops lobipes*. Males and females exhibit differences in habitat use, as both adult and immature females hang upside-down from clumps of moss (Fig. 97, specimen from Yanachaga-Chemillén National Park, Pasco; photo by André Baertschi), whereas adult males sit on branches (Fig. 98, specimen from Peruvian Amazon; photo by Robert Oelman). The preferred habitat of immature males is unknown, but they likely inhabit moss.

MEASUREMENTS (millimeters): Head width 5-6; pronotum supracoxal dilatation width 3.3-4; prozone length 3.4-4; metazone length 6.7-7.8; fore coxae length 7.8-8.8; fore femora length 9.8-10.8; tegminae length 42-45.

DISTRIBUTION: This species was originally described from Bolivia; we now expand its distribution to western Brazil and southeastern Peru (Fig. 96).

CONCLUSIONS

Pseudacanthops is morphologically very well defined by the presence of a median process on the frons and by the common shape of the male genitalia. It is distributed throughout the Neotropics from Mexico to north Bolivia, throughout Venezuela, the Amazon basin and the Guyanas and extends as far as central Brazil.

The analysis of the distribution patterns of its species shows that *P. caelebs* and *P. centralis* occur in Caribbean region, of which the first one is the most widespread species (Mexico, Belize, Honduras and Guatemala) the second one is known only from Nicaragua and Panama (Fig. 98). These two species are similar, sharing the same genitalia model, differing only in the shape of the distal process of the ventral phallosomere (Figs 32, 45). The other four species live in Amazon Basin of which *P. huaoranius* and *P. spinulosus* are morphologically very similar but with different shape of the male genitalia (Figs 59-61, 78-85). These two species are geographically distinguishable also because the first one lives only in Ecuador (Yasuni), while the second one occurs in east South America, (Fig. 96) (Venezuela, Guyana and French Guyana). This remarkable morphological likeness of both species clearly indicates a close phylogenetic relationship and their distribution pattern probably supports a common history of response to vicariant events. *Pseudacanthops lobipes* occurs in Peru, Bolivia and central Brazil (Fig. 96). It lives in parapatric distribution with *P. clorindae* in Peru (Fig. 96). This latter species occurs in Peru and central-west Brazil, it is the most diversified species of this genus, characterized by hyaline wings and by costal margin little excavate.

ACKNOWLEDGMENTS

We express our gratitude, for the loan of material, to the following persons: Peter Schwendinger (MHNG); Daniel Otte and Jason Weintraub (ANSP), Giovanni Onore (QCAZ), and Roger Roy (MNHN).

REFERENCES

- AGUDELO RONDÓN, A. A., LOMBARDO, F. & JANTSCH, L. J. 2007. Checklist of the Neotropical mantidae (Insecta, Dictyoptera, Mantodea). *Biota Colombiana* 8:105-158.
- BATTISTON, R., FONTANA, P., AGABITI, B. & GARCIA, P. L. 2005. Mantodea collected in Mexico during an 8800 Km Orthopterological Trip (Insecta: Mantodea). *Atti Accademia Roveretana degli Agiati* 5:199-215.
- BEIER, M. 1934. Mantodea, Fam. Mantidae. Subfam. Hymenopodidae. *Genera Insectorum* de P. Wytzman, 196^e fascicle. Desmet-Verteneuil, Bruxelles, 37 pp., 2 pl.
- CERDÀ, F. J. 1993. Mantodea de Venezuela. Géneros y lista preliminar de especies. Parte I: familias Mantoididae e Hymenopodidae. *Revista Facultad Agronomía* (Maracay) 19: 129-151.

- CHARPENTIER VON, T. 1843. Orthoptera descripta et depicta. *Voss, Lipsiae*, 1841-1845, 32 texts.
- CHOPARD, L. 1912. Contribution à la faune des Orthoptères de la Guyane française. Mantidae. *Annales de la Société entomologique de France* 80: 315-338.
- CHOPARD, L. 1913. Description d'un genre nouveau et d'une espèce nouvelle de Mantidae (Orth.) de la République Argentine. *Bulletin de la Société entomologique de France* 1913: 55-60.
- CHOPARD, L. 1916. Etudes des Mantides américains de la collection I. Bolivar (Orthoptères). *Annales de la Société entomologique de France* 85: 161-187.
- EHRMANN, R. 2002. Mantodea Gottesanbeterinnen der Welt. *Natur und Tier Verlag, Münster*, 519 pp.
- GIGLIO-TOS, E. 1927. Das Tierreich Orthoptera- Mantidae. *Walter de Gruyter, Berlin & Leipzig*, 50: XL + 707pp.
- JANTSCH, L. J. 1999. Estudos filogénético em Mantódeos americanos (Insecta: Pterigota: Mantodea). Tese de Doutorado. Pontificia Universidade Católica do Rio grande do Sul, 138 pp.
- KIRBY, W. F. 1904. A synonymic catalogue of Orthoptera. I (Forficilidae, Hemimeridae, Blattidae, Mantidae and Phasmidae). *British Museum Natural History X* + 501pp.
- LA GRECA, M. 1954. Sulla struttura morfologica dell'apparato copulatore dei Mantoidei. *Annuario Istituto Superiore Scienze e Lettere*, S. Chiara, Napoli, 2-25.
- LA GRECA, M. & LOMBARDO, F. 1997. A new species of *Pseudacanthops* Saussure 1870 from Bolivia (Insecta Mantodea). *Tropical Zoology* 10(1): 49-55.
- LICHTENSTEIN, A. A. H. 1802. A dissertation on two Natural Genera hitherto consounded under the name of Mantis. *Transactions of the Linnean Society London*, v. *Thomas Young*, Serie B 6: 1-39.
- LOMBARDO, F. & IPPOLITO, S. 2004. Revision of the species of *Acanthops* Serville 1831 (Mantodea, Mantidae, Acanthopinae) with comment on their phylogeny. *Annals of the Entomological Society of America* 97(6): 1076-1102.
- OTTE, D. & SPEARMAN, L. 2005. Mantids Species File. Catalog of the Mantide of the World. Insecta Diversity Association. Philadelphia, Publication Number 1, 489 pp.
- RIVERA, J. 2010. *Chromatophotina*, a remarkable new genus of praying mantid from the Neotropical Region and its two new species (Mantodea: Mantidae, Photinainae). *Zootaxa* 2415: 22-32.
- REHN, J. A. G. 1904. Studies in American mantids or Soothsayers. *Proceedings of the United States National Museum* 27 (1364): 561-574.
- SAUSSURE, H. DE 1869. Essai d'un Système des Mantides. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 3(2): 49-73.
- SAUSSURE, H. DE 1870. Addition au Système des Mantides. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 3(5): 221-244.
- SAUSSURE, H. DE 1871. Mémoires pour servir à l'histoire naturelle du Mexique, des Antilles et des Etats-Unis. IV *Synopsis des Mantides américains*. Genève & Bâle 1 (4): 5-186.
- SAUSSURE, H. DE 1872. Famille des Mantids (pp. 202-295, pl. V-VI). In: SAUSSURE, H. de 1870-1874. Mission scientifique au Mexique et dans l'Amérique centrale. Recherches Zoologiques 6 (section 1). *Imprimerie Nationale, Paris*, 533 pp., 8 plates.
- SAUSSURE, H. DE & ZEHNTNER L. 1894. Fam. Mantidae. (pp. 123-197). In: GODMAN, F. D. & SALVIN, O. (eds.). *Biologia Centrali-Americana. Insecta Orthoptera* (Orthoptera Genuina) Volume 1. *Godman & Salvin, London*, 458 pp, 22 plates.
- SNODGRASS, R. E. 1935. Principles of insect morphology. *McGraw Hill Book Company, New York*.
- STÅL, C. 1877. Systema Mantodeorum. Essai d'une systématisation nouvelle des Mantodées. *Bihang Till K. Svenska Vetenskaps Akademiens Handlingar* 4: 1-91.
- STOLL, C. 1787. Représentation exactement colorée d'après nature des Spectres, des Mantes, des Sauterelles, des Grillons, des Criquets et des Blattes, qui se trouvent dans les quatre

parties du monde, l'Europe, l'Asie, l'Afrique et l'Amérique. *Amsterdam*, 9+56 pp., 18 plates.

TRAVASSOS, L.F. 1945. Sobre a familia Acanthopidae Burmeister, 1838, emend. (Mantodea). *Arquivos de Zoologia do Estado de São Paulo* 4: 157-232.

TERRA, P. 1995. Revisão sistematica dos Generos de Louva-a-Deus da região neotropical (Mantodea). *Revista Brasileira de Entomologia* 39(1): 13-94.

WESTWOOD, J. O. 1889. Revisio Insectorum Familiae Mantidarum, speciebus novis aut minus cognitis descriptis et delineatis. Revisio Mantidarum, *Gurney and Jackson, London*, 1-55, 14 plates.

***Plumularia mooreana*, a new marine hydroid from French Polynesia (Hydrozoa, Cnidaria)**

Peter SCHUCHERT, Muséum d'histoire naturelle, C.P. 6434, CH-1211 Genève 6, Switzerland.

E-mail: Peter.Schuchert@ville-ge.ch

***Plumularia mooreana*, a new marine hydroid from French Polynesia (Hydrozoa, Cnidaria)** - A new species of *Plumularia* from Moorea is described. It is a member of the *P. setacea* species complex, being easily distinguishable from the latter through its large, truncate gonothecae provided with numerous nematothecae, as well as its shallow hydrothecae with a curved abaxial wall. Sterile colonies of the new species can be mistaken for *P. strobilophora*, though several reliable characters allow their distinction. The type material of *P. strobilophora* was re-examined for comparison and new illustrations are provided.

Keywords: Pacific - Tahiti - new species - *Plumularia strobilophora*.

INTRODUCTION

Hydroids of the genus *Plumularia* Lamarck, 1816, comprising about 90 potentially valid species, occur in all tropical to temperate seas (Schuchert, 2013). Most members of the genus more or less resemble the type species, *P. setacea* (Linnaeus, 1758), and species discrimination is often difficult due the paucity of available characters and a significant intraspecific variation (Schuchert, 2013). A comprehensive revision of the genus is highly desirable, as many nominal species are not objectively distinguishable or are inadequately described (comp. e. g. Calder *et al.*, 2009).

However, it is still possible to find undescribed *Plumularia* species which are unambiguously distinguishable from their congeners. While studying samples of *P. setacea* from around the world, several specimens of a *Plumularia* from Moorea (French Polynesia), collected by Drs Nicole Gravier-Bonnet, Alan Collins, and Gustav Paulay in 2009, were entrusted to me for study. They proved to belong to an unnamed species, whose description is provided herein.

TAXONOMIC PART

***Plumularia mooreana* n. spec.**

Figs 1-2

Plumularia strobilophora. – Ryland & Gibbons, 1991: 536, fig. 8. [not *Plumularia strobilophora* Billard, 1913]

HOLOTYPE MATERIAL: University of Florida Natural History Museum UF-7017; field number BM00-08101; Moorea, 17.55143°S 49.77698°W, 0-2 m depth, collected 06.12.2009, one fertile colony and several stems originating presumably from same colony, some stems with gonothecae, some detached gonothecae present.

PARATYPE MATERIAL: University of Florida Natural History Museum UF-6730; field number BM00-06413; Moorea, 17.45747°S 149.83277°W, 10-20 m depth, collected 21.11.2009; 2 sterile plumes. – UF-6762; field number BM00-06722; Moorea, depth 0-3 m, collected 23.11.2009; 5 sterile plumes. – UF-7026; field number BM00-08110; Moorea, 17.55143°S 149.77698°W; depth 0-2, collected 06.12.2009; several small, sterile plumes.

DIAGNOSIS: *Plumularia* species with large gonothecae borne on basal part of stem, bearing numerous, scattered nematothecae; walls undulated, distal end broadly truncate, attachment site to stem basilateral. Hydrothecae very shallow, with curved abaxial wall. Lateral nematothecae distinctly funnel-shaped. Plumes small, unbranched.

DESCRIPTION: Relatively small, delicate, pinnate shoots arising from creeping stolons. Stems monosiphonic, regularly and distinctly divided by transverse nodes, each internode with a distal apophysis and two nematothecae: one in the upper axil of apophysis and one in the lower half of segment, on side opposite to apophysis. Perisarc thick at base, thinning out distally.

Hydrocladia alternate, on two opposite sides of the stem, carrying up to four hydrothecae; segmented heteromerously, distinct nodes delimiting main- and inter-segments (hydrothecate and ahydrothecate segments), proximal-most segment short and without nematothecae (athecate segment). Main segments elongate, proximal node oblique, distal node straight, with a hydrotheca in middle of segment and three nematothecae: one median inferior and two laterals. Intersegments variable in length, each with one median nematotheca, proximal node straight, distal node oblique. Both types of segments may have indistinct internal, annular ridges close to their ends.

Hydrotheca inclined approx. 45° to main axis of segment, bowl-shaped, shallow, ratio diameter/depth about 2, adcauline wall not completely adnate, abcauline wall thickened and in the majority of the hydrothecae of one plume distinctly convex (bulging), rim smooth to somewhat irregularly undulated, internal wall with a ring of numerous, conspicuous desmocytes (small perisarc knobs).

Nematothecae two chambered, movable, lateral pair conspicuously funnel-shaped, with a broad, distal aperture; as high or higher than hydrothecal depth, wall facing hydrotheca depressed.

One to two gonothecae on basal part of stem where no hydrocladia occur; thin-walled, bullet-shaped, base often curved, lateral walls straight to convex, variably undulated (annular bulges/swellings), distal end a large, flat, circular surface. Connection site to stem is basilateral. Numerous (up to 15 seen) nematothecae, more tubular than the laterals associated to the hydrotheca, are scattered over the surface of the gonotheca.

The measurements are given in Table 1.

REMARKS: The following publications were considered to compare the new species to other *P. setacea*-like hydroids: Allman (1877), Bale (1884), Billard (1913), Calder (1997), Fraser (1937, 1938, 1944, 1948), Hirohito (1995), Jarvis (1922), Mammen (1967), Migotto (1996), Millard (1975), Nutting (1900, 1906, 1927), Ralph (1961), Ryland & Gibbons (1991), Schuchert (2013), Vervoort & Vasseur (1977), Vervoort & Watson (2003), Watson (1973). A complete list of all *Plumularia* species was obtained from Schuchert (2012).

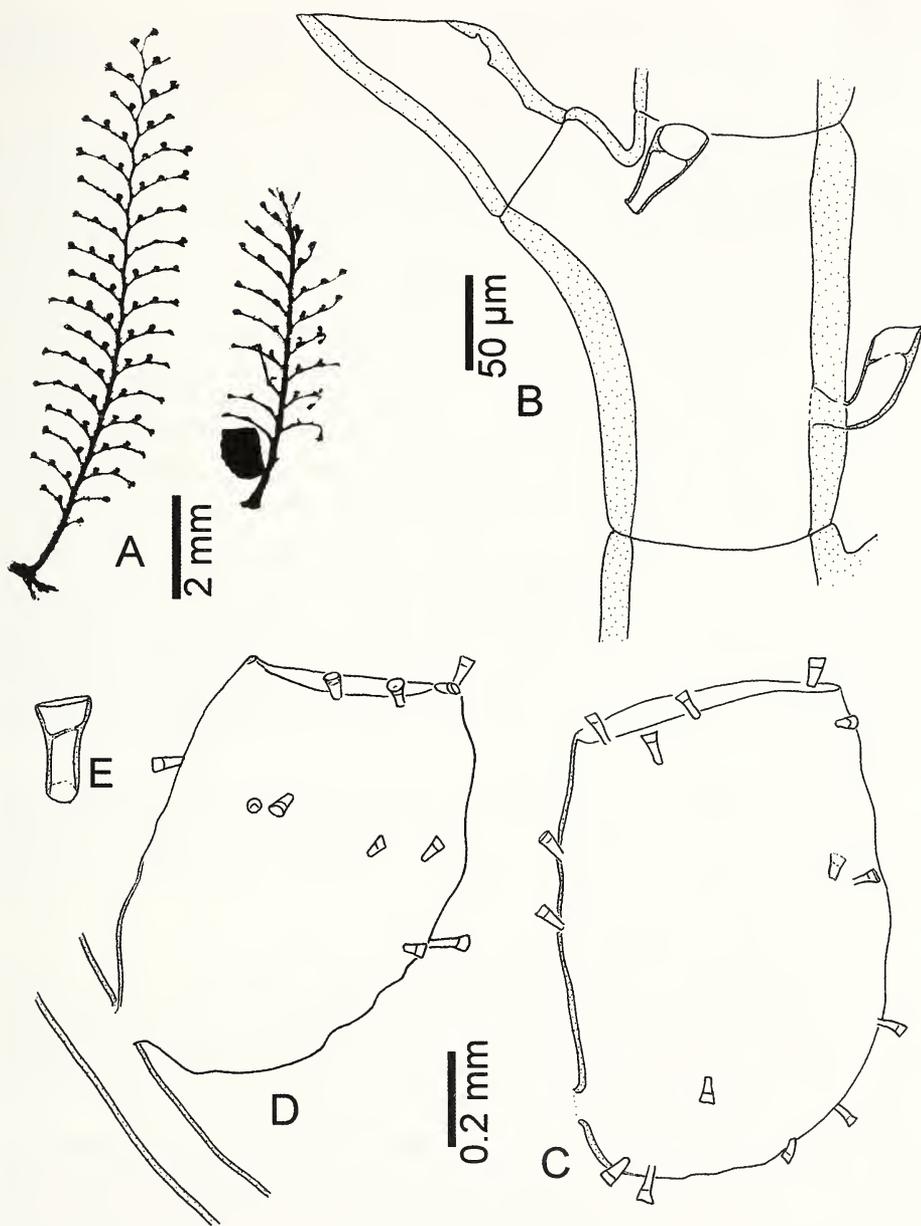


FIG. 1

Plumularia mooreana n. spec. (A) Silhouettes of two plumes: paratype (left), holotype (right). (B) Segment of stem with first, athecate segment of a hydrocladium, FU-6730. (C-D) Gonothecae, holotype. (E) Nematotheca of gonotheca, same scale as B.

Plumularia mooreana is a member of the large group of *P. setacea*-like hydroids (comp. Schuchert, 2013). It is, however, readily distinguished from the nearly cosmopolitan *P. setacea* through its different gonothecae, the shallower and more tilted hydrothecae, and the funnel-shaped lateral nematothecae.

The most characteristic feature of *P. mooreana* is found in its gonotheca, whose surface is covered with numerous nematothecae (Fig. 1B-C). Species belonging to the family Plumulariidae rarely have nematothecae on their gonothecae, a trait that is typical of the Halopterididae (Schuchert, 1997; the family also includes the genus *Polyplumularia*, see Peña Cantero *et al.*, 2010). The only known exceptions within the genus *Plumularia* are *P. wasini* Jarvis, 1922, *Plumularia australiensis* Watson, 1973, and some populations of *P. filicula* Allman, 1877 (see Vervoort & Watson, 2003). *Plumularia wasini* has 2-3 nematothecae on its gonothecae (Millard, 1975), but is otherwise rather different from *P. mooreana*: in having hydrothecae with a relatively long, free adcauline side and a straight abcauline side, a solitary nematotheca behind the hydrotheca, short main segments, gonothecae on hydrocladia, and stem-nematothecae in two rows. *Plumularia australiensis* closely resembles *P. wasini* and is therefore distinguishable from *P. mooreana* using the same characters listed for *P. wasini*. *Plumularia filicula* has normally no nematothecae on its gonothecae (comp. Ramil & Vervoort, 1992), but Vervoort & Watson (2003) described material from New Zealand which had a small gonothecae with two nematothecae. As already acknowledged by Vervoort & Watson (2003), the identity of this material is uncertain and it might represent another, undescribed species. The shape of the gonothecae and the hydrothecae of this material are very distinct from *P. mooreana* and both forms are clearly separable.

Although it is not particularly convex in *P. mooreana*, a curved outer abcauline hydrothecal wall is also uncommon in the genus *Plumularia*, being present in only a few congeners, e. g. *P. lagenifera* Allman, 1885, *P. gaimardi* (Lamouroux, 1924) (for a redescription see Schuchert, 2013), and *Plumularia caliculata* Bale, 1888. However, all of them have gonothecae that lack nematothecae.

The attachment of the gonotheca in the lower part of the stem is also seen in *P. strictocarpa* Pictet, 1893, but the gonothecae of this species have more distinct annular ridges and, again, bear no nematothecae. Moreover, its hydrothecae are different (deeper, straight walls). Both species occur sympatrically, as material of *P. strictocarpa* was collected concomitantly with *P. mooreana* (not shown, specimens UF-6820 & UF 7112 of the University of Florida Natural History Museum)

The trophosome of *P. mooreana* resembles most closely that of *P. strobilophora* Billard, 1913, notably regarding the rather shallow, strongly inclined hydrothecae. In the absence of gonothecae, the two species can be difficult to distinguish, and it seems that Ryland & Gibbons (1991) misidentified specimens of *P. mooreana* as *P. strobilophora*, although they noted the differences to descriptions given by other authors. In order to make sure that both species are clearly distinct, the type material of *P. strobilophora* was examined for this study (see below). Apart from the absence of nematothecae on the gonothecae, *Plumularia strobilophora* differs from *P. mooreana* in the following details: the first hydrocladial segment (athecate segment) is distinctly longer (comp. Figs 1B and 3A), there are 2-3 nematothecae on the stem apophyses (Fig. 3A),

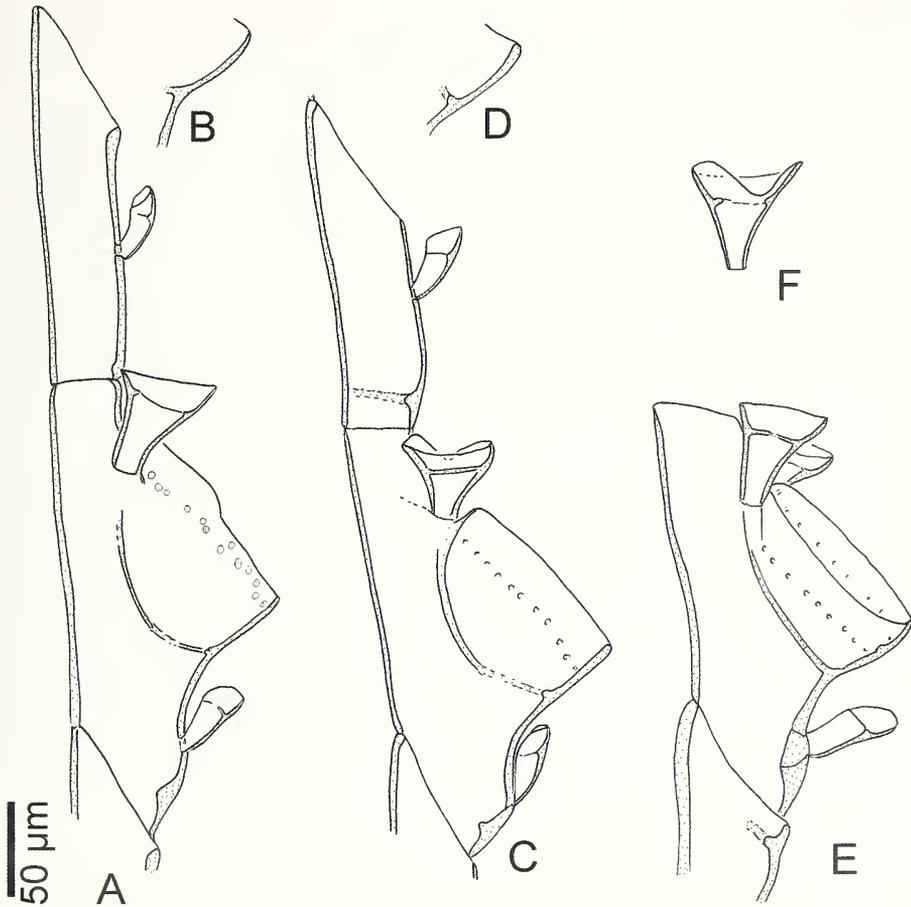


FIG. 2

Plumularia mooreana n. spec., scale bar applies to all drawings. (A) Main- and intersegment of hydrocladium, holotype. (B) Abcauline wall of hydrotheca, holotype. (C) Main- and intersegment of hydrocladium, FU-6730. (D) Abcauline wall of hydrotheca, FU-6730. (E) Main segment of hydrocladium, holotype. (F) Lateral nematotheca in adcauline view, holotype.

the abcauline hydrothecal wall is either straight or often concave (comp. Figs 2D and 3D), the portion of the main segments distal to the hydrotheca is distinctly longer (comp. Figs 2A, C and 3B, C), the intersegments are much longer (comp. Figs 2A, C and 3B, C), and the gonothecae are much smaller and carried on the stem region provided with hydrocladia.

The conspicuously funnel-shaped lateral nematothecae is another character which distinguishes *P. mooreana* from all *Plumularia* species discussed above (Fig. 2F).

The distinct ring of desmocytes (Figs 2A, C, E) is not unique to *P. mooreana*, being also present in other species (see Schuchert, 2013). What is rather special, is its

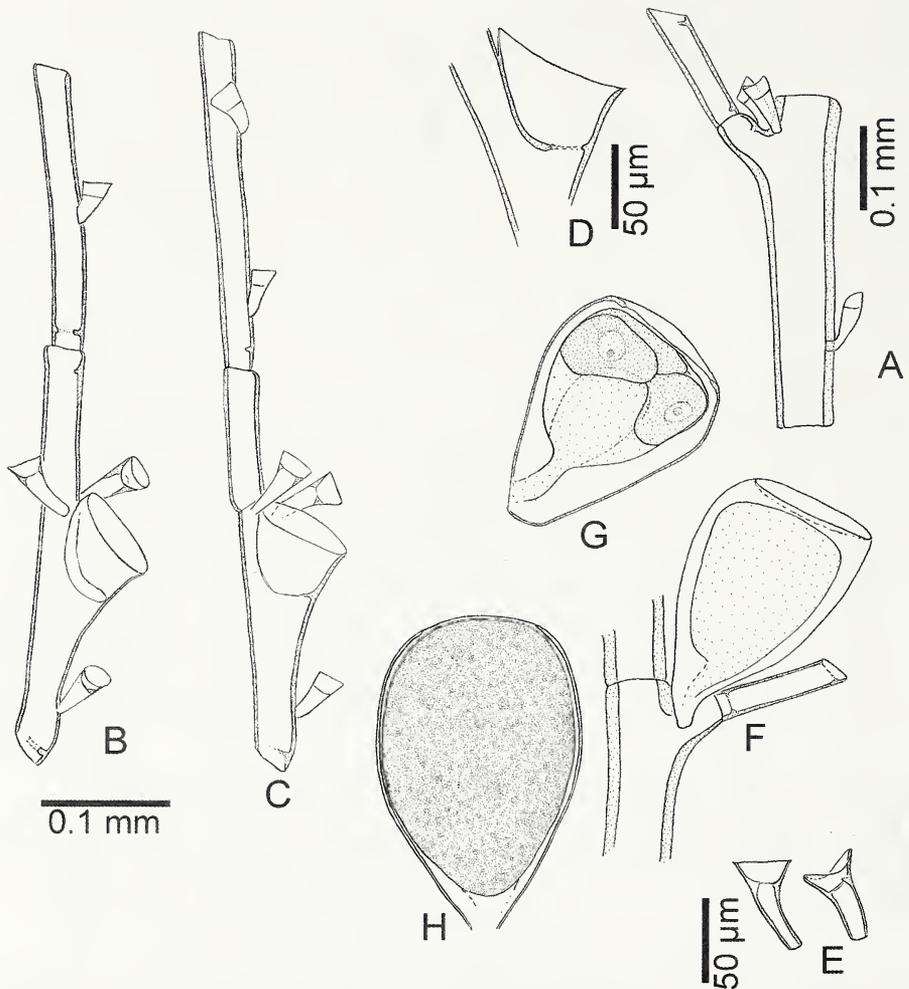


FIG. 3

Plumularia strobilophora Billard, 1913, syntypes ZMA-4014. (A) Segment of stem with first, athecate segment of a hydrocladium. (B-C) Main- and intersegment of hydrocladium. (D) Hydrotheca. (E) Lateral hydrothecae, same scale as D. (F-G) Female gonothecae, same scale as A. (H) Male (?) gonotheca, same scale as A.

position in the upper half of the hydrotheca. Usually it is located near its base and rather inconspicuous.

DISTRIBUTION: French Polynesia (this study), Fiji Islands (Ryland & Gibbons, 1991); depth 0-20 m.

***Plumularia strobilophora* Billard, 1913**

Fig. 3

Plumularia strobilophora Billard, 1913: 35, fig. 26, Indonesia. – Vannucci, 1951: 87, pl. 3 figs. 17-18. – Vervoort & Vasseur, 1977: 80, fig. 33.

Plumularia strobilifera. – Billard, 1933: 23, fig. 9. – Schmidt, 1972: 43. [misspellings] not *Plumularia strobilophora*. – Ryland & Gibbons, 1991: 536, fig. 8. [= *P. mooreana*]

SYNTYPE MATERIAL: Naturalis Museum Leiden (The Netherlands); registration number ZMA-4014; Siboga Expedition station 257; at least 2 colonies, one female growing on the hydroids *Idiellana pristis*, another putatively male on *Diphasia* spec.

TYPE LOCALITY: Duroa Strait, Kai (Kei) Islands, Indonesia, 52 m depth.

DIAGNOSIS: Small, *Plumularia setacea*-like hydroid, distinguishable through the very long first hydrocladial segment (athecate segment), the presence of two or more axillar nematothecae, the long distal part of the main segment (may be separated by a node), the much smaller, conical gonothecae with their broadly truncate end (in *P. setacea* bottle-shaped). The hydrocladial intersegments are long and have 1-2 nematothecae. In addition, all dimensions are distinctly smaller than in *P. setacea* (comp. Schuchert, 2013).

DISTRIBUTION: Banda Sea, Gulf of Suez, Philippines, French Polynesia, Brazil (Vervoort & Vasseur, 1977).

TABLE 1: Dimensions (ranges of values) of the species examined for this study. For more details see Schuchert (2013)

character	<i>P. mooreana</i>	<i>P. strobilophora</i>
plume height [mm]	10-24	12
approximate number of hydrocladia	20-36	24
length of cauline segments [μm]	210-240	290-370
diameter of cauline segments [μm]	100-130	50-80
length of first hydrocladial segment [μm]	75-110	120-150
length of main segments [μm]	200-240	280-320
length of intersegments [μm]	120-175	240-290
depth of hydrotheca [μm]	45-50	45-50
diameter of hydrotheca [μm]	100-115	80
Height of lateral nematothecae [μm]	35-50	50-60
length gonotheca [μm]	850-1000	female 250, male (?) 290

ACKNOWLEDGEMENTS

I wish to thank Nicole Gravier-Bonnet (University of La Réunion) and Gustav Paulay (University of Florida) for letting me examine and describe the material of *P. mooreana*. The loan of the syntype material of *Plumularia strobilophora* provided by the Naturalis Museum in Leiden was also much appreciated. Dale Calder and Horia Galea provided many valuable comments and suggestions which helped to improve the quality of this publication.

REFERENCES

- ALLMAN, G. J. 1877. Report on the Hydroida collected during the Exploration of the Gulf Stream by L. F. de Pourtalès, Assistant United States Coast Survey. *Memoirs of the Museum of Comparative Zoölogy* 5: 1-66, plates 1-34.
- ALLMAN, G. J. 1885. Description of Australian, Cape and other Hydroids, mostly new, from the collection of Miss H. Gatty. *Journal of the Linnean Society* 19: 132-161.
- BALE, W. M. 1884. Catalogue of the Australian hydroid zoophytes. *Sydney, Australian Museum Catalogue* No. 8: 1-198, plates 1-19.
- BALE, W. M. 1888. On some new and rare Hydroida in the Australian Museum collections. *Proceedings of the Linnean Society of New South Wales* ser 2 volume 3: 745-799, plates 712-721.

- BILLARD, A. 1913. Les Hydroides de l'expédition du SIBOGA. I Plumulariidae. *Siboga Expeditie* 7a: 1-115, plates 1-6.
- BILLARD, A. 1933. Les hydroïdes des golfes de Suez et d'Akaba. *Mémoires de l'Institut d'Égypte* 21: 1-30, pl. 31.
- CALDER, D. R. 1997. Shallow-water hydroids of Bermuda: superfamily Plumularioidea. *Royal Ontario Museum Life Sciences Contributions* 161: 1-86.
- CALDER, D. R., VERVOORT, W. & HOCHBERG, F. G. 2009. Lectotype designations of new species of hydroids (Cnidaria, Hydrozoa), described by C.M. Fraser, from Allan Hancock Pacific and Caribbean Sea Expeditions. *Zoologische Mededelingen* 83: 919-1054.
- FRASER, C. M. 1937. Hydroids of the Pacific coast of Canada and the United States. *The University of Toronto Press, Toronto*, pp. 208, pls 1-44.
- FRASER, C. M. 1938. Hydroids of the 1934 Allan Hancock Pacific Expedition. *Allan Hancock Pacific Expeditions* 4: 1-105.
- FRASER, C. M. 1944. Hydroids of the Atlantic coast of North America. *The University of Toronto Press, Toronto*, pp. 1-451, pls 1-94.
- FRASER, C. M. 1948. Hydroids of the Allan Hancock Pacific Expeditions since March, 1938. *Allan Hancock Pacific Expeditions* 4: 179-343.
- HIROHITO, EMPEROR OF JAPAN 1995. The hydroids of Sagami Bay II. Thecata. *Biological Laboratory of the Imperial Household, Tokyo*, pp. I-III, 1-354, pls 1-13.
- JARVIS, F. E. 1922. The hydroids from the Chagos, Seychelles and other islands and from the coasts of British East Africa and Zanzibar. *Transactions of the Linnean Society of London, Zoology* 18: 331-360, plates 24-26.
- LAMARCK, J. B. 1816. Histoire naturelle des animaux sans vertèbres. *Verdière, Paris*, pp. 1-568.
- LAMOUREUX, J. V. F. 1824. Description des polypiers flexibles. In: J.R.C. QUOY & J.P. GAIMARD, eds, *Zoologie*. Pp. 603-643, plates 88-95.
- LINNAEUS, C. 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus, differentiis, synonymis, locis*. Edition decima, reformata. *Holmiae, Laurentii Salvii*, pp. 1-823.
- MAMMEN, T. A. 1967. On a collection of Hydroids from Southern India. III Family Plumulariidae. *Journal of the Marine Biological Association of India* 7: 291-324.
- MIGOTTO, A. E. 1996. Benthic shallow-water hydroids (Cnidaria, Hydrozoa) of the coast of São Sebastião, Brazil, including a checklist of Brazilian hydroids. *Zoologische Verhandelingen, Leiden* 306: 1-125.
- MILLARD, N. A. H. 1975. Monograph on the Hydroida of southern Africa. *Annals of the South African Museum* 68: 1-513.
- NUTTING, C. C. 1900. American Hydroids. Part I The Plumularidae. *Smithsonian Institution, United States National Museum Special Bulletin* 4: 1-285.
- NUTTING, C. C. 1906. Hydroids of the Hawaiian Islands collected by the steamer Albatross in 1902. *Bulletin of the United States Fish Commission for 1903* 23: 931-959, plates 1-13.
- NUTTING, C. C. 1927. Report on Hydroida collected by the United States Fisheries steamer Albatross in the Philippine region 1910. In: Contributions to the biology of the Philippine Archipelago and adjacent regions, part 3. *Bulletin of the United States National Museum* 100: 195-242.
- PEÑA CANTERO, A. L., SENTANDREU, V. & LATORRE, A. 2010. Phylogenetic relationships of the endemic Antarctic benthic hydroids (Cnidaria, Hydrozoa): what does the mitochondrial 16S rRNA tell us about it? *Polar Biology* 33: 41-57.
- PICTET, C. 1893. Etude sur les hydraires de la Baie d'Amboine. *Revue suisse de Zoologie* 1: 1-64.
- RALPH, P. M. 1961. New Zealand thecate hydroids. Part IV.- The family Plumulariidae. *Transactions of the Royal Society of New Zealand, Zoology* 1: 19-74.
- RAMIL, F. & VERVOORT, W. 1992. Report on the Hydroida collected by the 'BALGIM' expedition in and around the Strait of Gibraltar. *Zoologische Verhandelingen* 277: 1-262.

- RYLAND, J. S. & GIBBONS, M. J. 1991. Intertidal and shallow water hydroids from Fiji. 2. Plumulariidae and Aglaopheniidae. *Memoirs of the Queensland Museum* 30: 525-560.
- SCHMIDT, H. E. 1972. Some new records of hydroids from the Gulf of Aqaba with zoogeographical remarks on the Red Sea area. *Journal of the Marine Biological Association of India* 13: 27-51.
- SCHUCHERT, P. 1997. Review of the family Halopterididae (Hydrozoa, Cnidaria). *Zoologische Verhandelingen, Leiden* 309: 1-162.
- SCHUCHERT, P. 2012. World Hydrozoa database. Accessed through: Schuchert, P. (2009), World Hydrozoa database at <http://www.marinespecies.eu/hydrozoa>, December 2012.
- SCHUCHERT, P. 2013. The status of *Plumularia lagenifera* Allman, 1885 (Cnidaria, Hydrozoa) and related species. *Zootaxa* 3613(2): 101-124.
- VANNUCCI, M. 1951. Hydrozoa e Scyphozoa existente no Instituto Paulista de Oceanografia. *Boletim do Instituto Paulista de Oceanografia* 2: 69-100, plates 1-4.
- VERVOORT, W. & VASSEUR, P. 1977. Hydroids from French Polynesia with notes on distribution and ecology. *Zoologische Verhandelingen, Leiden* 159: 3-98.
- VERVOORT, W. & WATSON, J. E. 2003. The marine fauna of New Zealand: Leptothecata (Cnidaria: Hydrozoa) (thecate hydroids). *NIWA Biodiversity Memoir* 119: 1-538.
- WATSON, J. E. 1973. Pearson Island expedition 1969. 9. Hydroids. *Transactions of the Royal Society of South Australia* 97: 153-200.

Note sur la diversité des oligochètes aquatiques dans la région genevoise (Suisse)

Régis VIVIEN

Rue du Pré-Naville 6, 1207 Genève. Email: regisvivien@hotmail.com

Note on the diversity of aquatic oligochaetes in the Geneva area (Switzerland). - The main purpose of this note is to update the inventory of aquatic oligochaetes in the Geneva area proposed by Vivien & Lafont (2013). Species diversity of this group has been studied in fine/sandy sediments of watercourses as well as in coarse surficial sediments and the hyporheic zone of a river. Seven new taxa (six new species) for the region have been found. One of these species (*Haber turquinae*) is new for Switzerland. One species mentioned in the area in the early 20th century was found again. The number of taxa in the Geneva area is currently 69 and is likely to increase as future work is conducted in the area.

Keywords: aquatic oligochaetes - inventory - Geneva area - watercourses - fine/sandy and coarse sediment - hyporheic zone.

INTRODUCTION

Les principales familles d'oligochètes peuplant les eaux douces européennes sont constituées par les Naididae, les Enchytraeidae, les Lumbriculidae, les Haplotaxidae et les Propappidae (Rodriguez & Reynoldson, 2011). La famille des Lumbriculidae comprend en outre quelques formes aquatiques ou amphibies.

Les oligochètes aquatiques sont diversifiés et abondants dans presque tous les habitats, incluant les eaux marines ou saumâtres, et les eaux hyporhéiques et souterraines. Ils sont couramment utilisés comme bioindicateurs de la qualité des sédiments et de l'eau des cours d'eau et des lacs, et des eaux souterraines (Lafont *et al.*, 2010; 2012 ; Rodriguez & Reynoldson, 2011). L'étude de leurs peuplements dans les sédiments grossiers superficiels et le milieu hyporhéique des cours d'eau permet, en plus d'évaluer la qualité de ces milieux, de connaître la dynamique des échanges entre les eaux de surface et les eaux souterraines (Vivier, 2006; Lafont & Vivier, 2006; Lafont *et al.*, 2010).

L'établissement d'un inventaire des espèces de cette taxocénose dans la région genevoise a débuté en 2008 (Vivien & Lafont, 2013) et est important entre autres pour les travaux d'écologie appliquée. La présence de quelques espèces dans la région genevoise avait été signalée auparavant par Piguet & Bretscher (1913).

59 taxons ont été rencontrés dans la région genevoise entre 2008 et 2011 dans les sédiments fins/sableux et grossiers de cours d'eau, des étangs et des rives du lac Léman (Vivien & Lafont, 2013). De nombreux taxons ont été nouvellement recensés dans la région ou en Suisse par ces auteurs.

Vivien & Lafont (2013) relèvent que leur inventaire est provisoire et que le nombre d'espèces recensées dans la région augmentera probablement au cours de la réalisation de futurs travaux. Pour établir un inventaire le plus complet possible dans la région, ils proposent 4 voies: effectuer des prélèvements dans des milieux non ou peu étudiés, tels que les sédiments grossiers et le milieu hyporhéique des cours d'eau; effectuer des prélèvements à différentes périodes de l'année; pratiquer la dissection en plus de l'examen microscopique de routine; développer et utiliser l'outil de détermination par barcoding moléculaire.

Ici nous suivons la première de ces options et rapportons les résultats obtenus en 2012 dans les sédiments fins/sableux de cours d'eau genevois, dans le cadre d'un suivi de la qualité biologique des sédiments par le Service de l'écologie de l'eau (Vivien, 2013), ainsi que dans les sédiments grossiers de surface et le milieu hyporhéique d'un cours d'eau (l'Allondon) dans le cadre d'une étude en collaboration avec le Muséum d'histoire naturelle de la Ville de Genève. Une analyse des résultats des peuplements d'oligochètes rencontrés dans les sédiments grossiers et le milieu hyporhéique est également proposée.

MATÉRIEL ET MÉTHODES

SITES D'ÉTUDE

Les sites d'études se situent dans le canton de Genève.

SÉDIMENTS FINS/SABLEUX DE COURS D'EAU

Neuf stations appartenant à cinq cours d'eau ont été étudiées en 2012 dans le cadre du programme 2012 de surveillance de la qualité des cours d'eau du Service de l'écologie de l'eau (Vivien, 2013): la Laire: Rougemont (46.13441°N 6.03529°E), Moulin-de-la-Grave (46.14353°N 5.99009°E) et embouchure (46.14670°N 5.96761°E); le Merley: aval rte de Chancy (46.17277°N 6.04347°E); le Couchefatte: Moulin-Roget (46.15827°N 5.98154°E); le Longet: amont rte de Vers-Vaux (46.13789°N 5.96804°E), le Moulin-de-la-Ratte: amont busage (46.18448°N 6.04466°E); le nant des Crues: Eaumorte (46.16362°N 6.02058°E) et Laconnex (46.15653°N 6.03274°E). Deux stations du nant d'Avril ont également été étudiées en 2012: Bourdigny (46.21658°N 6.04649°E) et Peney (46.20486°N 6.04063°E).

Des cartes présentant la localisation de plusieurs de ces cours d'eau et stations (Laire, Merley, nant des Crues et nant d'Avril) sont consultables dans Vivien & Lafont (2013) et SECOE (2006). Le Couchefatte et le Longet sont des affluents du Rhône situés à l'ouest du canton et le Moulin-de-la-Ratte est un affluent du Merley.

1 ou 2 campagnes de prélèvements ont été réalisées (mai et octobre). Au total, 17 relevés ont été effectués. Environ 110 spécimens ont été déterminés par relevé. Au total, 1870 spécimens ont été déterminés.

AUTRES MILIEUX / HABITATS

Les spécimens provenant des sédiments grossiers et milieu hyporhéique ont été prélevés en septembre 2012 près de l'embouchure de l'Allondon (46.17909°N 6.00910°E).

234 spécimens ont été examinés (sédiments grossiers: 153 spécimens, milieu hyporhéique: 81 spécimens).

PRÉLÈVEMENTS, TAMISAGE ET MONTAGE

Les sédiments fins/sableux des cours d'eau ont été prélevés à l'aide d'un filet type Surber de vide de maille de 0,2 mm. Les prélèvements ont été effectués à 2 ou 3 endroits différents (au niveau de la station). Le milieu hyporhéique (eau et sédiment), a été prélevé au moyen d'une sonde reliée à une pompe Bou-Rouch à un seul endroit et à deux profondeurs différentes (20 cm et 40 cm). Les sédiments grossiers ont été prélevés à l'aide d'un filet type Surber de vide de maille de 0,2 mm au même emplacement que le milieu hyporhéique. Les vers ont été fixés sur le terrain au formaldéhyde 5 %. Au laboratoire, le tamisage des sédiments a été effectué sur une colonne de 2 tamis (5 mm et 0,5 mm de vide de maille) pour les sédiments fins/sableux et d'un tamis (0,2 mm) pour les sédiments grossiers et le milieu hyporhéique. Les oligochètes ont été éclaircis dans une solution d'acide lactique/glycérol, puis montés entre lame et lamelle dans une solution d'enrobage permanente composée d'acide lactique, de glycérol et d'alcool polyvinylique (mowiol 4-88).

DÉTERMINATIONS

Les spécimens ont été identifiés à l'espèce, au genre, à la famille ou au groupe (dans le cas des Tubificinae avec ou sans soies capillaires non reconnaissables à l'état immature). Les ouvrages utilisés sont: Sperber (1948); Brinkhurst (1971); Timm & Veldhuijzen van Zanten (2002); Erséus *et al.* (2008); Timm (2009).

RÉSULTATS

Sur l'ensemble des prélèvements réalisés, huit taxons non trouvés de 2008 à 2011 ont été rencontrés. Il s'agit de: *Potamothrix bedoti* (2 spécimens trouvés à l'embouchure de la Laire); *Potamothrix vejdvskyi* (7 spécimens trouvés à l'embouchure de la Laire); *Stylaria lacustris* (3 spécimens trouvés à Peney dans le nant d'Avril); *Haber turquinae* (1 spécimen trouvé dans le Longet); *Chaetogaster langi* (quelques spécimens trouvés dans les sédiments grossiers et le milieu hyporhéique de l'Allondon); *Dorydrilus michaelsoni* (2 spécimens trouvés dans le milieu hyporhéique de l'Allondon); *Chaetogaster diastrophus* (nombreux spécimens trouvés dans les sédiments grossiers et le milieu hyporhéique de l'Allondon); *Fridericia* sp. (1 spécimen trouvé dans les sédiments grossiers de l'Allondon).

A l'exception de *Chaetogaster diastrophus* qui a été trouvé en grande nombre, ces taxons peuvent être considérés comme étant rares ou assez rares dans la région (faible fréquence et faible occurrence). Toutefois, la fréquence et l'occurrence de *Potamothrix bedoti* et de *Dorydrilus michaelsoni* ne sont pas connues avec exactitude puisque les spécimens identifiés ici correspondent aux formes adultes, ces espèces ne pouvant pas être déterminées à l'état immature.

Sur le site étudié (Allondon près de l'embouchure), les peuplements d'oligo-chètes des sédiments grossiers sont assez différents de ceux du milieu hyporhéique (les oligochètes ont été collectés au même emplacement dans ces deux milieux). Dans le milieu hyporhéique, une grande majorité de spécimens appartenant à *Cernosvitoviella* spp., *Marionina argentea* et *Lumbriculidae* gen. sp. est présente. Ces taxons sont des indicateurs d'échanges actifs entre les eaux souterraines et les eaux de surface et sont sensibles aux pollutions (organiques et toxiques) (Vivier, 2006; Lafont & Vivier, 2006).

Dans les sédiments grossiers superficiels, ces taxons sont moins présents et il y a une dominance de *Chaetogaster diastrophus* et *C. langi*, espèces caractéristiques des sédiments superficiels et indicateurs de pollution moyenne (Vivier, 2006). Aucun spécimen appartenant à des taxons résistants aux pollutions n'a été rencontré dans les deux milieux.

DISCUSSION

Tous les taxons rencontrés en 2012 et identifiés au niveau spécifique sont connus dans les écosystèmes d'eau douce européens. Ils ont été rencontrés en France (Juget & Lafont, 1979; Lafont, 1989; Rosso, 1995; Vivier, 2006). A noter que la présence d'*Haber turquinae* n'a été mentionnée en France que deux fois, dans des milieux souterrains (dans une grotte et dans une nappe phréatique) (Juget & Lafont, 1979; Paran *et al.*, 2004).

Potamothrix bedoti, *Potamothrix vej dovskyi*, *Haber turquinae*, *Stylaria lacustris*, *Chaetogaster langi*, *Dorydrius michaelsoni* et *Fridericia* sp. n'ont jamais été mentionnés dans la région genevoise auparavant et sont donc nouveaux pour la région (Tab. 1). Par contre, la présence de *Chaetogaster diastrophus* y a été mentionnée par Piguet & Bretscher (1913).

A l'exception de *Haber turquinae*, la présence de ces espèces a été mentionnée en Suisse auparavant (Piguet & Bretscher, 1913; Lang & Reymond, 1995).

Les résultats des peuplements d'oligochètes dans les sédiments grossiers et le milieu hyporhéique mettent en évidence une exfiltration de la nappe. Les échanges entre les eaux souterraines et le milieu hyporhéique sont actifs. Par contre, les peuplements en surface indiquent la présence d'échanges entre surface et subsurface moins actifs et d'une pollution moyenne. Une exfiltration de la nappe a été mise en évidence vers l'embouchure de l'Allondon par le passé au moyen de méthodes hydrologiques (Hottinger, 1998).

Le nombre de taxons recensés dans la région genevoise est actuellement de 69. La diversité de ce groupe dans la région genevoise est importante compte tenu de la faible surface de la région et de la faible diversité des substrats et milieux étudiés (surtout sédiments fins/sableux de cours d'eau). Cette diversité peut être expliquée par le fait que les prélèvements ont été effectués dans des sédiments à degrés de pollution très divers (à la fois en amont et en aval des cours d'eau) et à différentes périodes de l'année. De plus, le nombre de spécimens déterminés jusqu'à présent est assez important.

La poursuite en 2013 de l'étude des peuplements d'oligochètes aquatiques dans la région et en particulier dans des milieux encore peu étudiés (sédiments grossiers et milieu hyporhéique) permettra peut-être de compléter par la suite l'inventaire dans la région. De plus, le développement, actuellement en cours, du barcoding moléculaire des espèces de cette taxocénose permettra de réviser la taxonomie et d'améliorer les inventaires.

TABLEAU 1: liste des taxons nouvellement recensés dans la région genevoise (en 2012)

* espèce nouvelle pour la Suisse

Naididae**Tubificinae**

<i>Potamothrix bedoti</i>	Piguet, 1913
<i>Potamothrix vejdoskyi</i>	Hrabe, 1941
<i>Haber turquinae</i> *	Juget & Lafont, 1979

Naidinae

<i>Chaetogaster langi</i>	Bretscher, 1896
<i>Stylaria lacustris</i>	Linnaeus, 1767

Lumbriculidae

<i>Dorydrilus michaelsoni</i>	Piguet, 1913
-------------------------------	--------------

Enchytracidae*Fridericia* sp.

REMERCIEMENTS

Je remercie Jean Mariaux et Patrick Martin pour leurs commentaires qui m'ont permis d'améliorer le texte, Michel Lafont pour son aide pour les déterminations et pour sa relecture du manuscrit, Vincent Ebener et Bernard Bayerl pour leur assistance sur le terrain et Pascal Moeschler de m'avoir formé aux méthodes de prélèvement dans le milieu hyporhéique.

REFERENCES

- BRINKHURST, R. O. 1971. A guide for the identification of British Aquatic Oligochaeta. *Scientific Publication of the Freshwater Biology Association, Ambleside*, 22: 55 pp.
- ERSÉUS, C., WETZEL, M. J. & GUSTAVSSON L. 2008. ICZN rules – a farewell to Tubificidae (Annelida, Clitellata). *Zootaxa* 1744: 66-68.
- HOTTINGER, M. 1998. Etude hydrogéologique de la nappe alluviale de l'Allondon genevoise. *Diplôme post-grade en hydrogéologie, Centre d'hydrogéologie de l'Université de Neuchâtel (CHYN), Suisse*: 122 pp.
- JUGET, J. & LAFONT, M. 1979. Description de *Peloscolex turquini*, n. sp. et redescription de *Peloscolex moszynskii*, Kasprzak, 1971, (Tubificidae, Oligochaeta), avec quelques remarques sur la répartition du genre *Peloscolex* dans les eaux douces françaises. *Bulletin mensuel de la société linnéenne de Lyon* 48: 75-80, 113-118.
- LAFONT, M. 1989. Contribution à la gestion des eaux continentales : utilisation des Oligochètes comme descripteurs de l'état biologique et du degré de pollution des eaux et des sédiments. *Thèse de Doctorat d'Etat ès Sciences, UCBL Lyon I*: 311 pp. + annexes 92 pp.
- LAFONT, M. & VIVIER, A. 2006. Oligochaete assemblages in the hyporheic zone and coarse surface sediments: their importance for understanding of ecological functioning of watercourses. *Hydrobiologia* 564: 171-181.
- LAFONT, M., JEZEQUEL, C., VIVIER, A., BREIL, P., SCHMITT, L. & BERNOUD, S. 2010. Refinement of biomonitoring of urban water courses by combining descriptive and ecohydrological approaches. *Ecohydrology and Hydrobiology* 10: 3-11.
- LAFONT, M., TIXIER, G., MARSIALEK, J., JEZEQUEL, C., BREIL, P. & SCHMITT, L. 2012. From research to operational biomonitoring of freshwaters: a suggested conceptual framework and practical solutions. *Ecohydrology and Hydrobiology* 12: 9-20.
- LANG, C. & REYMOND, O. 1995. Etat trophique du petit lac en 1994 indiqué par les communautés de vers. Campagne 1994. *Rapport de la Commission Internationale pour la protection des eaux du lac Léman contre la pollution*: 193-197.

- PARAN, F., MALARD, F., MATHIEU, J., LAFONT, M., GALASSI, D. M. P. & MARMONIER, P. 2004. Distribution of groundwater invertebrates along an environmental gradient in a shallow water-table aquifer (pp. 99-105). *In*: GIBERT, J. (ed.). World Subterranean Biodiversity. Proceedings of an International symposium held on 8-10 December 2004 in Villeurbanne, France: 182 pp.
- PIGUET, E. & BRETSCHER, K. 1913. Oligochètes. Catalogue des invertébrés de la Suisse. Fascicule 7, Genève: 215 pp.
- RODRIGUEZ, P. & REYNOLDS, T. B. 2011. The Pollution Biology of Aquatic Oligochaetes. *Ed. Springer Science+Business Media*: 224 pp. + annexes.
- ROSSO, A. 1995. Description de l'impact des micropolluants sur les peuplements d'Oligochètes des sédiments de cours d'eau du bassin versant de l'Ill (Alsace). Elaboration d'une méthode biologique de diagnostic de l'incidence des micropolluants. *Thèse de Doctorat, Université Claude Bernard, Lyon I*: 176 pp. + annexes.
- SECOE. 2006. La Loire et ses affluents - État 2006 et évolution depuis 1996. *Service de l'écologie de l'eau, Département de l'intérieur et de la mobilité, Genève, Suisse*: 54 pp. + annexes.
- SPERBER, C. 1948. A taxonomical study of the Naididae. *Zoologiska Bidrag Fran Uppsala* 28: 1-296.
- TIMM, T. 2009. A guide to the freshwater Oligochaeta and Polychaeta of Northern and Central Europe. *Lauterbornia* 66: 1-235.
- TIMM, T. & VELDHUIZEN van ZANTEN, H. H. 2002. Freshwater Oligochaeta of North-West Europe. *Biodiversity Center of ETI, World Biodiversity Database, CD-ROM*.
- VIVIEN, R. 2013. Evaluation de la qualité biologique et physicochimique des sédiments de cours d'eau du secteur Loire-Champagne - campagne 2012. Rapport d'étude. *Service de l'écologie de l'eau, Département de l'intérieur et de la mobilité, Genève, Suisse*.
- VIVIEN, R. & LAFONT, M. 2013. Diversité des oligochètes aquatiques dans la région genevoise, *Revue suisse de Zoologie* 120: 161-173.
- VIVIER, A. 2006. Effets écologiques de rejets urbains de temps de pluie sur deux cours d'eau périurbains de l'ouest lyonnais et un ruisseau phréatique en plaine d'Alsace. *Thèse de Doctorat, Université Louis Pasteur, Strasbourg, France*, 208 pp.

Three new species of *Psyllipsocus* (Psocodea: 'Psocoptera': Psyllipsocidae) from Brazilian caves with description of a novel structure interpreted as a male accessory genital organ

Charles LIENHARD¹ & Rodrigo L. FERREIRA²

¹ Muséum d'histoire naturelle, C.P. 6434, CH-1211 Genève 6, Switzerland.

Corresponding author. E-mail: charleslienhard@bluewin.ch

² Universidade Federal de Lavras, Departamento de Biologia (Zoologia), C.P. 3037, CEP. 37200-000 Lavras (MG), Brazil. E-mail: drops@dbi.ufla.br

Three new species of *Psyllipsocus* (Psocodea: 'Psocoptera': Psyllipsocidae) from Brazilian caves with description of a novel structure interpreted as a male accessory genital organ. - The following closely related new species are described and illustrated: *Psyllipsocus clunijunctus* Lienhard n. spec., *P. serrifer* Lienhard n. spec., *P. similis* Lienhard n. spec. Within the genus they form a monophyletic species group characterized by the presence of an elaborate sclerotized clunial bridge medio-ventrally on the male abdominal apex. Based on morphological observations this novel structure is interpreted as an accessory genital organ, which is probably directly involved in copulation, partly replacing the primary male coupling organ (phallosome), which is strongly reduced in these species. The females of this species group are characterized by the presence of a cap-shaped spermapore sclerite and a sclerotized spermathecal blade. In the polyandrous species *P. serrifer* the spermathecal blade is saw-shaped and possibly serves as a "tin-opener" for thick-walled spermatophores. The function of this novel structure is presumably similar to that of the signum in the bursa copulatrix of some Lepidoptera.

Keywords: Brazil - cave fauna - new species - male genitalia - spermathecal signum.

INTRODUCTION

Psyllipsocus Selys-Longchamps is a very heterogeneous and probably ancient genus (Mockford, 2011) belonging to the suborder Trogiomorpha, infraorder Psyllipsocetae (Yoshizawa *et al.*, 2006). It comprises a total of 44 species, most of them described from North and Middle America and from the Aethiopian and Oriental regions (see Lienhard & Smithers, 2002 and Lienhard, 2011, 2012). 27 species are known from the New World (Lienhard & Smithers, 2002; Mockford, 2011, 2012) but only four species have been recorded from South America: *P. delamarei* Badonnel from Argentina (Badonnel, 1962), *P. variabilis* Badonnel from Colombia (Badonnel, 1986), *P. dubius* Badonnel from Venezuela (Badonnel, 1987) and *P. yucatan* Gurney from Brazil (García Aldrete & Mockford, 2009; Mockford, 2011; Lienhard *et al.*,

2012). Most of these species live on vegetation, especially on bark of trees, in soil litter or on lichen-covered rock outcrops; only a few species have been occasionally or exclusively recorded from caves (see Mockford, 2011; Badonnel, 1977a, b, 1987). A key to the 24 species known from North and Middle America was published by Mockford (2011).

This is the second contribution on *Psyllipsocus* resulting from a study on cave psocids from Brazil directed by the junior author. The first contribution (Lienhard *et al.*, 2012) reported *P. yucatan* from several Brazilian caves and treated the still enigmatic phenomenon of microcrystal deposits on the wing membranes of some living individuals of this species. Two contributions on the related family Prionoglarididae (Trogiomorpha: Prionoglaridetae) have also been published recently (Lienhard *et al.*, 2010; Lienhard & Ferreira, 2013).

At present we are aware of 17 *Psyllipsocus* species from Brazilian caves, most of them undescribed. Herein we describe three closely related species which form a monophyletic group characterized by several autapomorphies of male and female genitalia, in particular the presence of an elaborate sclerotized clunial bridge medioventrally on the male abdominal apex. This structure was incidentally discovered during routine dissection and slide-mounting of Brazilian *Psyllipsocus* specimens, soft tiny creatures with a body length of about 1.5 mm (see Fig. 1A). In some males, after separation of the hypandrium, it was not possible to flatten the dome-shaped abdominal apex by opening it ventrally between the paraprocts, for spreading the telson and the clunium (i. e. fused and well-sclerotized last two or three pretelsonic terga; see Mockford, 1993 and Lienhard, 1998). When using the standard method of dissection (see Lienhard, 1998: p. 62) the medioventral membrane at the base of the paraprocts can usually be cut by minute needles without any problem. In these males this zone resisted the usual mechanical treatment and finally showed to be differentiated as a sclerotized ventral connection between the hind corners of the clunium. Based on morphological observations this novel structure is here interpreted as an accessory genital organ, which is probably directly involved in copulation, partly replacing the primary male coupling organ (phallosome), which is strongly reduced in these species (see General Discussion).

MATERIAL AND METHODS

The material examined was collected by RLF (unless other collector mentioned) by hand-collecting in 32 caves situated in 20 municipalities and 5 states (see Fig. 1). In general only adults were studied. Nymphs are only mentioned if they were collected together with adults and therefore could be assigned to the same species as the latter. Dissection and slide-mounting followed the methods described by Lienhard (1998). The material examined is deposited in the following institutions: Universidade Federal de Lavras, Departamento de Biologia (Coleção de Invertebrados Subterrâneos), Lavras, Brazil (ISLA); Muséum d'histoire naturelle, Geneva, Switzerland (MHNG).

The pilosity of wing veins is usually heavily damaged in the material studied. For the drawings it was reconstructed on the basis of the insertion points of the hairs, which are always visible in slide-mounted wings, and of the few hairs on each wing

which were not lost. The length of these hairs was considered as representative for the pilosity of the entire wing, based on the observation that in *Psyllipsocus* the length of wing ciliation is uniform over the whole wing.

Abbreviations used in the descriptions: BL = body length (in alcohol); F = hind-femur (length); FW = forewing (length); HW = hindwing (length); IO/D = shortest distance between compound eyes divided by longitudinal diameter of compound eye in dorsal view of head; P2 = second article of maxillary palp; P4 = fourth (terminal) article of maxillary palp; T = hindtibia (length); t1, t2, t3 = tarsomeres of hindtarsus (length, measured from condyle to condyle); v1, v2, v3 = first (ventral), second (dorsal) and third (external) ovipositor valvula respectively. Abbreviations of wing veins and cells are used according to Yoshizawa (2005).

Abbreviations for Brazilian states: BA = Bahia, GO = Goiás, MG = Minas Gerais, RN = Rio Grande do Norte, TO = Tocantins.

TAXONOMY

THE *CLUNJUNCTUS* SPECIES GROUP OF *PSYLLIPSOCUS*

DIAGNOSIS: Autapomorphies of male and female genitalia: Phallosome strongly reduced, lacking basal struts; endophallus closely applied to the inner (dorsal) surface of the hypandrium (Figs 2GH, 5A, 9CD), anteriorly with a pair of weakly sclerotized oval plates and posteriorly with some small lateral sclerotizations and a dorso-median pair of lobules bearing 2-3 placoid sensilla (their minute central sense pegs not always distinct). Male abdominal apex with an elaborate clunial bridge, i. e. hind corners of clunium ventrally prolonged and medially connected to each other by a sclerotized but laterally and medially somewhat flexible structure bearing in the middle a ventrally open papillate cavity facing the dorsal side of the distal lobe of the hypandrium (Figs 3A, 10). Opening of the spermathecal duct (spermapore) situated dorsally near the tip of a thick-walled conical or dome-shaped sclerotized cap surrounding the distal portion of the duct (Fig. 2C); in resting position this spermapore sclerite situated in a zone of multiply folded membranes (Fig. 6G). Spermathecal sac with a longitudinal sclerotized saw- or file-like blade on the inner side of its wall (Fig. 7A-G); base of this sclerite situated near opening of spermathecal duct (Fig. 7IJ).

Other characters: Both sexes macropterous (Fig. 4A) or brachypterous (Fig. 1A, 2AB); pterostigma of forewing almost triangular (i. e. crossvein between R1 and Rs situated at base of pterostigma or close to it); distal closed cell of forewing at least twice as long as wide; vein CuA1 only weakly curved; wing membranes hyaline. P2 with a stout sensillum in basal half (Fig. 4F); P4 slender, slightly broadening towards apex and bearing a shallow apical prominence (Fig. 4F); lacinial tip as in Fig. 4E; pedicel lacking microspades organ (sensu Mockford, 1993, 2011); antennal flagellomeres long and cylindrical (Fig. 4H). Pretarsal claws simple, symmetrical, with a small preapical denticle (Fig. 4G); hind legs with well-developed coxal organ (sensu Mockford, 2011), less distinct in brachypterous individuals. Epiproct simple. Paraproct with a basally not articulated long anal spine and a setal organ (sensu Mockford, 2011) consisting of a short fine seta and a longer, thicker seta (Figs 3A, 6BG, 8E); paraproctal sensorium in macropterous individuals usually with 6 fine trichobothria on basal florets and one stout seta (Fig. 6B), in brachypterous individuals number of tricho-

bothria often reduced. Female with three pairs of ovipositor valvulae, v1 and v2 weakly developed, membranous, v3 broad oval, slightly sclerotized and uniformly setose (Fig. 2F); subgenital plate simple, apically with a small and often indistinct median cleft (Fig. 6C). Hind corners of clunium in female ventrally not prolonged, connected to each other by a membranous zone (Fig. 8E). Apical lobe of hypandrium broadly rounded, with four dorsal placoid sensilla, each bearing a minute central sense peg (Figs 2GH, 5A, 9CD).

SPECIES OF THE *CLUNJUNCTUS* GROUP: *P. clunjunctus* Lienhard n. spec., *P. serrifer* Lienhard n. spec., *P. similis* Lienhard n. spec.

DISCUSSION: See General Discussion, below.

DESCRIPTIONS OF THE NEW SPECIES

Psyllipsocus clunjunctus Lienhard n. spec.

Figs 1A, 2, 3, 7G

HOLOTYPE: ISLA; ♂ (slide-mounted); BRAZIL (GO), Damianópolis, cave Lapa do Ribeirão dos Porcos, 27.vi.2002, leg. R. L. Ferreira.

PARATYPES: ISLA and MHNG, slide-mounted and/or in alcohol; BRAZIL, leg. R. L. Ferreira (unless other collector mentioned), from the following municipalities. 2♂, 1♀, São Desidério (BA), cave Gruta do Catitu, 24.vii.2006. 1♂, São Desidério (BA), cave Gruta do Sumidouro do João Baio, 29.vii.2006. – 1♀, Várzea Nova (BA), cave Gruta Jurema, 20.vii.2008. – 3♂, 2♀, 1 nymph, Damianópolis (GO), cave Lapa do Ribeirão dos Porcos, 29.vii.2001. 3♀ (one of them allotype), 1 nymph, Damianópolis (GO), cave Lapa do Ribeirão dos Porcos, 27.vi.2002. – 1♂, 1♀, Presidente Olegário (MG), cave Lapa Vereda da Palha, 13.x.2010. – 5♂, 4♀, 7 nymphs, Baraúna (RN), cave Caverna Britador, 11.vi.2010, leg. D. M. Bento. 2♀, 5 nymphs, Baraúna (RN), cave Caverna Cipós, 11.vi.2010, leg. D. M. Bento. 3♂, 1♀, 3 nymphs, Baraúna (RN), cave Caverna Escada, 27.i.2010, leg. D. M. Bento. 1♀, 1 nymph, Baraúna (RN), cave Caverna Esquecida, 17.vi.2010, leg. D. M. Bento. – 1♀, Felipe Guerra (RN), cave Lapa do Engano, 5.viii.2010, leg. D. M. Bento. 2♂, Felipe Guerra (RN), cave Caverna Rumana, 19.i.2010. 1♂, Felipe Guerra (RN), cave Caverna Rumana, 5.viii.2010, leg. D. M. Bento. 1♂, 1♀, Felipe Guerra (RN), cave Gruta da Catedral, 14.ix.2008. 1♀, Felipe Guerra (RN), cave Gruta Carrapateira, 24.iv.2007. – 4♂, 3 nymphs, Governador Dix-Sept Rosado (RN), cave Gruta do Lagedo Grande, 21.vii.2010, leg. D. M. Bento. – 3♀, Mossoró (RN), cave Caverna Trinta, 10.vi.2010, leg. D. M. Bento. – 1♂, 2♀, Aurora do Tocantins (TO), cave Gruta das Rãs, 8.i.2009, leg. R. A. Zampaulo.

DESCRIPTION: See diagnosis of the species group, with the following complements. General colouration whitish to light or medium brown. Head often with a characteristic pattern of brown hypodermal pigment (Fig. 2D), compound eyes dark brown to black. Tibiae lacking transversal bands. Abdomen whitish or with some brown hypodermal pigment, terminalia brown.

Both sexes brachypterous (Fig. 1A), in female (Fig. 2B) forewings at most reaching abdominal apex, in male (Fig. 2A) often somewhat projecting over tip of abdomen. Forewing venation with irregularities due to brachyptery, especially in the region of pterostigma and vein Rs (Fig. 2AB), the latter usually simple. Hindwings strongly reduced, often almost veinless (Fig. 2B). Compound eyes larger in weakly brachypterous specimens (IO/D about 2.6) than in strongly brachypterous ones (IO/D up to 3.9). Three ocelli present even in strongly brachypterous individuals. Antenna very long (more than twice body length) but usually damaged in preserved material; maximal number of articles observed: 29 (in a distally damaged antenna).

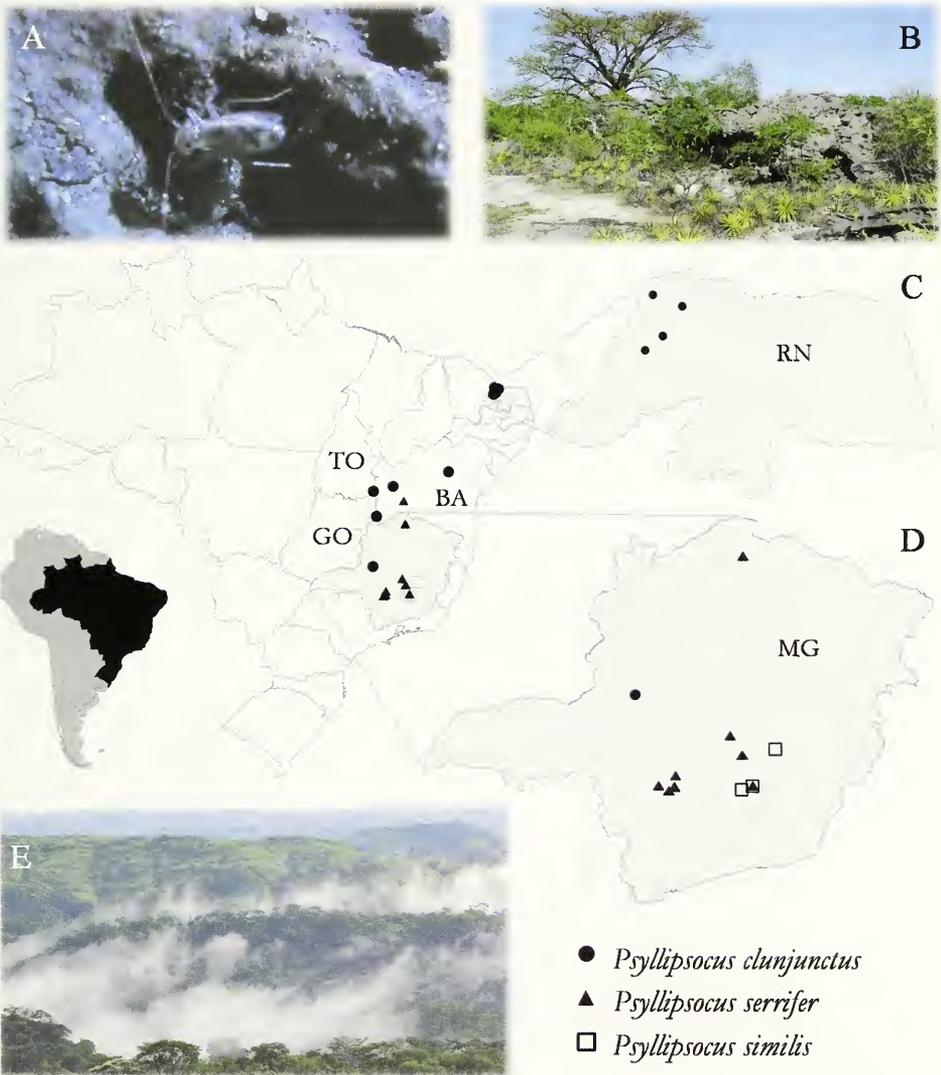


FIG. 1

Map of Brazil showing states and municipalities where specimens of the *Psyllipsocus clunjunctus* species group were collected. (A) *Psyllipsocus clunjunctus* Lienhard n. spec., habitus of brachypterous individual on guano (body length about 1.5 mm). (B) Caatinga formation (semi-arid) which exists in the areas near the caves in RN. (C) Collecting localities (municipalities) in RN. (D) Collecting localities (municipalities) in MG. (E) Cerrado formation (Brazilian Savanna) which exists in the areas near the caves in MG. – States: BA = Bahia, GO = Goiás, MG = Minas Gerais, RN = Rio Grande do Norte, TO = Tocantins.

Broad apical lobe of hypandrium (Fig. 2GH) with a distally rounded sclerotized median area, bearing 4-6 setae near its middle axis; pilosity of basal part of hypandrium as shown in Fig. 5A for *P. serrifer*; arrangement of the four dorsal placoid sensilla as shown in Fig. 2GH. Shape of latero-distal phallosomal sclerotizations and

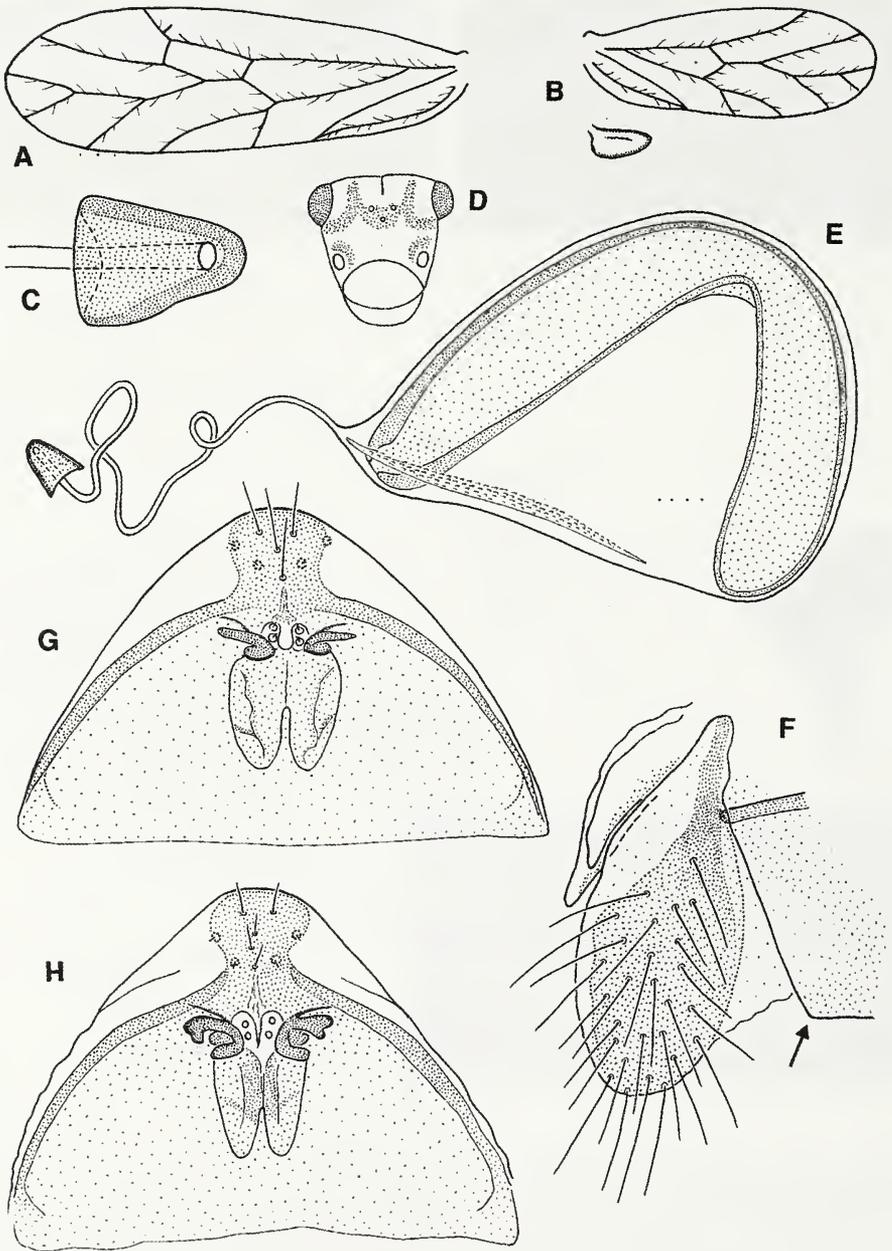


FIG. 2

Psyllipsocus clunjectus Lienhard n. spec. (A) Forewing of brachypterous male. (B) Forewing and hindwing of brachypterous female (same magnification as A). (C) Spermapore sclerite. (D) Head pattern of female from Baraúna (RN). (E) Spermatheca containing one spermatophore. (F) Hind corner of clunium (arrow) and left ovipositor valvulae. (G) Hypandrium and phallosome, ventral view (phallosome observed through ventral wall of hypandrium, pilosity of basal part of the latter not shown), male from São Desidério (BA). (H) Ditto, male from Damianópolis (GO).

of oval medio-distal phallosomal lobules somewhat variable, probably partly depending on position after slide-mounting; each lobule with two placoid sensilla (Fig. 2GH). Clunial bridge relatively simple, as shown in Fig. 3AB, central part seemingly articulated to the lateral parts by a partly membranous zone near the most narrow parts of the bridge (Fig. 3B). Central cavity laterally delimited by a rounded papillate border; these borders representing the ventralmost parts of the bridge. Clunial bridge on each side with a dorso-medially directed spur-like posterior prominence.

Spermapore sclerite of slightly variable shape and length (Figs 2C, 3C). Spermathecal blade slender, file-like, weakly sclerotized (Figs 2E, 7G). Spermathecal duct more than twice as long as spermathecal blade (Fig. 2E), occasionally with a weak thickening near spermathecal sac. Spermatophore long and slender, about 7-8 times longer than wide, sausage-shaped (Fig. 2E; in the spermatheca of one female three such spermatophores could be observed; this indicates that the species is polyandrous; see General Discussion, below).

MEASUREMENTS: Both sexes relatively small, body length usually 1.3-1.6 mm, exceptionally up to 1.8 mm in male and 2.0 mm in female. *Male holotype* (brachypterous): BL = 1.5 mm; FW = 1114 μm ; HW = 170 μm ; F = 386 μm ; T = 596 μm ; t1 = 320 μm ; t2 = 52 μm ; t3 = 66 μm ; IO/D = 2.8. – *Female allotype* (brachypterous): BL = 1.3 mm; FW = 733 μm ; HW = 166 μm ; F = 397 μm ; T = 607 μm ; t1 = 331 μm ; t2 = 50 μm ; t3 = 65 μm ; IO/D = 3.0.

ETYMOLOGY: The specific epithet refers to the clunial bridge joining the hind corners of the clunium to each other (Latin: *junctus*, -a, -um; joined).

DISTRIBUTION AND HABITAT: At present *P. clunjunctus* is known from 16 Brazilian caves situated in 9 municipalities (see Fig. 1). These caves are located in three limestone formations representing different ages and structures. The Bambuí group (upper Proterozoic), located in Minas Gerais, Goiás, Tocantins and Bahia states, comprises the biggest limestone group in Brazil, and contains a considerable proportion of the known caves in the country. The Una group (also upper Proterozoic) occurs in central Bahia state, and is spatially contiguous to the eastern “branch” of the Bambuí group; it is therefore plausible to assume subterranean continuities between these formations. The Apodi group, located in Rio Grande do Norte state, comprises younger limestones, dating from the Cretaceous. This formation is isolated from the previously cited groups.

The geographic distribution of *P. clunjunctus* is somewhat surprising, especially when considering its brachypterous condition, which limits dispersion. The contiguity between the Bambuí and Una limestone formations would explain most of the present distribution, except for the “unexpected” findings in Rio Grande do Norte state. However, many potential habitats between northern Bahia and Rio Grande do Norte (as granitic outcrops, full of fissures and spaces) have not been sampled, and the “distribution gap” observed is probably a sampling artefact.

The physical attributes of the caves inhabited by the different populations of *P. clunjunctus* are very heterogeneous and cave morphology or size are apparently not relevant factors determining the presence of these insects. On the other hand, the presence of guano, especially old piles from haematophagous bats, seems to be

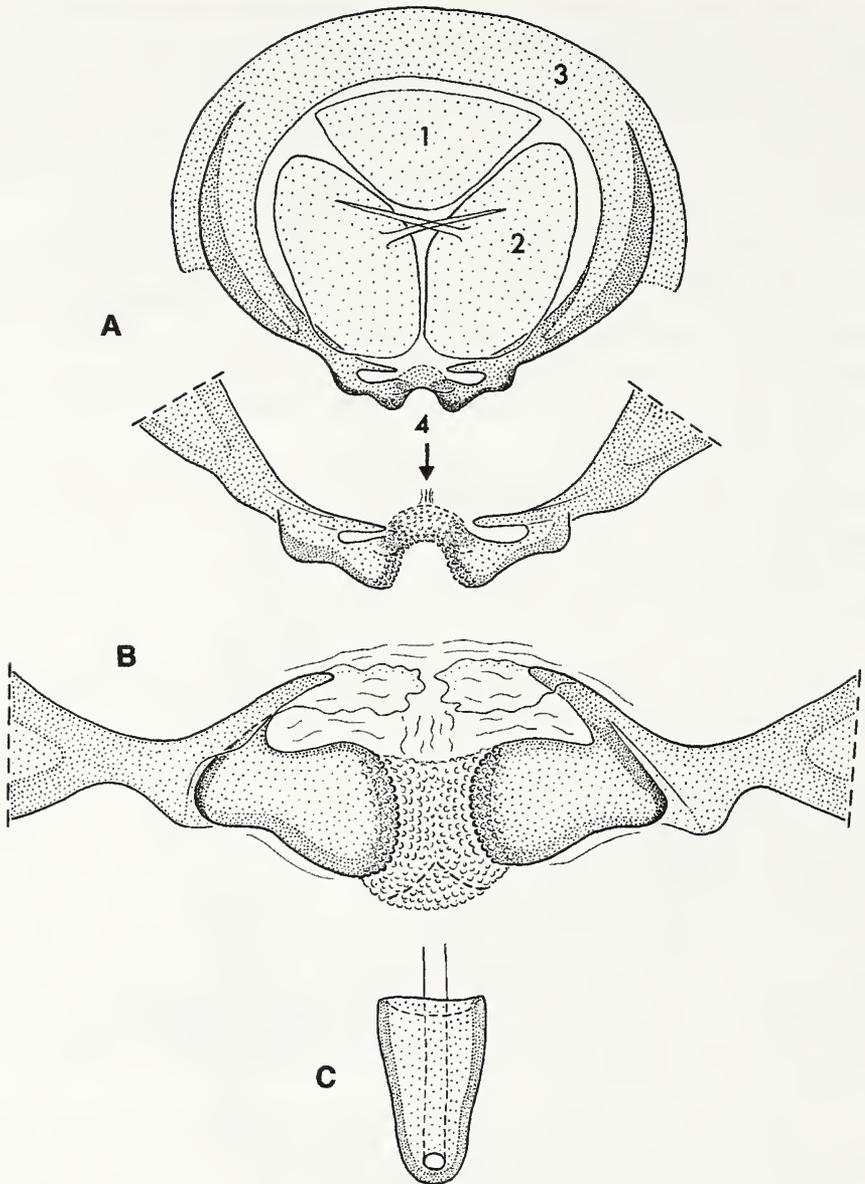


FIG. 3

Psyllipsocus clunjunctus Lienhard n. spec. (A) Schematic representation of slightly squashed male abdominal apex, with detail of clunial bridge, posterior view (1, epiproct; 2, paraproct; 3, clunium; 4 clunial bridge). (B) Clunial bridge, ventral view, posterior part upwards directed in the figure. (C) Spermopore sclerite of female (same magnification as B).

necessary for the occurrence of this species inside a cave. According to Ferreira & Martins (1999) and Ferreira *et al.* (2007) Psyllipsocidae generally prefer old guano piles in Brazilian caves and can be very abundant on this substrate.

DISCUSSION: This relatively small brachypterous species can easily be distinguished from both other species by the presence of a rounded sclerotized area on the distal lobe of the hypandrium, bearing some hairs in the middle, and by the characteristic arrangement of the four dorsal placoid sensilla of the hypandrium. The female is characterized by its particularly long spermathecal duct and the very large sausage-shaped spermatophore. The simple clunial bridge and the file-like spermathecal blade are similar to the corresponding structures in *P. similis*. See also General Discussion, below.

***Psyllipsocus serrifer* Lienhard n. spec.**

Figs 4-6, 7A-E, 7H-J

HOLOTYPE: ISLA; ♂ (slide-mounted); BRAZIL (MG), Pains, cave Gruta Paranoá, 15.i.2008, leg. R. L. Ferreira.

PARATYPES: ISLA and MHNG, slide-mounted and/or in alcohol; BRAZIL, leg. R. L. Ferreira (unless other collector mentioned), from the following municipalities. 2♀, 1 nymph, São Félix do Coribe (BA), cave PEA 377 (=BA 039), 10.v.2011, leg. S. S. Salgado. – 1♀, Arcos (MG), cave Gruta Labirinto, 28.i.2006. 1♀, Arcos (MG), cave Gruta da Bocaininha, 3.xii.2008. – 1♂, Cordisburgo (MG), cave Gruta do Salitre, 22.iv.2011. – 1♀, Dorosópolis (MG), cave Gruta P43, 9.xi.2003. – 1♂, Itabirito (MG), cave Gruta MP1, 29.viii.2005. – 1♀, Januária/Itacarambi (MG), cave Gruta Janelão, 28.vii.2003. – 1♂, Lagoa da Prata (MG), cave Gruta Salão de Festas, 4.v.2003. – 1♀, Matozinhos (MG), cave Gruta Pequenas III, 31.vii.2002. – 1♀, Pains (MG), cave Buraco do Nando, 12.x.2003. 1♀ (allotype), 1 specimen lacking abdomen, Pains (MG), cave Gruta Brasical, 28.ix.2003. 1♀, Pains (MG), cave Gruta do Sobradinho, 5.v.2001.

DESCRIPTION: See diagnosis of the species group, with the following complements. General colouration light to medium brown, exceptionally darker brown. Head often with a characteristic but rather variable pattern of brown hypodermal pigment (Fig. 6A), compound eyes dark brown to black. Tibiae uniformly brown, lacking transversal bands. Abdomen yellowish and usually with some red-brown hypodermal pigment, terminalia brown.

Both sexes macropterous (Fig. 4AB); one slightly brachypterous male has been observed, with vein Rs simple in both forewings (Fig. 4C). Three ocelli present; compound eyes relatively large, about same size in both sexes (IO/D 1.3-1.8). Antenna very long but usually damaged in preserved material.

Hypandrium (Fig. 5A) uniformly setose except for the glabrous and medially membranous apical lobe; the latter only bearing a transversal row of four short marginal setae; arrangement of the four dorsal placoid sensilla as shown in Fig. 5A. Shape of small postero-lateral sclerotizations of phallosome somewhat variable, probably partly depending on position after slide-mounting; phallosomal lobules posteriorly prominent, almost circular, each with two placoid sensilla (Fig. 5A). Clunial bridge relatively complex (Fig. 5BC), central part posteriorly with a movable membranous curtain held by a pair of sclerotized postero-lateral styli and, towards the middle of the cavity, by a sclerotized clip-like structure; the latter appears to be movable in dorso-ventral and antero-posterior directions. Lateral borders of the central papillate cavity representing the ventralmost parts of the clunial bridge, the antero-dorsal bulbous structure may be tendon-like, for insertion of muscles (Fig. 5B).

Spermathecal sclerite of slightly variable shape and length (Figs 6D-F). Spermathecal blade saw-like, well-sclerotized, with many prominent sharp denticles;

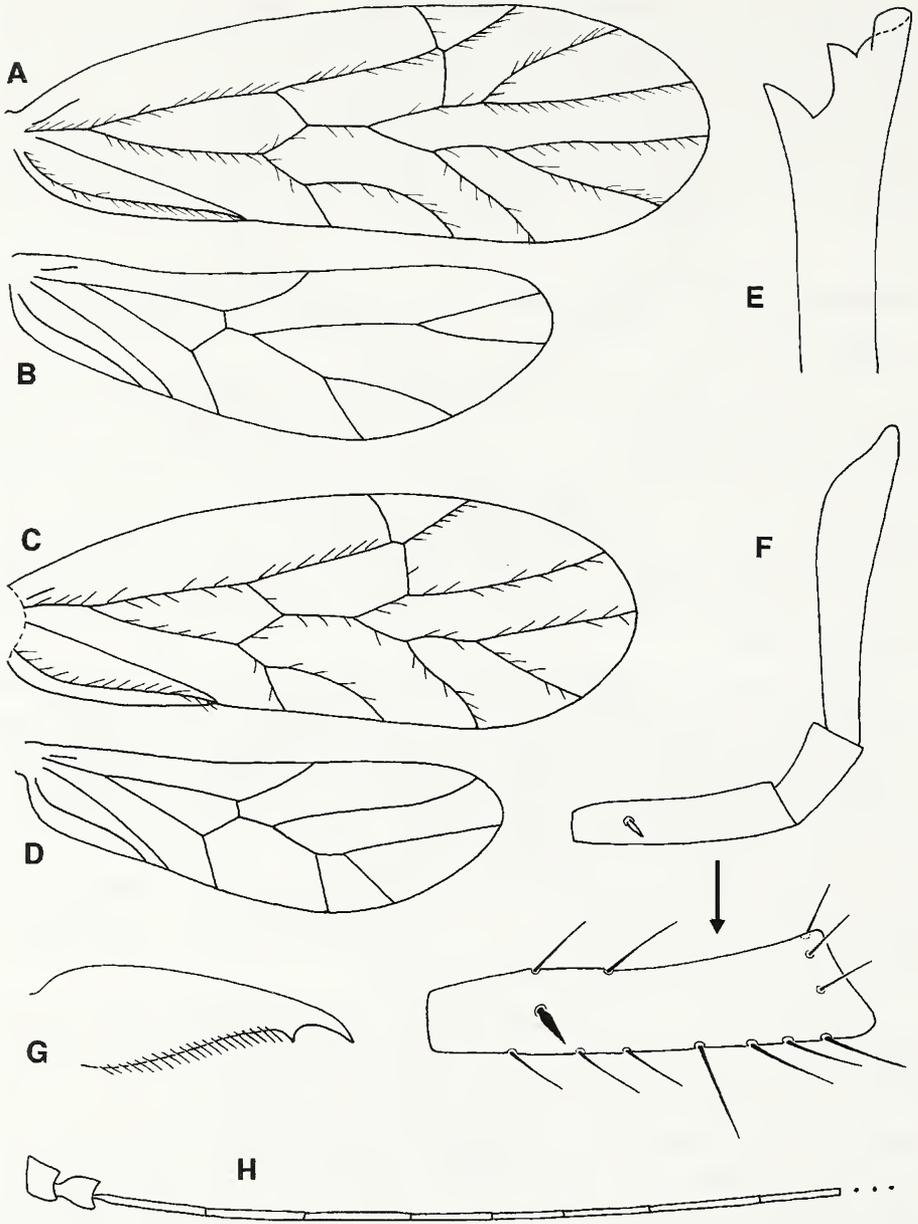


FIG. 4

Psyllipsocus serrifer Lienhard n. spec. A-B, E-H female; C-D male from Itabirito (MG). (A) Forewing. (B) Hindwing of the same specimen. (C) Forewing of slightly brachypterous male. (D) Hindwing of the same specimen. (E) Lacinal tip. (F) P2-P4 of maxillary palp, with detail of P2-chaetotaxy. (G) Pretarsal claw. (H) Scape, pedicel and the 8 basalmost antennal flagellomeres.

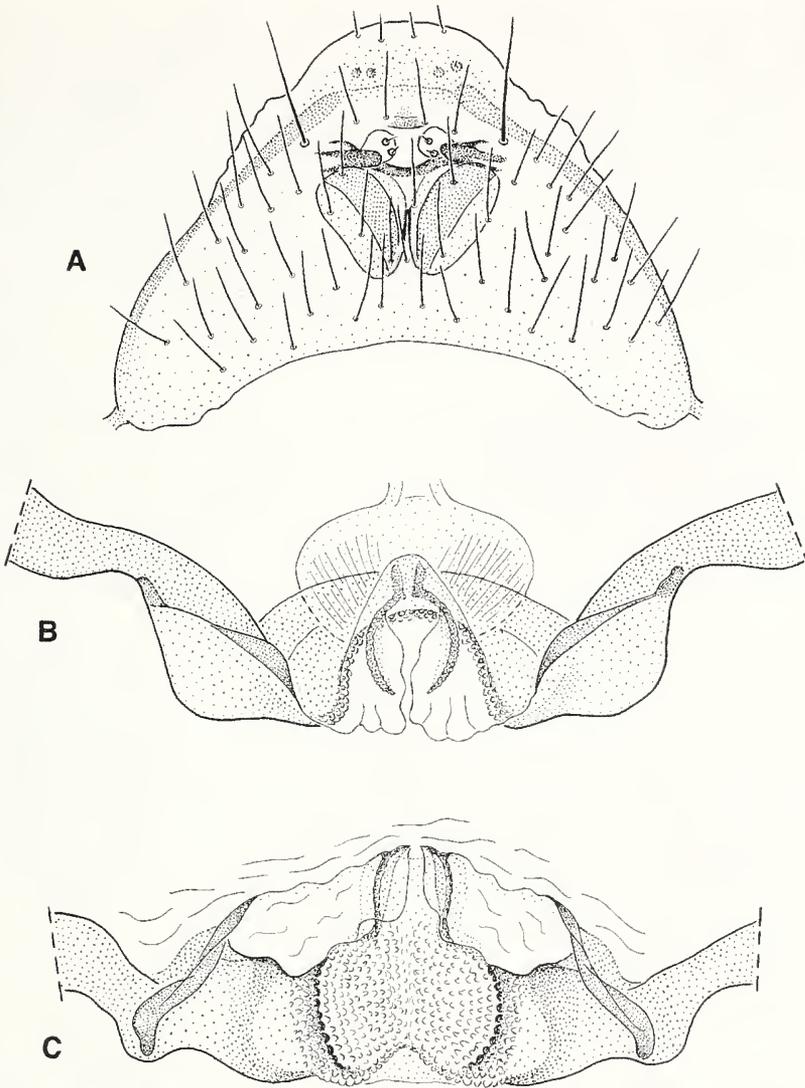


FIG. 5

Psyllipsocus serrifer Lienhard n. spec., male. (A) Hypandrium and phallosome, ventral view (phallosome observed through ventral wall of hypandrium). (B) Clunial bridge, posterior view. (C) Clunial bridge, ventral view, posterior part upwards directed in the figure (same magnification as B).

length and shape of sclerite and length of denticles rather variable [see Fig. 7A-E and Fig. 1: 7A-C correspond to the westernmost localities (Doresópolis and Pains), 7D corresponds to a locality situated towards central MG (Matozinhos) and 7E to the locality situated in northern MG (Gruta Janelão)]. In the females from northern MG

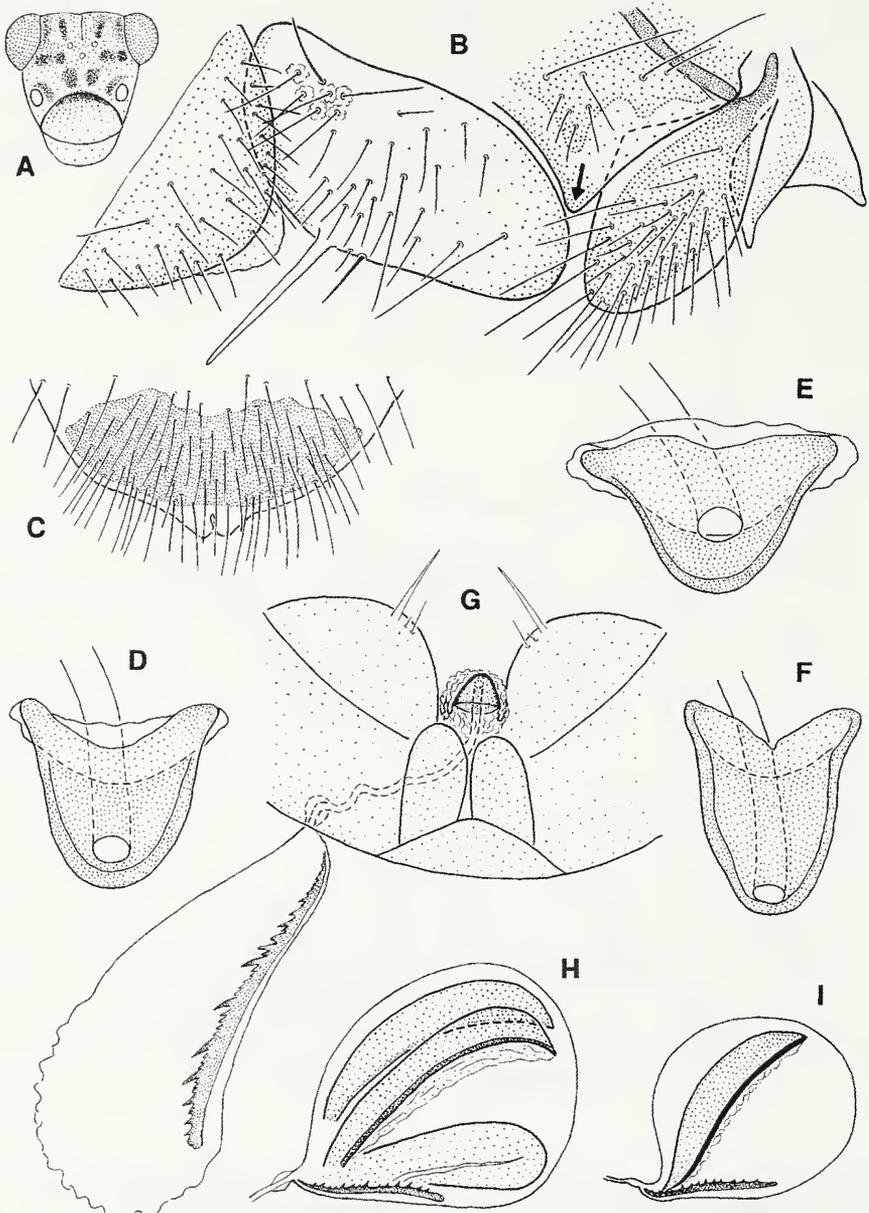


FIG. 6

Psyllipsocus serrifer Lienhard n. spec., female. (A) Head pattern. (B) Epiproct, right paraproct, right hind corner of clunium (arrow), right ovipositor valvulae. (C) Subgenital plate, ventral view. (D) Spermapore sclerite, female from Doresópolis (MG). (E) Ditto, female from Pains (MG), Basical cave. (F) Ditto, female from Matozinhos (MG). (G) Schematic representation of spread abdominal apex of a virgin female, showing subgenital plate, the pair of v3, paraprocts, spermapore sclerite surrounded by multiply folded membrane and empty spermatheca. (H) Spermatheca with three spermatophores (see General Discussion). (I) Spermatheca with one spermatophore.

and from nearby BA (see Fig. 1) prominent sharp denticles of the saw shorter than in the other females (Fig. 7E). Spermathecal duct not longer than spermathecal blade (Figs 6G, 7J), near spermathecal sac surrounded by a thickening (Fig. 7I), the latter weakly developed in the females from northern MG and nearby BA. Spermatophore usually sickle-shaped (Figs 6HI, 7J; in the spermatheca of one female three spermatophores could be observed, see Fig. 6H; this indicates that the species is polyandrous; see General Discussion, below).

MEASUREMENTS: Both sexes of about same size, body length 2.0-2.7 mm. *Male holotype* (macropterous): BL = 2.0 mm; FW = 2850 μ m; HW = 2170 μ m; F = 564 μ m; T = 1015 μ m; t1 = 480 μ m; t2 = 62 μ m; t3 = 73 μ m; IO/D = 1.5. – *Female allotype* (macropterous): BL = 2.5 mm; FW = 3040 μ m; HW = 2360 μ m; F = 606 μ m; T = 1086 μ m; hindtarsi broken; IO/D = 1.6.

ETYMOLOGY: The specific epithet refers to the saw-like spermathecal blade (Latin: *serra* – saw; suffix *-fer*, *-fera*, *-ferum* from *ferre* – to bear, carry).

DISTRIBUTION AND HABITAT: At present *P. serrifer* is known from 13 caves situated in 9 municipalities, mostly in southern and central Minas Gerais state, with one cave (Gruta Janelão) in northern Minas Gerais and one in nearby Bahia (see Fig. 1). Most of these caves are located in the southern part of the Bambuí limestone group; the two caves in northern Minas Gerais and Bahia states belong to the eastern branch of this formation. As with *P. clunijunctus*, the physical attributes of the caves inhabited by *P. serrifer* are very heterogeneous, but most of these caves are rich in old guano deposits.

DISCUSSION: This relatively large species is characterized by the presence of a saw-like spermathecal blade and by the complex clunial bridge, bearing a posterior membranous curtain which is laterally held by a pair of styli and medially by a clip-like sclerotized structure. The hypandrium is similar to that of *P. similis* except for the presence, in *P. serrifer*, of four marginal setae instead of two. The populations from northern MG and nearby BA slightly differ from the more southern populations of *P. serrifer* by two spermathecal characters (see description, above). A comparison of the characters of the clunial bridge between these populations was not possible because males are not yet known from the northern localities. See also General Discussion, below.

Psyllipsocus similis Lienhard n. spec.

Figs 7F, 8-9

HOLOTYPE: ISLA; ♂ (slide-mounted); BRAZIL (MG), Itambé do Mato Dentro, cave Baixada dos Crioulos 2, 29.vii.2004, leg. R. L. Ferreira.

PARATYPES: ISLA and MHNG, slide-mounted and/or in alcohol; BRAZIL, leg. R. L. Ferreira, from the following municipalities. 1 ♀, Itabirito (MG), cave Gruta MP8, 8.ix.2005. – 3 ♂, 2 ♀ (one of them allotype), 2 specimens lacking abdomen, Itambé do Mato Dentro (MG), cave Baixada dos Crioulos 2, 29.vii.2004. – 1 ♂, Moeda (MG), cave SMS 19, 3.xii.2005.

DESCRIPTION: See diagnosis of the species group, with the following complements. General colouration yellowish to medium brown. Head often with some patches of brown hypodermal pigment, especially on frons, compound eyes dark brown to black. Tibiae uniformly brown, lacking transversal bands. Abdomen whitish to light brown, terminalia light brown.

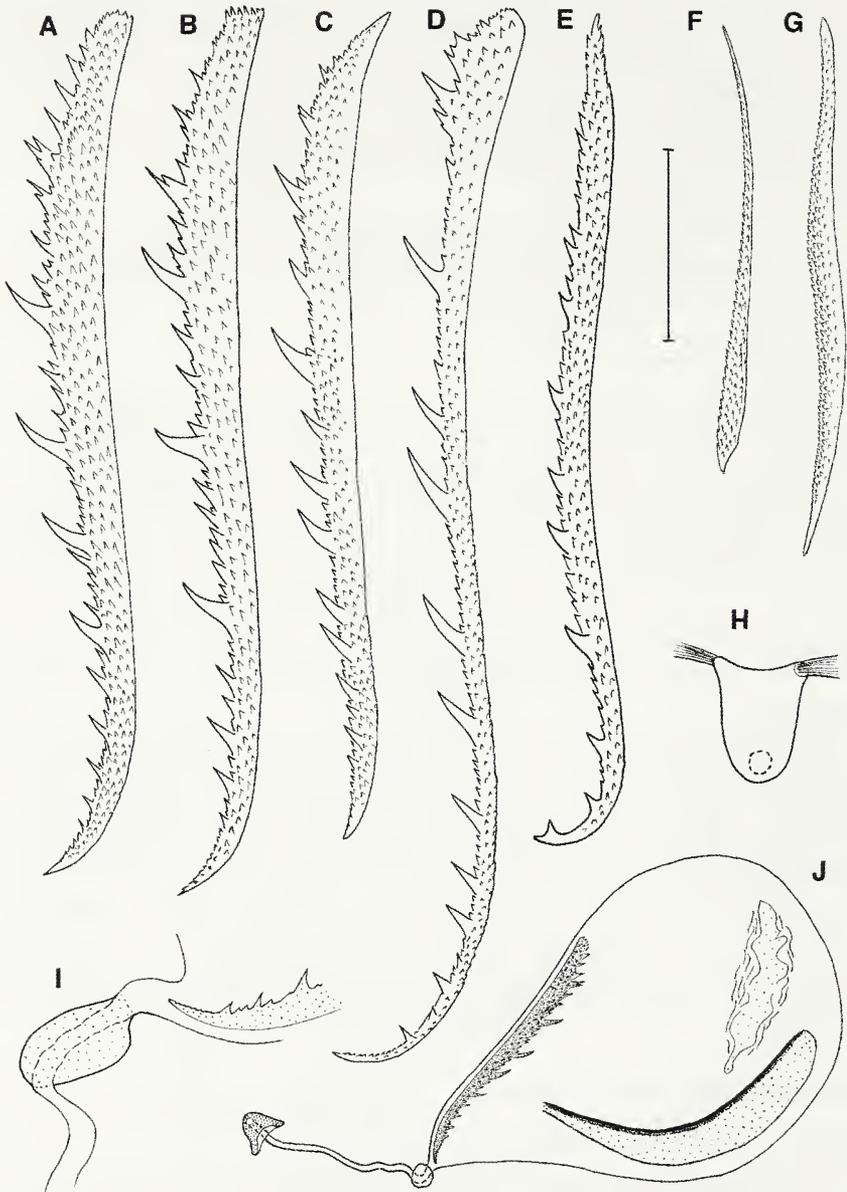


FIG. 7

Psyllipsocus spp., female. A-E: *Psyllipsocus serrifer* Lienhard n. spec. (A) Spermathecal blade, base downwards directed in the figure, female from Doresópolis (MG). (B) Ditto, female from Pains (MG), Brasical cave. (C) Ditto, female from Pains (MG), Sobradinho cave. (D) Ditto, female from Matozinhos (MG). (E) Ditto, female from Januária/Itacarambi (MG). (F) Ditto, *Psyllipsocus similis* Lienhard n. spec. (G) Ditto, *Psyllipsocus clununctus* Lienhard n. spec. H-J: *Psyllipsocus serrifer* Lienhard n. spec. (H) Spermapore sclerite with insertion points of muscles. (I) Spermatheca, transition zone between duct and sac, with base of spermathecal blade. (J) Spermatheca containing one spermatophore. Scale bar = 0.1 mm (A-G).

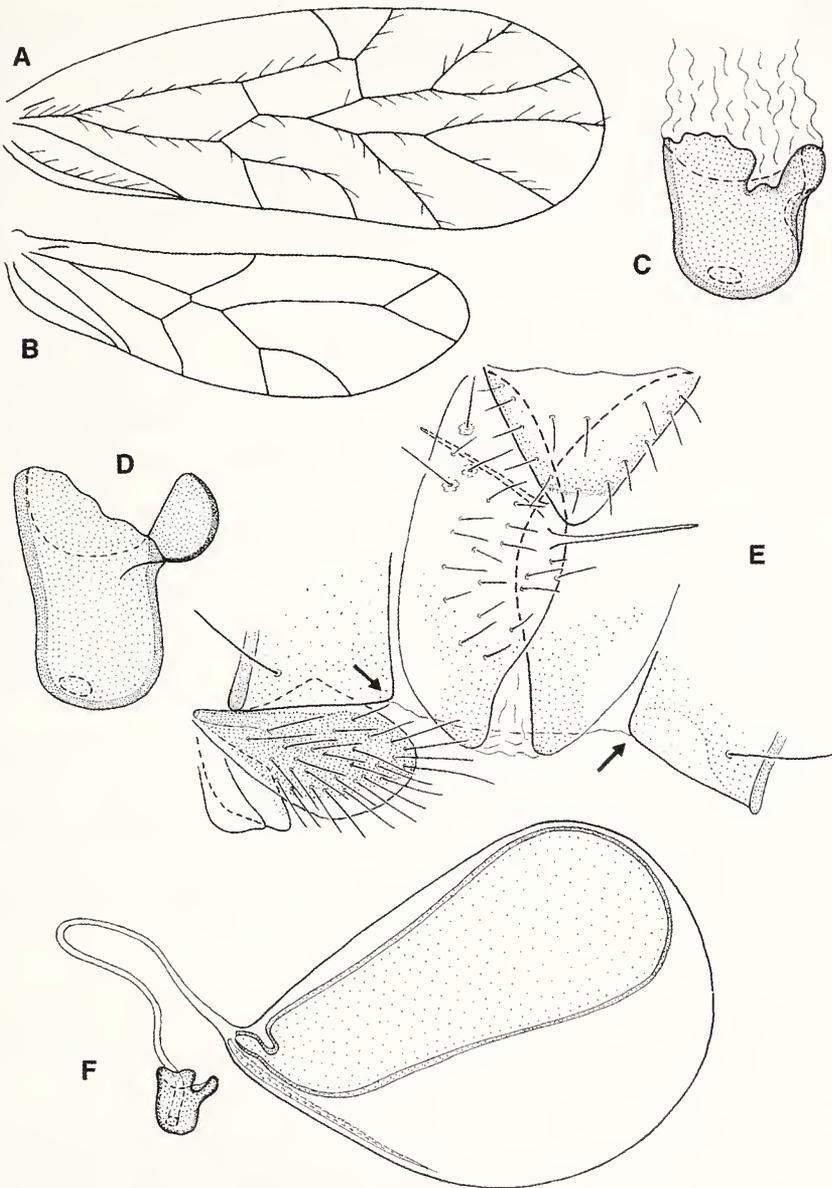


FIG. 8

Psyllipsocus similis Lienhard n. spec., female. (A) Forewing. (B) Hindwing of the same specimen. (C) Spermapore sclerite, female allotype from Itambé do Mato Dentro (MG). (D) Ditto, female from Itabirito (MG). (E) Epiproct, paraprocts (slightly overlapping due to slide-mounting), hind corners of clunium (arrows) and left ovipositor valvulae. (F) Spermatheca containing one spermatophore.

Both sexes macropterous (Fig. 8AB) or slightly brachypterous; in the forewing often some vein irregularities (e. g. Rs simple, M 2-branched). Three ocelli present; compound eyes of medium size in both sexes (IO/D 1.7-2.3). Antenna very long but usually damaged in preserved material.

Hypandrium (Fig. 9CD) uniformly setose except for the glabrous and medially membranous apical lobe (as shown in Fig. 5A for *P. serrifer*); the latter only bearing a pair of short marginal setae; arrangement of the four dorsal placoid sensilla as shown in Fig. 9CD. Shape of postero-lateral sclerotizations of phallosome and medio-distal semi-membranous microstructures somewhat variable, probably partly depending on position after slide-mounting; elongate oval phallosomal lobules not posteriorly prominent, situated between the lateral sclerotized bulges, each lobule with 2-3 placoid sensilla (Fig. 9CD). Clunial bridge relatively simple, somewhat flexible in middle and on each side at narrowest part (Fig. 9E), on each side with a dorso-medially directed spur-like posterior prominence; central cavity laterally delimited by a rounded papillate border, these borders representing the ventralmost parts of the bridge (Fig. 9AE).

Spermopore sclerite (Figs 8CDF, 9B) of slightly variable shape and length, its anterior border asymmetrically lobate. Spermathecal blade slender, file-like, weakly sclerotized (Figs 7F, 8F). Spermathecal duct about twice as long than spermathecal blade (Fig. 8F), no distinct thickening observed near spermathecal sac. Spermatophore broadly rounded, not much more than twice as long as wide, pear-shaped (Fig. 8F; in the spermatheca of one female two spermatophores could be observed; this indicates that the species is polyandrous; see General Discussion, below).

MEASUREMENTS: Both sexes of about same size, body length 1.7-2.2 mm. *Male holotype* (slightly brachypterous): BL = 1.7 mm; FW = 1600 μm ; HW = 1120 μm ; F = 480 μm ; T = 902 μm ; hindtarsi broken; IO/D = 2.0. – *Female allotype* (slightly brachypterous): BL = 1.7 mm; FW = 1640 μm ; HW = 1080 μm ; F = 475 μm ; T = 917 μm ; t1 = 392 μm ; t2 = 62 μm ; t3 = 75 μm ; IO/D = 2.1. – *Male paratype from Moeda* (macropterous): BL = 1.8 mm; FW = 1960 μm ; HW = 1500 μm ; F = 458 μm ; T = 846 μm ; t1 = 370 μm ; t2 = 69 μm ; t3 = 75 μm ; IO/D = 1.7.

ETYMOLOGY: The specific epithet (Latin: *similis*, *-is*, *-e*; similar) refers to the similarity of this species to the two other species of the *clunjunctus* species group, especially concerning the characters of the hypandrium (similar to *P. serrifer*) and of the clunial bridge and the spermathecal blade (similar to *P. clunjunctus*).

DISTRIBUTION AND HABITAT: At present *P. similis* is only known from three quartzite and iron ore caves situated in three municipalities in south-eastern Minas Gerais (see Fig. 1). Since there are macropterous specimens, which can easily disperse by flight, this narrow distribution may indicate some habitat specificity for this species. The three caves are located at higher altitudes (from 750 to 1550 m a.s.l.) than most of the caves in which the other species of the *clunjunctus* group usually occur. This may indicate some habitat preference (e. g. for low temperatures) that may explain the distribution and rarity of this species.

DISCUSSION: *P. similis* can be distinguished from both other species by the irregular anterior margin of the spermopore sclerite, by the broadly rounded pear-shaped

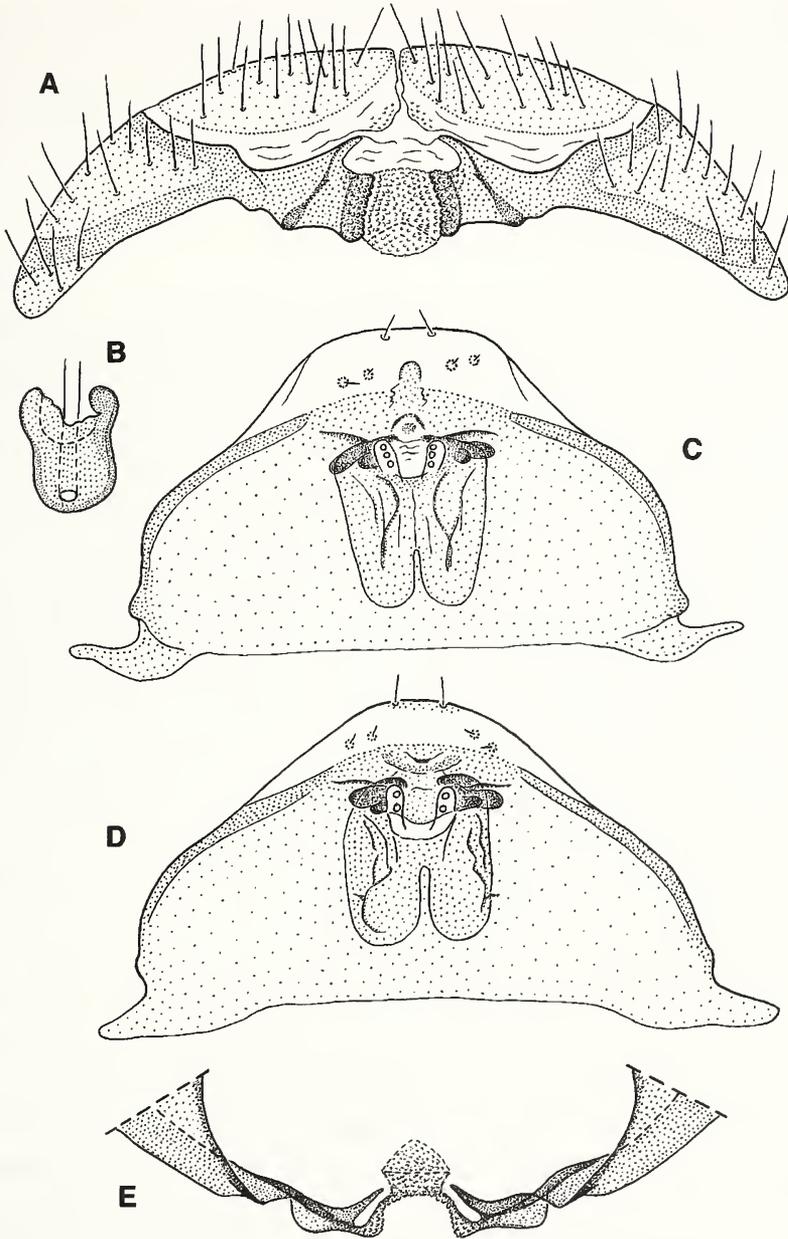


FIG. 9

Psyllipsocus similis Lienhard n. spec. (A) Male abdominal apex after separation of hypandrium, ventral view, slightly squashed, posterior part (i. e. paraprocts) upwards directed in the figure. (B) Spermopore sclerite, female paratype from Itambé do Mato Dentro (MG). (C) Hypandrium and phallosome, ventral view (phallosome observed through ventral wall of hypandrium, pilosity of basal part of the latter not shown), male from Moeda (MG). (D) Ditto, male from Itambé do Mato Dentro (MG). (E) Clunial bridge, posterior view. Same magnification for A-E.

spermatophore and by the presence of only two short marginal setae on the broad membranous and otherwise glabrous distal lobe of the hypandrium. Its file-like spermathecal blade and its simple clunial bridge are similar to the corresponding characters of *P. clunjunctus*. In *P. similis* general size and relative length of the spermathecal duct are intermediate between the other two species of the *clunjunctus* group. See also General Discussion, below.

GENERAL DISCUSSION

FUNCTIONAL MORPHOLOGY

The members of the *Psyllipsocus clunjunctus* species group are characterized by four striking synapomorphies (for details see diagnosis of the species group): in the male by (1) the strong reduction of the phallosome with characteristic structure of the endophallus and (2) the presence of an elaborate sclerotized clunial bridge medio-ventrally on the abdominal apex; in the female by (3) the presence of a cap-shaped sclerite surrounding the distal end of the spermathecal duct, the opening of which (spermapore) is situated on the dorsal side of the cap near its tip, and by (4) the presence of a sclerotized file- or saw-like spermathecal blade. Based on our morphological observations we offer some hypotheses about the function of these structures.

The function of the weakly sclerotized file-like spermathecal blade is difficult to evaluate. This kind of blade, present in *P. clunjunctus* and *P. similis*, only bears small rounded or acute denticles (Fig. 7FG) and probably represents an initial stage in the evolution of the heavily sclerotized saw-like blade, present in *P. serrifer*, which bears a certain number of prominent sharp denticles (Fig. 7A-E). This saw is somewhat similar to a signum, the sclerotized sharp structure located in the bursa copulatrix of many Lepidoptera females, the main function of which is to break off the external wall of the spermatophore, thus allowing females access to the resources contained in it (Sanchez *et al.*, 2011). Up to 2-3 large and relatively thick-walled spermatophores have been observed in the spermatheca of each of the three species of the *clunjunctus* group (see species descriptions), which therefore can be considered as polyandrous. In *P. serrifer* the thick wall of the concave side of the sickle-shaped spermatophore always faces the signum-like saw (Figs 6HI, 7J). The presence, in the slide-mounted spermatheca shown in Fig. 6I, of an amorphous mass containing numerous spermatozoan filaments outside the spermatophore, along its concave side, may indicate that this spermatophore has been freshly slit longitudinally by contact with the saw-like sclerite serving as a "tin-opener". Probably the amorphous and partly filamentous mass in the spermatheca near the spermatophore shown in Fig. 7J also corresponds to some spermatophore content. In the third dissected female of *P. serrifer* where spermatophores could be observed the spermatheca contains two presumably slit superimposed sickle-shaped spermatophores (the filamentous content of one of them is still attached along its concave side) and one fresh spermatophore close to the saw-like sclerite on which the traces of presumed slitting are clearly visible (Fig. 6H). The rounded shape of this fresh spermatophore may indicate that the other spermatophores became sickle-shaped only after having been slit by the spermathecal signum. Such sickle-shaped spermatophores were never observed in *P. similis* and *P. clunjunctus*. In some polyandrous

Lepidoptera Sanchez *et al.* (2011) observed a positive correlation between the presence of a well-developed sclerotized signum and the thickness of the wall of the spermatophore as a result of sexually antagonistic coevolution. In these Lepidoptera males apparently evolved thick-walled spermatophores which delay further copulation of the females with other males, and as a reaction to this, females evolved sclerotized signa to break off these spermatophores more easily. Our morphological observations suggest that the spermathecal signum of *P. serrifer*, a novel structure in Psyllipsocidae, may have a similar function as the bursal signum in the Lepidoptera studied by Sanchez *et al.* (2011).

Our previous knowledge on copulation in trogiomorph psocids combined with the present morphological observations also suggests a quite plausible functional interpretation of the male clunial bridge and of the cap-like spermapore sclerite of the female which bears subapically, on its dorsal surface, the opening of the spermathecal duct. Klier (1956) described in detail the copulation of another trogiomorph psocid, *Trogium pulsatorium* (Linnaeus). In this species the spermapore is situated on the tip of a slightly sclerotized dome-shaped papilla (Klier, 1956: fig. 66, indicated by the abbreviation DRecMP). During copulation the forceps-like male parameres (a pair of lateral longitudinal struts of the phallosome) grasp the spermapore papilla for establishing the close contact between the opening of the male seminal duct and the opening of the spermathecal duct as a condition for successful transmission of the liquid spermatophore. Klier (1956: p. 264) makes an interesting statement (translated from German): "Because in this position [i. e. maximal intromission] the parameres cannot reach the spermapore papilla, which is situated in the vagina, we must assume that the spermapore papilla is actively erected by the female, maybe due to augmented pressure of body fluid".

In the species of the *P. clunijunctus* group the phallosome is strongly reduced and lacks the pair of longitudinal struts which are usually present in males of *Psyllipsocus* (see Mockford, 2011) and which are probably responsible for the function of the phallosome as an intromittent coupling organ. However, a novel structure has evolved ventrally on the male abdominal apex of these species, the clunial bridge (see diagnosis of the species group, above). We assume that the medially concave, rugose, vice-like part of the clunial bridge can hold the sclerotized spermapore cap of the female after intromission of the latter into the apicalmost part of the male abdomen (Fig. 10). In resting position the spermapore cap is surrounded by a thin, multiply folded membrane (Fig. 6G). This membrane is attached to the anterior margin of the cap (Fig. 8C) and may allow the erection, by injection of hemolymph, of a short penis-like intromittent prominence bearing the sclerotized cap at its distal end (Fig. 10). The erection of this female "micropenis" would be on a greater scale than that suggested by Klier (1956) for the simple spermapore papilla in *Trogium pulsatorium*, but based on the same hypothetical mechanism (see above). The muscles originating laterally on the anterior margin of the spermapore cap (see Fig. 7H) are probably responsible for withdrawing this sclerite after copulation. As observed by Edward Mockford (personal communication) genital coupling in *Psyllipsocus* occurs in a symmetric female-above position (*sensu* Huber *et al.*, 2007: p. 661), i. e. female on top, male below (wings raised), both facing same direction. In the species of the *clunijunctus* group the opening

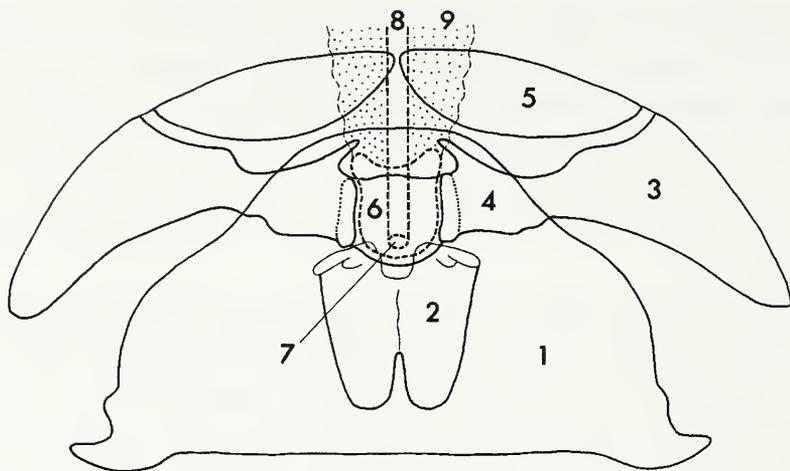


FIG. 10

Psyllipsocus similis Lienhard n. spec. Schematic representation of male and female genitalia in hypothetical coupling position, ventral view, based on Fig. 9A-C. Male: 1, hypandrium; 2, phallosome; 3, clunium; 4, clunial bridge; 5, paraproct. Female ("micropenis", interrupted line): 6, spermapore sclerite; 7, spermapore; 8, spermathecal duct; 9, hemolymph (dotted). For explanations see General Discussion: Functional Morphology.

of the spermathecal duct, situated dorsally (not terminally!) on the cap-like sclerite in resting position, would be ventrally directed in this coupling position, after intromission of the sclerite into the ventrally open median cavity of the clunial bridge. This vice-like flexible median part of the clunial bridge may catch the spermapore sclerite between its ventrally prominent jaws and firmly hold it during copulation (the thick and rigid wall of the spermapore sclerite prevents excessive squashing by the jaws). In this position the spermapore faces the distal end of the phallosomal structures situated on the dorsal side of the hypandrium (Fig. 10), and a close contact between the spermapore and the opening of the male seminal duct can be established. This hypothesis is quite plausible, though the opening of the male seminal duct has not been directly observed in the present study. The possibility of firmly holding the female spermapore sclerite for a long duration of genital coupling may be interpreted as an adaptation favouring the evolution of the particularly large and thick-walled spermophores observed in the species of the *clunjunctus* group, the production and transfer of which are probably rather time consuming. Indirectly this novel structure may thus also have favoured the evolution of the spermathecal signum in *P. serrifer* (see above).

It is interesting to compare these observations with the situation described for *Neotrogla* Lienhard (Trogiomorpha: Prionoglaridetae: Prionoglarididae), a recently discovered Brazilian genus of cave psocids (Lienhard *et al.*, 2010; Lienhard & Ferreira, 2013). The phallosome of *Neotrogla* is also strongly reduced and has lost its function as an intromittent coupling organ. However, in this genus it is not functionally replaced by a novel structure of the male but by an elaborate penis-like organ of the female, the gynosome, bearing the spermapore on its tip. In *Neotrogla*, the presence of a very long

spermathecal duct together with a longitudinal accessory sclerite (gynosomal rod) suggests the hypothesis that the gynosome can be deeply inserted into the male abdomen during copulation, to reach the opening of the seminal duct (ductus ejaculatorius) situated at the bottom of the male genital chamber (see Lienhard *et al.*, 2010: fig. 10c). The females of the *Psyllipsocus clunjunctus* group have a shorter spermathecal duct lacking any rod-like longitudinal accessory sclerite. Though the assumed intromission of the erected female “micropenis” must be deeper in these *Psyllipsocus* species than that of the simple spermapore papilla in *Trogium pulsatorium*, it is certainly less deep than that postulated for the gynosome in *Neotroglia*. While the gynosome is a strongly modified primary external genital organ of the female (spermapore papilla), the male clunial bridge is a completely novel structure, here interpreted as an accessory genital organ. This complex differentiation of the usually membranous last abdominal sternum is situated just ventrally of the paraprocts and forms a sclerotized but flexible connection between the ventrally prolonged hind corners of the clunium. It faces the phallosome and may functionally replace that organ's reduced parts (see above). In the other species of *Psyllipsocus* the hind corners of the male clunium are similar to those of the female (see arrows in Figs 2F, 6B, 8E), i. e. not prolonged ventrally and only connected to each other by a simple membranous zone which apparently has no function in genital coupling. As far as we know, this would be the only case in Psocoptera where the clunium is ventrally prolonged and gives rise to an elaborate accessory genital organ by fusion with the sclerotized medioventral zone of the last abdominal sternum. In the female this region of the abdominal apex probably has to remain membranous, constrained by the expansion needed during oviposition. In the male, however, an evolutionary potential apparently exists, realized in the males of the *Psyllipsocus clunjunctus* group by the differentiation of an elaborate clunial bridge.

DISTRIBUTION AND PHYLOGENY

The presently known distribution of the three species of the *Psyllipsocus clunjunctus* group is shown in Fig. 1 and has briefly been discussed for each species in the taxonomic part, above. *P. similis*, only known from three caves in south-eastern Minas Gerais state, seems to occupy a much more restricted area than the two other species. Never have two species been found in the same cave. Only in the municipality Itabirito (MG) more than one species were found: *P. serrifer* in the cave Gruta MP1 and *P. similis* in the cave Gruta MP8. While *P. clunjunctus* and *P. serrifer* have a clearly allopatric distribution, the much rarer *P. similis* seems to be sympatric with *P. serrifer*.

Within the genus *Psyllipsocus* the *clunjunctus* group is defined as a monophyletic clade by the four principal autapomorphies mentioned in the above discussion on functional morphology. At present it is not possible to present any hypothesis about a possible sister group relationship to other members of the genus *Psyllipsocus*. Within this species group, the usually macropterous *P. similis* appears to be most plesiomorphic due to the presence of a short and weakly sclerotized file-like spermathecal blade, a membranous hypandrial apex and simple pear-shaped spermatophores; the most recent common ancestor of the group could have been similar to this species. A first dichotomy gave probably rise to the brachypterous *P. clunjunctus*, characterized

by a somewhat longer spermathecal blade, a medio-apical hypandrial sclerotization and long sausage-shaped spermatophores. The sister-group of *P. clunijunctus* consists of the relatively primitive *P. similis* and the highly derived *P. serrifer*; the latter is characterized by the more elaborate clunial bridge, the well-sclerotized saw-like spermathecal blade and the sickle-shaped spermatophores. Hypandrial similarity between *P. serrifer* and *P. similis* is supposedly based on symplesiomorphy.

This phylogenetic hypothesis, together with the available distributional data, suggests an origin of the *clunijunctus* clade somewhere in central Minas Gerais state and a successful dispersal of *P. serrifer* and *P. clunijunctus* within the caves of the Bambuí group limestone formation and of the latter also towards north-eastern Brazil into the caves of the Una group and of the Apodi group (see Fig. 1 and remarks on *P. clunijunctus* in the taxonomic part, above). The very restricted area of *P. similis* may be interpreted as that of a relict population of this relatively plesiomorphic species.

ACKNOWLEDGEMENTS

We thank Edward L. Mockford (Illinois State University, Normal, Illinois, USA), Kazunori Yoshizawa (Hokkaido University, Sapporo, Japan) and John Hollier (MHNG) for critical reading of the manuscript and useful comments. RLF thanks Marconi Souza Silva (Lavras, MG, Brazil) for technical assistance and CL thanks John Hollier for many interesting discussions. RLF also thanks the Conselho Nacional do Desenvolvimento Científico e Tecnológico (CNPq grant 301061/2011-4).

REFERENCES

- BADONNEL, A. 1962. Psocoptères. *Biologie de l'Amérique australe* 1: 185-229.
- BADONNEL, A. 1977a. Psocoptères cavernicoles de Cuba (Première note) (pp. 339-344). In: ORGHIDAN, T. *et al.* Résultats des Expéditions biospéologiques Cubano-Roumaines à Cuba. *Bucharest*.
- BADONNEL, A. 1977b. Psocoptères cavernicoles de Cuba (Deuxième note) (pp. 345-353). In: ORGHIDAN, T. *et al.* Résultats des Expéditions biospéologiques Cubano-Roumaines à Cuba. *Bucharest*.
- BADONNEL, A. 1986. Psocoptères de Colombie (Insecta, Psocoptera). Missions écologiques du Professeur Sturm (1956 à 1978). *Spixiana* 9(2): 179-223.
- BADONNEL, A. 1987. Psocoptères de Venezuela et de la République Argentine (pp. 173-182). In: DECU, V. *et al.* Fauna hipogea y hemiedaphica de Venezuela y de otros países de América del Sur. Vol. 1(17). *Bucharest*.
- FERREIRA, R. L. & MARTINS, R. P. 1999. Trophic structure and natural history of bat guano invertebrate communities, with special reference to Brazilian caves. *Tropical Zoology* 12: 231-252.
- FERREIRA, R. L., PROUS, X. & MARTINS, R. P. 2007. Structure of bat guano communities in a dry Brazilian cave. *Tropical Zoology* 20(1): 55-74.
- GARCÍA ALDRETE, A. N. & MOCKFORD, E. L. 2009. A list of Psocoptera (Insecta: Psocodea) from Brazil. *Revista Mexicana de Biodiversidad* 80: 665-673.
- HUBER, B. A., SINCLAIR, B. J. & SCHMITT, M. 2007. The evolution of asymmetric genitalia in spiders and insects. *Biological Reviews* 82: 647-698. (Psocodea: pp. 660-662).
- KLIER, E. 1956. Zur Konstruktionsmorphologie des männlichen Geschlechtsapparates der Psocopteren. *Zoologische Jahrbücher (Abteilung Anatomie)* 75: 207-286.
- LIENHARD, C. 1998. Psocoptères euro-méditerranéens. *Faune de France* 83: XX+517 pp.

- LIENHARD, C. 2011. Synthesis of Parts 1-10 of the Additions and Corrections to Lienhard & Smithers, 2002: "Psocoptera (Insecta) – World Catalogue and Bibliography". *Natural History Museum of the City of Geneva*, 232 pp. Online (pdf, 2.1M): http://www.ville-ge.ch/mhng/psocoptera/divers/synthesis_add_1_10.pdf
- LIENHARD, C. 2012. Additions and Corrections (Part 11) to Lienhard & Smithers, 2002: "Psocoptera (Insecta) - World Catalogue and Bibliography" (pp. 1-13). In: YOSHIZAWA, K. (ed.). Psocid News. The Psocidologists' Newsletter. No. 14 (Feb. 29, 2012). *Systematic Entomology, Faculty of Agriculture, Hokkaido University, Sapporo*, 14 pp.
- LIENHARD, C. & FERREIRA, R. L. 2013. A new species of *Neotrogla* from Brazilian caves (Psocodea: 'Psocoptera': Prionoglarididae). *Revue suisse de Zoologie* 120(1): 3-12.
- LIENHARD, C. & SMITHERS, C. N. 2002. Psocoptera (Insecta): World Catalogue and Bibliography. *Instrumenta Biodiversitatis (Muséum d'histoire naturelle, Genève)* 5: xli+745 pp.
- LIENHARD, C., DO CARMO, T. O. & FERREIRA, R. L. 2010. A new genus of Sensitibillini from Brazilian caves (Psocodea: 'Psocoptera': Prionoglarididae). *Revue suisse de Zoologie* 117(4): 611-635.
- LIENHARD, C., FERREIRA, R. L., GNOS, E., HOLLIER, J., EGGENBERGER, U. & PIUZ, A. 2012. Microcrystals coating the wing membranes of a living insect (Psocoptera: Psyllipsocidae) from a Brazilian cave. *Scientific Reports* 2, 408 (8 figs); DOI:10.1038/srep00408.
- MOCKFORD, E. L. 1993. North American Psocoptera (Insecta). *Flora and Fauna Handbook* 10: XVIII+455 pp. Sandhill Crane Press, Gainesville, Florida.
- MOCKFORD, E. L. 2011. New species of *Psyllipsocus* (Psocoptera: Psyllipsocidae) from North and Middle America with a key to the species of the region. *Transactions of the American Entomological Society* 137: 15-47.
- MOCKFORD, E. L. 2012. Aspects of the biogeography of North American Psocoptera (Insecta) (pp. 307-328). In: STEVENS, L. (ed.). Global Advances in Biogeography. *InTech, Rijeka & Shanghai*, 360 pp. Also online: <http://www.intechopen.com/books/global-advances-in-biogeography/aspects-of-the-biogeography-of-northamerican-psocoptera>
- SANCHEZ, V., HERNANDEZ-BANOS, B. E., CORDERO, C. 2011. The evolution of a female genital trait widely distributed in the Lepidoptera: Comparative evidence for an effect of sexual coevolution. *PLoS ONE* 6(8): e22642. doi:10.1371/journal.pone.0022642
- YOSHIZAWA, K. 2005. Morphology of Psocomorpha (Psocodea: 'Psocoptera'). *Insecta Matsumurana, New Series* 62: 1-44.
- YOSHIZAWA, K., LIENHARD, C. & JOHNSON, K. P. 2006. Molecular systematics of the suborder Trogiomorpha (Insecta: Psocodea: 'Psocoptera'). *Zoological Journal of the Linnean Society* 146: 287-299.

An annotated list of the Orthoptera (Insecta) species described by Henri de Saussure, with an account of the primary type material housed in the Muséum d'histoire naturelle de Genève, Part 5: Grylloidea

John HOLLIER¹, Harald BRUCKNER² & Sam W. HEADS³

¹ Muséum d'histoire naturelle, C.P. 6434, CH-1211 Genève 6, Switzerland.

Email: john.hollier@ville-ge.ch

² Naturhistorisches Museum Wien, Burgring 7, 1010 Wien, Austria.

E-Mail: harald.bruckner@nhm-wien.ac.at

³ Illinois Natural History Survey, University of Illinois, 1816 South Oak Street, Champaign, Illinois 61820, USA. E-mail: swheads@illinois.edu

An annotated list of the Orthoptera (Insecta) species described by Henri de Saussure, with an account of the primary type material housed in the Muséum d'histoire naturelle de Genève, Part 5: The Grylloidea. - Henri de Saussure described 403 species or subspecies in the superfamily Grylloidea. The names are listed alphabetically, and the location of the type material (if known) and the current nomenclatural combination are given. When there is primary type material in the Muséum d'histoire naturelle de Genève (MHNG), the sex, verbatim label data and condition of the specimens is given, along with their location within the collection.

Keywords: Ensifera - Gryllidae - Gryllotalpidae - Mogoplistidae - Mymecophilidae - crickets - type-catalogue.

INTRODUCTION

In the forty years between 1859 and 1899 Swiss naturalist Henri de Saussure described 403 species or subspecies of crickets (Orthoptera: Grylloidea). The early publications relate to material he collected or acquired as a result of his expedition to Mexico and the Antilles in 1854-56, and only give rudimentary descriptions and inexact localities (Saussure, 1859, 1861). According to the preface of his first monograph on the Central American Blattodea (Saussure, 1864) the type material from his expedition was deposited in the MHNG. More details about many of these species are given in his contribution to the *Mission Scientifique au Mexique et dans l'Amérique centrale* (Saussure, 1874a), a work which also made considerable use of material in the Muséum National d'histoire naturelle (MNHN) in Paris. There followed a two part monograph on the "Gryllidae" (Saussure, 1877, 1878) the preparation of which included a three month stay in Vienna to study the material in the Imperial Museum as well as the collection of Carl Brunner von Wattenwyl, a Swiss entomologist working in Austria. Both of these collections are now housed in the Naturhistorisches Museum

Wien (NHMW). Saussure also made extensive use of other collections, notably those now housed in the Rijksmuseum van Natuurlijke Historie (RMNH) in Leiden and the Museum für Naturkunde der Humboldt-Universität (ZMHB) in Berlin. Saussure's last monograph about crickets was a contribution to the *Biologia Centrali-Americana* (BCA), a work published in London by the editors Frederick DuCane Godman and Osbert Salvin [of the British Museum (Natural History)] (Saussure, 1897). Unless otherwise stated in the descriptions, the assumption is that the type material of the species described in the BCA is in the Natural History Museum in London (BMNH). A few crickets were described in other papers dealing with material collected by expeditions such as those of Fedtchenko to Central Asia (Saussure, 1874b), and of Voeltzkow to Madagascar (Saussure, 1899), most of the material from the latter being deposited in the Forschungsinstitut und Naturmuseum Senckenberg (SMFD) in Frankfurt.

Saussure's type concept evolved through his career and although his later works include more information about the type series, he did not label specimens as types. The material in the MHNG, particularly that from Central America, was revised several times by Saussure and his successor Jean Carl, and has subsequently been studied by many experts. Consequently, while many specimens are labelled as types it is not always possible to tell by whom. There are also many specimens labelled as lectotypes, but the formal designation has not been published for many of them. Many of the locality and identification labels appear to have been added long after the descriptions and not always correctly. Type material of species subsequently placed in synonymy (whether correctly or not) usually only bears an identification label showing the name assumed to be correct, although there is often an indication of the junior synonym on the species name label in the insect box. Additionally, there are a number of specimens placed in the collection under names which have not been published, though in some cases these can be identified as specimens of species eventually published under a different name.

ARRANGEMENT AND FORMAT

The species are listed alphabetically. The format for each is:

specific epithet Author, year: page [*Original generic placement*].

Provenance as given in the original description, depository. Type series.

Number of specimens. Specimen: "Label data" [format of label]. Following the recommendations of Ohl & Oswald (2004) the condition of each specimen is noted. Other comments. Location of material in the MHNG main Orthoptera collection.

Currently valid combination following *Orthoptera Species File* (Eades *et al.*, 2011).

The following abbreviations are used in the list:

- ANIC Australian National Insect Collection, Canberra.
- BMNH The Natural History Museum, London.
- ETHZ Eidgenössische Technische Hochschule Zürich
- HLMD Hessisches Landesmuseum, Darmstadt.

- ISNB Institut Royal des Sciences Naturelles de Belgique, Brussels.
 MNHN Muséum National d'Histoire Naturelle, Paris.
 MNSL Naturkundemuseum, Leipzig.
 NHMW Naturhistorisches Museum Wien.
 OXUM Oxford University Museum of Natural History, Oxford.
 RMNH Rijksmuseum van Natuurlijke Historie, Leiden.
 SMFD Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt.
 SMNS Staatliches Museum für Naturkunde, Stuttgart.
 SMTD Staatliches Museum für Tierkunde, Dresden.
 ZIAS Zoological Institute of the Russian Academy of Sciences, St Petersburg.
 ZMHB Museum für Naturkunde, Berlin.
 ZMUH Zoologisches Museum, Hamburg.
 ZSMC Zoologische Staatssammlung München.

The abbreviation OSF is used for Eades *et al.*, 2011 and SysTax for Hoppe *et al.*, 2011.

CATALOGUE

abortivus Saussure, 1874a: 415-416, fig. 11 [*Grylloides*].

Cuba (leg. Poey). More than one ♀.

Two ♀ syntypes. A ♀ with labels: "L. Habana, Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Anurogryllus abortivus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The right antenna and the last tarsal segment of the right hind leg are missing. A ♀ with labels: "L. Habana, Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Anurogryllus abortivus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The last tarsal segment of both hind legs is missing. The right middle leg, which lacks the last tarsal segment, is detached and secured through the femur on the original pin. Box A6.

Anurogryllus abortivus (Saussure, 1874).

abyssinica Saussure, 1878: 447-448, fig. xlv [*Phaeophyllacris*].

Abyssinie (ancienne coll. Guérin-Méneville). Two ♂.

Two ♂ syntypes. A ♂ with labels: "1, Abyssinie, colln Guérin" [handwritten on ruled white card]; "Phaeophyllacris abyssinica Sss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. The right front leg, left middle leg and the claw of the right hind leg are missing. There is insect feeding damage to the abdomen and right femur. A ♂ with labels: "1, Abyssinie, colln Guérin" [handwritten on ruled white card]; "Phaeophyllacris abyssinica Sss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. The left front and middle legs and the last tarsal segment of the right hind leg are missing. There is slight mould damage to the specimen. Box A21.

Phaeophilacris abyssinica Saussure, 1878.

acinaceus Saussure, 1877: 333-334, fig xxxiii, 1-2 [*Pteroplistus*].

Presqu'île de Malacca (coll. Brunner de Wattenwyl n^{os} 1365 & 1362). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is at least one ♂ syntype in the NHMW.

Pteroplistes acinaceus Saussure, 1877.

acrobatus Saussure, 1877: 98 [*Nemobius*].

Afrique tropicale, Sierra-Leone (coll. Brunner de Wattenwyl no 421). Probably one ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Stenonemobius acrobatus (Saussure, 1877).

aculeatus Saussure, 1878: 681-682 [*Parametrypa*].

Brésil, Sierra Giva (Mus. de Berlin no 4071). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB (images in OSF).

Parametrypa aculeatus Saussure, 1878.

acutus Saussure, 1877: 321 [*Acanthoplistus*].

Afrique équinoxiale, Accra (Mus. de Berlin n° 1275). Unspecified number of ♀.

There is one ♂ placed under this name in the MHNG collection, but it cannot be part of the type series. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB (images in OSF). Box A18.

Acanthoplistus acutus Saussure, 1877.

acutus Saussure, 1878: 606-607 [*Apithes*].

Colombie (coll. Brunner de Wattenwyl n° 9986). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Hapithus acutus (Saussure, 1878).

aequipennis Saussure, 1899: 602-603 [*Gryllus*].

Zanzibar. Unspecified number of ♂ and ♀.

One ♂ and one immature syntype. A ♂ with labels: "Zanzibar (Voeltzkow) 12.5.89" [handwritten on white paper]; "VOELTZKOW" [printed on a strip of white paper]; "Gryllus aequipennis Sss." [handwritten on pink paper]; "Teleogryllus aequipennis (Ss) det. D. Otte 1983" [handwritten by Otte on white card]; "LECTOTYPE, Teleogryllus aequipennis (Sauss.) D. Otte 1983" [handwritten by Otte on red card]. Specimen set with wings folded, the right forewing is detached and glued to a card mount on the original pin. Both antennae and the left cercus are missing. There is a micro-tube with dissected parts secured through the stopper on the original pin. An immature specimen with labels: "Zanzibar" [handwritten on a strip of pink paper]; "VOELTZKOW" [printed on a strip of white paper]; "Probable syntype of T aequipennis (Sauss.), Hollier 2011" [handwritten on red paper]. Both middle legs, the tibia and tarsi of the left hind leg and the tarsi of the right hind leg are lost. There is an immature syntype in the SMFD (images on SysTax). Otte & Cade (1983: 118) refer to the ♂ specimen as the "type" without designating it as lectotype. Box A11.

A junior synonym of *Teleogryllus pulchriceps* (Gerstaecker, 1869).

aethiops Saussure, 1877: 82 [*Nemobius*].

Congo (coll. Brunner de Wattenwyl n° 10203). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Pteronemobius aethiops (Saussure, 1877).

afer Saussure, 1877: 159-160 [*Gryllus*].

La Côte de Mozambique; baie d'Algoa; Madagascar; Zanzibar. More than one ♂ and ♀ (measurements given as ranges).

One ♂ and two ♀ syntypes. A ♂ with labels: "♂ Baie d'Algoa, Afrique" [handwritten on ruled white card]; "Gryllus afer Sauss." [handwritten on pink paper]; "Teleogryllus afer (Saussure) det. D. Otte 1983" [handwritten by Otte on white card]; "LECTOTYPE Teleogryllus afer (Saussure) D. Otte 1983" [handwritten by Otte on red card]. Specimen set with wings folded; the left front leg, right middle leg and the last tarsal segment of the left hind leg are missing. The right antenna, the right front leg (lacking the tarsi), the left middle leg (lacking the tarsi), and the tarsi of the right hind leg are glued to a card mount on the original pin along with the right forewing. A micro-tube with dissected parts is secured through the stopper on the original pin. The specimen is in poor condition and has been repaired with glue. A ♀ with labels: "♀ Zanzibar, Afrique" [handwritten on ruled white card]; "Gryllus afer Sauss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna is missing. A ♀ with labels: "Madagascar ♀" [handwritten on white paper]; "Gryllus afer Sauss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with right wings spread and left wings folded; the left antenna, the tarsi of both front legs, the tarsi of the right middle leg, the tibia and tarsi of the left middle leg and about half of the tibia and the tarsi of the left hind leg are lost. Otte & Cade (1983: 121) incorrectly refer to the ♂ specimen as the holotype, and do not designate a lectotype. Box A11.

Teleogryllus afer (Saussure, 1877).

africanus Saussure, 1878: 540-541, fig. xxxviii [*Heterotrypus*].

Nubie, Chartoum (coll. Brunner de Wattenwyl n° 1116). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Phaloria africana (Saussure, 1878).

africanus Saussure, 1877: 244, fig. xvi, 7 [*Scapsipedus*].

Afrique méridionale (Muséum de Paris). One damaged ♂.

No specimens found in the MHNG. The holotype is in the MNHN according to OSF.

A junior synonym of *Scapsipedus marginatus* (Afzelius & Brannius, 1804).

alatus Saussure, 1877: 306 [*Ectatoderus*].

Brésil (Mus. de Berlin no 1004). Unspecified number of ♂.

The specimen placed under this name in the MHNG collection is from Tahiti and thus not part of the type material. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB (images in OSF). Box A18.

Ornebius alatus (Saussure, 1877).

albifrons Saussure, 1877: 155 [*Gryllus*].

Malacca (coll. Brunner de W. n° 11696). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The type material could not be located in the NHMW collection and its whereabouts is unknown.

Teleogryllus occipitalis albifrons (Saussure, 1877).

albipalpus Saussure, 1877: 236, fig. xiii, 3 [*Cophogryllus*].

Indes orientales (leg. Falconnet). One damaged ♀.

Holotype ♀ with labels: “♀ Indes Or., M Hi de Saussure” [handwritten on ruled white card with “Indes Or.” printed]; “Gryllodes albipalpus Sauss.” [handwritten on yellow paper]; “Holotypus” [printed on red card]. Most of both antennae, both front legs, the right middle leg and both hind legs are lost. Box A15.

Cophogryllus albipalpus Saussure, 1877.

albipalpus Saussure, 1877: 89-90 [*Nemobius*].

Brésil, Rio de Janeiro (coll. Brunner de Wattenwyl n° 8053). Unspecified number of ♀.

The MHNG collection has two specimens under this name, but there were collected after the publication of the description and so are not types. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW. Box A5.

Hygronemobius albipalpus (Saussure, 1877).

algerius Saussure, 1877: 191-192, fig. xi, 5 [*Gryllus*].

Algérie, Boutaleb au sud de Sétif; L'Asie Mineure, Amasia; (Turkestan). More than one ♂ and ♀.

One ♂ and three ♀ syntypes. A ♂ with labels: “♂ Amasia, Asie min. [handwritten on ruled white card]; “Gryllus algerius Sauss.” [handwritten on blue paper]; “Syntypus” [printed on red paper]. Most of the left antenna, the left front and middle legs, the tarsi of the right middle leg and the last tarsal segment of the left hind leg are missing. A ♀ with labels: “♀ Amasia, Asie min.” [handwritten on ruled white card]; “Gryllus algerius Sss.” [handwritten on blue paper]; “Syntypus” [printed on red paper]. The left antenna, most of the right antenna, the right front and middle legs and the left hind leg are lost. A ♀ with labels: “♀ Algérie, V^{ae} de Saussure” [handwritten on ruled white card with “Algérie” printed]; “Gryllus algerius Sss.” [handwritten on blue paper]; “Syntypus” [printed on red paper]. Both antennae and the tarsi of the right hind leg are lost. A ♀ with labels: “♀ Algérie, V^{ae} de Saussure” [handwritten on ruled white card with “Algérie” printed]; “Gryllus algerius Sss.” [handwritten on blue paper]; “Syntypus” [printed on red paper]. Both antennae and the left middle leg are missing. The left side of the ovipositor is broken off about one third of its length from the abdomen. Box A13.

Modicogryllus algerius algerius (Saussure, 1877).

ambulator Saussure, 1877: 193-194, fig. xi, 6 [*Gryllus*].

Habite? (Muséum de Paris). One damaged ♀.

No specimens found in the MHNG. The holotype is in the MNHN according to OSF.

Gryllus ambulator Saussure, 1877.

americanum Saussure, 1874a: 426-427, figs 41-42 [*Cycloptilum*].

Cuba (leg. Poey & Gundlach). Unspecified number of ♂ and ♀.

Two ♂ and two ♀ syntypes. A ♂ with labels: "Cuba, M H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cycloptilum americanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen card-mounted; most of the right antenna is missing. A ♂ with labels: "♂ Cuba, M H. de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Cycloptilum americanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen pinned laterally through the thorax; both antennae, the tarsi of the left front leg and the right middle leg are missing. A ♀ with labels: "♀ Cuba, M H. de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Cycloptilum americanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen card-mounted, the thorax and abdomen are separate, and the specimen appears to have been pinned and then broken. The antennae, the left front leg, left middle leg and left hind leg are lost. The left middle and hind legs and the right cercus are detached and glued to the card mount. A ♀ with labels: "♀ Cuba, M H. de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Cycloptilum americanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The specimen has broken where the pin was inserted, and only part of the thorax, the left hind leg and abdomen remain. A juvenile ♂ and two juvenile ♀ may also be considered syntypes. Box A18.

Cycloptiloides americanus (Saussure, 1874).

americanus Saussure, 1877: 293 [*Myrmecophilus*].

Colombie (Musée de Berlin). Unspecified number of ♀.

No specimens found in the MHNG. The type material is in the ZMHB. Ingrisch (2010: 10) refers to a ♀ lectotype, but it is not clear whether this has been formally designated elsewhere. Images in OSF.

Myrmecophilus americanus Saussure, 1877.

americanus Saussure, 1878: 642-643 [*Podoscirtus*].

Brésil, Bahia (coll. Brunner de Wattenwyl n^{os} 4867, 7933 & 7975). Three ♀.

No specimens found in the MHNG. There are two ♀ syntypes in the NHMW.

Podoscirtodes americanus (Saussure, 1878).

amusus Saussure, 1897: 270, 274; pl. 13, fig. 28 [*Orocharis*].

Brazil, Pernambuco (Mus. Genavense). More than one ♀ (ovipositor length given as range).

One ♀ syntype with labels: "♀ Pernambouc, Brésil, M H de Saussure" [handwritten on ruled white card]; "Orocharis amusus" [handwritten on green paper];

“Syntypus” [printed on red paper]. Specimen set with wings folded; both antennae, both front legs and both hind legs are lost. The whereabouts of any other syntypes is unknown. Box A28.

Orocharis amusus Saussure, 1897.

amusus Saussure, 1878: 641-642 [*Podoscirtus*].

Brésil, Pernambuco (Musée de Bruxelles). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The whereabouts of the type material is unconfirmed.

Podoscirtodes amusus (Saussure, 1878).

angusticollis Saussure, 1874a: 377-378, fig. 2 [*Cyrtoxipha*].

Mexique, Cordillère orientale. Unspecified number of ♂.

One ♂ syntype with labels: “♂ Potrero, Mexique, M^r H. d. Sauss.” [handwritten on ruled white card with “Mexique” printed]; “Cyrtox. angusticollis Sss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings spread, the left hind wing ragged and hanging vertically below the body; both antennae and the right front and middle legs are missing, the other legs appear to have been reattached with glue. Box A24.

Anaxipha angusticollis (Saussure, 1874).

angustus Saussure, 1877: 126-127, fig. xx, 4 [*Brachytrypus*].

Java (coll. Brunner de Wattenwyl nos 2257 & 7637). Three ♂ and one ♀.

The MHNG collection has two specimens from Java and two others, tentatively identified as this species from New Guinea. The specimens from Java were collected by Naville (♂) and Demole (♀), both names encountered fairly frequently in the MHNG collection, and so it is unlikely that they could be syntypes. There are at least two syntypes in the NHMW collection. Box A7.

Gymnogryllus angustus (Saussure, 1877).

annulicornis Saussure, 1874a: 491-492 [*Apithis*].

Surinam. Unspecified number of ♀.

One ♀ syntype with labels: “Surinam, M H. d. Sauss.” [handwritten on ruled white card]; “*Paroecanthus annulicornis* Sauss. ♀ M. H. S.” [handwritten in pencil on white paper]; “*Apithus annulicornis* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings roughly spread; the left antenna and the left middle leg are lost. Box A27.

Hapithus annulicornis (Saussure, 1874).

annulipes Saussure, 1877: 77-78 [*Nemobius*].

Nouvelle-Hollande (Musée de Paris). Unspecified number of ♀.

One possible syntype with labels: “N. Holl., M H de Saussure” [handwritten on ruled white card]; “*Nemobius annulipes* Sauss.” [handwritten on lilac paper]; “Possible syntype of *N. annulipes* Sauss. Hollier 2011” [handwritten on red paper]. Only the head

and part of the thorax survives. There is a ♀ syntype, referred to as the holotype in OSF, in the MNHN. Box A5.

A junior synonym of *Bobilla bivittata* (Walker, 1869).

antillarum Saussure, 1874a: 414-415, figs 10 & 13 [*Grylloides*].

Cuba (leg. Poey). Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "♂ Habana, Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Anurogryllus antillarum Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna, the last tarsal segment of the left front leg and the last tarsal segment of the left hind leg are missing. A ♀ with labels: "N. ♀ Habana, Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Anurogryllus antillarum Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of both antennae and the tarsi of the left hind leg are missing. Box A6.

Anurogryllus antillarum (Saussure, 1874).

antillarum Saussure, 1874a: 496-498 [*Orocharis*].

Guadeloupe. Unspecified number of ♂.

One ♂ syntype with labels: "♂ Guadeloupe, Antilles, M H de Saussure" [handwritten on ruled white card]; "Orocharis antillarum" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, the tibiae and tarsi of both front legs, the right middle leg and both hind legs are missing. Box A28.

Antillicharis antillarum (Saussure, 1874).

apertus Saussure, 1878: 576-577 [*Calyptotrypus*].

Le nord de la Nouvelle-Hollande, Rockhampton (coll. Brunner de Wattenwyl n° 5762). Unspecified number of ♀.

No specimens found in the MHNG or the NHMW, the whereabouts of the type specimen(s) is unknown.

Madasomma apertus (Saussure, 1878). (Regarded as *nomem dubium* in OSF)

apiatus Saussure, 1878: 664 [*Aphonus*].

Nouvelle-Guinée (Musée de Leyde). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the RMNH according to OSF.

Aphonoides apiatus (Saussure, 1878).

apithoides Saussure, 1897: 259, 260; pl. 13, fig. 6 [*Diatrypus*].

Panama, Bugaba (Champion). Unspecified number of ♀.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Diatrypa apithoides Saussure, 1897.

apricus Saussure, 1877: 203-204 [*Grylloides*].

Egypte (Mus. i. de Vienne). More than one ♂ (variation in colour of head mentioned).

The ♂ specimen found in the MHNG, although from Egypt, is identified as “*G. apricus*?” and so is not part of the type series. There is a ♂ syntype, referred to as the holotype in OSF, in the NHMW under the name “*Gryllopsis aprica*.” Box A14.

Cryncus apricus (Saussure, 1877).

arachnopsis Saussure, 1878: 439-440 [*Endecous*].

Brésil, Sierra Gival (Musée de Berlin n° 4070). Unspecified number of ♂.

No specimens found in the MHNG. The ♂ lectotype (designated by Gorochov, 1996b: 53) is in the ZMHB (images in OSF).

Endecous arachnopsis Saussure, 1898.

aranea Saussure, 1878: 431-432 [*Amphiacustes*].

Saint-Domingue (coll. Brunner de Wattenwyl n° 7929); Guadeloupe. More than one ♂.

No specimens found in the MHNG. There is a ♂ syntype from San Domingo in the NHMW.

A junior synonym of *Amphiacusta annulipes* (Serville, 1831).

aranea Saussure, 1878: 444-445, fig. xl, 3 [*Phaeophyllacris*].

Zanzibar (coll. Brunner de Wattenwyl n^{os} 988 & 3914; Musée de Berlin). More than one ♂.

No specimens found in the MHNG. There are two ♂ syntypes in the NHMW.

Phaeophilacris aranea Saussure, 1878.

araucanus Saussure, 1874a: 388 [*Nemobius*].

Chili. Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: “M H. d. Sauss., ♂ Chili, méridion.” [handwritten on ruled white card with “Chili” printed]; “*Nemobius araucarus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks most of both antennae, the right front leg and both middle and hind legs. A ♀ with labels: “M H. d. Sauss., ♀ Chili, méridion.” [handwritten on ruled white card with “Chili” printed]; “*Nemobius araucarus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks the right antenna, the left front leg and the tarsi of the left middle leg. Box A5.

Hygronemobius araucanus (Saussure, 1874).

argentinus Saussure, 1874a: 399 [*Gryllus*].

Brésil Méridional; République Argentine et le nord de la Patagonie, Buenos-Ayres, Bahia Blanca & Rio Negro de Patagones (leg. Claraz). Unspecified number of ♂ and ♀.

Lectotype ♂ designated by Pinho Martins & Zefa (2011: 88) with labels: “♂ Bahia Blanca, Rep. Arg., env. G. Claraz” [handwritten on ruled white card]; “*Gryllus*

argentines Sauss.” [handwritten on green paper]; “Lectotypus” [printed on red card]; “to be designated LT by L. de Pinho Martins, 30.iv.2009” [handwritten by Peter Schwendinger on white paper]. Specimen set with wings folded, the right forewing has been detached and is glued to a card on the original pin. Most of both antennae, the last tarsal segment of the right front leg and the last tarsal segment of the right hind leg are missing. The right middle leg, which lacks the tarsi, is detached and secured through the femur on the original pin. There are four ♂, ten ♀, and seven juvenile paralectotypes. Box A10.

Gryllus argentinus Saussure, 1874.

argentinus Saussure, 1874a: 460 [*Oecanthus*].

La Plata (leg. Claraz). Unspecified number of ♀.

One ♀ syntype with labels: “♀ Entre Rios, Rep. Arg., envoi G. Claraz” [handwritten on ruled white card]; “*Oecanthus argentinus* Sauss.” [handwritten on green paper]; “Musée de Genève, No A30” [printed on white card with “A30” handwritten]; “HOLOTYPE, *Oecanthus argentinus* Sauss., T. J. Walker 1969” [handwritten on red card with “HOLOTYPE” printed]. Specimen set with wings folded; both antennae, both front legs, both middle legs and the right hind leg are lost. The other specimens present in the MHNG collection under this name have a different country of provenance or were collected after the publication of the description. Box A22.

Oecanthus argentinus Saussure, 1874.

arietulus Saussure, 1877: 253 [*Loxoblemmus*].

Java; Sumatra; Japon (Mus. de Leyde). More than one ♀.

One possible ♀ syntype with labels: “Java, M H. de Saussure” [handwritten on ruled white card with “Java” printed]; *Loxoblemmus arietis* [sic] Sauss.” [handwritten on yellow paper]; “Possible syntype of *L. arietulus* Saussure, Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the left antenna, the left hind leg and the last tarsal segment of the right hind leg are missing. There is considerable insect feeding damage to the thorax, abdomen and right femur. There are syntypes in the RMNH according to OSF. Box A16.

Loxoblemmus arietulus Saussure, 1877.

assimilis pallida Saussure, 1897: 226 [*Gryllus*].

Mexico, Durango and Sinaloa, Presidio de Mazatlan (Forrer). Unspecified.

There are no specimens placed under this name in the MHNG collection. However, there are three specimens placed under “*G. assimilis aztecus*” which might be syntypes. A ♂ with labels: “Presidio, Mexico, Forrer” [printed on white card]; “*Gryllus assimilis* var. *aztecus* Sss.” [handwritten on green paper]; “Possible syntype of *G. a. pallida* Ss.? Hollier 2011” [handwritten on red paper]. Specimen set with wings roughly folded, the right wing is broken, and part has been glued to the identification label; most of the left antenna and the right hind leg are lost. A ♂ with labels: “Durango en Sinaloa, Mexico, Forrer” [handwritten on white card]; “*Gryllus assimilis* var. *aztecus* Sss.” [handwritten on green paper]; “Possible syntype of *G. a. pallida* Ss.? Hollier 2011” [handwritten on red paper]. Specimen set with wings roughly folded;

both antennae, the last tarsal segment of the right front leg and the right hind leg are missing. A ♀ with labels: “Durango en Sinaloa, Mexico, Forrer” [handwritten on white card]; “*Gryllus assimilis* var. *aztecus* Sss.” [handwritten on green paper]; “Possible syntype of *G. a. pallida* Ss.? Hollier 2011” [handwritten on red paper]. Specimen set with wings roughly folded; the claw of the right front leg, the tibia and tarsi of the left middle leg and the right hind leg are lost.

Gryllus assimilis pallida Saussure, 1897.

asyrinx Saussure, 1878: 645-646 [*Podoscirtus*].

Java (Mus. de Berlin n° 962). Unspecified number of ♀.

No specimens found in the MHNG. There is a specimen labelled as the holotype in the ZMHB according to SysTax (images on SysTax).

Munda asyrinx (Saussure, 1878).

atriceps Saussure, 1899: 608, fig. 9 [*Orthoxiphus*].

Nossi-Bé. Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the SMFD (images on SysTax).

Orthoxiphus atriceps Saussure, 1899.

auditor Saussure, 1897: 283-284; pl. 13, figs 33-34 [*Heterecous*].

Panama, Volcan de Chiriqui (Champion). Unspecified number of ♀.

No specimens found in the MNHG. The type material is in the BMNH according to their online database.

Heterecous auditor Saussure, 1897.

australis Saussure, 1877: 285 [*Anurogryllus*].

Nouvelle Hollande (Muséum de Paris). Unspecified number of ♂.

No specimens found in the MHNG. Otte & Alexander (1983: 36) state that the ♂ type in the MNHN really belongs to the genus *Anurogryllus* Saussure, which is otherwise only known from the Americas, and question the provenance of the specimen.

Anurogryllus australis Saussure, 1877. (Treated as *nomen dubium* in OSF).

australis Saussure, 1878: 437-439, fig. xlii [*Endacustes*].

Nouvelle-Hollande (Musée de Stuttgart). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the SMNS (Holstein & Ingrisich, 2004).

Endacusta australis Saussure, 1878.

azteca Saussure, 1874a: 490-491, fig. 37 [*Apithis*].

Mexique (Musée de Paris). Unspecified number of ♂ and ♀.

One ♀ syntype with labels: “♀ Mexique, M H de Saussure” [handwritten on ruled white card]; “*Apithis aztecus* Sss. ♀” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of the left antenna, the left front leg, part of the femur, the tibia and tarsi of the right front leg, and the left

middle leg are missing. The left hind leg, which lacks the tarsi, is detached and secured through the femur on the original pin. There is further type material in the MNHN according to OSF. Box A27.

Hapithus aztecus (Saussure, 1874).

azteca Saussure, 1874a: 375-376 [*Cyrtoxipha*].

Mexique, Cordillère orientale. More than one ♀ (variation in head colour mentioned).

Three ♀ syntypes. A ♀ with labels: "♀ Orizaba, Mexique, Mr H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Cyrtox. aztecus Sss." [handwritten on green card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right front and both middle legs are missing, large parts of both antennae are detached and adhere to the underside of the body. A ♀ with labels: "♀ Orizaba, Mexique, Mr H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Cyrtox. aztecus Sss." [handwritten on green card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae and the right hind leg are missing. A ♀ with labels: "♀ Orizaba, Mexique, Mr H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Cyrtox. aztecus Sss." [handwritten on green card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right antenna and the legs of the right side are lost, the left hind leg is detached and secured through the femur on the original pin. Box A24.

A junior synonym of *Anaxipha gracilis* (Scudder, 1869).

azteca Saussure, 1859: 316 [*Gryllotalpa*].

Mexico. Unspecified.

One ♀ syntype with labels: "♀ Mexique, M H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Gryllotal. azteca Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae and the last tarsal segment of the right hind leg are missing. A specimen much damaged by insect feeding may be a second syntype, but the other material placed under this name in the MHNG collection is not from Mexico, and mainly collected after the publication of the description. Box A2.

A junior synonym of *Neocurtilla hexadactyla* (Perty, 1832).

aztecus cayennensis Saussure, 1897: 235-236 [*Cyrtoxiphus*].

Guiana, Cayenne (Prudhomme). Unspecified.

Four ♀ syntypes. A card mounted ♀ with labels: "CAYENNE" [printed on a strip of green paper]; "Cyrtox. aztecus Sss. v. guianensis [sic]" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae are missing. A card-mounted ♀ with labels: "CAYENNE" [printed on a strip of green paper]; "Cyrtox. aztecus Sss. v. guianensis [sic]" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae are missing. A card-mounted ♀ with labels: "CAYENNE" [printed on a strip of green paper]; "Cyrtox. aztecus Sss. v. guianensis [sic]" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of

both antennae are missing. A card-mounted ♀ with labels: "CAYENNE" [printed on a strip of green paper]; "Cyrtox. aztecus Sss. v. guianensis [sic]" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae are missing. Although the labels on the pins give the name as "guianensis", the species name label in the insect box, which is contemporary with the other labels in the box for species described in the BCA, reads "aztecus Sauss. var. cayennensis Sauss., Cayenne." Box A24.

Anaxipha cayennensis (Saussure, 1897).

aztecus Saussure, 1897: 230; pl. 11, figs 35-36 [*Ectatoderus*].

Mexico, Chilpancingo in Guerrero, 4600 ft (H. H. Smith). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Hoplosphyrum aztecum (Saussure, 1897).

aztecus Saussure, 1897: 250; pl. 12, figs 20-22 [*Endacustes*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Nemoricantor aztecus (Saussure, 1897).

aztecus Saussure, 1859: 316 [*Gryllus*].

Tellus mexicana. Unspecified number of ♂.

Two possible ♂ syntypes. A ♂ with labels: "♂ Potrero, Mexique" [handwritten on ruled white card with "Mexique" printed]; "Gryllus assimilis Burm. var aztecus" [handwritten on green paper]; "Possible syntype of *G. aztecus* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings spread; most of both antennae and the right front leg are missing. A ♂ with labels: "♂ Oaxaca, Mexique, M H de Saussure" [handwritten on ruled white card with "Mexique" printed]; "Gryllus assimilis Burm. var aztecus" [handwritten on green paper]; "Possible syntype of *G. aztecus* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the left front leg and the claw of the right hind leg are lost. There is insect feeding damage to the thorax and abdomen. Box A9.

A junior synonym of *Gryllus assimilis assimilis* (Fabricius, 1775).

aztecus Saussure, 1874a: 471-472 [*Paroecanthus*]

Mexique (Musée de Paris). Unspecified number of ♂ and ♀.

Three ♀ syntypes. A ♀ with labels: "♀ Mexique, M H de Saussure" [handwritten on ruled white card]; "Paroecanthus aztecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the head (apart from the right antenna which is glued to the prothorax) and both front legs are missing, as is most of the right hind femur. The thorax and abdomen show considerable insect feeding damage. A ♀ with labels: "♀ Mirador, Mexique" handwritten on ruled white card with "Mexique" printed]; "Paroecanthus aztecus Sss." [handwritten on

green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, the right middle leg and the right hind leg are missing. A ♀ with labels: "♀ Mirador, Mexique, coll. Yersin" [handwritten on ruled white card]; "Paroecanthus aztecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the right middle leg and both hind legs are lost. The specimen has mould damage. The other specimens placed under this name in the MHNG collection were collected after the publication of the description. There are further syntypes in the MNHN according to OSF. Box A27.

Paroecanthus aztecus aztecus Saussure, 1874.

aztecus Saussure, 1859, 209 [*Phalangopsis*].

Mexico. Unspecified number of ♀.

The presumed syntypes are currently on loan from the MHNG. Box A20.

Amphiacusta azteca (Saussure, 1859).

bahiensis Saussure, 1878: 676-677 [*Metrypys*].

Brésil, Bahia (Mus. de Berlin n^o 990). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype labelled as the holotype in the ZMHB according to SysTax (images on SysTax).

Tafalisca bahiensis (Saussure, 1878).

barbarus Saussure, 1877: 267-268, fig. xviii, 3 [*Platyblemmus*].

Maroc; Tanger (coll. Brunner n^{os} 1985 & 1983, Mus. de Paris). More than one ♂ and ♀.

One possible ♂ syntype with labels: "♂ Tanger, Maroc, colln Guérin" [handwritten on ruled white card]; "Platyblemmus barbarus Sss." [handwritten on blue card]; "Sciobia Barbara (Sauss.) Det. R. L. Randell, 1963" [determination handwritten on white card with "Det. R. L. Randell, 19" printed]; "Possible syntype of P. barbarus Sauss., Hollier 2011" [handwritten on red paper]. The specimen lacks most of both antennae, both front legs, the left middle leg, the tarsi of the right middle leg, both hind legs and much of the abdomen. There is a micro-tube with dissected parts secured through the stopper on the original pin. Judging by the locality labels, the other specimens placed under this name in the MHNG appear to have been collected after the publication of the description. There are two syntypes, a ♂ and a juvenile, in the NHMW collection. Box A16.

Sciobia barbara (Saussure, 1877).

berthellus Saussure, 1877: 205-206 [*Gryllodes*].

Japon; Amboine; Banka (Musée de Leyde); Chine, Ile d'Amoy (coll. Brunner n^o 2910). More than one ♀.

The MHNG collection includes two series under this name; one from Australia and one from Japan (the latter collected by Fruhstorfer who was there in 1899/1901) neither of which are part of the type series. The NHMW collection includes specimens from Brunner's collection under this name, but none could be positively identified as syntypes. Box A14.

A junior synonym of *Velarifictorus aspersus aspersus* (Walker, 1869).

bicolor Saussure, 1874a: 405-406 [*Gryllus*].

Guayane, Monte Rico. Unspecified number of ♂ and ♀.

The only specimen placed under this name in the MHNG collections has the locality label "Perou" and is therefore not a syntype. The whereabouts of the type material is unknown. Box A9.

Gryllus bicolor Saussure, 1874.

bicolor Saussure, 1877: 98-100, fig. vii, 5 [*Nemobius*].

Indes orientales, Inde centrale (leg. Falconnet). Three ♂.

Three ♂ syntypes. A ♂ with labels: "♂ Inde centr., M H de Saussure" [handwritten on ruled white card]; "Nemobius bicolour Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with the right forewing spread and other wings folded; the left front leg, the left middle leg, the tibia and tarsi of the right middle leg and the left hind leg are missing. A ♂ with labels: "♂ Indes centrales, M^r H. d. Sauss." [handwritten on ruled white card]; "Nemobius bicolour Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both front and both middle legs are lost. A ♂ with labels: "♂ Indes centrales, M^r H. d. Sauss." [handwritten on ruled white card]; "Nemobius bicolour Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the left middle leg and both hind legs are lost. Box A5.

Stenonemobius bicolor bicolor (Saussure, 1877).

bimaculatus Saussure, 1878: 638-639, fig. lxx, 2 [*Podoscirtus*].

Indes Orientales? Java? (Musée de Paris). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the MNHN in Paris.

Munda bimaculata (Saussure, 1878).

birmanus Saussure, 1877: 322, fig. xxxi, 2 [*Acanthoplistus*].

Birman (coll. Brunner de Wattenwyl n° 3336). Unspecified number of ♂.

The specimens placed under this name in the MHNG collection are either from other localities or collected after the publication of the description and so are not types. There is a ♂ syntype in the NHMW collection. Box A18.

Acanthoplistus birmanus Saussure, 1877.

bitaeniatus Saussure, 1878: 534-535, fig. lix [*Paraeneopterus*].

Philippines (coll. Brunner de Wattenwyl n° 1793). One ♀.

The ♀ holotype is in the NHMW. The MHNG collection has one ♀ under this name but the locality label reads "Indes or." and it is not the type. There is a note with this specimen recognising it as a junior homonym of *L. bitaeniatus* Stål. The species was given the replacement name *Lebinthus saussurei* Bolivar, 1889. Box A28.

A junior synonym of *Lebinthus bitaeniatus* Stål, 1877.

blennus Saussure, 1877: 215 [*Gryllodes*].

Java (Musée de Leyde). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the RMNH.

Mitius blennus (Saussure, 1877).

bogotensis Saussure, 1878: 679-680 [*Metrypus*].

Nouvelle-Grenade, S^{te} Fé de Bogota (coll. Brunner de Wattenwyl n^o 4758). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the NHMW.

Tafalisca bogotensis (Saussure, 1878).

brasilianus Saussure, 1877: 309 [*Cycloptilus*].

Brésil (Mus. i. de Vienne). Unspecified number of ♂.

No specimens found in the MHNG. OSF refers to a specimen in the NHMW as the holotype, but this could not be located.

Ornebius brasilianus (Saussure, 1877).

brasilianus Saussure, 1878: 676 [*Metrypus*].

Brésil (Musée de Munich). Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unconfirmed.

Tafalisca brasiliانا (Saussure, 1878).

brevicauda Saussure, 1878: 454 [*Oecanthus*].

Afrique méridionale, le Cap (Musée de Paris). Unspecified number of ♀.

No specimens found in the MHNG. According to OSF the type material is lost.

Oecanthus brevicauda Saussure, 1878.

brevicaudatus Saussure, 1877: 286-287 [*Anurogryllus*].

Brésil, Bahia. Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Anurogryllus brevicaudatus Saussure, 1877.

brevipenne Saussure, 1899: 606 [*Trigonidium*].

Nossi-Bé. Unspecified number of ♂ and immature ♀.

One ♂ syntype with labels: "VOELTZKOW, Nossi-Bé" [printed on white paper with "Nossi-Bé" handwritten]; "Trigonidium brevipennis Sss. & Adl., ♂ larve" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Most of both antennae, both front legs and both middle legs are lost. There is further type material in the SMFD (images on SysTax). Box A23.

Trigonidium brevipenne Saussure, 1899.

brevipennis Saussure, 1897: 266, 268 [*Apithes*].

North America, Georgia, Louisiana (coll. Brunner v. W.). More than one ♀.

No specimens found in the MHNG. The type material could not be located in the NHMW collection and the whereabouts of the type material is unknown.

Hapithus brevipennis (Saussure, 1897).

brevipennis Saussure, 1878: 557-558 [*Cylindrogryllus*].

Brésil (Mus. de Berlin). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB in Berlin. Images in OSF.

Cylindrogryllus brevipennis Saussure, 1878.

brevipennis Saussure, 1874a: 418-419 [*Gryllodes*].

Pérou. Unspecified number of ♀.

One ♀ syntype with labels: "4 40, Tarma, Perou" [handwritten on ruled white card with "Perou" printed]; "Miogryllus brevipennis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of the left antenna, the left front leg, right middle leg and both hind legs are lost. Box A13.

A junior synonym of *Miogryllus convolutus* (Johannson, 1763).

brevipes Saussure, 1878: 599-601, fig. lxxv, 1 [*Amblyopus*].

Colombie (Musée de Leipzig et Musée de Berlin n° 997). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The ♂ lectotype (designated by Gorochov, 2011; 256) is in the ZMHB (images in OSF).

Amblyrhetus brevipes (Saussure, 1878).

brunneri Saussure, 1877: 170 [*Gryllus*].

Afrique, Maroc; Afrique méridionale; Afrique orientale, Zanzibar; Massaua (coll. Brunner 9133, 6572); Ténériffe; Indes, Bengale 3♂ 2♀, Cashmir; Nouvelle-Hollande. More than three ♂ and more than two ♀.

Three ♂ and four ♀, all syntypes. A ♂ with labels: "♂ Nouv. Holl." [printed on ruled white card with "♂" handwritten]; "Gryllus Brunneri Selys" [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Most of both antennae, the tarsi of the right front leg, the entire left middle and hind legs, the last tarsal segment of the right hind leg and the left cercus are missing. There is insect feeding damage to the thorax and abdomen. A ♂ with labels: ♂ Maroc, Algérie [sic], M Demole" [handwritten on ruled white card with "Algérie" printed]; "Gryllus Brunneri Selys" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; most of both antennae and all three left side legs are missing. A ♂ with labels: "♂ Afrique, M H de Saussure" [handwritten on ruled white card]; "Gryllus Brunneri Selys" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, both middle legs, the last tarsal segment of the left hind leg and the entire right hind leg are lost. A ♀ with labels: "♀ Bengale, Indes Or., colln Guérin" [handwritten on ruled white card with "Indes Or." printed]; "Gryllus Brunneri Selys." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna, the left front leg, the tarsi of the right front leg, the tarsi of the left middle leg, the last tarsal segment of the right hind leg and the entire left hind leg are lost. A ♀ with labels: "♀ Bengale, Indes Or., colln Guérin" [handwritten on ruled white card with "Indes Or." printed]; "Gryllus Brunneri Sauss. [sic]" [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set

with wings folded; both antennae, the tarsi of the right front leg, both middle legs and the left hind leg are missing. There is insect feeding damage to the head, thorax and abdomen. A ♀ with labels: "♀ Afrique, M H de Saussure" [handwritten on ruled white card]; "Gryllus Brunneri Sauss [sic]" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae and the left cercus are missing. A possible ♀ syntype with labels: "♀ Cazamanca, Afrique" [handwritten on ruled white card]; "Gryllus Brunneri Sélvs" [handwritten on pink card]; "Possible syntype of *G. brunneri* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the right front leg, the last tarsal segment of the right hind leg the entire left hind leg and most of both cerci are missing. This specimen presumably comes from Casamance in what is now Senegal, and so does not match the localities given in the description very well, but it appears to be contemporary with the other specimens. There are several immature specimens which might also be considered syntypes. Saussure ascribed the species to de Sélvs (1868), but that reference is incorrect. Otte & Cade (1984: 64-65) considered the species to be Saussure's, but they regarded it as a *nomen dubium* because they could not find a ♂ syntype, stating that the MHNG collection only contained two females with labels corresponding to the Brunner collection numbers of the specimens from Massaua. This was a lapse, the Massaua specimens being in the NHMW. OSF attributes the species to de Sélvs, but in that case the type specimens cannot be in the MHNG as there stated. Box A12.

Acanthogryllus brunneri (Saussure, 1877).

brunnerianus Saussure, 1877: 109-110, fig. xxi [*Apterogryllus*].

Le nord de la Nouvelle-Hollande (coll. Brunner de Wattenwyl n° 3767). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The ♀ lectotype (designated by Otte & Alexander, 1983: 64) is in the NHMW.

Apterogryllus brunnerianus Saussure, 1877.

brunnerianus Saussure, 1877: 314 [*Arachnocephalus*].

Célèbes (coll. Brunner de Wattenwyl n° 8647). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the NHMW.

Arachnocephalus brunnerianus Saussure, 1877.

brunnerianus Saussure, 1877: 327-329, fig. xxxii, 1 [*Cachoplistus*].

Australie (coll. Brunner de Wattenwyl n° 5526). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Cacoplistes brunnerianus Saussure, 1877.

brunnerianus Saussure, 1878: 589-590 [*Calyptotrypus*].

Java (coll. Brunner de Wattenwyl n° 7301). Unspecified number of ♀.

No specimens found in the MHNG. There is a probable ♀ syntype in the NHMW.

Mnesibulus brunnerianus (Saussure, 1878).

brunnerianus Saussure, 1878: 515-516 [*Nisitrus*].

Bornéo (coll. Brunner de Wattenwyl). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the NHMW.

Nisitris brunnerianus Saussure, 1878.

brunnerianus Saussure, 1874a: 368-369, fig. 4 [*Phylloscirtus*].

Mexique (Musée de Paris). Unspecified number of ♂ and ♀.

One ♂ and one ♀, both possible syntypes. A ♂ with labels: ♂ Mexique, M H. de Saussure" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus brunnerianus Sauss. [handwritten on green paper]; "Possible syntype Hollier 2011" [handwritten on red paper]. Specimen set with wings spread, the left hind wing being missing; most of both antennae and all of the legs are lost, as is most of the thorax; the abdomen and prothorax are joined with glue. A ♀ with labels: "♀ Mexique, M H. de Saussure" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus brunnerianus Sauss. [handwritten on green paper]; "Possible syntype Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; both antennae, the left front leg, both middle legs and both hind legs are lost. There are further syntypes in the MNHN according to OSF. Box A24.

Phyllopalpus brunnerianus (Saussure, 1874).

caeruleus Saussure, 1874a: 366-368 [*Phylloscirtus*].

Mexique, Cordillère orientale. One ♂ and four ♀.

Two ♂ and two ♀ possible syntypes. A ♂ with labels: "♂ Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus caeruleus Sauss." [handwritten on green paper]; "Possible Syntype, Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the left middle leg and both hind legs are lost. A ♂ with labels: "♂ Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus caeruleus Sauss." [handwritten on green paper]; "Possible Syntype, Hollier 2011" [handwritten on red paper]. Specimen set with forewings roughly spread, the right hind wing is glued to card and secured on the original pin, the left hind wing is folded; most of both antennae, the right middle leg and the right hind leg are missing. A ♀ with labels: "♀ Mexique" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus caeruleus Sauss." [handwritten on green paper]; "Possible Syntype, Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the tibia and tarsi of the left middle leg and the left hind leg are lost. An immature ♀ with labels: "♀ Mexique, coll. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Phylloscirtus caeruleus Sauss." [handwritten on green paper]; "Possible Syntype, Hollier 2011" [handwritten on red paper]. It is not clear whether Saussure gave the series correctly or whether one of the males is not part of the type series. Box A24.

Phyllopalpus caeruleus (Saussure, 1874).

caledonicus Saussure, 1878: 658 [*Aphonus*].

Nouvelle-Calédonie (coll. Brunner de Wattenwyl n° 4735). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Matuanus caledonicus (Saussure, 1878).

californicus Saussure, 1874a: 462 [*Oecanthus*].

Californie. Unspecified number of ♂.

One ♂ syntype with labels: “♂ Californ., M H. d. Sauss.” [handwritten on ruled white card with “Californ.” printed]; “*Oecanthus californicus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of both antennae, the last tarsal segment of the left middle leg, the tarsi of the right middle leg and both hind legs are missing. Box A22.

Oecanthus californicus californicus Saussure, 1874.

canotus Saussure, 1878: 522 [*Cardiodactylus*].

Nouvelle-Hollande (S.O.); Terre de roi Georges (Muséum de Paris). More than one ♀.

No specimens found in the MHNG. Otte & Alexander (1983: 309) stated that the type could not be found in the MHNG or the MNHN. Otte (2007: 343), who appears to have subsequently found a ♀ syntype in the MNHN, states that it is probably a junior synonym of *C. novaeguineae* (Haan, 1842).

Cardiodactylus canotus Saussure, 1878.

canotus Saussure, 1878: 611-162 [*Orocharis*].

Haiti; Cuba (Musée de Berlin n^{os} 957 & 953). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is a ♀ syntype, erroneously referred to as the holotype in OSF, in the ZMHB.

A junior synonym of *Antillicharis similis* (Walker, 1869).

canotus Saussure, 1878: 501 [*Phylloscirtus*].

Brésil, Nouvelle-Fribourg (Musée de Halle et de Genève). More than one ♂.

One ♂ syntype with labels: “♂ Brésil, M H. de Saussure” [handwritten on ruled white card]; “*Phylloscirtus canotus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of both antennae and all of the legs are lost. Box A24.

Cranistus canotus (Saussure, 1878).

cantans Saussure, 1897: 244 [*Ectecous*].

Mexico, Orizaba (♀, Mus. Genavense); Guiana, Cayenne (♂). Unspecified number of ♂ and ♀.

Lectotype ♂ (designated by Hebard, 1928: 92) with labels: “CAYENNE” [printed on green paper]; “*Ectecous cantans* Sss.” [handwritten on green paper]. There is a separate pin with the label: “PROPOSED LECTOTYPE” [handwritten on a strip of white card. Specimen set with wings folded; the left middle leg is lost. The hind legs are detached and secured through the femurs on the original pin. Part of the terminalia have been dissected and are glued to a card mount secured on the original pin. Hebard

designated “the ♂ from Cayenne”, but there is a second ♂ in the collection with the same labels on the pin and “PROPOSED PARALECTOTYPE” [handwritten on white card] on a separate pin, it is not clear which was actually seen by Hebard. The ♀ paralectotype from Mexico was considered to belong to a different genus by Hebard (1928: 92). Box A20.

Ectecous cantans Saussure, 1897.

cantans Saussure, 1877: 221 [*Grylloides*].

Indes orientales (Mus. I. de Vienne). Unspecified number of ♂.

No specimens found in the MHNG. The type material could not be located in the NHMW collection and its whereabouts is unknown.

Gryllopsis cantans (Saussure, 1877).

capense Saussure, 1878: 464 [*Trigonidium*].

Cap de Bonne-Espérance (Musée de Berlin n° 913). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

A junior synonym of *Trigonidium erythrocephalum* (Walker, 1869).

capensis Saussure, 1878: 456-457 [*Oecanthus*].

Cap de Bonne-Espérance (Musée de Stuttgart). Unspecified number of ♂ and ♀.

The three specimens placed under this name in the MHNG, although apparently collected before the publication of the description, are labelled “*capensis?* var.” and are therefore not syntypes. There is a ♂ and ♀ syntype in the SMNS (Holstein & Ingrisch, 2004). Box A22.

Oecanthus capensis Saussure, 1878.

capitatus Saussure, 1878: 602-603, fig. lxxv, 2 [*Amblyopus*].

[Provenance unknown] (Muséum de Paris). Probably one ♀.

No specimens found in the MHNG. No syntypes could be located in the MNHN (Desutter-Grandcolas, pers. comm.).

Amblyrhexus capitatus (Saussure, 1878).

capitatus Saussure, 1874a: 405 [*Gryllus*].

Pérou; Chili. More than one ♂.

Three ♂ syntypes. A ♂ with labels: “♂ Chili? colln Guérin” [handwritten on ruled white card with “Chili” printed]; “*Gryllus capitatus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings roughly spread; both antennae, both middle legs, the right hind leg, the last tarsal segment of the left hind leg and the cerci are missing. The right front leg is detached and glued to the side of the thorax. There is considerable insect feeding damage to the head, thorax, wings and abdomen. A ♂ with labels: “♂ Lima, Perou, M H de Saussure” [handwritten on ruled white card]; “*Gryllus capitatus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of both antennae, the tarsi of the right front leg and both hind legs are lost. A ♂ with labels: “♂ Perou” [printed on ruled white card with “♂” handwritten]; “*Gryllus capitatus*

Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; the last tarsal segment of the left hind leg and the left cercus are missing. Box A10.

Gryllus capitatus Saussure, 1874.

caraibeus Saussure, 1897: 248-249 [*Amphiacustes*].

Guadeloupe (Mus. Genavense). Unspecified number of ♂.

One ♂ syntype with labels: "3 33 Guade-, loupe, M H. d. Sauss." [handwritten on ruled white card]; "Amphiacustes caraibeus Sauss." [handwritten on green paper]; "Amphiacustes caraibeus nov. sp.! type!" [handwritten on white paper]; "Syntypus" [printed on red paper]. Specimen set with brachypterous forewings slightly spread; the tarsi of the left front leg and two tarsal segments of both hind legs are lost. The right front leg is detached and secured through the femur on the original pin. The femora of both hind legs have holes where they have been pinned, and appear to be attached with glue. There is also an immature ♂ which could be considered a syntype. Box A20.

Amphiacusta caraibea Saussure, 1897.

caraibeus Saussure, 1874a: 413-414 [*Gryllodes*].

Saint-Thomas; Guyane; Brésil. Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype, placed in the collection under the name "*muticus caraibeus* Sauss." A ♂ with labels: "♂ St Thomas, Antilles, colln Guérin" [handwritten on ruled white card]; "Anurogryllus muticus de Geer" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly spread; most of both antennae, the left front leg, the tarsi of the right front leg, the tarsi of the left middle leg, the entire right middle leg and the last tarsal segment of both hind legs are lost. There is insect feeding damage to the thorax, which is partially hollowed out. A ♀ with labels: "♀ Amérique tropicale, M H de Saussure" [handwritten on ruled white card]; "Anurogryllus muticus Sauss. [sic]" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with the right wings spread and left wings folded; the last tarsal segment of the left front leg, the entire left middle leg and the last tarsal segment of the left hind leg are missing. Box A6.

Anurogryllus muticus caraibeus (Saussure, 1874).

carinatus Saussure, 1877: 320-321, fig. xxxi, 1 [*Acanthoplistus*].

Afrique centrale (ex coll. Guérin-Méneville). One ♀.

Holotype ♀ with labels: "Afrique centr., coll. Guérin" [handwritten on ruled white card]; "Acanthoplistus carinatus Sss." [handwritten on pink paper]; "Holotypus" [printed on red card]. Specimen set with wings folded; both antennae, the tarsi of the left front leg, the entire right front leg, both middle legs and both hind legs are lost. Box A18.

Acanthoplistus carinatus Saussure, 1877.

castaneus Saussure, 1878: 563 [*Diatrypus*].

Brésil (Musée de Munich). Unspecified.

No specimens found in the MHNG. The type material is in the in ZSMC according to OSF.

Diatrypa castanea Saussure, 1878.

cavicola Saussure, 1897: 251 [*Arachnomimus*].

Guatemala, Cave of Lanquin in Vera Paz (Champion). One ♀ nymph.

The MHNG collection contains an immature specimen with the labels: "Lanquin, Vera Paz, Champion" [printed on white card]; "Arachnomimus cavicola Sauss." [handwritten on green paper]; "Type of *A. cavicola* Sauss.? Hollier 2011" [handwritten on red paper]. The specimen lacks most of the left antenna and the right middle leg. The ovipositor, if there was one, is missing. The status of this specimen is enigmatic because Saussure stated that there was only one immature ♀ and although the locality and collector of the specimen in the MHNG collection correspond with the description, the BMNH online database states that the type material is in their collection. Desutter-Grandcolas (1993: 37) refers to the ♀ type as being in the MHNG but states that she did not study it. Box A19.

Arachnopsita cavicola (Saussure, 1897).

cayennensis Saussure, 1897: 270, 275; pl. 13, figs 23-24 [*Orocharis*].

Guiana, Cayenne (Prudhomme). Unspecified number of ♂.

One ♂ syntype with labels: "CAYENNE" [printed on a strip of green paper]; "*Orocharis cayennensis* Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left middle leg and two tarsal segments of the right hind leg are missing. Box A28.

Orocharis cayennensis Saussure, 1897.

cephalotes Saussure, 1878: 628-629, fig. lxxix, 2 [*Euscirtus*].

Himalaya, Sikkim (leg. Schlagintweit). Unspecified number of ♀.

No specimens found in the MHNG or the NHMW, the whereabouts of the type specimen(s) is unknown.

Patisicus cephalotes (Saussure, 1878).

ceylonicus Saussure, 1877: 86-87 [*Nemobius*].

Ceylan leg. Humbert & Musée i. de Vienne. Unspecified number of ♂ and more than one ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "♂ Ceylan, Voy. M. Humb." [handwritten on ruled white card with "Ceylan" printed]; "*Nemobius ceylonicus* Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. The specimen was set with wings folded, but only the head and prothorax are on the pin, the rest of the thorax and abdomen are glued to the locality label. The left antenna, both front legs and both hind legs are missing, the middle legs, head and abdomen are much damaged by insect feeding. A ♀ with labels: "♀ Ceylan, Voyage Humb." [handwritten on ruled white card with "Ceylan" printed]; "*Nemobius ceylonicus* Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded: the left antenna and both middle legs are lost. The left hind leg is detached and glued to a card mount secured on the original pin, along with part of a leg apparently from a different specimen. There is a further syntype, labelled "Sauss. Type 1875, Novara Reise 1857-59", in the NHMW. Box A5.

A junior synonym of *Pteronemobius heydenii concolor* (Walker, 1871).

championi Saussure, 1897: 236; pl. 11, fig. 41 [*Cyrtoxiphus*].

Panama, Bugaba (Champion). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the BMNH (Marshall, pers. comm.).

Anaxipha championi (Saussure, 1897).

championi Saussure, 1897: 259, 260; pl. 13, figs 2-3 [*Diatrypus*].

Panama, Bugaba (Champion). Unspecified number of ♂.

One ♂ syntype with labels: "Bugaba, 800-1,500 ft., Champion" [printed on white card]; "Diatrypus Championi Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna, part of the tibia and the tarsi of the right front leg, the tarsi of the left middle leg and both of the hind legs are missing. There is another ♂ syntype, erroneously referred to as the holotype in OSF, in the BMNH. Box A26.

Diatrypa championi Saussure, 1897.

chichimecus Saussure, 1878: 490 [*Cyrtoxiphus*].

Mexique (British Museum). Unspecified number of ♂.

No specimens found in the MHNG. According to OSF there is a ♂ specimen (there referred to as the holotype) in the BMNH, but this is not on the BMNH online database.

Anaxipha chichimeca (Saussure, 1878).

chichimecus Saussure, 1897: 225, 226 [*Gryllus*].

Mexico, Ciudad in Durango, 8100 ft (Ferrer). Unspecified number of ♂ and ♀.

No specimens found in the MHNG, or in the BMNH (Marshall, pers. comm.). The whereabouts of the type material is unknown.

Anurogryllus chichimecus (Saussure, 1897).

chiliensis Saussure, 1861: 130 [*Gryllotalpa*].

Chili. Unspecified.

No specimens found in the MHNG. According to OSF there is type material in the Muséum d'histoire naturelle in Neuchâtel, and there is a specimen, which has suffered considerable insect feeding damage, under that name in their collection (Borer, pers. comm.).

Neocurtillia chiliensis (Saussure, 1861).

cicur Saussure, 1878: 647-648 [*Podoscirtus*].

Philippines, Luçon (Musée de Berlin n° 3256). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB (images in OSF).

Munda cicur (Saussure, 1878).

claraziana Saussure, 1874a: 346-347, fig. 21 [*Gryllotalpa*].

République Argentine (leg. Claraz). Three ♂ and three nymphs.

Three ♂ syntypes. A ♂ with labels: "Bahia, Brésil, M H. d. Sauss." [handwritten on ruled white card with "Brésil" printed]; "Bahia Blanca, envoi Claraz" [handwritten on white card]; "Gryllotalpa claraziana Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left hind leg is missing and most of the front right leg has been destroyed by insect feeding, which has also damaged the thorax and abdomen. A ♂ with labels: "Bahia, Brésil, M Claraz" [handwritten on ruled white card with "Brésil" printed]; "Gryllotalpa claraziana Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the femur, the tibia and the tarsi of the left middle leg are lost. A ♂ with labels: "Bahia, Brésil, M H. d. Sauss." [handwritten on ruled white card with "Brésil" printed]; "Gryllotalpa claraziana Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded, the left forewing is missing, and it may be this which is glued to a card mount on a separate pin; the right hind leg is missing. There are also two nymphs which might be considered syntypes. It is clear from the label on the first specimen that the material is from Bahia Blanca in Argentina where Claraz lived for a time rather than Brazil, and that the museum locality labels are erroneous. Box A2.

Neocurtilla claraziana (Saussure, 1874).

clarazianus Saussure, 1874a: 412-413, fig. 31 [*Gryllodes*].

République Argentine, Bahia Blanca (leg. Claraz); Brésil. More than one ♀.

Two ♀ syntypes. A ♀ with labels: "♀ Bahia Blanca, Rep. Arg., envoi G Claraz" [handwritten on ruled white card]; "Anurogryllus clarazianus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the claws of the left middle leg, the last tarsal segment of the right middle leg, the last tarsal segment of the right hind leg and the entire left hind leg are missing. A ♀ with labels: "♀ Pernamb., Brésil, M H. d. Sauss." [handwritten on ruled white card]; "Anurogryllus clarazianus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly set; most of both antennae, the tarsi of the right middle leg, the tibia and tarsi of the left middle leg and the last tarsal segment of both hind legs are lost. The left front leg is detached and glued to the underside of the thorax. Box A6.

A junior synonym of *Anurogryllus muticus muticus* (De Geer, 1773).

clarellus Saussure, 1877: 192-193, fig. xi, 2 [*Gryllus*].

Java (coll. Brunner de Wattenwyl n° 7298). Unspecified number of ♂ (♀ mentioned, but apparently not seen).

No specimens found in the MHNG. There is a ♂ syntype in the NHMW.

Modicogryllus clarellus (Saussure, 1877).

comanchus Saussure, 1897: 221, 222 [*Nemobius*].

Mexico, Durango and Sinaloa (Forrer). More than one ♀.

No specimens found in the MHNG. There is a probable ♀ syntype in the BMNH (Marshall, pers. comm.).

A junior synonym of *Neonemobius mormonius* (Scudder, 1896).

consobrinus Saussure, 1877: 188-189, fig. xi, 4 [*Gryllus*].

Bombay; Siam; Shanghai; Java; Sumatra (Musée de Leyde); Philippines; Senegal; Afrique orientale (coll. Brunner no 10870). More than one ♂ and ♀.

One ♂ and two ♀ syntypes. A ♂ with labels: "165" [printed on white paper]; "Philippines, Bolivar" [handwritten on white paper]; "Gryllus consobrinus Sauss." [handwritten on yellow paper]; "Modicogryllus confirmatus (Walker), Det. R. L. Randell, 1963" [printed on white card with "confirmatus (Walker)" and "63" handwritten]; "Modicogryllus consobrinus (Saussure, 1877) det. S. Ingrisch, 1998" [handwritten in pencil on white card]; "Probable syntype of *M. consobrinus* Sauss., Hollier 2011" [handwritten on red paper]. Specimen lacks both antennae and the ends of the cerci. The dissected genitalia are glued to a card mount with "Philip." handwritten on it secured on the original pin. A ♀ with labels: "Philippines, Bolivar" [handwritten on white paper]; "Gryllus consobrinus Sauss." [handwritten on yellow paper]; "Probable syntype of *M. consobrinus* Sauss., Hollier 2011" [handwritten on red paper]. Specimen lacks most of the right antenna, the left hind leg and the last tarsal segment of the right hind leg. A ♀ with labels: "CHINE A. NAV., 601/94" [printed on white paper with numerals handwritten]; "Gryllus consobrinus Sauss." [handwritten on yellow paper]; "Probable syntype of *M. consobrinus* Sauss., Hollier 2011" [handwritten on red paper]. Most of both antennae, both middle legs and the left hind leg are missing, as are both left wings and the right forewing. This specimen was collected by Naville and is not from the collection of Navás as suggested by Ingrish (1998). The MHNG also has the specimen designated as lectotype by Ingrish (1998: 336), which is from Myanmar (Burma). The country is not mentioned in the original description and this specimen was probably collected by L. Fea in the 1880s (as were two other Burmese specimens placed under this name in the MHNG collection), meaning that it is not part of the type series, and thus not a validly designated lectotype. There are also two ♂, one ♀ and one juvenile from Senegal which were mentioned in the description but these were described as a variation and are not considered syntypes. Box A13.

Modicogryllus consobrinus (Saussure, 1877).

conspersa Saussure, 1874a: 499-500 [*Orocharis*].

Brésil (Musée de Leipzig). One damaged ♂.

No specimens found in the MHNG. The ♂ holotype is in the NMSL according to OSF.

Orocharis conspersa Saussure, 1874.

corrugatus Saussure, 1897: 278, 279; pl. 13, figs 29-30 [*Orochirus*].

Mexico, Cordova (Saussure); Panama, Volcan de Chiriqui 2000 to 3000 ft (Champion). Unspecified number of ♂ and ♀.

One ♂ probable syntype with labels: "Bugaba, 800-1,500 ft., Champion" [printed on white card]; "Orochirus corrugatus Sss." [handwritten on green paper]; "Probable syntype of *O. corrugatus* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings roughly folded; most of both antennae are lost. The left hind leg is detached and glued to a piece of card on the original pin. The locality does not match that given in the description, but the specimen must have been available to

Saussure when he was preparing it. The measurements agree with *O. corrugatus*, rather than *O. musicus* Saussure, 1897: 279 which was described from Bugaba, but the labels may have been confused. There is further type material in the BMNH according to their online database. Box A27.

Orochirus corrugata Saussure, 1897.

costalis Saussure, 1878: 607 [*Apithes*].

Colombie (Musée de Berlin n° 952). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB.

Hapithus costalis (Saussure, 1878).

costatus Saussure, 1878: 499-500 [*Phylloscirtus*].

Colombie (coll. Brunner de Wattenwyl n° 9984); Brésil. More than one ♀.

No specimens found in the MHNG. There is a ♀ syntype from Columbia, referred to as the holotype in OSF, in the NHMW collection. The whereabouts of the Brazilian specimen(s) is unknown.

A junior synonym of *Phylloscirtus elegans* Guérin-Méneville, 1844.

couloni Saussure, 1874a: 504-505 [*Podoscirtus*].

Cuba (Musée de Neuchâtel). Unspecified number of ♀.

No specimens found in the MHNG. The type material could not be found in the collection of the Muséum d'histoire naturelle in Neuchâtel (Borer, pers. comm.) and is probably lost.

Podoscirtoides couloni (Saussure, 1874).

coulonianus Saussure, 1877: 273-274, fig. xxxv, 1 [*Landrevus*].

Java (Musée de Neuchâtel). Unspecified number of ♂.

No specimens found in the MHNG. The type material could not be found in the collection of the Muséum d'histoire naturelle in Neuchâtel (Borer, pers. comm.), and is probably lost.

Duolandrevus coulonianus (Saussure, 1877).

crassiceps Saussure, 1878: 629-630, fig. lxxix, 3 [*Euscirtus*].

Java (coll. Brunner de Wattenwyl n° 8598). More than one ♀ (variation in wing reticulation mentioned).

No specimens found in the MHNG. There is a ♀ syntype labelled as the holotype in the NHMW.

Euscirtodes crassipes (Saussure, 1878).

crassicornis Saussure, 1878: 417-418 [*Heterogryllus*].

Venezuela (Musée de Dresde). One damaged ♂.

No specimens found in the MHNG. The holotype is in the SMTD according to OSF.

Uvaroviella crassicornis (Saussure, 1878).

crypsiphonus Saussure, 1878: 677-678, fig. lxxiii, 2 [*Metrypus*].

Les Antilles ou la Colombie (Musée de Dresde). Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Tafalisca crypsiphonus (Saussure, 1878).

cubensis Saussure, 1859: 316 [*Gryllus*].

Cuba. Unspecified.

Four ♂ and two ♀ possible syntypes. A ♂ with labels: "♂ Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Gryllus cubensis Sauss. ♂" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings spread; the left antenna, the left hind leg and two tarsal segments of the right hind leg are lost. A ♂ with labels: "♂ Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Gryllus assimilis Burm. var. cubensis" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the last tarsal segment of both middle legs and two tarsal segments of the right hind leg are missing. A ♀ with labels: "Cuba" [handwritten on a strip of white paper]; "Gryllus assimilis Burm. var. cubensis" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the tarsi of the right hind leg are missing. A ♂ with labels: "♂ Habana, Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Gryllus assimilis Burm. var. cubensis" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded. A ♀ with labels: "♀ Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Gryllus assimilis Burm. var. cubensis" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings spread, the hind wings now droop; the last tarsal segment of the left middle leg is lost. A ♀ with labels: "♀ Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Gryllus assimilis Burm. var. cubensis" [handwritten on green paper]; "Possible syntype of G. cubensis Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the right antenna, the left front and middle legs and the last tarsal segment of both hind legs are missing. Box A9.

A junior synonym of *Gryllus assimilis assimilis* (Fabricius, 1775).

cubensis Saussure, 1874a: 384-385, fig. 5 [*Nemobius*].

Cuba (leg. Poey); Mexique; Brésil. Seven ♂ and five ♀.

Lectotype ♀ (designated by Vickery & Johnstone, 1970: 1746) with labels: "CUBA" [printed on a strip of white paper]; "21 Nemobius cubensis Saus." [handwritten on white paper]; "Nemobius cubensis Sauss." [handwritten on green paper]; "LECTOTYPE, Nemobius cubensis Saussure, 1874, Designated by Vickery and Johnstone, 1970" [handwritten on red card with "TYPE" printed]. Specimen set with wings folded; the right antenna and the right hind leg are lost. There are also at least three ♂ and two ♀ paralectotypes in the collection. Box A5.

Neonemobius cubensis (Saussure, 1874).

cyprius Saussure, 1877: 190-191 [*Gryllus*].

Chypre (coll. Brunner de Wattenwyl no 3410). Two ♂ and two ♀.

No specimens found in the MHNG. There are two ♂ and one ♀ syntypes in the NHMW.

Modicogryllus cyprius (Saussure, 1877).

dalmatinus Saussure, 1877: 312-313 [*Arachnocephalus*].

Dalmatie (Brunner). Unspecified number of ♂ and ♀.

There are no specimens placed under this name but the identification labels of five specimens placed under *A. vestitus* Costa suggest that they are possible syntypes. A ♂ with labels: "♂ Dalmatie" [handwritten on ruled white card]; "Arachnocephalus vestita Cost. (= dalmatinus Sss.)" [handwritten on pale blue paper]; "Possible syntype of *A. dalmatinus* Sauss., Hollier 2011" [handwritten on red paper]. The specimen lacks the right antenna, right front leg, both hind legs and both cerci. A ♂ with labels: "Dalmatie, M H de Saussure" [handwritten on ruled white card]; "Arachnocephalus vestita Cost. (= dalmatinus Sss.)" [handwritten on pale blue paper]; "Possible syntype of *A. dalmatinus* Sauss., Hollier 2011" [handwritten on red paper]. The specimen has lost the right antenna, the right middle and hind legs and the right cercus. A ♂ with labels: "Dalmatie, M H de Saussure" [handwritten on ruled white card]; "Arachnocephalus vestita Cost. (= dalmatinus Sss.)" [handwritten on pale blue paper]; "Possible syntype of *A. dalmatinus* Sauss., Hollier 2011" [handwritten on red paper]. Most of the left antenna is lost. A ♂ with labels: "Dalmatie, M H de Saussure" [handwritten on ruled white card]; "Arachnocephalus vestita Cost. (= dalmatinus Sss.)" [handwritten on pale blue paper]; "Possible syntype of *A. dalmatinus* Sauss., Hollier 2011" [handwritten on red paper]. Most of both antennae are missing. A ♀ with labels: "♀ Lesina, Dalmatie, M H de Saussure" [handwritten on ruled white card]; "Arachnocephalus vestita Cost. (= dalmatinus Sss.)" [handwritten on pale blue paper]; "Possible syntype of *A. dalmatinus* Sauss., Hollier 2011" [handwritten on red paper]. The specimen lacks the right hind leg and the cerci. A number of other specimens with the same identification label but without locality data are also potentially syntypes. There are a number of specimens from Brunner's collection in the NHMW collection from Dalmatia, presumably including syntypes, although none are labelled as such. Box A18.

A junior synonym of *Arachnocephalus vestitus* Costa, 1855.

debilis Saussure, 1877: 217 [*Gryllodes*].

Borneo, Banjermassing (Mus. de Leyde). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the RMNH.

Modicogryllus debilis (Saussure, 1877).

delalandi Saussure, 1877: 234-235, fig. xiii, 2 [*Cophogryllus*].

Afrique méridionale (Mus. de Paris, leg. Delalande & Mus. Halle). One ♂ and an unspecified number of ♀.

The MHNG collection has three specimens from the Cape and Transvaal under this name, but the species name label in the insect box reads "delalandi Sss. vel

affinissimus" which strongly suggests that these are not syntypes. There is a ♀ syntype in the MNHN (Desutter, pers. comm.). Box A15.

Cophogryllus delalandi Saussure, 1877.

dentatus Saussure, 1877: 91 [*Nemobius*].

Iles Samoa (Mus. i. de Vienne). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Pteronemobius dentatus (Saussure, 1877).

depressiusculus Saussure, 1878: 665, fig. lxxii, 1 [*Aphonus*].

Iles Viti (Godeffroy). Two ♀.

Two ♀ syntypes. A ♀ with labels: "609 33 E, par, Viti Inseln, Mus. Godf." [handwritten on white paper, originally rectangular but now irregular because the original identification has been torn away]; "Aphonus depressis-, ulcus Sauss." [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the right antenna is missing. A ♀ with labels: "609 34, Fidji Islands" [handwritten on white paper]; "Aphonus depressis-, ulcus Sauss." [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; two tarsal segments of the left middle leg are missing. There are two further ♀ specimens with different locality labels which are presumably not part of the type series. There are ♀ syntypes in the ZMUH according to OSF, but this seems doubtful. Box A29.

Aphonoides depressiusculus (Saussure, 1878).

depressus Saussure, 1878: 601-602 [*Amblyopus*].

Colombie (coll. Brunner de Wattenwyl no 11272). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Amblyrhexus depressus (Saussure, 1878).

devia Saussure, 1877: 25-26, fig. i,10 [*Gryllotalpa*].

Cap de Bonne-Espérance (Musée de Darmstadt). Unspecified number of ♂.

One ♂ syntype with labels: "♂ Cap b. sp., M H de Saussure" [handwritten on ruled white card with "Cap b. sp." printed]; "Gryllotalpa devia Sauss." [handwritten on pink paper]; "Gryllotalpa devia Saussure, HOLOTYPE, det. B. C. Townsend, 1980" [typewritten on white card with "det. B. C. Townsend, 1980" printed]. Specimen set with wings folded; most of both antennae, the tarsi of both middle legs and the last tarsal segment of the right hind leg are lost. There is another ♂ syntype, referred to as the holotype in OSF, in the HLMD. Box A2.

Gryllotalpa devia Saussure, 1877.

dewitzi Saussure, 1877: 315 [*Arachnocephalus*].

Philippines, Manille (Mus. de Berlin n° 1019). Unspecified number of ♀.

No specimens found in the MHNG. The type material is in the ZMHB according to OSF (images in OSF).

Arachnocephalus dewitzi Saussure, 1877.

dissimilis Saussure, 1874a: 387-388 [*Nemobius*].

Brésil (Musée de Leipzig). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The type material is in the MNSL according to OSF.

Hygronemobius dissimilis (Saussure, 1874).

domingensis Saussure, 1878: 613-615 [*Orocharis*].

St-Domingue (coll. Brunner de Wattenwyl n° 7027). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is a ♂ possible syntype in the NHMW.

Orocharis domingensis Saussure, 1878. [Spelled *dominguensis* in OSF]

dubius Saussure, 1877: 293 [*Myrmecophilus*].

Bintang (Musée de Berlin no 4078). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB (images in OSF).

Myrmecophilus dubius Saussure, 1877.

ephippium Saussure, 1877: 113-114, fig xix, 5 [*Brachytrypus*].

Java? Afrique? Probably one ♂ (however, description, but not measurements or illustration, headed by ♀ symbol).

One ♂ syntype with labels: “♂ Africque trop? M H de Saussure” [sic] [handwritten on ruled white card]; “*Macrogyllus ephippium* Sauss.” [handwritten on pink paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; the tibia and tarsi of the left front leg, the last tarsal segment of the right front leg, the entire left middle leg, right middle leg and right hind leg are missing. The left hind leg is detached and secured through the femur on a separate pin. Box A6.

Macrogyllus ephippium (Saussure, 1877).

episcopus Saussure, 1877: 201-203, fig. xii, 1 [*Gryllodes*].

Côte-d’Or (Musée de Leyde). Unspecified number of ♂ and more than one ♀ (measurements given as range).

The specimen placed under this name in the MHNG collection is from Senegal and not part of the type series. There are ♂ and ♀ syntypes in the RMNH according to OSF. Box A14.

Crynus episcopus (Saussure, 1877).

equestris Saussure, 1877: 252-253, fig. xvi, 4 [*Loxoblemmus*].

Les Molluques, Célèbes (coll. de Brunner de Wattenwyl no 8648); Java. Two ♂ and two ♀.

The ♂ lectotype (designated by Gorochoy, 1996a: 93) is in the NHMW, along with a ♀ paralectotype. There are two paralectotypes in the MHNG collection; one ♂ and one ♀. Box A16.

Loxoblemmus equestris Saussure, 1877.

euzonus Saussure, 1877: 235-236, fig. xiii, 1 [*Cophogryllus*].

Java (coll. Brunner de Wattenwyl n° 8604). Unspecified number of ♀.

The MHNG collections include a ♂ specimen under this name, but the locality label suggests that it was collected by Leo Zehntner long after the publication of the description. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW collection. Box A15.

Agryllus euzonus (Saussure, 1877).

extraneus Saussure, 1877: 214 [*Gryllodes*].

Flores (Musée de Berlin n° 3592). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

Modicogryllus extraneus (Saussure, 1877).

falconneti Saussure, 1877: 230 [*Gryllodes*].

Inde centrale (leg. Falconnet). Two ♀.

Two ♀ syntypes. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Gryllodes Falconneti Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. The specimen lacks the right front leg, the left middle leg and the right hind leg. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Gryllodes Falconneti Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. The specimen lacks most of both antennae. Box A14.

Gryllopsis falconneti (Saussure, 1877).

fallax Saussure, 1874a: 470-471, fig. 15 [*Paroecanthus*].

Cuba (leg. Gundlach). One ♂.

Holotype ♂ with labels: "♂ Cuba. M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Paroecanthus fallax Sauss." [handwritten on green paper]; "Holotypus" [printed on red card]. Specimen set with wings folded; both antennae, the left front leg, left middle leg, two tarsal segments of the right middle leg and both hind legs are missing. Box A27.

Paroecanthus fallax Saussure, 1874.

felderi Saussure, 1877: 242-243 [*Scapsipedus*].

Le Senaar; Madagascar. More than one ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "♂ Senaar [sic], M H de Saussure" [handwritten on ruled white card]; "Scrapsipedus felderi Sauss." [handwritten on pink paper]; "Syntypus" [handwritten on red paper]. Specimens set with wings spread; all of the legs are missing. There is insect feeding damage to the head and thorax. A ♀ with labels: "♀ Senaar [sic], M H de Saussure" [handwritten on ruled white card]; "Scrapsipedus felderi Sauss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings spread; most of the right antenna, the last tarsal segment of the left hind leg and the entire right hind leg are lost. Box A15.

Scrapsipedus felderi Saussure, 1877.

femoratus Saussure, 1877: 92-93, fig. vii, 2-4 [*Nemobius*].

Nouvelle-Hollande, Sydney (Musée i. de Vienne, coll. Brunner de Wattenwyl n° 3119). Unspecified number of ♂ and more than one ♀.

No specimens found in the MHNG. There are four syntypes, one ♂ and three ♀, in the NHMW.

A junior synonym of *Bobilla bivittata* (Walker, 1869).

fistulator Saussure, 1877: 212-213 [*Grylloides*].

Nouvelle-Hollande, Melbourne (coll. Brunner de Wattenwyl). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There are two syntypes, one ♂ and one ♀, in the NHMW.

Velarifictorus fistulator (Saussure, 1877).

flavifrons Saussure, 1897: 281; pl. 13, figs 31-32 [*Aphonus*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Eneopteroides flavifrons (Saussure, 1897).

flavispina Saussure, 1877: 213-214 [*Grylloides*].

Nouvelle-Hollande, Grahamtown (coll. Brunner de Wattenwyl n° 6726). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the NHMW. This species was considered a *nomen dubium* by Otte & Alexander (1983: 91), who placed the species in the genus *Comidogryllus* Otte & Alexander, 1983 (currently considered a synonym of *Loxoblemmus* Saussure, 1877).

Grylloides flavispina Saussure, 1877. (Considered *nomen dubium* in OSF).

foraminatus Saussure, 1878: 596-597 [*Paroecanthus*].

Cuba (Musée de Leyde). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the RMNH.

Selvagryllus foraminatus (Saussure, 1878).

forceps Saussure, 1878: 571-572, fig. lxii, 6 [*Calyptotrypus*].

Chine septentrional, Shang-hai (Museum de Paris). Unspecified number of ♂.

The MHNG collection includes two ♂ and a ♀ under this name. The specimens each have a locality label "Shanghai" [handwritten on a strip of white card], but since the description only treats the male characters it seems likely that they were acquired after the publication of the description. There is a ♂ syntype, referred to as the holotype in OSF, in the MNHN. Box A26.

Truljalia forceps (Saussure, 1878).

forcipatus Saussure, 1897: 228, 229; pl. 11, figs 29-34 [*Grylloides*].

Mexico, Omilteme in Guerrero, 8000 ft (H. H. Smith). Unspecified number of ♂.

One ♂ syntype with labels: "Omilteme, Geurero, 8000 ft, Aug., H. H. Smith" [printed on white card]; "forcipatus Ss" [handwritten on green paper with "nova" hand written on the reverse]; "Grylloides forcipatus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The right hind leg is lost; the left hind leg, which lacks two tarsal segments, is detached and secured through the femur on the original pin. Saussure seems to have had more than one specimen because he illustrated a dissected titillator while the specimen in the MHNG is intact. There are two possible syntypes in the BMNH (Marshall, pers. comm.). Box A14.

Anurogryllus forcipatus (Saussure, 1897).

foreli Saussure, 1898: 218-219, fig. 5 [*Thliptoblemmus*].

Algeria orientalis, Pagus oranensis. More than one ♂.

Four ♂ syntypes. A ♂ with labels: "ALGERIE, FOREL" [printed on pink paper]; "Oran" [handwritten on a strip of pink paper]; "Thliptoblemmus foreli Sauss." [handwritten on blue paper]; "Sciobia foreli (Sauss.), Det. RIL. [sic] Randell, 1963" [determination handwritten on white card with "Det. RIL. [sic] Randell, 19" printed]; "Syntypus" [printed on red paper]. The left antenna, both middle legs, both hind legs and the cerci are missing. A ♂ with labels: "Oran" [handwritten on pink paper]; "Thliptoblemmus foreli Sauss." [handwritten on blue paper]; "Syntypus" [printed on red paper]. Most of both antennae, the last tarsal segment of the right hind leg and the cerci are missing. A ♂ with labels: "Oran" [handwritten on pink paper]; "Thliptoblemmus foreli Sauss." [handwritten on blue paper]; "Syntypus" [printed on red paper]. The left antenna, the last tarsal segment of the left middle leg, the last tarsal segment of the left hind leg and the tarsi of the right hind leg are missing. A ♂ with labels: "Oran" [handwritten on pink paper]; "Thliptoblemmus foreli Sauss." [handwritten on blue paper]; "Syntypus" [printed on red paper]. The right antenna, the right middle and hind legs and the last tarsal segment of the left hind leg are lost. This specimen is considerably smaller than the others and could be a juvenile. The original description mentions the specimen collected by Forel and several specimens without localities; it seems likely that the locality labels on the other specimens (which are in a different handwriting to that on Forel's specimen) were added later. Box A17.

Sciobia foreli (Saussure, 1898).

forticeps Saussure, 1874a: 407-408 [*Gryllus*].

Brésil (Musée de Paris). Unspecified number of ♂ and ♀.

One ♂ and one ♀, both possible syntypes. A ♂ with labels: "♂ Brésil, M H de Saussure" [handwritten on ruled white card with "Brésil" printed]; "Gryllus forticeps Sauss." [handwritten on green paper]; "Possible syntype of *G. forticeps* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings roughly folded; both antennae, the tibia and tarsi of the left front leg, the tarsi of the right front leg, both middle legs, both hind legs, and the cerci are lost. There is some insect feeding damage to the thorax. A ♀ with labels: "♀ Brésil, M H de Saussure" [handwritten on ruled

white card with "Brésil" printed]; "Gryllus forticeps Sauss." [handwritten on green paper]; "Possible syntype of *G. forticeps* Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings roughly folded; most of both antennae, the right front leg, both middle legs, both hind legs and part of the ovipositor are missing. There is insect feeding damage to the thorax and abdomen, and the specimen is held onto the pin with glue. In the description the depository of the types is given as the MNHN, but it seems likely that Saussure may have kept some specimens. Box A10.

A junior synonym of *Miogryllus verticalis* (Serville, 1838).

fulvescens Saussure, 1878: 612 [*Orocharis*].

Saint Martin (République Argentine?) (Musée de Leyde). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The syntypes are in the RMNH according to OSF.

Antillicharis fulvescens (Saussure, 1878).

fulvipes Saussure, 1877: 35 [*Gryllotalpa*].

Singapur (Musée de Vienne, leg. Pfeiffer). Unspecified.

No specimens found in the MHNG. There is a ♂ syntype collected by Pfeiffer in the NHMW.

Gryllotalpa fulvipes Saussure, 1877.

funambulus Saussure, 1878: 547-548, fig. li, 3 [*Heterotrypus*].

Nouvelle-Guinée, Andai (Musée de Leyde). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the RMNH.

Heterotrypus funambula Saussure, 1878.

furcatus Saussure, 1878: 632-633, fig. lviii [*Anisotrypus*].

Iles Viti (Godeffroy). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMUH.

Anisotrypus furcatus Saussure, 1878.

furcatus Saussure, 1877: 231-232, fig. xii, 4 [*Grylloides*].

Inde centrale (leg. Falconnet). Three ♀.

Two ♀ syntypes. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Grylloides furcatus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Most of the right antenna and the tarsi of the left middle leg are lost. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Grylloides furcatus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. The right antenna, all of the legs on the right side and the last tarsal segment of the left hind leg are missing. The basal part of the left antenna is detached and glued to a card mount on the original pin. There are specimens in the NHMW from Brunner's collection which might include the third syntype. Box A14.

Grylloides furcata (Saussure, 1877).

fuscipennis Saussure, 1874a: 433-434 [*Diplacusta*].

Brésil. Unspecified number of ♂.

One ♂ syntype with labels: "♂ Brésil" [handwritten on ruled white card]; "Brasilia, Fregreils" [handwritten on white paper]; "Diplacustes fuscipennis Sauss." [handwritten on green paper]; "Holotypus" [printed on red card]. Specimen set with wings folded; most of both antennae, the tarsi of the left front leg, both middle legs, the last tarsal segment of the left hind leg and the right hind leg are missing. Box A19
Lerneca fuscipennis (Saussure, 1874).

gaudichaudi Saussure, 1874a: 453-454 [*Phalangopsis*].

Brésil. (Musée de Paris, leg. Gaudichaud). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the MNHN in Paris.

Phalangopsis gaudichaudi Saussure, 1874.

gaumeri Saussure, 1897: 270, 273; pl. 13, fig. 26 [*Orocharis*].

Mexico, Valladolid in Yucatan (Gaumer). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Orocharis gaumeri Saussure, 1897.

gracilipes Saussure, 1877: 160-161, fig. x, 4 [*Gryllus*].

Inde central (leg. Falconnet); Afrique tropicale, fleuve des Gazelles; Nouvelle Guinée; Iles de la Sonde. More than one ♀.

One ♀ syntype with labels: "Indes centr., M H de Saussure" [handwritten on ruled white card]; "Gryllus gracilipes Sauss." [handwritten on yellow paper]; "Syn-typus" [printed on red paper]. Specimen set with wings roughly folded; both antennae and the last tarsal segment of the right hind leg are lost. The left hind leg is detached and secured through the femur on the original pin. The whereabouts of the other syntypes is unknown. Box A11.

Teleogryllus gracilipes (Saussure, 1877).

grandidieri Saussure, 1877: 119-120 [*Brachytrypus*].

Madagascar (leg. Grandidier). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the MNHN (Desutter, pers. comm.).

Brachytrupes grandidieri (Saussure, 1877).

grandidieri Saussure, 1878: 573-574 [*Calyptotrypus*].

Madagascar (leg. Grandidier). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the MNHN (Desutter, pers. comm.).

Fryerius grandidieri (Saussure, 1878).

grandidieri Saussure, 1877: 82-83 [*Nemobius*].

Madagascar (leg. Grandidier). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the MNHN (Desutter, pers. comm.).

A junior synonym of *Pteronemobius aethiops* (Saussure, 1877).

grandis Saussure, 1874a: 447-448 [*Amphiacusta*].

Cuba; Guadeloupe. Unspecified number of ♀ and one nymph.

Two ♀ syntypes. A ♀ with labels: "♀ Cuba, M H. d. Sauss." [handwritten on ruled white card]; "annulipes Serv. ♀ Cuba" [handwritten on foxed white paper]; "Amphiacustes grandis Sauss." [handwritten on green paper]; "Holotypus" [printed on red card]; "Syntype not holotype, Hollier 2011" [handwritten on red paper]. The left antenna, the tarsi of both front legs, both middle legs and the tarsi of both hind legs are missing. A ♀ with labels: "Guadeloupe, Antilles" [handwritten on ruled white card with "Antilles" printed]; "Amphicusta sp. cf. grandis (Ss.), det. T. H. Hubbell, 1972" [handwritten on white card with "det. T. H. Hubbell, 19" printed]; "Possible syntype of A. grandis Sauss., Hollier 2011" [handwritten on red paper]. The left middle leg and the last tarsal segment of the right hind leg are missing. The left hind leg has been reattached with glue. Box A21.

Amphiacusta grandis Saussure, 1874.

guatemalae Saussure, 1874a: 475-476 [*Paroecanthus*].

Guatemala (leg. Rodriguez). Three ♂ and two ♀.

Two ♂ and two ♀ syntypes. A ♂ with labels: "3 18 ♂ Guate-, mala, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus guatemalae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae are missing. A ♂ with labels: "3 18 Guate-, mala ♂, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus guatemalae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; the right antenna and left middle leg are lost. The right hind leg, which lacks the last tarsal segment, is detached and secured through the femur on the original pin. A ♀ with labels: "3 18 ♀ Guate-, mala, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus guatemalae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the right antenna is missing. A ♀ with labels: "3 18 ♀ Guate-, mala, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus guatemalae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae and the last tarsal segment of the right hind leg are missing. Box A27.

Siccotrella guatemalae (Saussure, 1874).

guerinianus Saussure, 1877: 316-317 [*Liphoplus*].

[Provenance unknown] (ex coll. Guérin-Menneville [sic], Musée de Genève). Unspecified number of ♀.

One ♀ syntype with labels: "coll. Guérin" [handwritten on ruled white card]; "Liphoplus Guerinianus Sss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. The left antenna, left middle leg and the last tarsal segment of the left hind leg are lost. There is insect feeding damage to the head and thorax. The pink identification

label and the red margin of the species name label in the insect box indicate that this species was thought to be from Africa. Box A18.

Ornebius guerinianus (Saussure, 1877).

guineensis Saussure, 1878: 473-474 [*Homoeoxiphus*].

Ile de Fernando-Po (coll. Brunner de Wattenwyl n° 6657). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the NHMW.

Trigonidium guineense (Saussure, 1878).

gundlachi Saussure, 1874a: 373-375 [*Cyrtoxipha*].

Cuba (leg. Gundlach); le sud des États-Unis. Three ♂ and four ♀.

Two ♂ and two ♀ syntypes. A ♂ with labels: "♂ Cuba, M. H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cyrtoxiphus gundlachi Sauss." [handwritten on green paper]; "rev. T. J. Walker, Dec. 1968 (no lectotype designated)" [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; both antennae, the left hind leg and the tarsi of the right hind leg are missing. A ♂ with labels: "♂ Cuba, M. H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cyrtoxiphus gundlachi Sauss." [handwritten on green paper]; "rev. T. J. Walker, Dec. 1968" [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; most of both antennae, two tarsal segments of the left middle leg and both hind legs are missing. A ♀ with labels: "♀ Cuba, M. H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cyrtoxiphus gundlachi Sauss." [handwritten on green paper]; "rev. T. J. Walker, Dec. 1968" [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; most of both antennae and both hind legs are lost. A ♀ with labels: "♀ Cuba, M. H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cyrtoxiphus gundlachi Sauss." [handwritten on green paper]; "rev. T. J. Walker, Dec. 1968" [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; the right antenna and much of the abdomen, including the ovipositor, are lost. A ♀ with labels: "CUBA" [printed on a strip of white paper]; "47 ♀" [handwritten on white paper]; "Cyrtoxiphus gundlachi Sauss." [handwritten on green paper]; "rev. T. J. Walker, Dec. 1968" [handwritten on white card], is probably not part of the type series, this locality label also being present on a series identified as *C. poeyi* Bolivar, 1888. Specimen set with wings roughly folded; most of both antennae are lost. The whereabouts of the rest of the type series is unknown. Box A24.

Cyrtoxipha gundlachi Saussure, 1874.

guyennensis Saussure, 1877: 216 [*Gryllodes*].

Surinam (coll. Brunner de Wattenwyl n° 5059). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

A junior synonym of *Miogryllus verticalis* (Serville, 1838).

haani Saussure, 1878: 523, fig. 55, 2 [*Cardiodactylus*].

Nouvelle-Guinée, Gebeh (Mus. de Leyde). One ♀.

No specimens found in the MHNG. According to OSF the ♀ holotype, erroneously stated to be ♂, is in the RMNH.

Cardiodactylus haani Saussure, 1878.

haani Saussure, 1877: 257, fig. xvi, 5 [*Loxoblemmus*].

Java (Mus. de Leyde & coll. Brunner de Wattenwyl n° 8606).

The ♂ lectotype (designated by Gorochov, 1985a: 10) is in the NHMW. The specimen placed under this name in the MHNG collection is from the Philippines and therefore not a syntype. Box A16

Loxoblemmus haani Saussure, 1877.

haani Saussure, 1874a: 515 [*Metrypa*].

Brésil. One ♂.

No specimens found in the MHNG. The ♂ holotype is presumably in the RMNH.

Brazitrypa haani (Saussure, 1874).

haani Saussure, 1878: 466 [*Trigonidium*].

Java (Musée de Leyde). One ♀.

No specimens found in the MHNG. The ♀ holotype is in the RMNH according to OSF.

Metioche haani (Saussure, 1878).

hastatus Saussure, 1897: 221, 222 [*Nemobius*].

Mexico, Ciudad in Durango, 8100 ft (Forrer). Unspecified number of ♀.

No specimens found in the MHNG. According to the BMNH online database there is type material, referred to as the ♀ holotype in OSF, in their collection.

A junior synonym of *Allonemobius fasciatus fasciatus* (De Geer, 1773).

hastatus Saussure, 1877: 245 [*Scapsipedus*].

Indes orientales; L'Himalaya (Musée de Vienne & Mus. de Paris). Unspecified number of ♂ and more than one ♀ (some measurements given as range).

No specimens found in the MHNG. There are two syntypes, one ♂ and one ♀ collected by Hügel, in the NHMW.

A junior synonym of *Modicogryllus facialis* (Walker, 1871).

hebraeus Saussure, 1877: 206-207, fig. xii, 3 [*Grylloides*].

Palestine. Unspecified number of ♀.

One ♀ syntype with labels: "♀ Palestine, M H de Saussure" [handwritten on white paper]; "Grylloides hebraeus Sss." [handwritten on blue paper] "Holotypus, K. HARZ" [handwritten in red on white card, with hand coloured red margin]. The specimen lacks most of both antennae, the claws of the right front leg, the last tarsal segment of the left hind leg and the tarsi of the right hind leg. The ovipositor is detached and glued to a card mount secured on the original pin. Box A14.

Gryllopsis hebraeus (Saussure, 1877).

hector Saussure, 1877: 272-273, fig. xxxv, 5 [*Landrevus*].

Ile de Boubon (Muséum de Paris). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the MNHN.

Paralandrevus hector (Saussure, 1877).

hedyphonus Saussure, 1878: 415-416 [*Ectecous*].

Brésil (Musée de Berlin n^{os} 1028 & 1042). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The ♂ lectotype (designated by Gorochov, 1996b: 52) is in the ZMHB.

Ectecous hedyphonus Saussure, 1878.

helvola Saussure, 1874a: 495-496 [*Orocharis*].

Guyane (Muséum de Paris). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the MNHN according to OSF.

Orocharis helvola Saussure, 1874.

hemelytrus Saussure, 1877: 208-209 [*Grylloides*].

Java (coll. Brunner de Wattenwyl n^{os} 7041 & 8601). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There are at least two syntypes, one ♂ and one ♀, in the NHMW.

Velarifictorus hemelytrus (Saussure, 1877).

heydeni Saussure, 1874a: 485-486 [*Eneoptera*].

Brésil (leg. Heyden). More than one ♀ (colour variation mentioned).

One ♀ syntype with labels: "♀ Brésil, M H de Saussure" [handwritten on ruled white card with "Brésil" printed]; "Brasilia, Freyreifs" [handwritten on white card]; "Ligypterus Heydeni Sauss." [handwritten on green paper]; "Holotype, dissected Robillard & Desutter-Grandcolas" [handwritten on red paper]. Most of both antennae, the claw of the left front leg, the last tarsal segment of the right middle leg and two tarsal segments of both hind legs are lost. The left middle leg is detached and glued to the locality label. A micro-tube with dissected parts is secured through the stopper on the original pin. This specimen, there referred to as the holotype, was the basis of a partial redescription of this species by Robillard & Desutter-Grandcolas (2005: 425). Box A24.

Ligypterus heydeni (Saussure, 1874).

hirtellus Saussure, 1878: 640-164 [*Podoscirtus*].

[Provenance unknown] (Musée de Munich). Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Podoscirtodes hirtellus (Saussure, 1878).

histrío Saussure, 1877: 229-230 [*Grylloides*].

Indes orientale (leg. Falconnet). Four ♀.

Two ♀ syntypes. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Grylloides histrío Sauss. ♀" [handwritten on yellow paper]; "Grylloides histrío Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. The last tarsal segment of the right front leg, the entire left middle leg and the last tarsal segment of the left hind leg are lost. A ♀ with labels: "♀ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Grylloides histrío Sauss. ♀" [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Most of both antennae are missing. There is another ♀ placed under this name which may be a syntype, but the locality label is the same as that attached to a ♂ specimen which cannot be part of the type series. Box A14.

Turanogryllus histrío (Saussure, 1877).

histrío Saussure, 1878: 467-468 [*Homoeoxiphus*].

Ceylan (leg. Humbert). Unspecified number of ♀.

One ♀ syntype with labels: "♀ Ceylan, M. Humbert" [handwritten on printed white card with "Ceylan" printed]; "Homoeoxiphus histrío Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded. It has been card mounted, apparently after having broken where the pin was inserted, in three pieces: the head, which lacks most of the right antenna; the prothorax, which lacks the left front leg, and the rest of the body. Box A23.

A junior synonym of *Homeoxypha lycoides* (Walker, 1869).

histrío Saussure, 1877: 95-96 [*Nemobius*].

Java (coll. Brunner de Wattenwyl no 7040). Unspecified number of ♂.

The MHNG collection includes four ♂ and two ♀ specimens under this name, but the locality labels suggest that these were part of the material collected by Leo Zehntner after the publication of the description. There is a ♂ syntype, referred to as the holotype in OSF, in the NHMW. Box A5.

A junior synonym of *Dianemobius fascipes fascipes* (Walker, 1869).

hofmanni Saussure, 1878: 569-571, fig. lxii, 2 [*Calypotrypus*].

Java (Musée de Stuttgart, de Genève et de Paris). Unspecified number of ♂ and ♀.

The ♂ lectotype (designated by Gorochov, 2002: 323) is in the SMNS. There are at least two ♂ paralectotypes in the MHNG collection. Box A26.

Truljalia hofmanni (Saussure, 1878).

hofmanni Saussure, 1877: 211-212 [*Grylloides*].

Afrique tropicale, les bords du fleuve des Gazelles (Musée de Stuttgart). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype, in the SMNS (Holstein & Ingrisch, 2004).

Gryllopsis hofmanni (Saussure, 1877).

humbertianus Saussure, 1878: 468-469, fig. 48, 1 [*Homoeoxiphus*].

Ceylan, Trincomalie (leg. Humbert). More than one ♂ (variation in wing length mentioned).

Two ♂ syntypes. A ♂ with labels: "Trincomale, Ceylan, M. Humbert" [handwritten on white card with "Ceylan" printed]; "Piestoxiphus Humbertianus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the tarsi of the right middle leg, the left middle leg, the right hind leg and two tarsal segments of the left hind leg are missing. A ♂ with labels: "♂ Ceylan, M. Humbert" [handwritten on printed white card with "Ceylan" printed]; "Piestoxiphus Humbertianus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left middle and hind legs are missing. The specimen has mould damage. Box A23.

Trigonidium humbertianum (Saussure, 1878).

humbertiellus Saussure, 1877: 260-261, fig. xvii [*Stephoblemmus*].

Les montagnes du Ceylan (leg. Humbert). Unspecified number of ♂.

One ♂ syntype with labels: "♂ Perandenia, Ceylan, Voyage Humbert" [handwritten on ruled white card with "Ceylan" printed]; "Probable syntypus of *S. humbertiellus* Saussure, Hollier 2011" [handwritten on red paper]. The specimen is in very poor condition having lost both antennae, the last tarsal segment of the left front leg, the left middle leg, both hind legs, the right wings, part of the thorax and most of the abdomen. Most of the left forewing is still intact. This specimen was placed under the name *S. diadema* Saussure in the MHNG collection, but is obviously a syntype of *S. humbertiellus*. There is a second left forewing on a card mount on a separate pin without labels which may be the remains of another syntype. Box A16.

Stephoblemmus humbertiellus Saussure, 1877.

hyalinus Saussure, 1878: 516-517 [*Nisitrus*].

Bornéo, Benjermassing (Musée de Leyde). Unspecified number of ♀.

The MHNG collection includes a number of specimens under this name, but they were collected in Sumatra after the publication of the description and are therefore not types. According to OSF there is a specimen, referred to as the holotype, in the RMHN. Box A25.

Nisitrus hyalinus Saussure, 1878.

hybridus Saussure, 1898: 220, 224, fig. 7 [*Platyblemmus*].

Marocco [sic] septentrionalis. Unspecified number of ♂.

Two ♂ syntypes. A ♂ with labels: "MAROC" [printed on a strip of white paper]; "Platyblemmus hybridus Sss." [handwritten on blue card]; "Sciobia hybrida (Sauss.) Det. R. L. Randell, 1963" [determination handwritten on white card with "Det. R. L. Randell, 19" printed]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, both front legs, both middle legs and the left hind leg are lost. The right hind leg is detached and secured on the original pin. Another hind leg, which may belong to this specimen, is secured on a separate pin next to the specimen. A ♂ with labels: "MAROC" [printed on a strip of white paper]; "Platyblemmus

hybridus Sss.” [handwritten on blue card]; “Syntypus” [printed on red card]. Specimen set with wings folded; most of both antennae, the tibia and tarsi of the left front leg, the entire right front leg and the last tarsal segment of the left hind leg are missing. Box A16.

Sciobia hybrida (Saussure, 1898).

ignobilis Saussure, 1877: 165 [*Gryllus*].

Java (coll. Brunner de Wattenwyl n° 8602); Amboine (Musée de Leyde). More than one ♀.

The specimens placed under this name in the MHNG collection are from Madagascar and therefore not syntypes. There are two ♀ syntypes in the NHMW collection that have been labelled as lectotype and paralectotype but a formal designation does not seem to have been published. Box A11.

A junior synonym of *Grylloderes nefandus nefandus* (Kirby, 1906).

ignobilis nigra Saussure, 1899: 602 [*Gryllus*].

[Provenance unspecified]. Unspecified number of ♂ and ♀.

One ♂ and two ♀, all possible syntypes. There are no specimens placed under this name in the MHNG collection. The specimens placed under “*G. ignobilis*” may be syntypes of this subspecies however, being larger headed and darker than the specimens placed under “*G. ignobilis* var.” A ♂ with labels: “Fianarantsoa, Madagascar, M. H de Saussure” [handwritten on ruled white card]; “*Gryllus ignobilis* Sauss.” [handwritten on pink paper]; “Possible syntype of *ignobilis niger* Sauss., Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the left middle leg is missing. The right hind leg had been glued on, but is now detached and secured through the femur on a separate pin. A ♀ with labels: “Fianarantsoa, Madagascar, M. H de Saussure” [handwritten on ruled white card]; “*Gryllus ignobilis* Sauss.” [handwritten on pink paper]; “Possible syntype of *ignobilis niger* Sauss., Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; most of both antennae and the right hind leg are missing. A ♀ with labels: “Fianarantsoa, Madagascar, M. H de Saussure” [handwritten on ruled white card]; “*Gryllus ignobilis* Sauss.” [handwritten on pink paper]; “Possible syntype of *ignobilis niger* Sauss., Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the last tarsal segment of the right hind leg is missing. There is a ♂ syntype, erroneously referred to as the holotype in OSF, in the SMFD. Box A11.

Grylloderes nefandus nigra (Saussure, 1899).

ignobilis pallida Saussure, 1899: 602 [*Gryllus*].

[Provenance unspecified]. Unspecified number of ♂ and ♀.

Three ♀ possible syntypes. There are no specimens placed under this name in the MHNG collection, but three ♀ under “*ignobilis* var.” are probably syntypes, being lighter in colour than those placed under “*ignobilis*”. A ♀ with labels: “VOELTZKOW, nossi be” [printed on white paper with “nossi be” handwritten]; “*Gryllus ignobilis* Sss var.” [handwritten on pink paper]; “Possible syntype of *ignobilis pallida* Sauss., Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the left antenna, the

tarsi of the left middle leg and the last tarsal segment of the right hind leg are missing. A ♀ with labels: "nossibe [sic]" [handwritten on pink paper]; "VOELTZKOW" [printed on white paper]; "Gryllus ignobilis Sss var." [handwritten on pink paper]; "Possible syntype of ignobilis pallida Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded. A ♀ with labels: "nossibe [sic]" [handwritten on pink paper]; "VOELTZKOW" [printed on white paper]; "Gryllus ignobilis Sss var." [handwritten on pink paper]; "Possible syntype of ignobilis pallida Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded. There is a ♂ syntype, erroneously referred to as the holotype in OSF, in the SMFD. Box A11.

Grylloderes nefandus pallida (Saussure, 1899).

imbecillus Saussure, 1877: 218 [*Gryllodes*].

Borneo (coll. Brunner de Wattenwyl no 11079). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Modicogryllus imbecillus (Saussure, 1877).

imitator Saussure, 1878: 487 [*Cyrtoxiphus*].

Cuba. Unspecified number of ♀.

One ♀ syntype with labels: "♀ Cuba, Mr H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "Cyrtox. imitator Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The specimen is now glued to the locality label having become detached from a previous mount. The wings are folded; most of both antennae, the left front leg, both middle legs and both hind legs are lost. There are another two ♀ and one ♂ in the collection, each with a label "CUBA" [printed on a strip of white paper], which may also be syntypes although the labels look more recent than the handwritten one. Box A24.

Anaxipha imitator (Saussure, 1878).

inalata Saussure, 1874a: 435-436 [*Diplacusta*].

Surinam (Musée de Hambourg). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMUH.

Lerneca inalata (Saussure, 1874).

indicus Saussure, 1878: 454-455 [*Oecanthus*].

Indes orientales, Bombay, Madras, Java. Unspecified number of ♂ and more than one ♀.

Three ♀ syntypes. A ♀ with labels: "♀ Madras, Indes or., colln Guérin" [handwritten on ruled white card with "Indes or." printed]; "Oecanthus indicus Sauss." [handwritten on yellow paper], "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the left middle leg, the tarsi of the right front leg, the left middle leg and both hind legs are missing. The ovipositor has been broken near the base and is missing. A ♀ with labels: "JAVA" [printed on a strip of yellow paper]; "Oecanthus indicus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red

paper]. Specimen set with wings folded; most of both antennae, the tarsi of the right front leg, two tarsal segments of the left hind leg and the right hind leg are lost. A ♀ with labels: "*Oecanthus indicus* Ss." [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen set with wings folded, the pin going laterally through the thorax; the left front middle and hind legs, and the last tarsal segment of the right hind leg are lost. There is a fourth ♀ labelled "Celebes" which may be a mislabelled syntype because the pin is the same as that of the Madras specimen. The whereabouts of the rest of the type material is unknown. Images in OSF. Box A21.

Oecanthus indicus Saussure, 1878.

indivisus Saussure, 1878: 633-634 [*Anisotrypus*].

Bornéo, Banjermassing (Musée de Leyde). One damaged ♀.

There is one specimen placed under this name in the MHNG collection, but the locality label reads "Viti Levu" and it is not a syntype. The ♀ holotype is in the RMNH according to OSF. Box A28.

Anisotrypus indivisus Saussure, 1878.

infernalis Saussure, 1877: 156 [*Gryllus*].

Chine, Tschifu (Musée i. de Vienne). Unspecified number of ♂ and ♀.

The specimen standing under this name in the MHNG collection was captured in 1972 and is not part of the type material. There is a ♀ syntype labelled as a paralectotype in the NHMW collection, but it is not clear whether a lectotype designation as been formally published and where the supposed lectotype is deposited. Box A8.

Teleogryllus infernalis (Saussure, 1877).

infernalis Saussure, 1877: 83 [*Nemobius*].

Java (coll. Brunner de Wattenwyl n° 7302). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

A junior synonym of *Polionemobius taprobanensis* (Walker, 1869).

insignis Saussure, 1878: 515 [*Nisitrus*].

Sumatra (Musée i. de Vienne). Unspecified number of ♀.

No specimens found in the MHNG. The type material could not be located in the NHMW collection and its whereabouts is unknown.

Nisitrus insignis Saussure, 1878.

insularis Saussure, 1878: 470-471 [*Homoeoxiphus*].

Iles Fidji; Australie septentrionale (coll. Brunner de W. n° 2761); Java (Mus. i. de Vienne). More than one ♂ and ♀.

One ♂ and two ♀ syntypes. A ♂ with labels: "♂ Iles Fidschi" [handwritten on ruled white card]; "Homoeoxiphus insularis Sss." [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the left middle leg and half of the tibia and the tarsi of the right hind leg are missing. A ♀ with labels: "♀ Iles Fidschi" [handwritten on ruled white card];

"Homoeoxiphus insularis Sss." [handwritten on lilac card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, both front legs, both middle legs and the right hind leg are lost, the left hind leg is detached and is glued to the locality label. A ♀ with labels: "♀ Ovalou, Iles Fiti [sic]; M. H. d. Sauss." [handwritten on ruled white card]; "Syntypus" [printed on red paper]. The specimen has broken where the pin was inserted and only the head and prothorax remain; the left front leg lacks two tarsal segments and the right front leg, partial broken by the pin, lacks the end of the tibia and the tarsi. There is a syntype from northern Australia in the NHMW. Box A23.

Metioche vitticollis insularis (Saussure, 1878).

insularis Saussure, 1878: 639-640 [*Podoscirtus*].

Iles Viti (coll. Brunner de Wattenwyl n° 3903); Nouvelle-Calédonie (idem n° 4734). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is one ♂ syntype from Fiji in the NHMW. Another, from New Caledonia, in the same collection, was considered not to be conspecific and described as *Adenopterus crouensis* Otte, 1987 (Otte *et al.*, 1987: 438).

Munda insularis (Saussure, 1878).

intermedia Saussure, 1874a: 345-346 [*Gryllotalpa*].

Mexique, terres chaudes de la côte du golfe; Amérique centrale (Musée de Paris). Unspecified number of ♂ and ♀.

One ♂ syntype with labels: "Vera Cruz, Mexique, M H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Gryllotalpa intermedia Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae are missing. There are further syntypes in the MNHN according to OSF. Box A2.

A junior synonym of *Neocurtilla hexadactyla* (Perty, 1832).

irroratus Saussure, 1878: 577-578, fig. lxii, 8 [*Calyptotrypus*].

Ceylan (coll. Brunner de Wattenwyl n° 5657; Museum de Paris). Unspecified number of ♂ and ♀.

The specimens placed under this name in the MHNG collection are either part of the material from the 1926-27 Indian expedition of Carl & Escher or are identified as "Calyptotrypus irroratus?" and are thus not part of the type series. No type specimens could be identified in the NHMW collection. Box A23.

A junior synonym of *Varitrella varipennis* (Walker, 1869).

irroratus Saussure, 1878: 436-437 [*Endacustes*].

Nouvelle-Hollande, Queensland (coll. Brunner de Wattenwyl nos 3763, 6085 & 8937; Musée de Genève). Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "Queensland, Nouv. Holl., M H de Saussure" [handwritten on ruled white card with "Nouv. Holl." printed]; "Endacustes irrorata Sauss." [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Both

antennae, the tarsi of the right front leg, two tarsal segments of the left middle leg, the last tarsal segment of the right middle leg, two tarsal segments of the left hind leg and the right hind leg are missing. A ♀ with labels: "Queensland, Nouv. Holl., M H de Saussure" [handwritten on ruled white card with "Nouv. Holl." printed]; "Endacustes irrorata Sauss." [handwritten on lilac paper]; "Syntypus" [printed on red paper]. Both antennae, the tarsi of the left front leg, the tarsi of the left middle leg and both of the hind legs are missing. There are three more syntypes, two ♂ and one ♀, in the NHMW. Box A21.

Endacusta irrorata Saussure, 1878.

jansoni Saussure, 1897: 259-260, pl. 13 fig. 4 [*Diatrypus*].

Nicaragua, Chontales (Janson). One damaged ♂.

No specimens found in the MHNG. The ♂ holotype is in the BMNH according to their online database.

Diatrypa jansoni Saussure, 1897.

javanus Saussure, 1877: 85-86 [*Nemobius*].

Java; for var., Ceylan leg. Humbert. Unspecified number of ♂ and ♀.

Two ♀ syntypes. A ♀ with labels: "♀ Java, M H. de Saussure" [handwritten on ruled white card]; "Nemobius javanus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded, the left hind wing is missing; most of both antennae and the right front leg are missing. A ♀ with labels: "♀ Java, M Hy de Saussure" [handwritten on ruled white card]; "Nemobius javanus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right antenna, the left middle leg and the right hind leg are missing. There is also a ♀ with labels: "Ceylan, Voy. de M. Humbert" [handwritten on ruled white card with "Ceylan" printed]; "Nemobius javanus? Sauss." [handwritten on yellow paper]; "Mentioned in description: Syntypus? Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the left middle leg is lost and the specimen has suffered mould damage. The other specimens placed under this name in the MHNG collection were collected after the description or are from other localities, and are therefore not part of the type series. Box A5.

A junior synonym of *Polionemobius taprobanensis* (Walker, 1869).

javanus Saussure, 1878: 637-638, fig. lxx, 1 [*Podoscirtus*].

Java (coll. Brunner de Wattenwyl n° 8596). More than one ♀ (colour variation mentioned).

No specimens found in the MHNG. There are ten specimens from Java under this name in the NHMW collection, but the Brunner collection number cited in the description is written on a label placed in the box rather than attached to any of the specimens. While some of the specimens are almost certainly syntypes, those individuals cannot be positively identified.

Munda javana (Saussure, 1878).

kirschianus Saussure, 1878: 419-420 [*Amusus*].

Venezuela (Mus. Genève, Dresde & Berlin). More than one ♂ and one ♀.

One ♂ paralectotype with labels: “♂ Venezuela, M H de Saussure” [handwritten on ruled white card]; “Amusus Kirschianus Sauss.” [handwritten on green paper]; “Paralectotypus” [printed on orange card]. The right front leg, right middle leg and both hind legs are missing, as is the left cercus. The ♂ lectotype (designated by Gorochoy, 1996b: 54) is in the ZMHB. Box A20.

Luzara kirschiana (Saussure, 1878).

kirschii Saussure, 1877: 209 [*Grylloides*].

Java (Musée de Dresde). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the SMTD.

Modicogryllus kirschii (Saussure, 1877).

kriechbaumeri Saussure, 1877: 101-103, fig. viii [*Hemigryllus*].

Brésil (Musée de Munich et de Genève). Unspecified number of ♂ and ♀.

The one ♂ and two ♀ syntypes are currently on loan from the MHNG. Box A5. A junior synonym of *Hemigryllus ortonii* (Scudder, 1869).

krugi Saussure, 1878: 607-608, fig. lxiv, 1-2 [*Apithes*].

Antilles; Cuba (coll. Krug (Berlin)). Unspecified number of ♂.

One ♂ possible syntype with labels: “♂ Porto Rico, Dr Krug” [handwritten on ruled white card]; “Orochirus Krugii Sss.” [handwritten on green paper]; “Possible syntype of *A. krugii* Sauss. Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the tarsi of the left hind leg and two tarsal segments of the right hind leg are lost. The right hind leg is detached and secured through the femur on the original pin. The left hind leg has been reattached with glue. It is not clear whether the locality label should be taken to mean that this is not a syntype, the species name label in the insect box only has the locality “Amér. trop.” handwritten in the lower left corner without precision. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB. Box A27.

Laurepa krugi (Saussure, 1878).

krugii Saussure, 1897: 232 [*Liphoplus*].

Cuba (Dr Krug, Mus. Berol. et Genavese?). More than one ♀.

One ♀ syntype with labels: “♀ Cuba, Dr Krug” [handwritten on ruled white card]; “*Liphoplus Krugii* Sss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks both hind legs. The abdomen has been broken and repaired with glue. There is a second pin with a leg glued onto a card mount with “*Liphoplus Krugii* Sss., Cuba, 2e patte” handwritten on the lower side and a label “Cuba” [handwritten on ruled white card]. Box A18

A junior synonym of *Cycloptilum antillarum* (Redtenbacher, 1892).

laplatae Saussure, 1874a: 408-409 [*Gryllus*].

République Argentine, environs de Buenos-Ayres (leg. Meyer-Dürr). Unspecified number of ♂ and ♀.

Two ♂ and three ♀ syntypes. A ♂ with labels: "♂ Buenos Ayres, coll. Meyer-D" [handwritten on ruled white card]; "Grylloides La Platae Sauss." [handwritten on green paper]; "Miogryllus verticalis (Aud.-Serv.) Det. R. L. Randell, 1963" [handwritten on white card with "Det. R. L. Randell, 196" printed]; "Syntypus" [printed on red paper]. The right antenna, most of the left antenna, both middle legs, the last tarsal segment of the right hind leg and the cerci are lost. The right hind leg has been reattached with glue. A ♂ with labels: "♂ Buenos Ayres, M H. d Sauss." [handwritten on ruled white card]; "Grylloides La Platae Sauss." [handwritten on green paper]; "Miogryllus verticalis (Aud.-Serv.) Det. R. L. Randell, 1963" [handwritten on white card with "Det. R. L. Randell, 196" printed]; "Syntypus" [printed on red paper]. The right hind leg is detached and secured through the femur on the original pin. A ♀ with labels: "♀ Buenos Ayres, coll. Mey.Dür" [handwritten on ruled white card]; "Grylloides La Platae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The tarsi of the left middle leg and part of the claw of the right hind leg are lost. A ♀ with labels: "♀ Buenos Ayres, coll. Meyer Dür" [handwritten on ruled white card]; "Grylloides La Platae Sauss." [handwritten on green paper]; "Miogryllus verticalis (Aud.-Serv.) Det. R. L. Randell, 1963" [handwritten on white card with "Det. R. L. Randell, 196" printed]; "Syntypus" [printed on red paper]. Most of both antennae, the right middle leg and the last tarsal segment of the left hind leg is lost. There is insect feeding damage to the underside of the thorax. A ♀ with labels: "♀ Buenos Ayres, coll. Mey.Dür" [handwritten on ruled white card]; "Grylloides La Platae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The right antenna, and the end of the ovipositor are missing, and there is some mould damage. A juvenile ♀ collected by Meyer-Dür may also be considered a syntype. Box A14.

A junior synonym of *Miogryllus verticalis* (Serville, 1838).

lativertex Saussure, 1899: 603-604, figs 5-6 [*Loxoblemmus*].

Madagascar. Unspecified number of ♀.

One ♀ syntype with labels: "nossi-bé" [handwritten on a strip of white paper]; "Loxoblemmus lativertex Sss. ♀" [handwritten on pink paper]; "Syntypus" [printed on pink paper]. Most of the right antenna and the claw of the right hind leg are missing. This specimen was placed in the collection as "Loxoblemmus lativentris Sauss." but this was obviously an error because the determination label on the pin is correct. Box A16.

Loxoblemmus lativertex Saussure, 1899.

limbatus Saussure, 1877: 241-241, fig. xiv, 2 [*Scapsipedus*].

Madagascar (leg. Grandidier). Unspecified number of ♂ and ♀.

One ♂ syntype with labels: "Madagask., Grandid." [handwritten on white paper]; "Scrapipedus limbatus Sauss." [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with the left forewing spread; most of the left antenna, the right middle leg and the last tarsal segment of the right hind leg are lost. The right forewing is detached and glued to a card mount secured on the original pin. The left middle leg, which lacks the claw, is detached and glued to the same card

mount, which as "266 file teeth" handwritten on it. There is also a micro-tube containing dissected parts secured through the stopper on the original pin. Box A15.

Scrapsipedus limbatus Saussure, 1877.

lineolatus Saussure, 1897: 254 [*Oecanthus*].

Brazil, Rio Grande do Sul (leg. Ihering, Mus. Genavense). Unspecified number of ♂.

One ♂ syntype with labels: "Brésil, Rio grande da Sul, D^r Ihering, 614.16" [printed on white paper]; "lineolatus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the left front leg and the tarsi of the left hind leg are missing. The right forewing has been detached and is glued to a card point on the original pin. Box A22.

Oecanthus lieolatus Saussure, 1897.

longicauda Saussure, 1878: 529-530 [*Piestodactylus*].

Australie occidentale (Musée de Berlin n° 951). More than one ♀ (colour variation mentioned).

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

A junior synonym of *Eurepa marginipennis* (White, 1841).

longicaudus Saussure, 1877: 304 [*Ectatoderus*].

Iles Nicobar (Mus. i. de Vienne, voyage de la "Novara"). One immature ♀.

No specimens found in the MHNG. The ♀ holotype, labelled "Sauss. Type 1875, Novara 1857-59", is in the NHMW.

Ornebius longicaudus (Saussure, 1877).

longipennis Saussure, 1877: 161-162, fig. x, 3 [*Gryllus*].

Indes orientales (Musée de Paris). Unspecified number of ♂.

No specimens found in the MHNG. The type material should be in the MNHN Paris, but according to OSF it is lost.

Teleogryllus longipennis (Saussure, 1877).

longipennis Saussure, 1874a: 383-384 [*Nemobius*].

République Argentine, Buenos-Ayres (leg. Claraz). Four ♀.

Three ♀ syntypes. A ♀ with labels: "♀ Buenos Ayres, Rep Arg., M H de Saussure" [handwritten on ruled white card]; "Nemobius longipennis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left middle and hind legs are missing. A ♀ with labels: "♀ Buenos Ayres, Rep. Arg., env. G. Claraz" [handwritten on ruled white card]; "Nemobius longipennis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right hind leg is detached and secured through the femur on the original pin. A ♀ with labels: "♀ Buenos Ayres, Rep Arg., env. G. Claraz" [handwritten on ruled white card]; "Nemobius longipennis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen mounted on card on its left side with

wings folded; the left front leg is invisible, the right hindleg is detached and glued to the card mount. Box A5.

Pteronemobius longipennis (Saussure, 1874).

longipes Saussure, 1878: 545-546 [*Heterotrypus*].

Amboine (Musée de Bruxelles). Unspecified number of ♂.

One possible ♂ syntype with labels: "♂ Sayckerbayk [?], Amboine, M H de Saussure" [handwritten on ruled white card]; "Heterotrypus longipes Sauss." [handwritten on yellow paper]; "Possible syntype of H. longipes Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the left antenna, right front leg, both middle legs and the left hind leg are missing. There is a ♂ syntype, referred to as the holotype in OSF, in the ISNB. Box A26.

Phaloria longipes (Saussure, 1878).

loricatus Saussure, 1877: 306-307 [*Ectatoderus*].

Guinée, Chinchoxo (Musée de Berlin n° 4476, leg. Falkenstein). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype labelled as the holotype in the ZMHB (images on SysTax).

Ectatoderus loricatus Saussure, 1877.

macilenta Saussure, 1874a: 343, fig. 23 [*Gryllotalpa*].

Surinam. Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Gryllotalpella macilenta (Saussure, 1874).

macilentus Saussure, 1878: 666-668, fig. lxxii, 3 [*Aphonus*].

Colombie; Panama (coll. Brunner de Wattenwyl n°s 10322 & 9985). One ♂ and two ♀.

No specimens found in the MHNG. The syntypes are in the NHMW.

Stenaphonus macilentus (Saussure, 1878).

macilentus Saussure, 1897: 234, 235; pl. 11, fig. 45 [*Cyrtoxiphus*].

Panama, Bugaba (Champion). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the BMNH (Marshall, pers. comm.).

Macroanaxipha macilenta (Saussure, 1897).

macilentus gracilis Saussure, 1897: 235 [*Cyrtoxiphus*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♀.

One ♀ syntype with labels: "Teapa, Tabasco, March. H. H. S." [printed on white card]; "Cyrtoxiph. maclientus var. gracilis Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; most of both antennae, the tarsi of the left middle leg and both hind legs are lost. The variety

was implicitly treated as part of the nominal species by Kirby (1906: 82) who gave Mexico as one of the type localities, and the subspecies is not mentioned in OSF. Box A24.

Macroanaxipha macilenta (Saussure, 1897).

macilentus Saussure, 1878: 501-502, fig. xlvi, 2 [*Phylloscirtus*].

Republique Argentine. Unspecified number of ♀.

One ♀ syntype with labels: "Buenos Ayres, Rep. Arg., Mr. H. de Saussure" [handwritten on ruled white card]; "Phylloscirtus macilentus Sauss" [handwritten on green paper]; "Syntypus" [printed on red paper]. Both antennae, all of the legs and the left wings are missing. Box A24.

Cranistus macilentus (Saussure, 1878).

maculipennis Saussure, 1878: 643-644, fig. lxx, 4 [*Podoscirtus*].

Brésil (Mus. i. de Vienne). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, labelled "Sauss. 1875 Type", placed under this name in the NHMW.

Podoscirtodes maculipennis (Saussure, 1878).

maculosus Saussure, 1899: 600 [*Nemobius*].

Nossi-Bé. Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the SMFD (images in OSF).

Pteronemobius maculosus (Saussure, 1899).

madecassum Saussure, 1878: 464 [*Trigonidium*].

Madagascar (leg. Grandidier). Unspecified number of ♂.

The specimens placed under this name in the MHNG are part of the material collected by Voeltzkow's 1889-95 expedition and so are not syntypes. The whereabouts of the type material is unknown. Box A22.

A junior synonym of *Trigonidium cicindeloides* Rambur, 1838.

madecassus Saussure, 1878: 581-582 [*Calyptotrypus*].

Madagascar (leg. Grandidier). Unspecified number of ♂.

The specimen placed under this name in the MHNG collection is a ♀ which was collected by Voeltzkow's 1889-95 expedition and so not a syntype. There is a ♂ syntype in the MNHN (Desutter, pers. comm.). Box A26.

Fryerius madecassa (Saussure, 1878).

major Saussure, 1874a: 343-344 [*Gryllotalpa*].

Etats-Unis, Illinois. Unspecified number of ♂.

One ♂ syntype with labels: "♂ Illinois, New York [sic], M^r H. d. Sauss." [handwritten on ruled white card with "New York" printed]; *Gryllotalpa major* Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; two tarsal segments of the left middle leg and one tarsal segment of the right hind leg are missing. Box A2.

Gryllotalpa major Saussure, 1874.

major Saussure, 1877: 75-76 [*Nemobius*].

Brésil (Musée de Zurich). Unspecified number of ♀.

No specimens found in the MHNG. There are two specimens from Para in Brazil placed under *A. fasciatus* in the ETHZ collection, but no indication that these are syntypes (Schmid, pers. comm.). There are no specimens in the Zurich University collections (Oberholzer, pers. comm.).

A junior synonym of *Allonemobius fasciatus fasciatus* (De Geer, 1773).

malgachus Saussure, 1877: 94 [*Nemobius*].

Madagascar (leg. Grandidier). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the MNHN (Desutter, pers. comm.).

Pteronemobius malgachus (Saussure, 1877).

mandibularis Saussure, 1877: 246-247, fig. xvi, 1 [*Scapsipedus*].

Indes orientales, Bombay (Musée de Paris); Japon (Mus. de Leyde). More than one ♂.

There are a number of specimens under this name in the MHNG collection, but they are from other localities than those given in the original description. Some were collected after the publication of the description and many are only tentatively identified. None are syntypes. No syntypes could be located in the MNHG (Desutter, pers. comm.). Box A15.

A junior synonym of *Velarifictorus aspersus aspersus* (Walker, 1869)

maorius Saussure, 1877: 209-210 [*Gryllodes*].

Nouvelle-Zélande (Musée de Berlin n° 1014). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

Gryllopsis maorica (Saussure, 1877).

maritimus Saussure, 1877: 313-314 [*Arachnocephalus*].

Iles Viti; les Molluques, Amboine (Mus. de Leyde). More than one ♀.

One ♀ possible syntype with labels: “♀ Ovalou, Fidji Isl., M H de Saussure” [handwritten on ruled white card]; “*Arachnocephalus maritimus* Sauss.” [handwritten on lilac paper]; “Possible syntype of *A. maritimus* Sauss., Hollier 2011” [handwritten on red paper]. Specimen lacks most of both antennae and the last tarsal segment of the right hind leg. The left middle leg is detached but secured by the other legs, and the ovipositor is broken. There is a ♀ syntype, erroneously referred to as the holotype in OSF, in the RMNH in Leiden. Box A18.

Arachnocephalus maritimus Saussure, 1877.

maritimus Saussure, 1878: 478-479, fig. xlix, 4 & fig. lxxix, 3 [*Cyrtoxiphus*].

Iles de Viti, Upolu, Ovalou; Iles Samoa (coll. Brunner no 5404); Tahiti (coll. Brunner n° 9080). More than one ♂ and ♀.

Two ♂ and one ♀, all possible syntypes. A ♂ with labels: “♂ Ovalou, Iles Viti” [handwritten on ruled white card]; “*Cyrtoxiphus maritimus* Sauss.” [handwritten on lilac paper]; “Possible Syntype, Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the right antenna, both front legs and both middle legs are missing. A ♂ with labels: “♂ Ovalou, Iles Viti, Oceanie, M H. de Saussure” [handwritten on ruled white card]; “*Cyrtoxiphus maritimus* Sauss.” [handwritten on lilac paper]; “Possible Syntype, Hollier 2011” [handwritten on red paper]. Specimen set with wings folded, the parts extending beyond the abdomen are lost; most of both antennae, the right middle leg and the last tarsal segment of the left hind leg are missing. A ♀ with labels: “♀ Opolu [sic], Oceanie, M H. d. Sauss.” [handwritten on ruled white card]; “maritime” [handwritten in pencil on white paper]; “*Cyrtoxiphus maritimus* Sauss.” [handwritten on lilac paper]; “Possible Syntype, Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the left front leg and both hind legs are missing. There is a ♂ syntype from Samoa in the NHMW. Box A24.
Anaxipha maritima (Saussure, 1878).

marmorata Saussure, 1899: 612, fig. 12 [*Voeltzkowia*].

Nossi-Bé. Unspecified number of ♂ and ♀.

One ♂ and three ♀ syntypes. A juvenile ♂ with labels: “Nossibé” [handwritten on a strip of pink paper]; “VOELTZKOW” [printed on a strip of white paper]; “*Voeltzkowia marmorata* Sss. & Adl. [sic]” [handwritten on pink paper]; “Syntypus” [printed on red paper]. The left antenna and all three right legs are lost. A ♀ with labels: “Nossibé” [handwritten on a strip of pink paper]; “VOELTZKOW” [printed on a strip of white paper]; “*Voeltzkowia marmorata* Sss. & Adl. [sic]” [handwritten on pink paper]; “Syntypus” [printed on red paper]. Most of the right antenna, the right front leg and the left hind leg are missing. A juvenile ♀ with labels: “Nossibé” [handwritten on a strip of pink paper]; “VOELTZKOW” [printed on a strip of white paper]; “*Voeltzkowia marmorata* Sss. & Adl. [sic]” [handwritten on pink paper]; “Syntypus” [printed on red paper]. Both antennae, the right middle leg, the left hind leg and the last tarsal segment of the right hind leg are missing. A juvenile ♀ with labels: “Nossibé” [handwritten on a strip of pink paper]; “VOELTZKOW” [printed on a strip of white paper]; “*Voeltzkowia marmorata* Sss. & Adl. larva” [handwritten on pink paper]; “Syntypus” [printed on red paper]. All of the legs are lost. There are further syntypes in the SMFD according to SysTax. Box A21.

Malgasia marmorata (Saussure, 1899).

maroccanus Saussure, 1898: 215, 217, fig. 4 [*Homaloblemmus*].

Marocco [sic] septentionalis. Unspecified number of ♂.

One ♂ syntype with labels: “MAROC” [printed on a strip of white card]; “*Homaloblemmus maroccanus* Sauss.” [handwritten on blue card]; “*Homaloblemmus maroccanus*” [handwritten on pink paper]; “Syntypus” [printed on red paper]. The left antenna, the tibia and tarsi of the left front leg, the entire right front leg and the left middle leg are lost. The left hind leg, which lacks the claw, is detached and secured through the femur on the original pin. Box A15.

A junior synonym of *Sciobia practicola* Bolivar, 1884.

mauretanicus Saussure, 1898: 215, 218 [*Homaloblemmus*].

Marocco [sic], Tanger. Unspecified number of ♂.

One ♂ syntype with labels: "Tanger" [printed on white card]; "Homaloblemmus mauretanicus Sauss." [handwritten on blue card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the tarsi of the right middle leg, the tarsi of the right hind leg and the last tarsal segment of the left hind leg are missing. Box A15.

Sciobia mauretanicus (Saussure, 1898).

maxillaris Saussure, 1897: 270, 273-274; pl. 13, fig. 27 [*Orocharis*].

Panama, Volcan de Chiriqui 2500 ft (Champion). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Orocharis maxillaris Saussure, 1897.

maya Saussure, 1897: 270, 275 [*Orocharis*].

Mexico, Temax in N. Yucatan (Gaumer). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Orocharis maya Saussure, 1897.

membranaceus colosseus Saussure, 1899: 601 [*Brachytrypus*].

Madagascar. Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the SMFD (images on SysTax).

Brachytrypus membranaceus colosseus Saussure, 1899.

mexicana Saussure, 1874a: 437-438, fig. 18 [*Prosthacusta*].

Mexique, environs de Cordova. Unspecified number of ♂.

One ♂ syntype with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Prosthacustes mexicanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the left antenna, the right middle leg and both hind legs are missing. There is also a ♀ under this name in the MNHG collection, but it was collected by H. H. Smith in the 1890s and is not a syntype. Box A19.

A junior synonym of *Prothacusta circumcincta* (Scudder, 1869).

mexicanus Saussure, 1897: 245; pl. 12, figs 11-13 [*Amusis*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the BMNH (Marshall pers. comm.).

Amusina mexicana (Saussure, 1897).

mexicanus Saussure, 1874a: 501-503, fig. 14 [*Euscirtus*].

Mexique, Cordillère orientale. Unspecified number of ♂ and ♀.

One ♀ syntype with labels: "♀ Potrero, Mexique, M H. d. Sauss." [handwritten on ruled white card with "Mexique" printed]; "Euscirtus mexicanus Sss." [handwritten

on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, the last tarsal segment of both front legs, the right middle leg and right hind leg are missing. The left hind leg is detached and secured through the femur on the original pin. The whereabouts of the other syntypes is unknown. Box A28.

Euscyrtes mexicanus Saussure, 1874.

mexicanus Saussure, 1859: 316 [*Gryllus*].

Mexico. Unspecified.

Two ♂ and three ♀ syntypes. A ♂ with labels: "♂ Michoacan, Mexique, M^r de Saussure" [handwritten on ruled white card with "Mexique" printed]; "Gryllus mexicanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly spread; both antennae, the left front leg, the tibia and tarsi of the right front and middle legs, the entire left middle leg and the right cercus are missing. A ♂ with labels: "♂ Mexique" [printed on ruled white card with "♂" handwritten]; "Gryllus mexicanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings spread; the left front leg, the last tarsal segment of the left hind leg and the claw of the right hind leg are lost. A ♀ with labels: "♀ Mexique" [printed on ruled white card with "♀" handwritten]; "Gryllus mexicanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings spread; most of the right antenna and the tarsi of the left front leg are missing. A ♀ with labels: "♀ Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the tarsi of the left middle leg and the last tarsal segment of both hind legs are lost. A ♀ with labels: "♀ Orizaba, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Gryllus mexicanus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the tarsi of the left middle leg and the last tarsal segment of both hind legs are lost. There is insect feeding damage to the abdomen. Four nymphs with similar labels may be considered syntypes; the other specimens placed under this name were collected after the publication of the original description. Box A10.

A junior synonym of *Gryllus assimilis assimilis* (Fabricius, 1775).

mexicanus Saussure, 1897: 231; pl. 11, fig. 37 [*Liphoplus*].

Mexico, Amula in Guerrero, 6000 ft (H. H. Smith). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Ornebius mexicanus (Saussure, 1897).

mexicanus Saussure, 1897: 271, 276 [*Orocharis*].

Mexico, Teapa in Tabasco (H. H. Smith); Guatemala, Pantaleon and Mirandilla (Champion). Unspecified number of ♂ and ♀.

One ♂ and one ♀, both syntypes. A ♂ with labels: "Teapa, Tabisco, Feb., H. H. S." [printed on white card]; "Orocharis mexicanus" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly spread; the left front leg, the last tarsal segment of the right middle leg and the right hind leg are

missing. A ♀ with labels: “Teapa, Tabisco, Feb., H. H. S.” [printed on white card]; “*Orocharis mexicanus* Sss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings roughly folded; the left antenna and the last tarsal segment of the right hind leg are lost. There is further type material in the BMNH according to their online database. Box A28.

Orocharis mexicanus Saussure, 1897.

mexicanus Saussure, 1859: 317 [*Paroecanthus*].

[Provenance unknown]. Unspecified.

Three ♂ and three ♀ syntypes. A ♂ with labels: “♂ Orizaba, Mexique, env. Sumichrast” [handwritten on ruled white card with “Mexique” printed]; “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; the claws of the left middle leg is lost. A ♂ with labels: “♂ Potrero. Mexique, env. Sumichrast” [handwritten on ruled white card with “Mexique” printed]; “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; the hind legs are detached and secured through the femur on the original pin. A ♂ with labels: “♂ Potrero, Mexique, envoi Sumichrast” [handwritten on ruled white card with “Mexique” printed]; “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings spread; the left middle leg, the tarsi of the right middle leg, the tarsi of the left hind leg and the right hind leg are lost. The specimen has broken into two parts, the head and prothorax are on the original pin and the rest of the thorax and the abdomen are on a second pin. A ♀ with labels: “♀ Mexique” [printed on ruled white card with “♀” handwritten]; “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of both antennae, the right middle leg and the left hind leg are lost. A ♀ with labels: “♀ Orizaba, Mexique, env. Sumichrast” [handwritten on ruled white card with “Mexique” printed]; “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings roughly spread; both antennae, two tarsal segments of the right middle leg, part of the tibia and the tarsi of the left middle leg, two tarsal segments of the right hind leg and the left hind leg are missing. A ♀ with labels: “*Paroecanthus mexicanus* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings spread; two tarsal segments of the right hind leg are lost. Box A27.

Paroecanthus mexicanus Saussure, 1859.

micado Saussure, 1877: 247 [*Scapsipedus*].

Japon (Musée de Vienne); Célèbes (Mus. de Dresde). More than one ♂.

No specimens found in the MHNG. The five specimens placed under this name in the NHMW collection were collected after the publication of the description and are thus not syntypes. The whereabouts of the type material is unknown.

Velarifictorus micado (Saussure, 1877).

micromegas Saussure, 1874a: 418 [*Gryllodes*].

Mexique. Unspecified number of ♀.

One ♀ syntype with labels: “♀ Mexique, Mr H de Saussure” [handwritten on ruled white card with “♀ Mexique” printed]; “*Miogryllus micromegas* Sauss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Both antennae, the left front and middle legs, the last tarsal segment of the left hind leg and the entire right hind leg are missing. Box A13.

A junior synonym of *Miogryllus convolutus* (Johannson, 1763).

minutus Saussure, 1878: 454 [*Oecanthus*].

Brésil, Pernambuco (Mus. de Bruxelles). Unspecified number of ♂ and ♀ (mention of ♂ in measurements).

No specimens found in the MHNG. According to OSF the type material is in the in ISNB.

Oecanthus minutus Saussure, 1878.

miopteryx Saussure, 1877: 152-153, fig. x, 5 [*Gryllus*].

Pérou. Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Gryllus miopteryx Saussure, 1877.

mitratus Saussure, 1898: 220, 221 [*Platyblemmus*].

Marocco [sic], Tanger. Unspecified number of ♂.

One ♂ syntype with labels: “7. 94, [Arabic writing, presumably locality name]” [handwritten on white card]; “Tanger” [printed on a strip of white card]; “*Platyblemmus mitratus* Sss.” [handwritten on blue card]; “Syntypus” [printed on red paper]. The specimen lacks the right antenna and the left hind leg. Box A16.

Sciobia mitratus (Saussure, 1898).

miurus Saussure, 1877: 131-132 [*Brachytrypus*].

Gabon (coll. Brunner de Wattenwyl no 6912). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, labelled as the holotype by Gorochov, in the NHMW.

Phonarellus miurus (Saussure, 1877).

modulator Saussure, 1878: 545 [*Heterotrypus*].

Philippines, Manille (Mus. de Berlin n° 965). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB.

Phaloria modulator (Saussure, 1878).

montanus Saussure, 1897: 266, 268-269; pl. 13, figs 18-20 [*Apithes*].

Panama, Bugaba (Champion). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the BMNH (Marshall pers. comm.).

Hapithus montanus (Saussure, 1897).

montanus Saussure, 1897: 240 [*Thamnoscirtus*].

Panama, Bugaba (Champion). Unspecified number of ♂.

One card-mounted ♂ syntype with labels: "Bugaba, 800-1,500 ft., Champion" [printed on white card]; "*Thamnoscirtus montanus* Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the left antenna, the right front leg and the left hind leg are missing, the left front leg is detached and glued to the card. Box A24.

A junior synonym of *Phylloscirtus elegans* Guérin-Ménéville, 1844.

mortuifolia Saussure, 1878: 559-561, fig. lxi [*Phyllogryllus*].

Cayenne. One damaged ♀.

Holotype ♀ with labels: "♀ Cayenne, M h de Saussure" [handwritten on ruled white card]; "*Phyllogryllus mortuifolia* Sauss." [handwritten on green paper]; "Holotypus" [printed on red card]. Specimen set with wings folded; the head, the left front leg, left middle leg, the tibia and tarsi of the right hind leg and the left hind leg are lost. The right front leg is detached and glued to a piece of card on the original pin. The specimen has considerable insect feeding damage to the thorax and abdomen. Box A26.

A junior synonym of *Phyllogryllus velutinus* (Walker, 1869).

musicus Saussure, 1878: 480, fig. 49, 4 [*Cyrtoxiphus*].

Tahiti (coll. Brunner de Wattenwyl no 9081). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is a ♂ specimen from Tahiti placed under this name in the NHMW, but this has the Brunner collection number 9080. The Brunner collection number 9081 refers to a ♂ specimen from Samoa also placed under *A. musica* in the NHMW collection, as are another ♂ and a ♀ from Samoa. These are almost certainly all syntypes, the locality and collection numbers probably having been confused.

Anaxipha musica (Saussure, 1878).

musicus Saussure, 1897: 279-280 [*Orochirus*].

Panama, Bugaba (Champion). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Orochirus musica Saussure, 1897.

mutus Saussure, 1874a: 510 [*Aphonus*].

Guyane. Unspecified number of ♂.

One ♂ syntype with labels: "♂ Guyane" [handwritten on ruled white card]; "*Aphonus mutus* Sss." [handwritten on green paper]; "Syntype" [printed on red paper]. Specimen set with wings folded; most of both antennae, the end of the tibia and the tarsi of the left front leg, the tibia and tarsi of the left middle leg and the entire right middle leg are lost. The specimen has been repaired with glue. There is a micro-tube with dissected genitalia secured through the stopper on the original pin. Box A29.

Aphonomorphus mutus (Saussure, 1874).

mutus Saussure, 1878: 678-679 [*Metrypus*].

Amérique tropicale (coll. Brunner de Wattenwyl n° 2928). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ specimen in the NHMW with the appropriate Brunner collection number which is probably a syntype, but this has been placed under the name *Aphonomorphus mutus* Saussure.

Tafalisca muta (Saussure, 1878).

nablista Saussure, 1897: 266, 268 [*Apithes*].

Colombia (coll. Brunner v. W. n° 12346). Unspecified number of ♀.

No specimens found in the MHNG. The type material could not be located in the NHMW collection and the whereabouts of the type material is unknown.

Hapithus nablista (Saussure, 1897).

nemoralis Saussure, 1874a: 390-391 [*Nemobius*].

République Argentine, Corrientes; Brésil; Pérou, Tarma (leg. Jelski). More than one ♂.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Hygronemobius nemoralis (Saussure, 1874).

nietneri Saussure, 1878: 442-443 [*Arachnopsis*].

Ceylan (Mus. de Berlin n° 3155; Mus. Genève leg. Nietner). Unspecified number of ♂ and one nymph.

One juvenile ♂ paralectotype with labels: "Trincomali [sic], Ceylan, coll. Humbert" [handwritten on ruled white card with "Ceylan" printed]; "Paralectotypus" [printed on orange card]. The right antenna, left middle leg and the last tarsal segment of the right hind leg are missing. The ♂ lectotype (designated by Gorochov, 1996b: 49) is in the ZMHB (images in OSF). Box A21.

Arachnomimus nietneri (Saussure, 1878).

niger Saussure, 1877: 164-165 [*Gryllus*].

Inde centrale (leg. Falconnet); Java. Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "♂ Indes inter., M H de Saussure" [handwritten on ruled white card]; "Gryllus niger Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right front leg and left hind leg are missing. The right hind leg, which lacks two tarsal segments, is detached and secured through the femur on the original pin. A ♀ with labels: "♂ [sic] Indes or., M. H de Saussure" [handwritten on ruled white card]; "Gryllus niger Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings spread, the left antenna is detached and glued to the locality label. The species name label in the insect box has the locality "Indes centrales" handwritten in the lower left corner; the locality label of the ♀ was obviously a lapse. Box A12.

A junior synonym of *Melanogryllus conscitus* (Walker, 1869).

niger Saussure, 1874a: 474-475 [*Paroecanthus*].

Guatemala (leg. Rodriguez). Two ♀.

Two ♀ syntypes. A ♀ with labels: "3 18 ♀ Guate-, mala, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus niger Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left middle leg, the tibia and tarsi of the right middle leg and the tarsi of the right hind leg are missing. A ♀ with labels: "3 18 ♀ Guate- mala, M H. d. Sauss." [handwritten on ruled white card]; "Paroecanthus niger Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna is missing. Box A27.

Siccotrella niger Saussure, 1874.

nigritus Saussure, 1877: 94-95 [*Nemobius*].

Java (Musée i. de Vienne). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, labelled as the holotype by Gorochoy, in the NHMW.

Pteronemobius nigritus (Saussure, 1877).

nigritus Saussure, 1899: 607 [*Piestoxiphus*].

Nossi-Bé. Unspecified number of ♀.

One ♀ syntype with labels: "VOELTZKOW, Nossi-Bé" [printed on white paper with "Nossi-Bé" handwritten]; "Piestoxiphus nigritus Sss. & Adl. [sic]" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; both antennae, both front legs, both middle legs and the right hind leg are lost. The left hind leg is detached and secured through the femur on the original pin. There is further type material in the SMFD (images on SysTax). Box A23.

Trigonidium nigritum Saussure, 1899.

niloticus Saussure, 1877: 221-222 [*Gryllodes*].

Egypte (coll. Brunner n^{os} 11275 & 11271; Mus. de Berlin). Three ♂ and three ♀.

The specimens placed under this name in the MHNG collection were collected in what was then Syria, and are not part of the type series. There are at least two syntypes in the NHMW collection, a ♂ has been labelled lectotype and a ♀ labelled paralectotype, but the lectotype does not seem to have been formally designated.

Turanogryllus niloticus (Saussure, 1877).

novarae Saussure, 1878: 469-470 [*Homoeoxiphus*].

Java, Batavia (Mus. i. de Vienne). Unspecified number of ♀.

No specimens found in the MHNG or in the NHMW, the whereabouts of the type material is unknown.

Trigonidium novarae (Saussure, 1878).

novarae Saussure, 1877: 315-316 [*Liphoplus*].

Tahiti (Mus. i. de Vienne, voyage de la "Novara"). Unspecified number of ♂.

There are a ♂ and a ♀ placed under this name in the MHNG collection, both with the locality label "Iles Tonga, Oc. Pacif." meaning that these are not part of the type series. There is a ♂ syntype, labelled as the holotype, in the NHMW collection. Box A18.

Ornebius novarae (Saussure, 1877).

novarae Saussure, 1877: 83-84, fig. 10 [*Nemobius*].

Java (Musée i. de Vienne (Voyage de la Novara), Musée de Leyde). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is a syntype, incorrectly labelled as the holotype, in the NHMW.

Pteronemobius novarae (Saussure, 1877).

obtusus Saussure, 1899: 604, fig. 7 [*Loxoblemmus*].

Nossi-Bé. Unspecified number of ♂.

No specimens found in the MHNG. The type material ought to be in the SMFD, but does not appear on SysTax.

Loxoblemmus obtusus Saussure, 1899.

occultus Saussure, 1877: 299 [*Mogisoplistus*].

Chili (Mus. de Berlin n° 1005). One damaged specimen.

No specimens found in the MHNG. The holotype is in the ZMHB according to SysTax. Images on SysTax.

Ornebius occultus (Saussure, 1877).

ocellaris Saussure, 1878: 658-659 [*Aphonus*].

Zanzibar. Unspecified number of ♀.

No specimens found in the MHNG. There is a syntype from Brunner's collection in the NHMW.

Aphonoides ocellaris (Saussure, 1878).

ocellaris Saussure, 1874a: 440-441 [*Heterogryllus*].

Brésil (Musée de Paris). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the MNHN according to OSF.

Heterogryllus ocellaris Saussure, 1874.

ocellaris Saussure, 1897: 270, 273 [*Orocharis*].

Guatemala, Capetillo (Champion). Unspecified number of ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Orocharis ocellaris Saussure, 1897.

ocularis Saussure, 1899: 606-607 [*Piestoxiphus*].

Nossi-Bé. Unspecified number of ♂ and ♀.

One ♀ syntype with labels: "VOELTZKOW, Nossi-Bé" [printed on white paper with "Nossi-Bé" handwritten]; "Piestoxiphus ocellaris Sss & Ad. ♀" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the right front leg and the last tarsal segment of the left hind leg are lost. The whereabouts of the rest of the type material is unknown. Box A23.

Metioche ocellaris (Saussure, 1899).

olmeca Saussure, 1874a: 467-468 [*Ectotrypa*].

Mexique (Musée de Paris). One damaged ♀.

No specimens found in the MHNG. The ♀ holotype is in the MNHN according to OSF.

Ectotrypa olmeca Saussure, 1874.

olmecus Saussure, 1897: 236-237; pl. 11, figs 42-43 [*Cyrtoxiphus*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the BMNH (Marshall, pers. comm.).

Anaxipha olmeca (Saussure, 1897).

olmecus Saussure, 1897: 262, 264; pl. 13, figs 16-17 [*Paroecanthus*].

Mexico, Atoyac in Vera Cruz (Schumann, ♀), Jalapa (M. Trujillo, ♂). Unspecified number of ♂ and ♀.

One ♀ syntype with labels: "Atoyac, Vera Cruz, Schumann" [printed on white card]; "Paroecanth. olmecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, the right front leg, the last tarsal segment of the right middle leg and the right hind leg are missing. There is further type material in the BMNH according to their online database. Box A27.

Selvagryllus olmecus Saussure, 1897.

ornata Saussure, 1874a: 480 [*Diatrypa*].

Surinam? Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Diatrypa ornata Saussure, 1874.

ornaticeps Saussure, 1877: 178-179 [*Gryllus*].

Côte-d'Or (Musée de Leyde). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. According to OSF the type material is lost. *Grylloderes ornaticeps* (Saussure, 1877). (Treated as a *nomen dubium* in OSF).

parabolicus Saussure, 1877: 258-259, fig. xvi, 6 [*Loxoblemmus*].

Java (coll. Brunner de Wattenwyl n° 8605 & Mus. de Leyde). More than one ♂.

No specimens found in the MHNG. There is a ♂ syntype in the NHMW.

Loxoblemmus parabolicus Saussure, 1877.

paranae Saussure, 1878: 433-435, fig. lxxxii [*Hemicophus*].

Parana (Musée de Munich). Unspecified number of ♂.

No specimens found in the MHNG. According to OSF the type material is in the ZSMC.

Hemicophus paranae Saussure, 1878.

paranae Saussure, 1874a: 386 [*Nemobius*].

République Argentine (leg. Claraz). Unspecified number of ♀.

One ♀ syntype with labels: "♀ Buenos Ayres, Rep Arg., env. G. Claraz" [handwritten on ruled white card]; "Nemobius paranae Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with right forewing slightly spread; the left wings and the legs of the left side are missing. There is a ♀ specimen labelled as a type in the NHMW. Box A5.

Pteronemobius paranae (Saussure, 1874).

parvipennis Saussure, 1874a: 419-420 [*Grylloides*].

Brésil, Sainte-Catherine (Musée de Paris). Unspecified number of ♀.

One ♀ syntype with labels: "♀ S^t Catherina, Brésil, M^r H de Saussure" [handwritten on ruled white card with "Brésil" printed]; "Grylloides parvipennis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Both antennae, the claw of the right front leg, the entire right middle leg and both hind legs are missing. No syntypes could be located in the MNHN (Desutter, pers. comm.). Box A14.

A junior synonym of *Miogryllus convolutus* (Johannson, 1763).

parvulus Saussure, 1899: 613 [*Oecanthus*].

Nossi-be; Aldabra. Unspecified number of ♂ and ♀.

One ♂ and one ♀, both syntypes. A ♂ with labels: "VOELTZKOW, Nossi-Bé" [printed on white paper with "Nossi-Bé" handwritten]; "Oecanthus parvulus Sss. & Adl. [sic]" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae, both front legs and both middle legs are missing. The left hind leg, which lacks the tarsi, is detached and glued to the locality label. A ♀ with labels: "VOELTZKOW, Nossi-Bé" [printed on white paper with "Nossi-Bé" handwritten]; "Oecanthus parvulus Sss. & Adl. [sic]" [handwritten on pink paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna, both front and both middle legs are missing. There are further syntypes in the SMFD (images in OSF). Box A22.

A junior synonym of *Oecanthus brevicauda* Saussure, 1878.

patagonus Saussure, 1874a: 421-422, fig. 12 [*Grylloides*].

Le nord de la Patagonie et le sud de la République Argentine (leg. Claraz). Unspecified number of ♂ and ♀.

One ♂ and two ♀, all syntypes. A ♂ with labels: "L. Bahia Blanca, ♂ Rep. Arg., envoi G. Claraz" [handwritten on ruled white card]; "Grylloides patagonus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of the right antenna is missing. A ♀ with labels: "L. Bahia Blanca, ♀ Rep. Arg., envoi

G. Claraz" [handwritten on ruled white card]; "Grylloides patagonus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The right antenna, both front legs, the last tarsal segment of the left middle leg and the last tarsal segment of both hind legs are missing. The ovipositor is broken off near the base. A ♀ with labels: "L Buenos Ayres, ♀ Rep. Arg., envoi G. Claraz" [handwritten on ruled white card]; "Grylloides patagonus Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of both antennae and the right hind leg are missing. The ovipositor is broken off near the base. The specimen from Brunner's collection in the NHMW was collected by Fruhstorfer after the publication of the description and is not a syntype. Box A14.

Neogrylloides patagonus (Saussure, 1874).

peruviana Saussure, 1874a: 378-379 [*Cyrtoxipha*].

Pérou, Tarma (leg. Telski & Dobwski). Unspecified number of ♂.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Anaxipha peruviana peruviana (Saussure, 1874).

peruvianus Saussure, 1874a: 511-512 [*Aphonus*].

Pérou, Tarma (leg. Telsky). Unspecified number of ♂.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Aphonomorphus peruvianus (Saussure, 1874).

peruviensis Saussure, 1874a: 406-407 [*Gryllus*].

Pérou, Moyabamba. Unspecified number of ♂.

One ♂ and one juvenile, both syntypes. A ♂ with labels: "♂ Moyabamba, Perou, M H de Saussure" [handwritten on ruled white card with "Perou" printed]; "Gryllus peruviensis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Only the left hind leg, secured through the femur, remains of this specimen. A nymph with labels: "L. Perou, M H de Saussure" [handwritten on ruled white card with "Perou" printed]; "Gryllus peruviensis Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of both antennae and the last tarsal segment of the left hind leg are missing. Box A10.

Gryllus peruviensis Saussure, 1874.

petersi Saussure, 1878: 578-580, fig. lxii, 3 [*Calyptotrypus*].

Sennaar (Musée de Berlin n° 3248). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB. Images in OSF.

Madasumma petersi (Saussure, 1878).

phalangium Saussure, 1874a: 450-451 [*Amphiacusta*].

Amérique centrale (leg. Rodriguez). Unspecified number of ♂.

One ♂ syntype with labels: "2 14 Guatemala, M H. d. Sauss." [handwritten on ruled white card]; "Aphiacustes phalangium Sss." [handwritten on green paper];

“Phalangium ♂ Sauss” [handwritten on foxed white paper]; “Syntypus” [printed on red paper]. Most of the left antenna, the tarsi of the left front leg, the right front leg, the tarsi of the right middle leg and the tarsi of both hind legs are missing. A second specimen in the MHNG is on currently loan. Box A21.

Prolonguripes phalangium (Saussure, 1874).

phthisicus Saussure, 1878: 555-556, fig. liii [*Stenogryllus*].

St-Domingue (coll. Brunner de Wattenwyl n° 6594). Unspecified number of ♀. No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Stenogryllus phthisicus Saussure, 1878.

pictus Saussure, 1878: 521-522 [*Cardiodactylus*].

Moluques (coll. Brunner de W. n° 5802). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is at least one syntype in the NHMW.

Cardiodactylus pictus Saussure, 1878.

pictus Saussure, 1897: 237 [*Cyrtoxiphus*].

Panama (coll. Brunner von Wattenwyl n° 11765). Unspecified number of ♂.

The two specimens placed under this name in the MHNG collection were collected in 1922 and are therefore not part of the type series. There is a specimen from Panama with the Brunner collection number 11765 in the NHMW collection which is probably a syntype but this specimen is not labelled as such and is currently placed under *Anaxipha angusticollis* Saussure. Box A24.

Symphylloxiphus picta (Saussure, 1878).

pictus Saussure, 1877: 277 [*Landrevus*].

Ceylan (Mus. de Berlin n° 3154, leg. Nietner). Unspecified number of ♀.

No specimens found in the MHNG. According to OSF the type material is in the ZMHB.

A junior synonym of *Jareta insignis* (Walker, 1869).

pictus Saussure, 1877: 67-68, fig. 6 [*Pseudonemobius*].

Cashmir (Mus. i. de Vienne). One ♂ and two ♀.

One possible ♀ syntype with labels: “♀ Indes or., Ms Hy de Sauss.” [printed on ruled white card]; “Pseudonemobius pictus Sauss.” [handwritten on yellow paper]; “Possible syntype of *P. pictus* Sauss., Hollier 2011” [handwritten on red paper]. The specimen is card mounted, possibly after having broken where the pin was inserted because the head, prothorax and front legs are missing. There are two specimens collected by Carl Hügel in Kashmir in the NHMW collection which are probably syntypes although they are not labelled as such. Another specimen also collected by Hügel, but from Sri Lanka, has been labelled as lectotype, although this designation does not seem to have been published (and the locality would exclude it from the type series). Box A5.

Paranemobius pictus (Saussure, 1877).

pipilans Saussure, 1897: 258; pl. 13, fig. 1 [*Phyllogryllus*].

Guiana, Cayenne (Mus. Genavense, leg. Prudhomme). Unspecified number of ♂.

Two ♂ syntypes. A ♂ with labels: "CAYENNE" [printed on a strip of green paper]; "Phyllogryllus, g - n, pipilans Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the last tarsal segment of the right front leg and the tarsi of both hind legs are lost. A ♂ with labels: "CAYENNE" [printed on a strip of green paper]; "Phyllogryllus, g - n, pipilans Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; the left front and right hind legs are detached and glued to a piece of card on the original pin. Box A26.

Phyllogryllus pipilans Saussure, 1897.

planiceps Saussure, 1878: 572-573, fig. lxii, 9 [*Calyptotrypus*].

Le nord de la Nouvelle-Hollande, Cap York (coll. Brunner de Wattenwyl n° 6081). More than one ♀ (variation of ovipositor mentioned).

No specimens found in the MHNG or the NHMW, the whereabouts of the type series is unknown.

Madasumma planiceps (Saussure, 1878). (Regarded as *nomen dubium* in OSF).

platyceps Saussure, 1878: 618-620, fig. lxxviii [*Tapinotus*].

Nouvelle-Calédonie (coll. Brunner de Wattenwyl n° 6678). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ specimen under this name in the NHMW with the Brunner collection number 6678, but this is from Damara (Namibia) and has a label stating that it is not a type. It is possible that the locality cited in the description or the data label is a lapse, and that this specimen is a syntype.

Tamborina platyceps (Saussure, 1878). (Regarded as *nomen dubium* in OSF).

plebejus Saussure, 1877: 165-166 [*Gryllus*].

Philippines (coll. Brunner de Wattenwyl n° 3006). Unspecified number of ♀.

One possible ♀ syntype with labels: "PHILIPPINES, M. PETEL, 603 - 74" [printed on white paper with numerals handwritten]; "Gryllus plebejus Sauss." [handwritten on yellow paper]; "Possible syntype of G. plebejus Sauss., Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; most of both antennae are missing. The hind legs are detached and secured through the femur on the original pin, the right hind leg lacks the tarsi. There are two ♀ syntypes in the NHMW collection that have been labelled as lectotype and paralectotype but a formal designation does not seem to have been published. Box A11.

Plebeigryllus plebejus (Saussure, 1877).

podagrosus Saussure, 1897: 262, 264-265; pl. 13, figs 7-11 [*Paroecanthus*].

Guatemala, Senahu in Vera Paz (Champion); Panama, Bugaba and La Caldera in Chiriqui (Champion). More than one ♂ and ♀.

One ♂ syntype with labels: "Bugaba, 800-1,500 ft., Champion" [printed on white card]; "Paroecanth. podagrosus Sss." [handwritten on green paper]; "Syntypus"

[printed on red paper]. Specimen set with wings folded; most of both antennae is missing. There is further type material in the BMNH according to their online database. Box A27.

Angustitrella podagrosa (Saussure, 1897).

poeyi Saussure, 1874a: 420-421, fig. 8 [*Grylloides*].

Cuba (leg. Poey); Brésil. Unspecified number of ♂ and ♀.

Three ♂ syntypes. A ♂ with labels: "♂ Cuba, M H de Saussure" [handwritten on ruled white card with "Cuba" printed]; "Grylloides Poeyi Sss." [handwritten on green paper]; "Grylloides sigillatus (Walker), Det. R. L. Randell, 1963" [determination handwritten on white card with "Det. R. L. Randell, 19" printed]; "Syntypus" [printed on red paper]. Most of both antennae, the tibia and tarsi of the right hind leg and the entire left hind leg are lost. A ♂ with labels: "♂ Cuba" [handwritten on ruled white card]; "Grylloides Poeyi Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of both antennae, both hind legs and both cerci are lost. A ♂ with labels: "♂ Cuba" [handwritten on ruled white card]; "Grylloides Poeyi Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of the right antenna, the last tarsal segment of the right front leg, the entire left middle leg and both hind legs are missing. Box A14.

A junior synonym of *Grylloides sigillatus* (Walker, 1869).

priapus Saussure, 1878: 648-649, fig. lxx, 3 [*Podoscirtus*].

Nouvelle-Calédonie (coll. Brunner de Wattenwyl n° 5964). Unspecified number of ♂ and ♀.

No specimens found in the MHNG or the NHMW. Gorochov (2003: 299) designated a neotype in the ZIAS.

Matuanus priapus (Saussure, 1878).

pulchellus Saussure, 1878: 401-403, fig. 1 [*Pentacentrus*].

Ile de Ceylan (Musée de Berlin n° 3171). More than one ♀ (colour variation mentioned).

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

Pentacentrus pulchellus Saussure, 1878.

pulex Saussure, 1877: 96-97 [*Nemobius*].

Australie septentrionale (coll. Brunner de Wattenwyl n° 6426). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the NHMW.

A junior synonym of *Pteronemobius regulus* (Saussure, 1877).

pulvillatus Saussure, 1877: 124-126 [*Brachytrypus*].

Java (Musée de Leyde). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the RMNH.

Gymnogryllus pulvillatus (Saussure, 1877).

pusillus Saussure, 1878: 486 [*Cyrtoxiphus*].

Ceylan (leg. Humbert). Two ♀.

There are no specimens under this name in the MHNG collection. The single ♀ placed under the name *C. longipennis* Serville is labelled as coming from Mauritius and is therefore not part of the type series. The whereabouts of the type material is unknown. Box A24.

A junior synonym of *Natula longipennis* (Serville, 1838).

quadrinaculatus Saussure, 1877: 172-173 [*Gryllus*].

Indes orientales. Unspecified number of ♂ and ♀.

One ♂ syntype with labels: "♂ Indes Or., M H de Saussure" [handwritten on ruled white card with "Indes Or." printed]; "Gryllus 4-maculatus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the right middle leg and the last tarsal segment of the left hind leg are missing. The right hind leg, which lacks the last tarsal segment, is detached and glued to a card on the original pin. Box A11.

Gryllus quadrinaculatus quadrinaculatus Saussure, 1877.

quadristrigatus Saussure, 1877: 166-167 [*Gryllus*].

Afrique tropicale, le Sennar, la Côte-d'Or; Indes orientales, la côte de Coromandel. Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Grylloderes quadristrigatus (Saussure, 1877).

regulus Saussure, 1877: 87 [*Nemobius*].

Nouvelle-Hollande, Adélaïde (Musée de Leyde). Unspecified number of ♀.

No specimens found in the MHNG. The ♂ neotype, designated by Otte & Alexander (1983: 177), is in the ANIC.

Pteronemobius regulus (Saussure, 1877).

regulus Saussure, 1878: 650 [*Podoscirtus*].

Amboine (Musée i. de Vienne). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, labelled as the holotype, in the NHMW.

Munda regulus (Saussure, 1878).

rex Saussure, 1874a: 442-443 [*Paragryllus*].

Brésil (Musée de Leipzig). One damaged ♂.

No specimens found in the MHNG. According to OSF the ♂ holotype is in the SMTD.

Paragryllus rex Saussure, 1874.

ritsemæ Saussure, 1878: 669-670 [*Aphasius*].

Iles de Sonde, Timor (Musée de Leyde). Unspecified number of ♂ and more than one ♀ (variation of femur mentioned).

One ♂ possible syntype with labels: "♂ Timor, M. H de Saussure" [handwritten on ruled white card]; "Aphasius Ritsemæ Sauss." [handwritten on yellow paper]; "Possible syntype of *A. ritsemæ* Sauss. Hollier 2011" [handwritten on red paper]. Specimen set with wings folded; the right antenna and both middle legs are lost. The insect box contains specimens of other species labelled by Saussure as de Haan types, and so it seems likely that he acquired material from Leiden by gift or exchange. There are syntypes in the RMNH according to OSF. Box A29.

Aphasius ritsemæ (Saussure, 1878).

ritsemæ Saussure, 1878: 485-486 [*Cyrtoxiphus*].

Java (Musée de Leyde). Unspecified number of ♂ and ♀.

The MHNG collection includes two specimens under this name from Java, but both of these have the identification label "*Cyrtoxiphus ritsemæ* Sauss.?" and are therefore unlikely to be part of the type series. According to OSF there are syntypes in the RMNH.

A junior synonym of *Homoeoxipha lycoides lycoides* (Walker, 1869).

ritsemæ Saussure, 1877: 276-277, fig. xxxv, 4 [*Landrevus*].

Java (Musée de Leyde). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the RMNH.

Endolandrevus ritsemæ (Saussure, 1877).

ritsemæ Saussure, 1877: 136 [*Liogryllus*].

Japon (Musée de Leyde). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the RMNH.

Phonarellus ritsemæ (Saussure, 1877).

rodriguezi Saussure, 1874a: 497-498 [*Orocharis*].

Amérique centrale (leg. Rodriguez). One ♀.

Holotype ♀ with labels: "2 14 Guate-, mala, M H. d. Sauss." [handwritten on ruled white card]; "G. Rodriguez Sauss., Amér. centrale" [handwritten on white paper]; "*Orocharis rodriguezi* Sauss." [handwritten on green paper]; "Holotypus" [printed on red card]. Specimen set with wings folded; the left antenna, right front leg, left middle leg, two tarsal segments of the left hind leg and the right hind leg are lost. Box A28.

Antillicharis rodriguezi (Saussure, 1874).

rogenhoferi Saussure, 1877: 329-330, fig. xxxii, 2 [*Cachoplistus*].

Kashmir (Musée de Vienne). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, labelled as the holotype, in the NHMW.

Cacoplistes rogenhoferi Saussure, 1877.

rogenhoferi Saussure, 1878: 410-411, fig. xxxvii [*Larandus*].

Brésil (Musée de Vienne). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Laranda rogenhoferi Saussure, 1878.

rolphi Saussure, 1878: 605-606 [*Apithes*].

Brésil (Musée de Leipzig). Unspecified number of ♀.

No specimens found in the MHNG. The type material is in the MNSL according to OSF.

Hapithus rolphi (Saussure, 1878).

rostratus Saussure, 1877: 274-276, fig. xxxv, 2 [*Landrevus*].

Amboine (coll. Brunner de Wattenwyl n° 5434); Nouvelle-Guinée (Mus. de Leyde). More than one ♂ and an unspecified number of ♀.

No specimens found in the MHNG. The ♂ lectotype (designated by Gorochov, 1985b: 18) is in the NHMW.

Endolandrevus rostratus (Saussure, 1877).

rufidulus Saussure, 1878: 523 [*Cardiodactylus*].

Nouvelle-Hollande (Muséum de Paris). One damaged ♀.

The specimen placed under this name in the MHNG collection is labelled as being from New Guinea. It is a ♀ and lacks the hind legs, as did the holotype, and it is possible that the locality in the description or the label is a lapse. Otte & Alexander (1983: 310) regard the name as a *nomen dubium* because they could not find the type in the MNHG or the MNHN. Box A25.

Cardiodactylus rufidulus Saussure, 1878. (Regarded as *nomen dubium* in OSF).

rufidulus Saussure, 1878: 648 [*Podoscirtus*].

Nouvelle Calédonie (coll. Brunner de Wattenwyl). Unspecified number of ♀.

The specimen placed under this name in the MHNG collection is a ♂ and so not a syntype. There is a ♀ syntype in the NHMW. Box A29.

Matuanus rufidulus (Saussure, 1878).

rufus Saussure, 1877: 88-89 [*Nemobius*].

Brésil (coll. Brunner de Wattenwyl n° 1112). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the NHMW.

Pteronemobius rufus (Saussure, 1877).

saltator Saussure, 1874a: 438-439 [*Dyscophus*].

Brésil (Musée de Paris); Pérou (leg. Telski). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. There is a ♀ syntype in the MNHN (Desutter, pers. comm.).

Dyscophogryllus saltator (Saussure, 1874).

saltator Saussure, 1877: 226-227 [*Grylloides*].

Afrique centrale, Bar-el-Abaid (Musée de Leyde). One ♂ nymph.

No specimens found in the MHNG. The ♂ holotype is in the RMNH according to OSF.

Gryllopsis saltator (Saussure, 1877).

saltator meridionalis Saussure, 1897: 276 [*Orocharis*].

Mexico, Teapa in Tabasco (H. H. Smith); Guatemala, Mirandilla (Champion).

Unspecified number of ♂ and ♀.

No specimens found in the MHNG, or in the BMNH (Marshall pers. comm.).

The whereabouts of the type material is unknown.

A junior synonym of *Orocharis mexicanus* Saussure, 1897.

scitulus Saussure, 1878: 469 [*Homoeoxiphus*].

Java. Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Anaxipha scitula (Saussure, 1878).

scudderianus Saussure, 1874a: 402 [*Gryllus*].

Amérique septentrionale (Musée de Paris). Unspecified number of ♂ and ♀.

One ♀ syntype with labels: "♀ Amér. Sept., M H de Saussure" [handwritten on ruled white card]; "Gryllus Scudderianus Sauss. ♀" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings roughly folded; both antennae, the last tarsal segment of the right front leg and the entire left hind leg are missing. There is a ♀ which is probably a syntype in the MNHN (Desutter, pers. comm.).

Gryllus scudderianus Saussure, 1874.

servillii Saussure, 1877: 156-158 [*Gryllus*].

Replacement name for *G. fuliginosus* Serville, 1838, the type of which was examined by Saussure in the MNHN and considered to be distinct from *G. fuliginosus* Stoll, 1813. The MHNG collection includes a long series from Australia which was used for the measurements given by Saussure but which are not syntypes. Boxes A10 and A11.

A junior synonym of *Teleogryllus commodus* (Walker, 1869).

setosus Saussure, 1877: 279-280, fig. xxv, 6 [*Odontogryllus*].

Pérou (Musée de Genève). Unspecified number of ♂.

One ♂ syntype with labels: "Perou" [printed on ruled white card]; "Odontogryllus setosus Sauss." [handwritten on green paper]; "Holotypus Odontogryllus setosus Sss., (nymph ♂)" [handwritten on red card with "Holotypus" printed]; "Series not specified: treat as syntype, Hollier 2011" [handwritten on red paper]. Most of both antennae, the right front leg, the claws of the left front and middle legs and the last tarsal segments of both hind legs are lost. Some dissected parts are sealed into a plastic vial secured on the original pin. Box A17.

Odontogryllus setosus Saussure, 1877.

siamensis Saussure, 1878: 528-529 [*Piestodactylus*].

Siam (Musée de Halle). Unspecified number of ♀.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Eurepa siamensis (Saussure, 1878). (Species not treated in OSF).

sibilans Saussure, 1878: 562-563 [*Diatrypus*].

Porto-Rico (coll. Brunner de Wattenwyl). One damaged ♀.

No specimens found in the MHNG or the NHMW, the whereabouts of the holotype is unknown.

Antillicharis sibilans (Saussure, 1878).

sigmoidalis Saussure, 1878: 628 [*Euscirtus*].

Philippines, Luçon (Mus. de Berlin n° 3153). Unspecified number of ♀ (and ♂?).

One ♂ possible syntype with labels: “♂ Philippines” [handwritten on ruled white card]; “*Euscirtus sigmoidalis* Sss.” [handwritten on yellow paper]; “Possible syntype of *E. simoidalis* Sauss., Hollier, 2011” [handwritten on red paper]. The other specimen placed under this name in the MHNG was collected after the publication of the description. There is at least one syntype in the ZMHB (images in OSF). Box A28.

Euscirtus sigmoidalis Saussure, 1878.

silens Saussure, 1878: 665-666 [*Aphonus*].

Brésil? (Musée de Dresde). Unspecified number of ♂.

No specimens found in the MHNG. The whereabouts of the type material is unconfirmed.

Aphonomorphus silens (Saussure, 1878).

simillimus Saussure, 1878: 544-545, fig. li, 1 [*Heterotrypus*].

Amboine (Musée de Leyde). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype, referred to as the holotype in OSF, in the RMNH.

Phaloria simillima (Saussure, 1878).

simodus Saussure, 1878: 590-591 [*Calyptotrypus*].

Philippines (coll. Br. de Wattenwyl n° 3008). Unspecified number of ♂.

No specimens found in the MHNG. There is a ♂ syntype in the NHMW.

A junior synonym of *Mnesibulus lineolatus* Stål, 1877.

smithi Saussure, 1897: 236 [*Cyrtoxiphus*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♂.

One ♂ syntype with labels: “Teapa, Tabasco, Feb., H. H. S.” [printed on white card]; “*Cyrtoxiph. smithii* ♂ Sss.” [handwritten on green paper]; “*Syntypus*” [printed on red paper]. Specimen set with wings folded; most of both antennae, both middle

legs and both hind legs are lost. There is at least one further syntype in the BMNH (Marshall, pers. comm.). Box A24.

Anaxipha smithi (Saussure, 1897).

smithianus Saussure, 1897: 283, 284; pl. 13, fig. 35 [*Heterecous*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♀.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Heterecous smithianus Saussure, 1897.

spectrum Saussure, 1878: 446-447 [*Phaeophyllacris*].

Zanzibar (coll. Brunner de Wattenwyl n° 989). One damaged ♂.

No specimens found in the MHNG. The ♂ holotype is in the NHMW, preserved in alcohol.

Phaeophilacris spectrum Saussure, 1878.

spiculatus Saussure, 1878: 682, fig. lxxv [*Parametrypa*].

Afrique méridionale, Natal (coll. Brunner de Wattenwyl n°s 6314 & 3314; Mus. i. de Vienne). More than one ♀.

No specimens found in the MHNG. There are three specimens under this name in HNMW, at least one of which, with labels “Bröger, Pt. Natal 1872”, “Parametrypa” and “Spiculatus Sauss., Natal ♀ Type!” is a syntype.

A junior synonym of *Parametrypa fortipes* (Walker, 1869).

steini Saussure, 1877: 313 [*Arachnocephalus*].

Philippines, Luçon (Musée de Berlin n° 3152). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The syntypes are in the ZMHB (images on SysTax).

Arachnocephalus steini Saussure, 1877.

steini Saussure, 1878: 586-587, fig. lxii, 10 [*Calypotrypus*].

Guinée (Musée de Berlin). One damaged ♂.

No specimens found in the MHNG. The ♂ holotype is in the ZMHB according to OSF (images in OSF).

Kilimagryllus steini (Saussure, 1878).

stramineus Saussure, 1878: 482 [*Cyrtoxiphus*].

Iles Viti, Ovalou (cat. Godeffroy n° 4639). Two ♂.

Two ♂ syntypes. A ♂ with labels: “♂ Ovalou, Iles Viti, Oceanie, M H. de Saussure” [handwritten on ruled white card]; “Cyrtoxiphus stramineus Sauss.” [handwritten on lilac paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; both antennae, both front legs, the right middle leg and the tarsi of the right hind leg are missing. The specimen appears to have split where transfixed by the pin and been repaired with glue. A ♂ with labels: “♂ Opulu, Oceanie, M H. d. Sauss.” [handwritten on ruled white card]; “Cyrtoxiphus stramineus Sauss.” [handwritten on

lilac paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; both front legs, both middle legs and the left hind leg are lost. The status of the second specimen as a syntype is less certain since it has slightly different locality data from that given in the original description, but the label looks more recent than that of the other specimen and may have been added carelessly. Box A24.

Anaxipha straminea (Saussure, 1878).

subsulcatus Saussure, 1899: 604-605 [*Arachnocephalus*].

Insula Aldabra. Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the SMFD (images on SysTax).

Arachnocephalus subsulcatus Saussure, 1899.

sulcatus Saussure, 1897: 262, 263; pl. 13, figs 12-13 [*Paroecanthus*].

Guatemala, San Gerónimo (Champion). One damaged ♂.

No specimens found in the MHNG. The type material is in the BMNH according to their online database.

Siccotrella sulcatus Saussure, 1897.

taciturnus Saussure, 1878: 661 [*Aphonus*].

[Provenance unknown] (Musée de Dresde). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the SMTD.

Aphonoides taciturnus (Saussure, 1878).

tacitus Saussure, 1878: 471-472 [*Homoeoxiphus*].

Océanie. Unspecified number of ♂.

One ♂ syntype with labels: “♂ Océanie” [handwritten on ruled white card]; “Homeoxiphus tacitus Sauss.” [handwritten on lilac paper]; “Syntypus” [printed on red paper]. Specimen set with wings roughly folded; most of both antennae, the left middle leg and both hind legs are lost. The left front leg is detached and glued to a piece of card on the original pin. The original, very fine, pin with the card mount and locality label, have been pinned to a piece of cork on a second pin, which carries the other labels. Box A23.

Metioche tacitus (Saussure, 1878).

tacitus Saussure, 1878: 652-653 [*Podoscirtus*].

Guinée? Java? (Mus. de Genève). Two ♂.

Two ♂ syntypes. A ♂ with labels: “♂ Guinée, M. Sarasin” [handwritten on ruled white card]; “Podoscirtus tacitus Sss.” [handwritten on pink paper]; “Syntypus” [printed on red paper]. Specimen set with wings spread, most of the left forewing is missing; two tarsal segments of the left front and right middle legs, most of the tibia and the tarsi of the left middle leg and both hind legs are lost. A ♂ with labels: “♂ Guinée, M. Sarasin” [handwritten on ruled white card]; “Podoscirtus tacitus Sss.” [handwritten on pink paper]; “Syntypus” [printed on red paper]. Specimen set with

wings spread; the left antenna, left front leg, both middle legs and the last tarsal segment of both hind legs are lost. Box A29.

Munda tacita (Saussure, 1878).

tahitense Saussure, 1878: 465 [*Trigonidium*].

Tahiti (Mus. i. de Vienne). Unspecified.

The specimen placed under this name in the MHNG collection is from Java and thus not part of the type material. There is a ♂ syntype in the NHMW. Box A22.

Rhicnogryllus tahitensis tahitensis (Saussure, 1878).

taicoun Saussure, 1877: 256 [*Loxoblemmus*].

Japon (Mus. i. de Vienne); Java (Mus. de Darmstadt & de Dresde). Unspecified number of ♂ and more than one ♀ (some measurements given as range).

No specimens found in the MHNG. There are three specimens from Yokohama, one ♂ and two ♀, in the NHMW which are probably syntypes.

Loxoblemmus taicoun Saussure, 1877.

tapinopus Saussure, 1878: 407-409, fig. lxxxii [*Agnotecous*].

Nouvelle Calédonie (coll. Brunner de Wattenwyl n° 5965). One ♂.

No specimens found in the MHNG or the NHMW. The neotype, designated by Desutter-Grandcolas (1997: 169), is in the MNHN.

Agnotecous tapinopus Saussure, 1878.

tartarus Saussure, 1874b: 34 [*Gryllus*].

Valle Sarafschanense. Unspecified number of ♀.

One ♀ syntype with labels: "2 17 Turkest., M^r H. d. Sauss." [handwritten on rule white card]; "Gr. Tartarus Sauss. ♀, Turkestan, M. H. S." [handwritten on white paper]; "Gryllus tartarus Sauss." [handwritten on yellow paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the left antenna and two tarsal segments of the right hind leg are missing. Box A12.

Tartarogryllus tartarus (Saussure, 1874).

tartarus Saussure, 1874b: 36 [*Nemobius*].

Prope Maracandam et in Caucaso. Unspecified number of ♂ and ♀.

Lectotype ♂ (designated by Vickery & Johnstone, 1970: 1747) with labels: "Samarkand" [printed in Cyrillic characters on a strip of white card]; "♂ Turkest., M H. d. Sauss." [handwritten on ruled white card]; "Nemobius tartarus Sss." [handwritten on yellow paper]; "LECTOTYPE, Nemobius tartarus Saussure, 1874. Designated by Vickery & Johnstone, 1970" [handwritten on red card with "TYPE" printed]. Specimen set with wings folded; the right antenna, the right middle leg and the tarsi of both hind legs are missing. There are also one ♂ and one ♀ paralectotype in the collection. Box A5.

Pteronemobius heydenii tartarus (Saussure, 1874).

telskii Saussure, 1874a: 511 [*Aphonus*].

Pérou (leg. Telsky); Brésil, Santa-Cruz (Muséum de Paris). Unspecified number of ♂ and ♀.

One ♂ syntype with labels: “♂ Tarma, Perou, M H. de Saussure” [handwritten on ruled white card with “Perou” printed]; “Aphonus Telskii Sss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; the right antenna is missing. The left hind leg is detached and glued to the locality label. No syntypes could be located in the MNHN (Desutter, pers. comm.). Box A29.

Aphonomorphus telskii (Saussure, 1874).

temulentus Saussure, 1878: 413-414 [*Paragryllus*].

Brésil (Musée de Berlin n° 939). More than one ♂ (colour variation mentioned).

The specimens placed under this name in the MHNG collection are from Costa Rica and not part of the type series. There is a ♂ syntype, referred to as the holotype in OSF, in the ZMHB. Box A19.

Paragryllus temulentus Saussure, 1878.

terebrans Saussure, 1878: 655-656, fig. lxxii [*Anaudus*].

Zanzibar (coll. Brunner de Wattenwyl n° 10492). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Paranaudus terebrans (Saussure, 1878).

terebrans Saussure, 1897: 271, 277 [*Orocharis*].

Antilles, Porto Rico (Mus. Genavense). Unspecified number of ♀.

Two ♀ syntypes. A ♀ with labels: “♀ Porto Rico” [handwritten on ruled white card]; “*Orocharis terebrans* Sss.” [handwritten on green paper]; “LECTOTYPUS, selected by T. J. Walker, 1970” [handwritten on white card]; “Syntypus” [printed on red paper]. Specimen set with wings folded; both antennae, the tarsi of the right middle leg and the left hind leg are missing. A ♀ with labels: “♀ Portorico, M. H de Saussure” [handwritten on ruled white card]; “*Orocharis terebrans*” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with wings folded; most of the left antenna, the last tarsal segment of both front legs, the left middle leg, the last tarsal segment of the right middle leg and the last tarsal segment of both hind legs are missing. The hind legs appear to have been reattached with glue. The lectotype has not been formally designated, but it is considered by Walker to be con-specific with specimens that were later used to describe *Carylla tenebrans* Otte & Perez-Gelabert, 2009, which would make the latter a junior synonym of *terebrans* Saussure (Walker, pers. comm.). Box A27.

Carylla terebrans (Saussure, 1897). [Not mentioned in OSF].

terrestris Saussure, 1877: 224-226 [*Gryllodes*].

Turkestan, Dourmane (leg. Fedtschenko). One teneral ♂ and an unspecified number of ♀.

One ♂ syntype with labels: “♂ Turkestan, M H de Saussure” [handwritten on ruled white card]; “Dourmene 21” [handwritten on white paper]; “*Gryllus terrestris* Sss.” [handwritten on blue paper]; “Syntypus” [printed on red paper]. The specimen is pale and slightly wrinkled, corresponding to the teneral state of the specimen mentioned in the description. The whereabouts of the ♀ syntypes is unknown. Box A13.

A junior synonym of *Turanogryllus lateralis* (Fieber, 1853).

thoracicus Saussure, 1874a: 507-508 [*Anaudus*].

Brésil, Bahia (Musée de Neuchâtel). Unspecified number of ♀.

No specimens found in the MHNG. The type material could not be found in the collection of the Muséum d'histoire naturelle in Neuchâtel (Borer, pers. comm.) and is probably lost.

Anaudus thoracicus Saussure, 1874.

thoracicus Saussure, 1874a: 455-456 [*Cophus*].

Cuba (leg. Gundlach). Unspecified number of ♂ and ♀ nymphs.

One ♂ and one ♀, both syntypes. A ♂ with labels: "Juv. ♂ Cuba, M H. d. Sauss." [handwritten on ruled white card with "Cuba" printed]; "85 larva" [handwritten on white paper]; "Cophus thoracica Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Most of both antennae, the tarsi of both front legs and both middle legs, the last tarsal segment of the left hind leg and the tarsi of the right hind leg are missing. A micro-tube with dissected parts is secured through the stopper on the original pin. A ♀ with labels: "Juv. Cuba, M H. d. Sauss." [handwritten on ruled white card]; "85 larva" [handwritten on white paper]; "Cophus thoracica Sauss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The tarsi of both middle legs are missing. Box A21.

Otteius thoracicus (Saussure, 1874).

tibialis Saussure, 1878: 580, fig. lxii, 1 [*Calyptotrypus*].

Molukues (coll. Brunner de Wattenwyl n° 5801). One damaged ♀.

No specimens found in the MHNG or the NHMW, the whereabouts of the ♀ holotype is unknown.

Madasumma tibialis (Saussure, 1878).

tibialis Saussure, 1897: 236; pl. 11, fig. 40 [*Cyrtoxiphus*].

Mexico, Teapa in Tabasco (H. H. Smith). Unspecified number of ♂ and ♀.

One ♂ syntype with labels: "Teapa, Tabasco, March, H. H. S." [printed on white card]; "Cyrtox. tibialis Sss. ♂" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings spread; the right front leg is missing. There are further syntypes in the BMNH (Marshall, pers. comm.). Box A24.

A junior synonym of *Anaxipha gracilis* (Scudder, 1869).

tibialis Saussure, 1897: 270, 274; pl. 13, fig. 25 [*Orocharis*].

Mexico, Teapa in Tabasco (H. H. Smith); Panama, Bugaba (Champion). Unspecified number of ♂ and more than one ♀ (two sets of ♀ measurements).

One ♂ and two ♀ syntypes. A ♂ with labels: "Bugaba, 800-1500 ft., Champion" [printed on white card]; "Orocharis tibialis Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae and the left hind leg are missing. A ♀ with labels: "Bugaba, 800-1500 ft., Champion" [printed on white card]; "Orocharis tibialis Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the left antenna is missing. A ♀ with labels: "Teapa, Tabasco, April, H. H. S." [printed on

white card]; "Orocharis tibialis Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of the right antenna and the tibia and tarsi of the left front leg are lost. There is further type material in the BMNH according to their online database. Box A28.

Orocharis tibialis Saussure, 1897.

tibialis Saussure, 1897: 232, 264; pl. 13, figs 14-15 [*Paroecanthus*].

Panama, Bugaba 1000 ft, Volcan de Chiriqui 3500 ft (Champion). Unspecified number of ♂ and ♀.

One ♂ syntype with labels: "V. de Chiriqui, 3-4000 ft., Champion" [printed on white card]; "Paroecanth. tibialis Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; the tarsi of the left hind leg are missing. There is further type material in the BMNH according to their online database. Box A27.

Selvagryllus tibialis Saussure, 1897.

timidus Saussure, 1897: 281, 282 [*Aphonus*].

Colombia (coll. Brunner v. W. n° 10682). Unspecified number of ♂.

No specimens found in the MHNG. There is one syntype in the NHMW collection.

Aphonomorphus timidus (Saussure, 1897).

tolteca Saussure, 1874a: 376-377 [*Cyrtoxipha*].

Mexique, Orizaba. Three ♀.

Three ♀ syntypes. A ♀ with labels: "♀ Orizaba, Mexique, coll Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Cyrtoxiph. toltecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimens set with wings folded; most of both antennae and both hind legs are missing. A ♀ with labels: "♀ Orizaba, Mexique, coll Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Cyrtox. toltecus Sss." [handwritten on green paper]; "Type!" [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimens set with wings folded; most of both antennae and both hind legs are lost. A ♀ with labels: "♀ Orizaba, Mexique, coll Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Cyrtoxiph. toltecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimens set with wings folded; most of both antennae, the right middle leg and both hind legs are missing. The abdomen is wrinkled. There is also a ♂ from Potrero, apparently contemporary, but not part of the type series. Box A24.

A junior synonym of *Anaxipha angusticollis* (Saussure, 1874).

tolteca Saussure, 1874a: 478-479, fig. 19 [*Diatrypa*].

Mexique, Cordillère près Cordova. Unspecified number of ♂ and ♀.

One ♂ and one ♀ syntype. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Diatrypus toltecus Sss." [typed on white card]; "Syntypus" [printed on red paper]. Specimen set with wings folded; most of both antennae and the last tarsal segment of the right hind

leg are missing. There is a micro-tube with dissected parts secured through the stopper on the original pin. The specimen has been repaired with glue. A ♀ with labels: "♀ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Diatrypus toltecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen set with wings folded; both antennae, the right front leg, the last tarsal segment of the left middle leg and both hind legs are lost. The ovipositor is broken. The specimen is on the original, rather fine, pin but this has been pinned to a piece of pith, and the labels are on the new pin. Box A26.

Diatrypa tolteca Saussure, 1874.

toltecus Saussure, 1897: 246, 247-248; pl. 12, figs 14-17 [*Amphiacustes*].

Mexico, Omilteme in Guerrero, 8000 ft (H. H. Smith), Cordova (Saussure). Unspecified number of ♂ and ♀.

Ten ♂ syntypes and two possible ♀ syntypes. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., July, H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "TYPUS" [printed on red card]; "Lectotype, Amphiacustus toltecus Ss., det. T. H. Hubbell, 1972" [handwritten on white card with "det. T. H. Hubbell, 196" printed]. Specimens set with wings folded; the left antenna, the left front leg and the tarsi of the right middle leg are lost. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., July, H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]; Specimen set with wings folded; most of the right antenna and the tarsi of the right hind leg are lost. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]; Specimen set with wings folded; both antennae, the claw of the right idle leg and the right hind leg are lost. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., July, H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]; Specimen set with wings folded; the right antenna, the tarsi of the left middle leg and the last tarsal segment of the left hind leg are missing. The specimen is breaking where the pin is inserted due to verdigris. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "GENITALIA CLN 949" [printed on white card with numerals handwritten]; "FIGURED SPEC., T. H. Hubbell 1973" [printed on yellow card with last two numerals handwritten]; "Paratypus" [printed on orange card]; Specimen set with wings folded; both antennae are missing. The genitalia have been dissected and their whereabouts is unknown. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]. Specimen set with wings folded; most of the right antenna and the last tarsal segment of the right middle leg are lost. The right hind leg, which lacks the last tarsal segment, and left hind leg, which lacks the tarsi, are detached and secured through the femur on the original pin. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]; Specimen set with wings folded; both antennae, the right middle

leg and both hind legs are lost. The right front and left middle legs are detached and glued to the locality label. There is insect feeding damage to the end of the abdomen. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]. Specimen set with wings folded; both antennae are missing. The right hind leg is detached and secured through the femur on the original pin. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., Aug., H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]. Specimen set with wings folded; most of both antennae, and the right hind leg are lost. The left hind leg is detached and secured through the femur on the original pin. A ♂ with labels: "Omilteme, Guerrero, 8000 ft., July, H. H. Smith" [printed on white card]; "Amphiacustes toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]. Specimen set with wings folded; the tibia and tarsi of the right front leg are lost. A ♀ with labels: "♀ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "Paratypus" [printed on orange card]. Most of both antennae, the left front leg and the left middle leg are missing. The left hind leg is detached and secured through the femur on the original pin. The end of the ovipositor has been broken off. A ♀ with labels: "♀ Orizaba, Mexique, env. Sumichrast" [handwritten on ruled white card with "Mexique" printed]; "toltecus Sss." [handwritten on green paper]; "Paratypus" [printed on orange card]. The right antenna left front leg and right middle leg are missing. Both hind legs are detached and secured through the femur on the original pin. There are further syntypes in the BMNH according to their online database.

Amphiacusta tolteca Saussure, 1897.

toltecus Saussure, 1874a: 416, fig. 7 [*Grylloides*].

Mexique, Cordillère orientale. Many ♂ and ♀.

Six ♂ and four ♀ syntypes. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white paper with "Mexique" printed]; "Grylloides toltecus Sss." [handwritten on green paper]; "Syntypus" [printed on red paper]. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white paper with "Mexique" printed]; "Grylloides toltecus Sss." [handwritten on green paper]; "Anurogryllus B. Otte '05" [handwritten on white card]; "Syntypus" [printed on red paper]. Specimen has lost most of both antennae and the tarsi of both middle legs. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white paper with "Mexique" printed]; "Grylloides toltecus Ss." [handwritten on green paper]; "Syntypus" [printed on red paper]. Specimen lacks two tarsal segments of the right hind leg. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white paper with "Mexique" printed]; "Grylloides toltecus Ss." [handwritten on green paper]; "Urogryllus toltecus (Sauss.), Det. R. L. Randell, 1963" [determination and last two numerals handwritten on white card with "Det. R. L. Randell, 19" printed]; "Syntypus" [printed on red paper]. Specimen lacks the left antenna and the last tarsal segment of the left hind leg. A ♂ with labels: "♂ Potrero, Mexique, env. Sumichrast" [handwritten on ruled white paper with "Mexique" printed]; "Grylloides toltecus Ss." [handwritten on green paper]; "Syntypus" [printed on red paper]. The tarsi

of the right hind leg are lost. A ♂ with labels: “♂ Potrero, Mexique” [handwritten on ruled white paper with “Mexique” printed]; “Grylloides toltecus Ss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen set with forewings spread; the left antenna and the tarsi of the left middle leg are missing. A ♀ with labels: “♀ Potrero, Mexique, env. Sumichrast” [handwritten on ruled white paper with “Mexique” printed]; “Grylloides toltecus Ss.” [handwritten on green paper]; “Urogryllus toltecus (Sauss.), Det. R. L. Randell, 1963” [determination and last two numerals handwritten on white card with “Det. R. L. Randell, 19” printed]; “Syntypus” [printed on red paper]. Specimen lacks the right antenna, the left middle leg, the right hind leg and the last tarsal segment of the left hind leg. A ♀ with labels: “♀ Potrero, Mexique, env. Sumichrast” [handwritten on ruled white paper with “Mexique” printed]; “Grylloides toltecus Ss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks most of both antennae and the last tarsal segment of the left hind leg. A ♀ with labels: “♀ Potrero, Mexique” [handwritten on ruled white paper with “Mexique” printed]; “Grylloides toltecus Ss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks both antennae, and the right front, middle and hind legs. A ♀ with labels: “♀ Potrero, Mexique, env. Sumichrast” [handwritten on ruled white paper with “Mexique” printed]; “Grylloides toltecus Ss.” [handwritten on green paper]; “Syntypus” [printed on red paper]. Specimen lacks most of both antennae and the tibia and tarsi of the left middle leg. An immature specimen with labels: “Potrero, Mexique, env. Sumichrast” [handwritten on ruled white paper with “Mexique” printed] and “Grylloides toltecus Ss.” [handwritten on green paper] should probably also be considered a syntype. Box A14.

Anurogryllus toltecus (Saussure, 1874).

toltecus Saussure, 1859: 316-317 [*Nemobius*].

Tellus mexicana. Series unspecified.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Neonemobius toltecus (Saussure, 1859).

toltecus Saussure, 1878: 595-596, fig. lxvi [*Paroecanthus*].

Mexique (Musée de Berlin n° 968). Unspecified number of ♀.

No specimens found in the MHNG. According to OSF the type material is in the ZMHB.

Siccotrella toltecus Saussure, 1878.

tridentatus Saussure, 1877: 300-301 [*Mogisoplastus*].

Guinée, Chinchoxo (Musée de Berlin n° 4475, leg. Falkenstein). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the ZMHB.

Mogoplistes tridentatus Saussure, 1877.

tripartitus Saussure, 1878: 548-549 [*Heterotrypus*].

Iles de Viti (coll. Brunner de Wattenwyl n° 4437). Unspecified number of ♂.
 No specimens found in the MHNG. There is a ♂ syntype in the NHMW.
Phaloria tripartita (Saussure, 1878).

truncatus Saussure, 1877: 91 [*Nemobius*].

Nouvelle Hollande (Museum de Paris). Unspecified number of ♀.
 No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the MNHN.
Pteronemobius truncatus (Saussure, 1877).

tuberculata Saussure, 1874a: 479 [*Diatrypa*].

Buenos-Ayres (Muséum de Paris). One damaged ♂.
 No specimens found in the MHNG. The ♂ holotype is in the MNHN according to OSF.
Diatrypa tuberculata Saussure, 1874.

typographicus Saussure, 1877: 168-169 [*Gryllus*].

Zanzibar (coll. Brunner de Wattenwyl n° 10264). Unspecified number of ♂.
 No specimens found in the MHNG. There is a ♂ syntype, labelled as "Type", in the NHMW.
 A junior synonym of *Teleogryllus xanthoneurus* (Gerstaecker, 1869).

unispina Saussure, 1874b: 24 [*Gryllotalpa*].

Prope Maracandam et Taschkent et in pratis ad flumen Syr-Daria. Unspecified number of ♂ and ♀.
 One ♂ syntype with labels: "Tashkent" [printed in Cyrillic characters on a strip of white card]; "♂ Samar-, kand [sic], Coll. Fedschk." [handwritten on ruled white card]; "unispina Sauss, ♂, Turkestan, M. H. S." [handwritten on white paper]; "Gryllotalpa unispina Sauss." [handwritten on blue paper]; "Syntypus" [printed on red paper]. Specimens set with wings folded; the last tarsal segment of both hind legs is missing. The whereabouts of the rest of the type material is unknown. Box A1.
Gryllotalpa unispina Saussure, 1874.

vaginalis Saussure, 1877: 188 [*Gryllus*].

Java (Musée de Leyde). Unspecified number of ♀.
 No specimens found in the MHNG. There is a ♀ syntype, referred to as the holotype in OSF, in the RMNH.
Modicogryllus vaginalis (Saussure, 1877).

vaginalis Saussure, 1878: 615-617 [*Orocharis*].

Cuba. Unspecified number of ♂ and ♀ (colour variation mentioned).
 One ♂ and one ♀, both possible syntypes. A ♂ with labels: "♂ Portorico, D^r Krug" [handwritten on ruled white card]; "Orocharis vaginalis Sauss." [handwritten on green paper]; "Possible syntype of *O. vaginalis* Sauss., Hollier 2011" [handwritten on

red paper]. Specimen set with wings folded; both antennae, part of the tibia and the tarsi of the right front leg, the tarsi of both middle legs, the right hind leg and the tarsi of the left hind leg are missing. A ♀ with labels: “♀ Portorico, D^r Krug” [handwritten on ruled white card]; “*Orocharis vaginalis* Sauss.” [handwritten on green paper]; “Possible syntype of *O. vaginalis* Sauss., Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; the left hind leg is lost. Saussure (1897: 277) gives Porto Rico rather than Cuba as the distribution for this species, suggesting that the locality in the original description was a lapse. Box A27.

Carylla vaginalis (Saussure, 1878).

varicolor Saussure, 1877: 307-308, fig. xxix, 4 [*Ectatoderus*].

[Provenance unknown] (Musée de Hambourg). Unspecified number of ♂.

No specimens found in the MHNG. The whereabouts of the type material is unknown.

Ectatoderus varicolor Saussure, 1877.

vaucheri Saussure, 1898: 215, 217 [*Homaloblemmus*].

Marocco [sic]. More than one ♂ (colour variation mentioned).

Three ♂ possible syntypes. A ♂ with labels: “Tanger” [printed on white card]; “*Homaloblemmus vaucheri* Sauss.” [handwritten on blue card]; “Syntypus” [printed on red paper]. Apart from lacking the tips of the antennae, the specimen is in perfect condition. A ♂ with labels: “Rabat, Marocco, v.1897” [handwritten on white card]; “*Homaloblemmus vaucheri* Sauss.” [handwritten on blue card]; “Hebard Collection” [printed on white card]; “♂ Java, M H de Saussure” [handwritten on ruled white card with “Java” printed]; “Possible syntype” [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the left middle leg and the last tarsal segment of the right middle leg are lost. There is a micro-tube containing dissected parts secured through the stopper on the original pin. The Java label is below the micro-tube and clearly erroneous. A ♂ with labels: “Rabat, Maroc., v.98” [handwritten on pink paper]; “*Homaloblemmus vaucheri* Sauss.” [handwritten on blue card]; “*Scobia praticola* (Bol.), Det. R. L. Randell, 1963” [identification handwritten on white card with “Det. R. L. Randell, 19” printed]; “Possible Syntype” [handwritten on red paper]. Specimen set with wings folded; both middle legs are missing. The left hind leg, which lacks the last tarsal segment, is detached and secured through the femur on the original pin. The date on the locality label would suggest that this specimen was collected too late to be a syntype, but the pin is identical to that of the specimen of this species from Tanger and of the specimen of *H. mauretanicus* in the same box. It seems possible that the label was added later using the locality of the other specimen from Rabat and that the date is a lapse. The fourth ♂ placed under this name in the MHNG collection was collected after the publication of the description. Box A15.

A junior synonym of *Scobia praticola* Bolivar, 1884.

venosus Saussure, 1878: 426-428, fig. xxxix, 1 [*Homoeogryllus*].

Sénégal (British Museum & Musée de Leipzig); Cote d’Or (Mus. de Genève & Leyde). More than one ♂ and unspecified number of ♀.

Lectotype ♂ (designated by Desutter, 1985: 202) with labels: “♂ Senégal, M H de Saussure” [handwritten on ruled white card]; “Homoeogryllus venosus Sauss.” [handwritten on pink paper]; “Homoeogryllus venosus Sauss., DESUTTER det.” [handwritten on white card]; “LECTOTYPE” [printed on red card. Specimen set with wings spread; most of both antennae, the left front leg, the tarsi of the right front leg, both middle legs, the right hind leg and the last tarsal segment of the left hind leg are lost. The right forewing has been detached and glued to white card with “120 teeth (+13)” handwritten on it secured on the original pin. There is also a micro-tube with dissected parts secured through the stopper on the original pin. Box A20.

Homoeogryllus venosus Saussure, 1878.

venustulus Saussure, 1878: 482-483 [*Cyrtoxiphus*].

Java. Unspecified number of ♂.

One ♂ probable syntype with labels: “♂ Sumatra, M H. de Saussure” [handwritten on ruled white card]; “Cyrtoxiphus venustulus Sauss.” [handwritten on yellow paper]; “Probable Syntype, Hollier 2011” [handwritten on red paper]. Specimen set with wings folded; most of both antennae, the tarsi of the right middle leg and both of the hind legs are lost. The locality label does not accord with the locality given in the original description but this could be a lapse. The species name label in the insect box gives the locality as “Iles de la Sonde.” Images on OSF. Box A24.

Svistella venustula (Saussure, 1878).

viduus Saussure, 1874a: 505-506 [*Podoscirtus*].

Brésil (Musée de Neuchâtel). Unspecified number of ♀.

No specimens found in the MHNG. The type material could not be found in the collection of the Muséum d'histoire naturelle in Neuchâtel (Borer, pers. comm.) and is probably lost.

Podoscirtoides viduus (Saussure, 1874).

virescens Saussure, 1878: 675-676 [*Metrypus*].

Java (Musée de Leyde). Unspecified number of ♂.

No specimens found in the MHNG. The whereabouts of the type material is unconfirmed.

Tafalisca virescens (Saussure, 1878).

viridicatus Saussure, 1897: 240 [*Thamnoscirtus*].

Guiana (coll. Brunner von Wattenwyl n° 12430). Unspecified number of ♂ and ♀.

No specimens found in the MHNG. The NHMW has three ♂ and one ♀ under this name, one of the ♂ having the Brunner collection number 12430, but these are from Buenos Aires. It is likely that they are all syntypes and that the locality cited in the description is a lapse

Phylloscirtus viridicatus (Saussure, 1878).

vitiensis Saussure, 1878: 661-662, fig. lxxi, 2 [*Aphonus*].

Iles de Viti (coll. Brunner de Wattenwyl n° 3909). One ♂ and two ♀.

The MHNG collection includes part of an ovipositor and the spermatophore illustrated by Saussure glued to a card mount with "3909 Br" handwritten in pencil on it, which is clearly part of the type material. However, the specimen in the NHMW with the Brunner collection number 3909 is placed under *Podoscirtus insularis* Saussure, 1878. It is not clear if this is a lapse in the description, a labelling error or whether the type series was actually mixed and one specimen has been subsequently re-identified. Box A29.

Mistshenkoana vitiensis (Saussure, 1878).

voeltzkowi Saussure, 1899: 605, fig. 8 [*Ectatoderus*].

Nossi-Bé. Unspecified number of ♂.

No specimens found in the MHNG. There is a supposed ♂ syntype in the SMFD (images on SysTax). Although the data label gives Aldabra rather than Nossi-Bé as the locality it is clear from the labels that Saussure saw and named the specimen.

Ectatoderus voeltzkowi Saussure, 1899.

walkeri Saussure, 1877: 233 [*Cophogryllus*].

[Provenance unknown] Musée de Londres. One ♂.

No specimens found in the MHNG. The holotype is in the BMNH according to OSF.

A junior synonym of *Gryllodes sigillatus* (Walker, 1869).

westwoodianus Saussure, 1877: 330-331, fig. xxxii, 3 [*Cacoplistus*].

Nouvelle-Hollande? (Musée de l'Université d'Oxford). One damaged ♀.

Three specimens placed under this name in the MHNG collection are labelled "Calcutta" and one "Tonkin" which was collected after the publication of the description. None of them are types. According to Otte & Alexander (1983: 364) the holotype is in the OXUM. Box A19.

Cacoplistes westwoodianus Saussure, 1877.

yersini Saussure, 1877: 311-312, fig. xxviii [*Arachnocephalus*].

Hyères (leg. Yersin). Unspecified number of ♂ and ♀.

Four ♂ and ten ♀, all syntypes. A card-mounted ♂ with labels: "♂ Hyères, France, colln. Yersin" [handwritten on ruled white card]; "Arachnocephalus Yersini Sss." [handwritten on pale blue paper]; "Syntypus" [printed on red paper]. The specimen is mounted on its back; the right antenna, the last tarsal segment of the right front leg, both the middle legs and the cerci are missing. Two ♂ on the same card mount with labels: "♂ Hyères, France, colln. Yersin" [handwritten on ruled white card]; "Arachnocephalus Yersini Sss." [handwritten on pale blue paper]; "Syntypus" [printed on red paper]. The specimen on the left lacks most of the right antenna, all three right legs and the cerci. The specimen on the right lacks the left antenna, left front leg, both middle legs, the right hind leg and the cerci. A ♀ with labels: "♀ Hyères, France, colln. Yersin" [handwritten on ruled white card]; "Arachnocephalus Yersini

Sss.” [handwritten on pale blue paper]; “Syntypus” [printed on red paper]. The left antenna, the left front and middle legs and the cerci are lost. Five ♀ on the same card mount with labels: “♀ Hyères, France, colln. Yersin” [handwritten on ruled white card]; “Arachnocephalus Yersini Sss.” [handwritten on pale blue paper]; “Syntypus” [printed on red paper]. The leftmost specimen lacks the left antenna and the right middle and hind legs. The next specimen has lost the right middle leg, the left hind leg and the cerci. The middle specimen lacks most of both antennae and the right middle and hind legs. The next specimen has lost most of both antennae, the right front and middle legs and the cerci. The rightmost specimen lacks both middle legs, the ovipositor is broken towards the tip and the cerci are missing. One ♂ and four ♀ on the same card mount with labels: “♀ [sic] Hyères, France, colln. Yersin” [handwritten on ruled white card]; “Arachnocephalus Yersini Sss.” [handwritten on pale blue paper]; “Syntypus” [printed on red paper]. The leftmost specimen has lost the left antenna, the left front leg, the right middle leg and the cerci. The next specimen, the ♂, lacks the right middle leg and left cercus. The middle specimen lacks both antennae, the left front leg and the right middle leg. The next specimen has lost the right antenna, right front leg and left cercus. The rightmost specimen lacks both cerci; the left middle leg is detached and glued underneath the thorax. The mounting of several small specimens on an undivided card mount is characteristic of Yersin’s collection (Hollier, 2007). Box A18.

A junior synonym of *Arachnocephalus vestitus* Costa, 1855.

zambesi Saussure, 1877: 248-249, fig. xv [*Homaloblemmus*].

Afrique, rives du fleuve Zambèse (coll. Brunner de Wattenwyl n° 6637). Unspecified number of ♀.

No specimens found in the MHNG. There is a ♀ syntype in the NHMW.

Gryllus zambesi (Saussure, 1877).

OTHER NAMES

Two other names ascribed to Saussure appear in the literature resulting from a figure legend having a different name from that given in the description (perhaps unsurprising given the problems involved in the publication of the work in question, see Hollier & Hollier (2011)). Thus, the name *Cycloptilum poeyi* appears in the figure legend to Saussure, 1874a: plate 8, figures 41-42, which depict *C. americanus*, and the name *Amphiacusta mexicanum* in the figure legend to Saussure, 1874a: plate 8, figures 39-40, which depict *A. aztecus*. In some catalogues, including OSF, these are taken to be junior synonyms, but it is arguable that they are merely a lapse and the names unavailable. The name *Orocharis saltatrix* Saussure, 1874 is listed in some catalogues, including OSF, as a junior synonym of *Orocharis saltator* Uhler, 1864, but it is simply a misspelling and the species is attributed to Uhler in the text.

ACKNOWLEDGEMENTS

Thanks are due to Anita Hollier, Peter Schwendinger and Bernhard Merz for comments on the layout and text, and to Bernd Hauser for historical information about the MHNG collection. Claude Weber kindly allowed access to his unpublished transcription of part of Henri de Saussure’s diary. Special thanks are due to Carlos

Carbonell, who made available his notes on the MHNG collection. David Rentz and Tom Walker provided information about lectotype designations. Holger Braun cleared up some points about the information in OSF. George Beccaloni & Judith Marshall kindly provided information about the holdings of the BMNH, Laure Desutter of the MNHN, Matthias Borer of the Musée d'histoire naturelle de Neuchâtel, Andreas Müller & Franziska Schmid of ETHZ and Barbara Oberholzer of the Zürich University collection. Val McAtear was of great help in providing some of the literature from the Royal Entomological Society library.

REFERENCES

- DESUTTER, L. 1985. Étude préliminaire des espèces Africaines du genre *Homoeogryllus* Guérin-Méneville (Grylloidea, Phalangopsidae). *Annales de la Société Entomologique de France* (NS) 21: 189-206.
- DESUTTER-GRANDCOLAS, L. 1993. The cricket fauna of Chiapanecan caves (Mexico): systematics, phylogeny and the evolution of troglobiotic life (Orthoptera, Grylloidea: Phalangopsidae, Luzarinae). *International Journal of Speleology* 22: 1-82.
- DESUTTER-GRANDCOLAS, L. 1997. Les grillons de Nouvelle-Calédonie (Orthoptères, Grylloidea): espèces et données nouvelles. *Mémoires du Muséum National d'Histoire Naturelle* 171: 165-177.
- EADES, D. C., OTTE, D., CIGLIANO, M. M. & BRAUN, H. 2011. *Orthoptera Species File Online*. Version 2.0/4.0. Online at <http://www.Orthoptera.SpeciesFile.org> [accessed 20.xi.2012].
- GOROCHOV, A. V. 1985a. On the fauna of crickets of the subfamily Gryllinae (Orthoptera, Gryllidae) of eastern Indochina (pp. 9-17). In: MEDVEDEV, L. N. (ed.) Fauna I Ekologiya Nasekomye Vietnam [Insects of Vietnam]. *Nauka, Moscow*, 200 pp. [In Russian].
- GOROCHOV, A. V. 1985b. On the Orthoptera subfamilies Itarinae, Podoscirtinae and Nemobiinae (Gryllidae) of eastern Indochina (pp. 17-25). In: MEDVEDEV, L. N. (ed.) Fauna I Ekologiya Nasekomye Vietnam [Insects of Vietnam]. *Nauka, Moscow*, 200 pp. [In Russian].
- GOROCHOV, A. V. 1996a. New and little known crickets from the collection of the Humboldt University and some other collections (Orthoptera: Grylloidea). Part 1. *Zoosystematica Rossica* 4: 81-114. [In Russian].
- GOROCHOV, A. V. 1996b. New and little known crickets from the collection of the Humboldt University and some other collections (Orthoptera: Grylloidea). Part 2. *Zoosystematica Rossica* 5: 29-90.
- GOROCHOV, A. V. 2002. Taxonomy of Podoscirtinae (Orthoptera: Gryllidae). Part 1: the male genitalia and Indo-Malayan Podoscirtini. *Zoosystematica Rossica* 10: 303-350.
- GOROCHOV, A. V. 2003. Taxonomy of Podoscirtinae (Orthoptera: Gryllidae). Part 2: Indo-Malayan and Australo-Oceanian Podoscirtini. *Zoosystematica Rossica* 11: 267-303.
- GOROCHOV, A. V. 2011. Taxonomy of Podoscirtinae (Orthoptera: Gryllidae). Part 9: the American tribe Paroecanthini. *Zoosystematica Rossica* 20: 216-270.
- HAAN, W. DE. 1842. Bijdragen tot de kennis der Orthoptera. In: TEMMINCK, C. J. (ed.) *Verhandelingen over de natuurlijke geschiedenis der Nederlandsche overzeesche bezittingen*. *Zoologie* 16: 45-248.
- HEBARD, M. 1928. Studies in the Dermaptera and Orthoptera of Colombia. Fifth paper: Orthopterous family Gryllidae. *Transactions of the American Entomological Society* 54: 79-124.
- HOLLIER, J. A. 2007. An annotated list of the species described by Alexandre Yersin (1825-1863) and of the Yersin type material housed in the Muséum d'histoire naturelle in Geneva. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 80: 71-77.
- HOLLIER, J. & HOLLIER, A. 2011. On the title and publication dates of Henri de Saussure's contribution to the Mission Scientifique au Mexique et dans l'Amérique Centrale. *Metaleptea* 31(2): 9-10.

- HOLSTEIN, J. & INGRISCH, S. 2004. Catalogue of type specimens of Orthoptera (Insecta) deposited in the Staatliches Museum für Naturkunde in Stuttgart. Part 1: Ensifera. *Stuttgarter Beiträge zur Naturkund* (Serie A, Biologie) 665: 1-33.
- HOPPE, J. R., STÜTZEL, T., WALOBEK, D. & SCHWEIGGERT, F. 2011. *SysTax – a database system for systematics and taxonomy*. Online at www.biologie.uni-ulm.de/systax [accessed 25.vii.2011].
- INGRISCH, S. 1998. The genera *Velarifictorus*, *Modicogryllus* and *Mitius* in Thailand (Ensifera: Gryllidae, Gryllinae). *Entomologica Scandinavica* 29: 315-359.
- INGRISCH, S. 2010. Review of the ant loving crickets of South-East Asia (Orthoptera: Gryllidae, Myrmecophilinae). *Entomologische Zeitschrift* 120: 2-12.
- KIRBY, W. 1906. A synonymic catalogue of Orthoptera vol. 2. Orthoptera Saltatoria part 1 (Achetidae et Phasgonuridae). *Trustees of the British Museum, London*. viii + 526 pp.
- OHL, M. & OSWALD, J. D. 2004. Annotated list of the primary type specimens of Megaloptera and Raphidioptera (Insecta, Neuropterida) in the Museum für Naturkunde der Humboldt-Universität zu Berlin. *Deutsche Entomologische Zeitschrift* (N.S.) 51: 87-96.
- OTTE, D. 2007. New species of *Cardiodactylus* from the western Pacific region (Gryllidae: Eneopterinae). *Proceedings of the Academy of Natural Sciences of Philadelphia* 156: 341-400.
- OTTE, D. & ALEXANDER, R. D. 1983. The Australian crickets (Orthoptera: Gryllidae). *Monographs of the Academy of Natural Sciences of Philadelphia* 22: 1-477.
- OTTE, D., ALEXANDER, R. D. & CADE, W. 1987. The crickets of New Caledonia (Gryllidae). *Proceedings of the Academy of Natural Sciences of Philadelphia* 139: 375-457.
- OTTE, D. & CADE, W. 1983. African crickets (Gryllidae). 1. *Teleogryllus* of eastern and southern Africa. *Proceedings of the Academy of Natural Sciences of Philadelphia* 135: 102-127.
- OTTE, D. & CADE, W. 1984. African crickets (Gryllidae). The genus *Platygryllus* from eastern and southern Africa. *Proceedings of the Academy of Natural Sciences of Philadelphia* 136: 45-66.
- PINHO MARTINS, L. DE & ZEFA, E. 2011. Contribution to the taxonomy of *Gryllus* Linnaeus, 1758 in South America: Part I: Redescription of *Gryllus argentinus* Saussure, 1874 (Orthoptera, Grylloidea, Gryllidae). *Entomological Science* 14: 87-93.
- ROBILLARD, T. & DESUTTER-GRANDCOLAS, L. 2005. A revision of Neotropical Eneopterinae crickets (Orthoptera, Grylloidea, Eneopteridae) with a phylogenetic discussion. *Insect Systematics and Evolution* 35: 411-435.
- SAUSSURE, H. DE 1859. Orthoptera Nova Americana. *Revue et Magazine de Zoologie* 11: 201-212, 315-317, 390-394.
- SAUSSURE, H. DE 1861. Orthoptera Nova Americana. *Revue et Magazine de Zoologie* 13: 126-130, 156-164, 313-324, 397-402.
- SAUSSURE, H. DE 1864. Othoptères de l'Amérique moyenne. *Ramboz & Schuchardt, Genève*, 279 pp., 2 plates. [Accounted as the third part of *Mémoires pour servir à l'Histoire naturelle du Mexique, des Antilles et des Etats-Unis* 1858-71, although the title page says the fourth].
- SAUSSURE, H. DE 1874a. Famille Gryllidae (pp. 296-515). In: SAUSSURE, H. DE. Mission scientifique au Mexique et dans l'Amérique centrale 6 (part 1). Imprimerie Nationale, Paris, 515 pp., 8 pl.
- SAUSSURE, H. DE 1874b. *Orthoptères in Voyage au Turkestan de A. Fedtchenko* volume 2 Recherches Zoographiques, Part 5, fascicule 1. 50 pp., 1 pl.
- SAUSSURE, H. DE 1877. Mélanges orthoptérologiques. 5e fascicule: Gryllidae. *Mémoires de la Société de Physique et d'histoire naturelle de Genève* 25: 1-352.
- SAUSSURE, H. DE 1878. Mélanges orthoptérologiques. 6e fascicule: Gryllidae. *Mémoires de la Société de Physique et d'histoire naturelle de Genève* 25: 369-704.
- SAUSSURE, H. DE 1897. Gryllidae (pp. 217-284). In: GODMAN, F. D. & SALVIN, O. (eds). *Biologia Centrali-Americana. Insecta Orthoptera* (Orthoptera Genuina) Volume 1. *Godman & Salvin, London*. x + 458 pp., 22 pls.

- SAUSSURE, H. DE 1898. *Analecta Entomologica I Orthopterologica. Revue suisse de Zoologie* 5: 183-248, 787-809.
- SAUSSURE, H. DE 1899. Orthoptera (pp. 567-664). *In*: VOELTZKOW, A. (ed.). *Wissenschaftliche Ergebnisse der Reisen in Madagaskar und Ostafrika in den Jahren 1889-95. Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* 21: 1-664.
- SÉLYS-LONGCHAMPS, E. DE 1868. Additions et corrections au catalogue raisonné des Orthoptères de Belgique. *Annales de la Société entomologique de Belgique* 11: 23-42.
- VICKERY, V. R. & JOHNSTONE, D. E. 1970. Generic status of some Nemobiinae (Orthoptera: Gryllidae) in northern North America. *Annals of the Entomological Society of America* 63: 1740-1749.

REVUE SUISSE DE ZOOLOGIE

Tome 120 — Fascicule 3

	Pages
BOYADZHIEV, P. S. & TODOROV, I. A. Description of a new species of <i>Stepanovia</i> Kostjukov (Hymenoptera: Eulophidae) from Bulgaria . .	347-356
FIERS, F. <i>Bryocamptus</i> (<i>Bryocamptus</i>) <i>gauthieri</i> (Roy, 1924): a Mediterranean edaphic specialist (Crustacea: Copepoda: Harpacticoida) . .	357-371
LOMBARDO, F., IPPOLITO, S. & RIVERA, J. Synopsis of the Neotropical mantid genus <i>Pseudacanthops</i> Saussure, 1870, with the description of three new species (Mantodea: Acanthopidae)	373-403
SCHUCHERT, P. <i>Plumularia mooreana</i> , a new marine hydroid from French Polynesia (Hydrozoa, Cnidaria)	405-413
VIVIEN, R. Note sur la diversité des oligochètes aquatiques dans la région genevoise (Suisse)	415-420
LIENHARD, C. & FERREIRA, R. L. Three new species of <i>Psyllipsocus</i> (Psocodea: 'Psocoptera': Psyllipsocidae) from Brazilian caves with description of a novel structure interpreted as a male accessory genital organ	421-443
HOLLIER, J., BRUCKNER, H. & HEADS, S. W. An annotated list of the Orthoptera (Insecta) species described by Henri de Saussure, with an account of the primary type material housed in the Muséum d'histoire naturelle de Genève, Part 5: Grylloidea	445-535

REVUE SUISSE DE ZOOLOGIE

Volume 120 — Number 3

Pages

BOYADZHIEV, P. S. & TODOROV, I. A. Description of a new species of <i>Stepanovia</i> Kostjukov (Hymenoptera: Eulophidae) from Bulgaria . .	347-356
FIERS, F. <i>Bryocamptus</i> (<i>Bryocamptus</i>) <i>gauthieri</i> (Roy, 1924): a Mediterranean edaphic specialist (Crustacea: Copepoda: Harpacticoida) . .	357-371
LOMBARDO, F., IPPOLITO, S. & RIVERA, J. Synopsis of the Neotropical mantid genus <i>Pseudacanthops</i> Saussure, 1870, with the description of three new species (Mantodea: Acanthopidae)	373-403
SCHUCHERT, P. <i>Plumularia mooreana</i> , a new marine hydroid from French Polynesia (Hydrozoa, Cnidaria)	405-413
VIVIEN, R. Note on the diversity of aquatic oligochaetes in the Geneva area (Switzerland)	415-420
LIENHARD, C. & FERREIRA, R. L. Three new species of <i>Psyllipsocus</i> (Psocodea: 'Psocoptera': Psyllipsocidae) from Brazilian caves with description of a novel structure interpreted as a male accessory genital organ	421-443
HOLLIER, J., BRUCKNER, H. & HEADS, S. W. An annotated list of the Orthoptera (Insecta) species described by Henri de Saussure, with an account of the primary type material housed in the Muséum d'histoire naturelle de Genève, Part 5: Grylloidea	445-535

Indexed in CURRENT CONTENTS, SCIENCE CITATION INDEX

PUBLICATIONS DU MUSEUM D'HISTOIRE NATURELLE DE GENÈVE

CATALOGUE DES INVERTEBRES DE LA SUISSE, N ^{os} 1-17 (1908-1926)	série Fr. 285.—
(prix des fascicules sur demande)	
REVUE DE PALÉOBIOLOGIE	Echange ou par fascicule Fr. 35.—
LE RHINOLOPHE (Bulletin du centre d'étude des chauves-souris)	par fascicule Fr. 35.—
THE EUROPEAN PROTURA: THEIR TAXONOMY, ECOLOGY AND DISTRIBUTION, WITH KEYS FOR DETERMINATION	
J. NOSEK, 345 p., 1973	Fr. 30.—
CLASSIFICATION OF THE DIPLOPODA	
R. L. HOFFMAN, 237 p., 1979	Fr. 30.—
LES OISEAUX NICHEURS DU CANTON DE GENÈVE	
P. GÉROUDET, C. GUEX & M. MAIRE	
351 p., nombreuses cartes et figures, 1983	Fr. 45.—
CATALOGUE COMMENTÉ DES TYPES D'ECHINODERMES ACTUELS CONSERVÉS DANS LES COLLECTIONS NATIONALES SUISSES, SUIVI D'UNE NOTICE SUR LA CONTRIBUTION DE LOUIS AGASSIZ À LA CONNAISSANCE DES ECHINODERMES ACTUELS	
M. JANGOUX, 67 p., 1985	Fr. 15.—
RADULAS DE GASTÉROPODES LITTORAUX DE LA MANCHE (COTENTIN-BAIE DE SEINE, FRANCE)	
Y. FINET, J. WÜEST & K. MAREDA, 62 p., 1991	Fr. 10.—
GASTROPODS OF THE CHANNEL AND ATLANTIC OCEAN: SHELLS AND RADULAS	
Y. FINET, J. WÜEST & K. MAREDA, 1992	Fr. 30.—
O. SCHMIDT SPONGE CATALOGUE	
R. DESQUEYROUX-FAUNDEZ & S.M. STONE, 190 p., 1992	Fr. 40.—
ATLAS DE RÉPARTITION DES AMPHIBIENS ET REPTILES DU CANTON DE GENÈVE	
A. KELLER, V. AELLEN & V. MAHNERT, 48 p., 1993	Fr. 15.—
THE MARINE MOLLUSKS OF THE GALAPAGOS ISLANDS: A DOCUMENTED FAUNAL LIST	
Y. FINET, 180 p., 1995	Fr. 30.—
NOTICE SUR LES COLLECTIONS MALACOLOGIQUES DU MUSEUM D'HISTOIRE NATURELLE DE GENEVE	
J.-C. CAILLIEZ, 49 p., 1995	Fr. 22.—
PROCEEDINGS OF THE XIIIth INTERNATIONAL CONGRESS OF ARACHNOLOGY, Geneva 1995 (ed. V. MAHNERT), 720 p. (2 vol.), 1996	Fr. 160.—

INSTRUMENTA BIODIVERSITATIS

CATALOGUE OF THE SCAPHIDIINAE (COLEOPTERA: STAPHYLINIDAE) (<i>Instrumenta Biodiversitatis</i> I), I. LÖBL, xii + 190 p., 1997	Fr. 50.—
CATALOGUE SYNONYMIQUE ET GEOGRAPHIQUE DES SYRPHIDAE (DIPTERA) DE LA REGION AFROTROPICALE (<i>Instrumenta Biodiversitatis</i> II), H. G. DIRICKX, x +187 p., 1998	Fr. 50.—
A REVISION OF THE CORYLOPHIDAE (COLEOPTERA) OF THE WEST PALAEARCTIC REGION (<i>Instrumenta Biodiversitatis</i> III), S. BOWESTEAD, 203 p., 1999	Fr. 60.—
THE HERPETOFAUNA OF SOUTHERN YEMEN AND THE SOKOTRA ARCHIPELAGO (<i>Instrumenta Biodiversitatis</i> IV), B. SCHÄTTI & A. DESVOIGNES, 178 p., 1999	Fr. 70.—
PSOCOPTERA (INSECTA): WORLD CATALOGUE AND BIBLIOGRAPHY (<i>Instrumenta Biodiversitatis</i> V), C. LIENHARD & C. N. SMITHERS, xli + 745 p., 2002	Fr. 180.—
REVISION DER PALÄARKTISCHEN ARTEN DER GATTUNG <i>BRACHYGLUTA</i> THOMSON, 1859 (COLEOPTERA, STAPHYLINIDAE) (1. Teil) (<i>Instrumenta Biodiversitatis</i> VI), G. SABELLA, CH. BÜCKLE, V. BRACHAT & C. BESUCHET, vi + 283 p., 2004	Fr. 100.—
PHYLOGENY, TAXONOMY, AND BIOLOGY OF TEPHRITOID FLIES (DIPTERA, TEPHRITOIDEA) Proceedings of the “3rd Tephritoid Taxonomist’s Meeting, Geneva, 19.-24. July 2004” (<i>Instrumenta Biodiversitatis</i> VII). B. MERZ, vi + 274 p., 2006	Fr. 100.—
LISTE ANNOTÉE DES INSECTES (INSECTA) DU CANTON DE GENÈVE (<i>Instrumenta Biodiversitatis</i> VIII). (ed. B. MERZ), 532 p., 2012	Fr. 85.—

Revue suisse de Zoologie: Instructions for Authors

The *Revue suisse de Zoologie* publishes original results of zoological systematics and related fields. Priority is given to contribution submitted by members of the Swiss Zoological Society or studies presenting results based on collections of Seiss museums. Contributions from other authors may be accepted as space permits.

Submission of a manuscript implies that it has been approved by all authors, that it reports their unpublished work and that it is not being considered for publication elsewhere. A financial contribution may be asked from the authors for the impression of colour plates. All manuscripts are refereed by experts.

In order to facilitate publication and avoid delays authors should follow the *Instructions to Authors* and refer to a current issue of the RSZ or our web-pages for acceptable style and format. Papers may be written in French, German, Italian and English. Authors and writing in their native language should pay particular attention to the linguistic quality of the text.

Manuscripts must be printed, on one side only and double-spaced, on A4 (210 x 297 mm) or equivalent paper and all pages should be membered. All margins must be at least 25 mm wide. Authors must submit **three paper copies** (print-out), including tables and figures, and are expected to retain another copy. **Original artwork** should only be submitted with the revised version of the accepted manuscript. The accepted final version of the manuscript must be submitted on a CD as a single file in Microsoft Word (.doc) or Rich Text Format (.rtf).

The text should be in roman (standard) type face throughout, except for genus and species names which must be formatted in *italics* (**bold italics** in taxa headings) and author's names in the list of references (not in other parts of the text!), which should be formatted in SMALL CAPITALS, LARGE CAPITALS may be used for main chapter-headings and SMALL CAPITALS, for subordinate headings. Footnotes and cross-references to specific pages should be avoided. Papers should conform to the following general layout.

Title page. A concise but informative full title plus a running title of not more than 40 letters and spaces, full name(s) and surname(s) of author(s), and full address(es) including e-mail address(es) if possible.

Abstract. The abstract is in English, composed of the title and a short text of up to 200 words. It should summarise the contents and conclusions of the paper and name all newly described taxa. The abstract is followed by up to 10 keywords, separated by hyphens, which are suitable for indexing. Some of the terms used in the title may be omitted from the list of keywords in favour of significant terms not mentioned in the title.

Introduction. A short introduction to the background and the reasons for the work.

Material and methods. Sufficient experimental details must be given to enable other workers to repeat the work. The full binominal name should be given for all organisms. The International Code of Zoological Nomenclature must be strictly followed. Cite the authors of species on their first mention.

Results. These should be concise and should not include methods or discussion. Text and tables should not duplicate the same information. The abbreviations gen. n., sp. n., syn. n. and comb. n. must be used to distinguish all new taxa, synonyms or combinations. Primary types must be deposited in a museums or similar institution. In taxonomic papers the species heading should be followed by synonyms, material examined, description, distribution, and comments. All material examined should be listed in similar, compact and easily intelligible format; the information should be in the same language in the text. Sex symbols should be used rather than "male" and "female" (text file: ♂ = ♂, ♀ = ♀).

Discussion. The should not be excessive and should not repeat results nor contain new information, but should emphasize the significance and relevance of the results reported.

References. The autor-date system (name-year system) must be used for the citation of references in the text, e.g. White & Green (1995) or (White & Green, 1995). For references with three and more authors the form Brown *et al.* (1995) or (Brown *et al.*, 1995; White *et al.*, 1996) should be used. In the text authors' names have to be written in standard type face. However, in the list of references they should be formatted in SMALL CAPITALS (see below). The list of references must include all publications cited in the text and only these. References must be listed in alphabetical order of authors, in the case of several papers by the same author, the name has to be repeated for each reference. The title of the paper and the name of the journal must be given in full in the following style:

PENARD, E. 1888. Recherches sur le *Ceratium macroceros*. Thèse, Genève, 43 pp.

PENARD, E. 1889. Etudes sur quelques Hélozoaires d'eau douce. *Archives de Biologie* 9: 1-61.

MERTENS, R. & WERMUTH, H. 1960. Die Amphibien und Reptilien Europas. *Kramer, Frankfurt am Main*, XI + 264 pp.

HANDLEY, C. O. JR 1996. Checklist of the mammals of Panama (pp. 753-795). In: WENZEL, R. L. & TIPTON, V. J. (eds). Ectoparasites of Panama. *Field Museum of Natural History, Chicago*, XII + 861 pp.

Tables. These should be self-explanatory, with the title at the top, organised to fit 122 x 180 mm.

Figures. These may be line drawings or half tones, not integrated in the text-file, and all should be numbered consecutively. Drawings and lettering should be prepared to withstand reduction to fit the page size of 122 x 170 mm. Magnification should be indicated with scale lines. Refrain from mixing drawings and half tones. Originals of figures (ink drawings, photographs, slides) should be submitted together with the revised version of the accepted manuscript. Original drawings will not be returned automatically. The *Revue suisse de Zoologie* declines responsibility for lost or damaged slides or other documents. If files of scanned figures are submitted, this should be clearly indicated on the print-out. Scanned line drawings must be saved as TIF files in bitmap mode with a resolution of at least 600 dpi. Half tone illustrations and photos must have at least 300 dpi resolution.

Legends to figures. These should be typed in numerical order on a separate sheet.

Proofs. Only page proofs are supplied, and authors may be charged for alterations (other than printer's errors) if they are numerous.

Offprints. All authors will receive a PDF file of their article, but no free offprints. Offprints may be ordered at current prices when the proofs are returned.

Correspondence. All correspondence should be addressed to:

Revue suisse de Zoologie, Muséum d'histoire naturelle, CP 6434, CH-1211 Genève 6, Switzerland.

Phone: +41 22 418 63 33 - Fax: +41 22 418 63 01. E-mail: rsz.mhn@ville-ge.ch

Home page RSZ: <http://www.ville-ge.ch/mhng/publication03.php>



BOYADZHIEV, P. S. & TODOROV, I. A. Description of a new species of *Stepanovia* Kostjukov (Hymenoptera: Eulophidae) from Bulgaria . . . 347-356

FIERS, F. *Bryocamptus* (*Bryocamptus*) *gauthieri* (Roy, 1924): a Mediterranean edaphic specialist (Crustacea: Copepoda: Harpacticoida) . . . 357-371

LOMBARDO, F., IPPOLITO, S. & RIVERA, J. Synopsis of the Neotropical mantid genus *Pseudacanthops* Saussure, 1870, with the description of three new species (Mantodea: Acanthopidae) 373-403

SCHUCHERT, P. *Plumularia mooreana*, a new marine hydroid from French Polynesia (Hydrozoa, Cnidaria) 405-413

VIVIEN, R. Note on the diversity of aquatic oligochaetes in the Geneva area (Switzerland) 415-420

LIENHARD, C. & FERREIRA, R. L. Three new species of *Psyllipsocus* (Psocodea: 'Psocoptera': Psyllipsocidae) from Brazilian caves with description of a novel structure interpreted as a male accessory genital organ 421-443

HOLLIER, J., BRUCKNER, H. & HEADS, S. W. An annotated list of the Orthoptera (Insecta) species described by Henri de Saussure, with an account of the primary type material housed in the Muséum d'histoire naturelle de Genève, Part 5: Grylloidea 445-535

Indexed in CURRENT CONTENTS, SCIENCE CITATION INDEX