

## New Neotropical Hydroptilidae (Trichoptera)

J. OLÁH<sup>1</sup> & K. A. JOHANSON<sup>2</sup>

<sup>1</sup>*H-4032 Debrecen, Tarján u. 28, Hungary. E-mail: profolah@gmail.com*

<sup>2</sup>*Swedish Museum of Natural History, Entomology Department,  
Box 50007, S-104 05 Stockholm, Sweden. E-mail: kjell.arne.johanson@nrm.se*

**Abstract** – Eighty-two new species are described from Bolivia (1 sp.), Ecuador (4 spp.), French Guiana (37 spp.), Mexico (1 sp.) and Peru (41 spp.). Two of the new species were collected from both Ecuador and Peru. The new species are classified into the genera *Abtrichia* MOSELY, 1939 (2 spp.), *Acostatrichia* MOSELY, 1939 (1 sp.), *Alisotrichia* FLINT, 1964 (3 spp.), *Angrisanoia* ÖZDIKMEN, 2008 (2 spp.), *Betrichia* MOSELY, 1939 (1 sp.), *Cerasmatrichia* FLINT, HARRIS et BOTOSANEANU, 1994 (2 spp.), *Ceratotrichia* FLINT, 1992 (1 sp.), *Flintiella* ANGRISANO, 1995 (2 spp.), *Hydroptila* DALMAN, 1819 (7 spp.), *Leucotrichia* MOSELY, 1934 (2 spp.), *Metrichia* ROSS, 1938 (6 spp.), *Neotrichia* MORTON, 1905 (25 spp.), *Ochrottrichia* ROSS, 1938 (15 spp.), *Orinocotrichia* HARRIS, FLINT et HOLZENTHAL, 2002 (1 sp.), *Oxyethira* EATON, 1873 (7 spp.), *Ragatrichia* gen. n. (2 spp.), *Rhyacopsyche* MÜLLER, 1879 (2 spp.) and *Zumatrichia* MOSELY, 1937 (2 spp.). New records of 35 species in 22 genera are given. The following species were transferred to other genera: *Rhyacopsyche patulosa* WASMUND et HOLZENTHAL, 2007 to *Ochrottrichia*; *Rhyacopsyche otarosa* WASMUND et HOLZENTHAL, 2007 to *Angrisanoia*; *Ochrottrichia dietzi* FLINT, 1974 to *Ragatrichia*; *Rhyacopsyche garuhape* ANGRISANO et SGANGA, 2009 to *Ragatrichia*; and *Rhyacopsyche yatay* ANGRISANO, 1989 to *Ragatrichia*. With 309 figures.

**Key words** – Micro-caddisflies, new species, new genus, new records, South America.

## INTRODUCTION

With about 2,100 species (MORSE 2010), the Hydroptilidae STEPHENS, 1836 forms the largest family in the Trichoptera, surpassing the Leptoceridae by only a few species, and the Hydropsychidae by around 300 species. In Trichoptera as a whole, the New World species diversity is about half as high as that of the Old World, but in Hydroptilidae the diversity in

the Old World is only slightly higher than that of the New World. The group is generally overlooked taxonomically, possibly because of the small size of the species, and the true picture of the distribution of species diversity in the world is presently unclear, only based on scattered research focus. As the other megadiverse family, Leptoceridae, the larvae of many Hydroptilidae species inhabit lentic waters (HICKIN 1967), and are therefore able to populate areas without permanent running water bodies.

The family is divided into 6 tribes and 68 recognized genera with extant species (MORSE 2010). All tribes and 22 of the 38 genera (FLINT *et al.* 1999, HARRIS *et al.* 2002) recorded from the Neotropical Region, including the new genus described below, are represented in the material that this report is based upon. Sixteen genera are represented in the material presented below.

This research was executed to increase our knowledge about the taxonomic species diversity and morphological variation in the family, as well as to increase our understanding of the biogeography of individual species in the group.

## MATERIAL AND METHODS

This study is based on 928 male and 71 female specimens, representing 117 species in 22 genera and 6 subfamilies. One new species was described from Bolivia, four from Ecuador, thirty-seven from French Guiana, one from Mexico, and forty-one from Peru. Two of the new species were collected from both Ecuador and Peru. All specimens are preserved in 70–80% ethanol.

On so small specimens as the hydroptilids it may be very difficult to visualise and correctly interpret genital structures with absolute certainty. Moreover, their genitalia are usually concealed by dense pilosity. Therefore, our understanding of the genital appendages, or periphallallic organs of the hydroptilids cannot be classified without a degree of uncertainty. Without macerating and denuding the genitalia, it is often difficult to correctly determine specimens to species level. The setae mask the otherwise visible free genital structures projecting out of the cover of segment IX. In the case of species in the genera *Oxyethira* EATON, 1873 and *Catoxyethira* ULMER, 1912, as well as in several species in the tribe Leucotrichiini the enlarged and enforced segment VIII frequently produces a second layer covering the entire segment IX together with its substructures projecting out freely. The setal cover usually hides essential parts of the basal articulating sections of the genital structural elements, especially those of the paraprocts, gonopods and basal plate of the gonopods that are already under cover of segment IX. After being macerated, strongly denuded genitalia, i.e. without setae but with intact alveoli, is required for the observation of

fine structures of the periphallallic elements, their articulations and interactions. Particularly taxonomically important is the articulation between paraprocts, gonopods and the basal plate of the gonopods.

A high quality stereomicroscope of highest resolution is required to observe important three-dimensional structures, instead of using the higher magnification of compound microscope. Stereomicroscope uses two separate optical paths to provide different viewing angles to the left and right eyes. It therefore produces a three-dimensional visualization of the genital structures with great working distance and sufficient depth of field, while higher resolution induces smaller depth of field and working distance. The stereomicroscope should not be confused with a compound microscope equipped with double eyepieces. In a compound microscope, both eyes see the same image, and the binocular eyepieces simply provide greater viewing comfort. However, the higher magnification potential of the compound microscope may help to detect and understand difficult parts of the genitalia. Shape, connections, interactions and articulations of the small and frequently weakly pigmented structures require experience. Permanent movement and maceration with fine tipped pins of the properly cleared and denuded genitalia under the stereomicroscope, as well as under inverted compound microscope with large working depth, help us to detect the otherwise indiscernible structures of various articulations. The preparations and illustrations were produced according to the methodology by OLÁH & JOHANSON (2010)

In hydroptilids all the basic periphallallic structures, together with genital segment IX and postgenital segment X of the genital groundplan are present. Cerci are not observed in the family. The periphallallic structures of paraprocts, gonopods and basal plate of gonopods are frequently vestigial or strongly modified, and were commonly present under various names in literature. In this work we used a terminology on morphological characters as applied in OLÁH & JOHANSON (2007, 2008, 2010).

The material is deposited in the following institutions:

NHRS = Swedish Museum of Natural History, Stockholm, Sweden; NMNH = National Museum of Natural History (Smithsonian Institution), Washington D.C., U.S.A.; OPC = Oláh Private Collection, presently under National Protection of the Hungarian Natural History Museum, Hungary.

## NEW SPECIES AND NEW RECORDS

### Tribe Hydroptilini

### Genus *Hydroptila* DALMAN, 1819

### ***Hydroptila felfela* sp. n.**

(Figs 1–4)

*Diagnosis* – This medium-sized species most closely resembles *H. chattanooga* FRASER et HARRIS, 1991 from USA, from which it differs by having a long posterolateral process on

segment IX, not absent; bifid segment X, not trifid, gonopods differently shaped; phallic organ with long free ejaculatory duct.

*Description* – Male (in alcohol). Medium-sized species with forewing length 2.1 mm. Ocelli absent. Postoccipital setal warts pronounced, with eversible globular scent organ, scent organ composed of densely packed stout and long setae. Tentorium reduced, not discernible. Antennae 27 segments, each scapus longer than each pedicel, flagellomeres shorter than wide with narrow basal ring covered with small sensilla placodea followed by narrow ring of whorled fimbriate setae and longer wide apical part packed with large sensilla placodea. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular, anterior margin evenly convex, wide, not diamond-shaped nor narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomeral process.

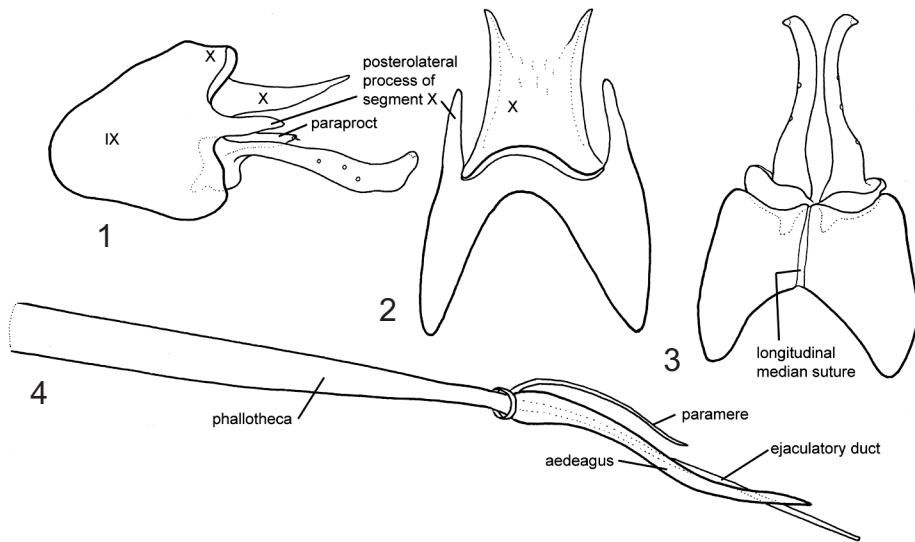
Male genitalia. Segment VIII not annular, clearly separated into tergite and sternite. Segment IX synsclerotized; produced rounded anterolaterally; longer excised anteriorly dorsally than ventrally; dorsum very short and emarginate by dark bridle band; ventrum longer than dorsum with well-developed longitudinal medial suture; posterolateral process long and glabrous. Segment X (dorsal plate) with deep mesal, indistinct excision in dorsal view; more sclerotized laterally. Paraprocts (subphallic plate) forming rounded short plate with two short setae in ventral view. Gonopods long slender, slightly S-shaped in lateral and ventral view; curving upward in lateral view; each base forming basoventral, well-developed lobe. Phallic organ very long, basal half twice as high as apical region; distal portion composed of long spines and free ejaculatory duct longer than spine; paramere with single coil.

*Type material* – Holotype, male: **Mexico**, State of Veracruz, Los Manantiales, Tlilapan, N 18°47.944', W 097°06.270', 1171 mao, 25.vi.2006, light trap, leg. M. ESPELAND & T. MALM (NHRS).

*Etymology* – *Felfela*, from “felfelé”, upward in Hungarian, refers to the upward curving gonopods.

### *Hydroptila grenadensis* FLINT, 1968

*New records* – **Ecuador**: Gareno, near Puerto Napo, 10–11.X.2010, light trap, leg. J. OLÁH jr. (5 males, OPC). **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS, 1 male, OPC). San Martin Prov., stream crossing Juan Guerra-Chazuta rd., 10 km (rd.) W Chazuta, 6°37.157'S, 76°10.905'W, light, loc. 12, 10.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS). San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS).



Figs 1–4. *Hydroptila felfela* sp. n., holotype, male genitalia: 1 = lateral view, 2 = dorsal view, 3 = ventral view, 4 = phallus, lateral view

### ***Hydroptila hossa* sp. n.**

(Figs 5–8)

*Diagnosis* – This species most closely resembles *H. venezuelensis* FLINT, 1981 from which it differs by having segment IX with high anterodorsal excision in lateral view; segment X deeply excised in dorsal view; paraprocts broad rounded and shorter than half length of gonopods, not longer; gonopods more constricted middle in ventral view; and apical end of the phallic organ with double coils.

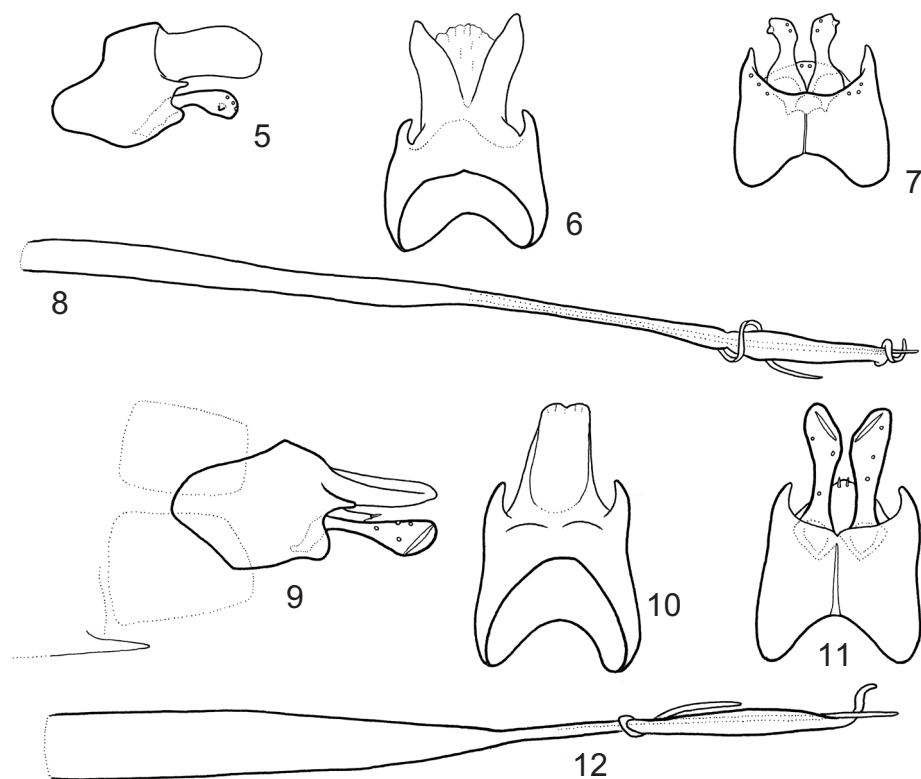
*Description* – Male (in alcohol). Medium-sized, forewing length 2.1 mm. Ocelli absent. Postoccipital setal warts pronounced, without eversible globular scent organ. Tentorium reduced, not discernible. Antennae broken; scapus curved, pedicel slightly shorter; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomeral process.

Male genitalia. Segment VIII annular, quadrangular. Segment IX synsclerotized; produced lateroventrad; posterolateral process present. Segment X (dorsal plate) with deep mesal, V-shaped excision in dorsal view; rounded membranous structure discernible in

and beneath excision. Paraprocts (subphallic plate) forming rounded, short plate, with two short setae in ventral view. Gonopods capitate both in lateral and ventral view, possessing single short black peg only; shorter than segment X. Phallic organ very long, basal half 2× higher than apical half; distal portion high, ending in spiral with two coils; ejaculatory duct ending free; paramere with single coil.

*Type material* – Holotype, male: **Peru**: San Martin Prov., stream crossing Juan Guerra-Chazuta rd., 10 km (rd.) W Chazuta, 6°37.157'S, 76°10.905'W, light, loc. 12, 10.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (1 male, NHRS). **Peru**: Manu-Mt Mother of God, River Gamitana, 12°52'S, 71°21'W, 546 m, Malaise and light trap, 24–30.V.2005, leg. JUAN CHAVEZ LOPEZ & FAVIOLA MONTES CARLOS (1 male, NHRS, 1 female, OPC).

*Etymology* – *Hossa*, from “hosszú”, long in Hungarian, refers to the extremely elongated tube of the phallic organ.



**Figs 5–8.** *Hydroptila hossa* sp. n., holotype, male genitalia: 5 = lateral view, 6 = dorsal view, 7 = ventral view, 8 = phallus, lateral view; **Figs 9–12.** *Hydroptila karikatla* sp. n., holotype, male genitalia: 9 = lateral view, 10 = dorsal view, 11 = ventral view, 12 = phallus, ventral view

### **Hydroptila karikatla** sp. n. (Figs 9–12)

*Diagnosis* – This medium-sized species is closest to *H. helicina* FLINT, 1991, from which it differs by having gonopods with rounded apex, not straight-cut apicad in lateral view; gonopods capitate, not parallel-sided in ventral view; apical section of phallic organ high, not low; there is only a half coil around the free ejaculatory duct, not a double coil.

*Description* – Male (in alcohol). Medium-sized, forewing length 2.2 mm. Ocelli absent. Postoccipital setal warts pronounced, with eversible elongate scent organ. Tentorium reduced, not discernible. Antennae with 35 segments; scapes curved, pedicels slightly shorter; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomesal process.

Male genitalia. Segment VIII with quadrangular tergite and sternite. Segment IX synsclerotized; produced rounded lateroventrally; posterolateral process present. Segment X (dorsal plate) with short, tiny mesal V-shaped excision in dorsal view; lateral margin more strongly sclerotized. Paraprocts (subphallic plate) forming rounded, short plate, with two short setae in ventral view. Gonopods long, triangular, possessing black subapical line, and rounded, less sclerotized apical margin in lateral view; capitate, with long constriction at middle in ventral view. Phallic organ with basal half 2× higher than apical half; distal portion high, ending in half coil around free ejaculatory duct; paramere with single coil.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Karikatla*, from “karikátlan”, ring-less in Hungarian, refers to the half coil present around the ejaculatory duct on the apex of the phallic organ.

### **Hydroptila karima** sp. n. (Figs 13–16)

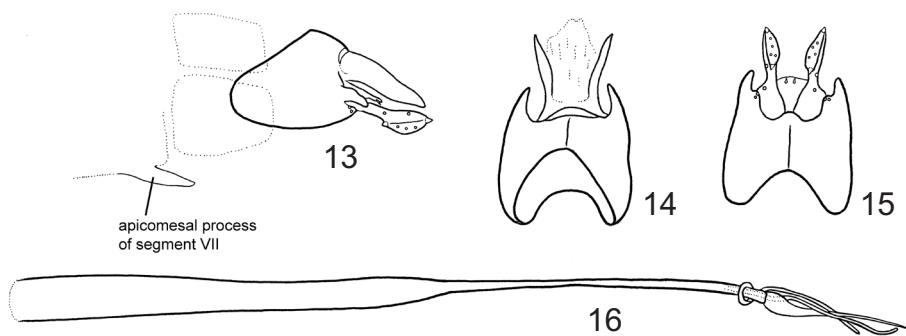
*Diagnosis* – This species is close to *H. narifer* FLINT, 1991 from Colombia, from which it differs by having posterolateral process of segment IX blunt lobe-shaped, not pointed; paraprocts each without apicomesal lobe from venter; gonopods with a straight, black rim connecting apicodorsal and apicoventral black pegs very pronounced in lateral view; gonopods highly capitate, not parallel-sided in ventral view; apical half of phallic very low, not high; subdivided phallic head with paramere, free ejaculatory duct and spine-shaped ending of phalotheca short, not as long as at *H. narifer*.

*Description* – Male (in alcohol). Large, forewing length 3.2 mm. Ocelli absent. Post-occipital setal warts pronounced, with eversible scent organ. Tentorium reduced, not discernible. Antennae with 38 segments; scapes curved, pedicels slightly shorter; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomeseal process.

Male genitalia. Segment VIII with quadrangular tergite and sternite. Segment IX synsclerotized and produced rounded lateroventrally; posterolateral process present, blunt lobe-shaped. Segment X (dorsal plate) discernible, forming vertical lateral plates; membranous between lateral lobes that seems flexible to move backward with and along head of phallic organ. Paraprocts (subphallic plate) forming rounded, short plate with two short setae in ventral view. Gonopods capitate, with low basal half in lateral view; black rim connecting apicodorsal and apicoventral black pegs very pronounced even on un-cleared intact specimens; in ventral view capitate with narrow middle and very wide base. Phallic organ with basal half double high compared to apical half; short subdivided distal portion high again ending in curving pointed spine accompanied by paramere and free ejaculatory duct.

*Type material* – Holotype, male: **Peru**: Amazonas Prov., river crossing Olmos-Tarapoto rd., 371 km (rd.) E Olmos Desv. Jaén, 5°41.178'S, 77°46.421'W, light, loc. 02, 5.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratype: **Peru**: same as holotype (1 male, NHRS).

*Etymology* – *Karima*, from “karima”, rim in Hungarian, refers to the straight black rim connecting the apicodorsal and apicoventral black pegs on the gonopods.



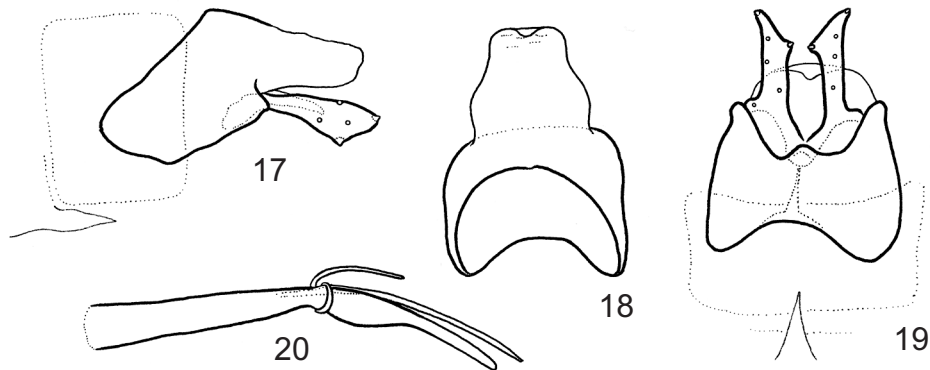
**Figs 13–16.** *Hydroptila karima* sp. n., holotype, male genitalia: 13 = lateral view, 14 = dorsal view, 15 = ventral view, 16 = phallus, lateral view



**Hydroptila parhuzam** sp. n.  
(Figs 17–20)

*Diagnosis* – This species resembles *H. bidens* FLINT, 1983 from Argentina, from which it differs by having (1) segment X with rounded broader basal half and without any apical excision; (2) paraprocts broadly rounded, not triangular in ventral view; (3) gonopods parallel-sided, not clavate or capitate in ventral view; (4) and parameres are short, not long.

*Description* – Male (in alcohol). Medium-sized species with forewing length 2.4 mm. Ocelli absent. Postoccipital setal warts pronounced, concealing eversible globular scent organ. Tentorium reduced, not discernible. Antennae with 36 segments; scapes curved, pedicels slightly shorter than scapes; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomeral process.



**Figs 17–20.** *Hydroptila parhuzam* sp. n., holotype, male genitalia: 17 = lateral view, 18 = dorsal view, 19 = ventral view, 20 = phallus, ventral view

*Male genitalia.* Segment VIII annular and quadrangular. Segment IX synsclerotized; produced lateroventrally; posterolateral process lacking. Segment X (dorsal plate) forming roof of genital chamber, elongate membranous, with broader rounded basal half and without apical excision in dorsal view. Paraprocts fused rounded plate in ventral view. Gonopods gradually enlarging in lateral view and almost parallel-sided in ventral view; single, short, black peg present both on apicodorsal and apicoventral angle visible in lateral and ventral view. Phallic organ with distinct tubular basal and subdivided distal division, distal portion with elongate free ejaculatory duct and broad based and abruptly slender process; well developed short paramere starting with single coil after midlength constriction.

*Type material* – Holotype, male: **Peru**: Pasco Reg., Yanachaga-Chemillen NP., side river to Rio Huancabamba, N end of park, along Oxabamba-Pozuzo rd., 10°11.133'S, 75°34.106'W, light, loc.01, 31.XII.2008, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665' S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS, 1 male, OPC). San Martin Prov., stream crossing Juan Guerra-Chazuta rd., 10 km (rd.) W Chazuta, 6°37.157'S, 76°10.905'W, light, loc. 12, 10.I.2009, leg. T. MALM & K. A. JOHANSON (2 males, NHRS, 1 male, OPC). San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (10 males, NHRS, 7 males, OPC).

*Etymology* – *Parhuzam*, from “párhuzam”, parallel in Hungarian, refers to the parallel-sided gonopods in ventral view.

### *Hydroptila pulestoni* FLINT, 1980

*New records* – **Chile**: Region del Biobio (VIII), ca 20 km WSW Arauco, stream crossing road at Puento Caripilum, 37°18.141'S, 73°30.633'W, 20 m (Loc#06), light trap, 2.I.2006, leg. K. A. JOHANSON (1 male, NHRS, 1 male, OPC).

### ***Hydroptila sarkos* sp. n.**

(Figs 21–24)

*Diagnosis* – This medium-sized species is close to *H. hossa* sp. n. from which it differs by having segment IX with very short dorsum; pigmented dorsoapical rim of segment IX M-shaped, not V-shaped; the gonopods are slender and angled in ventral view, not robust and capitate, and right angled in lateral view, not rounded.

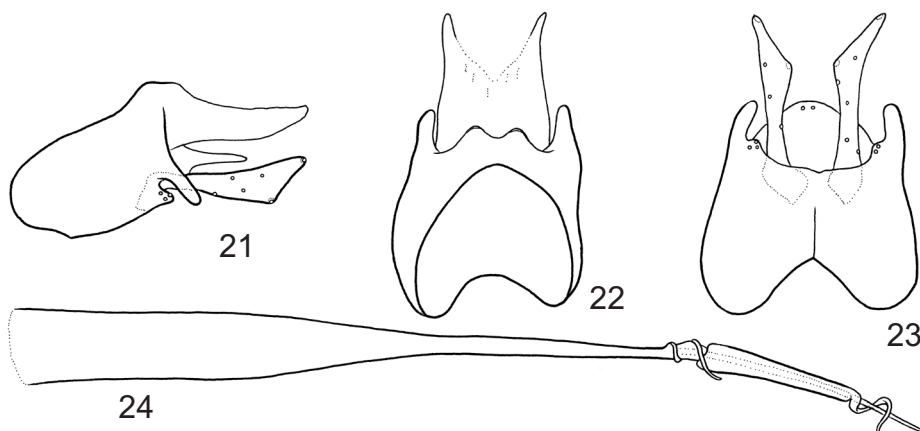
*Description* – Male (in alcohol). Medium-sized, forewing length 2.2 mm. Ocelli absent. Postoccipital setal warts pronounced, with eversible globular scent organ. Tentorium reduced, not discernible. Antennae with 32 segments; scapus curved, pedicel slightly shorter; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,2,4. Sternum VII with pointed apicomeral process.

Male genitalia. Segment VIII annular and quadrangular. Segment IX synsclerotized; rounded lateroventrally anteriorly in lateral view; posterolateral process present, long blunt and downward directed. Segment X (dorsal plate) with deep mesal V-shaped excision in dorsal view with indistinct mesal border. Paraprocts (subphallic plate) rounded short plate with two short setae in ventral view. Gonopods triangular in right-angled ventroapical corner in ventral view; slender, angled in ventral view. Phallic organ long, basal

half double high compared to apical half; distal portion high again ending in spiral with two coils; ejaculatory duct ending free; paramere with single coil.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Sarkos*, from “sarkos”, angled in Hungarian, refers to the right-angled ventroapical corner of the gonopods in lateral view.



Figs 21–24. *Hydroptila sarkos* sp. n., holotype, male genitalia: 21 = lateral view, 22 = dorsal view, 23 = ventral view, 24 = phallus, lateral view

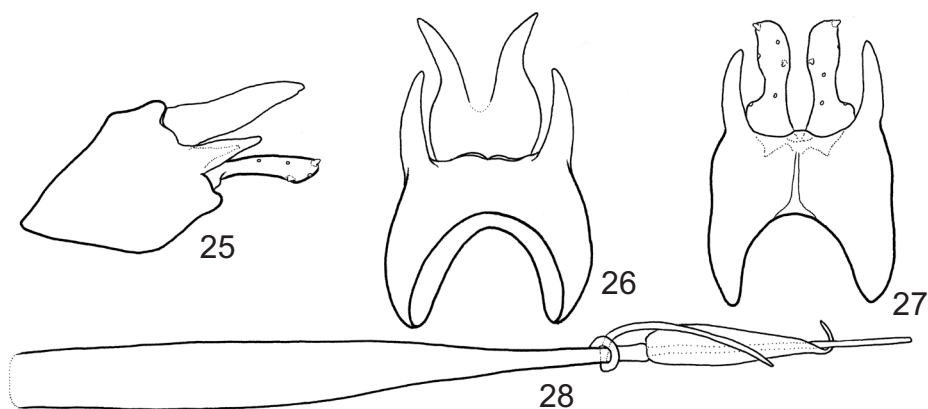
### ***Hydroptila tulipa* sp. n.** (Figs 25–28)

*Diagnosis* – This medium-sized species is closest to *H. maza* HARRIS et HOLZENTHAL, 1999 described from Costa Rica, but differs by having segment X with tulip-shape in dorsal view, not simply constricted midway; paraprocts rounded convex, not slightly concave in ventral view; (3) gonopods almost straight, not curving laterad in ventral view; gonopods bidentate possessing minute teeth-like projection, not unidentate.

*Description* – Male (in alcohol). Medium-sized species with forewing length 2.9 mm. Ocelli absent. Postoccipital setal warts pronounced, concealing eversible globular scent organ. Tentorium reduced, not discernible. Antennae with 32 segments; scapus curved, pedicel shorter; flagellomeres quadrangular. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent;

metascutellum triangular. Tibial spurs 0,2,4. apex of apicomeres process on sternite VII narrowing blunt in lateral and pointed in ventral view.

Male genitalia. Segment VIII annular and quadrangular. Segment IX synsclerotized; produced triangular lateroventrally; posterolateral process much developed long digitate triangular. Segment X (dorsal plate) forming roof of genital chamber, tulip-shaped in dorsal view with deep apical excision. Paraprocts fused rounded plate in ventral view with two subapical setae. Gonopods almost parallel-sided slightly capitate in lateral view and clavate in ventral view; two short black peg or tooth-like projections present both on apicodorsal and apicoventral angles visible in lateral and ventral view. Phallic organ with distinct tubular basal and subdivided distal division; distal portion with elongate free ejaculatory duct and broad phalothecal body turned perpendicular at apex; well developed short paramere present starting with single coil after midlength constriction.



**Figs 25–28.** *Hydroptila tulipa* sp. n., holotype, male genitalia: 25 = lateral view, 26 = dorsal view, 27 = ventral view, 28 = phallus, ventral view

*Type material* – Holotype, male: **Peru**: Dep. Lima, Pacaran, Province Canete, River Chillon Obrajillo, 877 m, 12°52'05"S, 76°02'60"W, 16–17.III.2006, light trap, leg. JUAN CHAVEZ LOPEZ & FAVIOLA MONTES CARLOS (NHRS). Paratypes: **Peru**: Huanuco, Tomayquichua Distr., River Tomayquichua, 2041 m, humid subtropical forest 10°04'27"S, 76°12'36"W, 29.X.–6.XI.2005, light trap, leg. FAVIOLA MONTES CARLOS (2 males, NHRS, 2 males, OPC).

*Etymology* – *Tulipa*, from “tulipán”, tulip in Hungarian, refers to the tulip-shaped segment X in lateral view.

### *Hydroptila venezuelensis* FLINT, 1981

*New records* – **Ecuador**: Garenó, near Puerto Napo, 10–11.X.2010 light trap, leg. J. OLÁH jr. (1 male, OPC).

Genus *Oxyethira* EATON, 1873  
(Table 1)

**Table 1.** Subgeneric features in *Oxyethira* EATON, 1873. Generic features: segment IX completely retracted within segment VIII, venter IX pointed or rounded anteriorly, not truncate or excised mesally, caudal end of segment IX indistinct, fused with gonopods

Subgenera	Subgeneric features
<i>Trichoglène</i> NEBOISS, 1977	<i>Dorsolateral lobes/processes and spiralling paramere absent</i> Antennae with 27–41 segments; segment VIII cylindrical unmodified: without excisions and processes; paraprocts separated, fused to pleuron IX, paramere lost or short at <i>O. brevis</i> WELLS, 1981, and <i>O. caledoniensis</i> KELLEY, 1989. Australasia
<i>Oxyethira</i> EATON, 1873	<i>Dorsolateral spines/lobes/processes VIII and spiralling paramere present</i> Antennae with 30–44 segments; spines on dorsolateral lobes VIII; long excision on venter VIII; long, stout basal plate. Holarctic, Oriental
<i>Holarctotrichia</i> KELLEY, 1984	Antennae with 24–40 segments; long dorsolateral process VIII; venter VIII medium excised; paraprocts convergent, nearly fused distally, long paramere. Holarctic
<i>Argyrobothrus</i> BARNARD, 1934	Antennae with 29–38 segments; dorsolateral process VIII; short excision on venter VIII. Afrotropical, Nearctic
<i>Dampfitrichia</i> MOSELY, 1937	Antennae with 26–41 segments; dorsolateral process VIII; short excision on venter VIII; paraprocts fused with subdistal bridge. Australasia, Oriental, Nearctic, Neotropical
<i>Mesotrichia</i> KELLEY, 1984	Long excision on venter VIII; non spiralling paramere present. Jamaica
<i>Pacificotrichia</i> KELLEY, 1989	<i>Dorsolateral processes and paramere lost</i> Antennae with 24–30 segments; dorsolateral processes VIII lost; dorsum VIII long excised, ventrum VIII short excised, paraprocts fused distally, paramere lost. Pacific Islands: Fiji, New Caledonia, Vanuatu
<i>Oxytrichia</i> MOSELY, 1939	Antennae with 25–40 segments; dorsolateral lobe VIII present or absent; venter VIII long excised, paramere lost. Holarctic, Neotropical
<i>Tanytrichia</i> KELLEY, 1984	Antennae with 30 segments; venter VIII long excised; dorsolateral process VIII retained or lost; long venter IX; paramere lost; paired distolateral processes on aedeagus. Neotropical
<i>Dactylotrichia</i> KELLEY, 1984	Antennae with 27–28 segments; dorsolateral processes VIII lost; venter VIII long excised; paramere lost; long finger-like processes on venter IX. Neotropical
<i>Loxotrichia</i> MOSELY, 1937	Antennae with 29–33 segments; dorsolateral processes VIII lost; venter VIII long excised; paramere lost; fused, long paraprocts. Nearctic, Neotropical

**Oxyethira arantala** sp. n.  
(Figs 29–31)

*Diagnosis* – This new species belongs to a group of species with rather aberrant and asymmetric features: *Oxyethira absona* FLINT, 1991 (Colombia), *O. presilla* HARRIS et DAVENPORT, 1999 (Peru) *O. quinquaginta* KELLEY, 1983 (Ecuador); *O. rareza* HOLZENTHAL et HARRIS, 1992 (Costa Rica), *O. sierruca* HOLZENTHAL et HARRIS, 1992 (Costa Rica), *O. simanka* sp. n. (French Guiana), *O. sinistra* SANTOS, HENRIQUES-OLIVEIRA et NESSIMIAN, 2009 (Brazil), *O. torza* sp. n. (French Guiana). We separate these species under the name of the first described species: *Oxyethira quinquaginta* new species group. Aberrations may include asymmetrical segment VIII, asymmetrical tergum X, vestigial gonopods, asymmetrical paraprocts. Like at most Neotropical subgenera the dorsolateral processes or lobes on segment VIII lacking, paramere lost, segment VIII variously excised both dorsally and ventrally. According to KELLEY's (1984) subgeneric diagnosis these species having antenna with 34–50 segments belong to subgenus *O. (Oxytrichia)* MOSELY, 1939, the only Neotropical *Oxyethira* subgenus with such a high number of antennal segments. Other Neotropical subgenera have reduced their antennal segments to about 27–33. However the structure of asymmetric genitalia differentiates this group of species from all the known members of subgenus *O. (Oxytrichia)* and a detailed comparative study is required to establish its taxonomic position. *Oxyethira arantala* sp. n. is closest to *O. presilla*, but differs by having posteromesal process present on segment VII; dorsum VIII more deeply excised; tergum X elongate asymmetric, well-differentiated from segment IX; paraprocts modified into a pair of upward arching asymmetrical spine-like processes, right process more developed, the longest process of the genitalic structures.

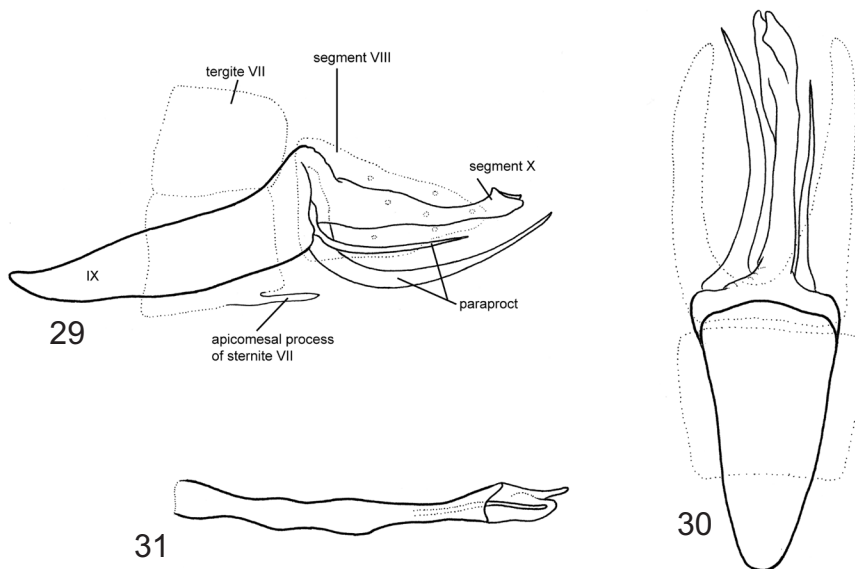
*Description* – Male (in alcohol). Forewing length 2.1 mm. 3 ocelli present. Postoccipital setal warts medium-sized, semicircular, oblique between longitudinal and transversal; laterally rounded and mesally straight-cut; widely separated and without eversible globular scent organ. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible at tentorial pits, indiscernible between. Antennae with 37 segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide, each with whorled fimbriate setae; scapus fully packed with sensilla placodea. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII with small pointed spine-like apicomeral process.

Male genitalia. Segment VIII deeply excised both in dorsum and ventrum, entire segment VIII reduced almost to huge triangular lateral setose plates covering in lateral view most of processes of segment IX. Segment IX with anteriorly elongate ventrum and without dorsum. Segment X slightly longer than lateral plates of segment VIII, forming long sclerotized irregular process with small dorsal subapical triangle in lateral view and with an additional small right-side lobe on apex. Paraprocts composed of pair of asymmetric

spine-like processes, right side process strongly developed, representing longest genital strural element; left side paraproctal process less developed, thin spine-like. Gonopods not visible. Phallic organ exhibit an irregular tube without any paramere, but with complex bilobed apex and free apical section of ejaculatory duct.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (2 males, NHRS, 1 male, OPC).

*Etymology* – *Arantala*, from “aránytalan”, asymmetric in Hungarian, refers to the asymmetrical genital structure.



Figs 29–31. *Oxyethira arantala* sp. n., holotype, male genitalia: 29 = lateral view, 30 = dorsal view, 31 = phallus, lateral view

### *Oxyethira azteca* MOSELY, 1937

*New records* – **French Guiana**: Approuaguekaw, Kaw Mt, 4°32.833'N, 52°11.452' W, 77 m, 24.I.2007, FRG 5, light trap, leg N. JÖNSSON (3 males, NHRS, 1 male, OPC). Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (1 male, OPC)

*Oxyethira bidentata* MOSELY, 1934

*New records* – **Chile**: Region del Maule (VII), stream ca 2.5 km SE Pont Chovellén, ca 10 km S Curanipe, 35°56.343'S, 72°42.934'W, 36 m (Loc#02), light trap, 17–18.I.2006, leg. K. A. JOHANSON (4 males, 2 females, NHRS, 1 male, OPC). Region de los Lagos (X), Isla Grande de Chiloé, Rio Melilebú, along road between Tebuhueico and Hullinco, 5.4 km S crosspoint to Curaco, river, 100 m upstream bridge, ca 42°43.089'S, 73°53.797'W, 43 m (Loc#15), light trap, leg. K. A. JOHANSON (7 males, NHRS). Region de los Lagos (X), Isla Grande de Chiloé, stream along coastal road between Dalcahue and Quemchi, 24.5 km from Dalcahue, 42°17.153'S, 73°28.104'W, 102 m (Loc#14), light trap, leg. K. A. JOHANSON (1 male, NHRS). Region del Biobio (VIII), ca 20 km WSW Arauco, stream crossing road at Puento Caripilum, 37°18.141'S, 73°30.633'W, 20 m (Loc#06), light trap, 2.I.2006, leg. K. A. JOHANSON (14 males, NHRS, 10 males, OPC). Region del Biobio (VIII), river above Salto del Laja, 30 km N Los Angeles, 37°13.026'S, 72°22.010'W, 120 m (Loc#09), light trap, 4.I.2006, leg. K. A. JOHANSON (2 males, NHRS). Region del Maule (VII), stream ca 2.5 km SE Pont Chovellén, ca 10 km S Curanipe, 35°56.343'S, 72°42.934' W, 36 m (Loc#02), light trap, 17–18.I.2006, leg. K. A. JOHANSON (2 males, NHRS). Region de los Lagos (X), 20 km N Valdivia, small lake near Rio Cruces, 39°43.850'S, 73°10.451'W (Loc#13), light trap, leg. K. A. JOHANSON (35 males, NHRS, 9 males, OPC).

***Oxyethira kerek* sp. n.**

(Figs 32–34)

*Diagnosis* – This new species belongs to a group of species having a pair of slender digitiform setaless processes on the ventrum of the segment IX. KELLEY (1984) gave them subgeneric status *O. (Dactylotrichia)* based mostly on the presence of these sternal processes. He considered these processes as gonopods (clasper); however, they are setaless sternal outgrowths of segment IX. Setose gonopods are present between these sternal processes and the paraproctal plate (subgenital plate). *Oxyethira kerek* sp. n. is closest to *O. dactylonedys* KELLEY, 1983 described from Paraguay, but easily distinguishable by the completely fused rounded paraproctal plate and by the shape of sclerotized distal spine-like half of the phallic organ with the tip turning perpendicular to the longitudinal axis of the phallic organ.

*Description* – Male (in alcohol). Forewing length 2.5 mm. 3 ocelli present. Postoccipital setal warts medium-sized, ovoid, oblique between longitudinal and transversal, widely separated and without eversible globular scent organ. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible at tentorial pits, indiscernible between. Antennae with 30 segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide; apical half of scapus fully packed with sensilla placodea. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular

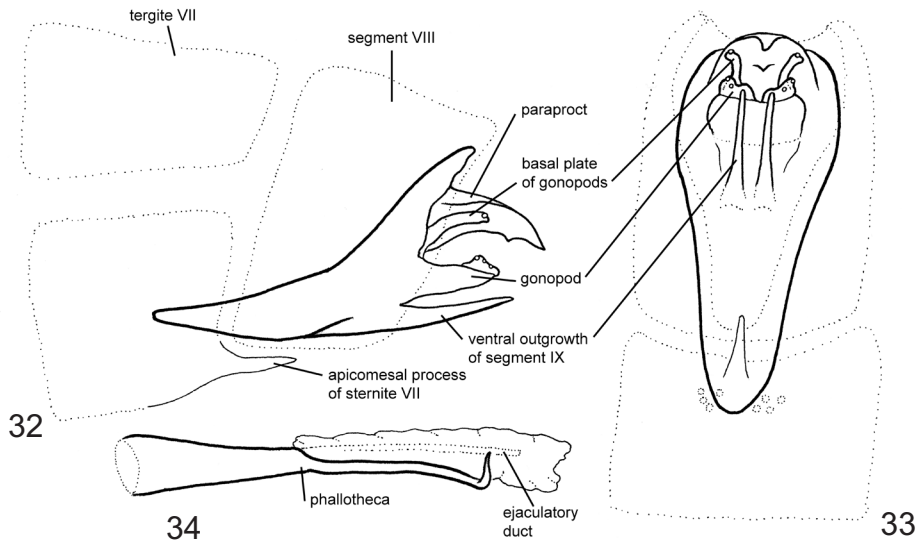


with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII with small pointed spine-like apicomesal process and covered by long and stout setae of two groups just anteriorly of apicomesal process.

Male genitalia. Segment VIII shortly excised in dorsum and long excised, almost entirely separated in ventrum. Segment IX completely retracted within segment VIII and characterized in lateral view with anteriorly elongate ventrum and without dorsum; pair of long setaless pointed digitiform sternal outgrowth developed as an apomorphic character of this species group. Segment X indistinct. Paraprocts forming well-developed rounded plate, slightly downward curving in lateral view with subapical ventral tip. Gonopods developed on tip of ventral apical elongation as pair of short bilobed setose units. Basal plate of gonopods (bilobed process) present as pair of slightly pigmented long digitate processes with single seta on their tip; their connection to basement of gonopods indistinct. Phallic organ without any paramere exhibits higher basal tube continuing into low apical half, slender spine-like sclerotized unit giving support to entirely membranous aedeagus, ejaculatory duct discernible inside membranous part.

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Negro, 37 km (rd.) W Moyobamba, near Olmos-Tarapoto rd., 6°00.278'S, 77°15.437'W, light, loc. 05, 6.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kerek*, from “kerek”, circular in Hungarian, refers to the rounded paraproctal plate.



**Figs 32–34.** *Oxyethira kerek* sp. n., holotype, male genitalia: 32 = lateral view, 33 = ventral view, 34 = phallus, lateral view

*Oxyethira macrosterna* FLINT, 1974

*New records* – **French Guiana:** Approuaguekaw, Kaw Mt, 4°32.833'N, 52°11.452' W, 77 mao, 24.I.2007, FRG 5, light trap, leg. N. JÖNSSON (16 males, NHRS, 6 males, OPC). St. Georgesoyapok, Gabaret Creek St. Georges, 17 mao 27.I.2007 3°54.577'N, 51°50.212'E FRG 7 leg N. JÖNSSON (1 male, NHRS). Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (1 male, NHRS)

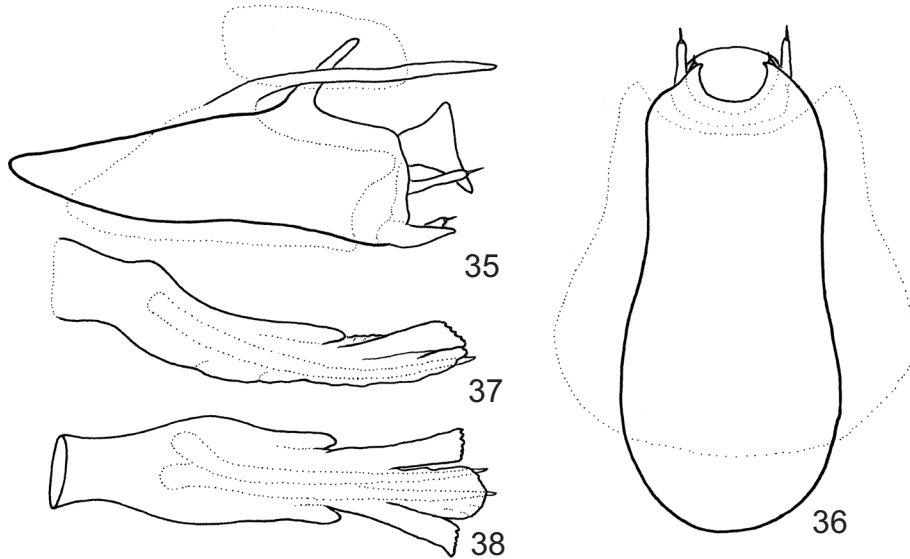
***Oxyethira nyultka* sp. n.**

(Figs 35–38)

*Diagnosis* – Closest to *O. bicornuta* KELLEY, 1983 from Brazil, it is a member of subgenus *O. (Tanytrichia)* KELLEY, 1984, but differs by having spinelike process on dorsum VIII straight, not sinuous; different ventral shape of segment IX; elongate phallic organ, not abbreviated; long and straight internal phallic spines, not short and curved; presence of a pair of phallic apicolateral long processes with truncate serrated apex.

*Description* – Male (in alcohol). Forewing length 1.5 mm. 3 ocelli present. Postoccipital setal warts medium-sized, ovoid, oblique between longitudinal and transversal, widely separated and without eversible globular scent organ. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible only at tentorial pits; indiscernible between them. Antennae 25–27 segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide; basal whorl present. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII with small pointed spine-like apicomeral process.

Male genitalia. Sternum VIII with backward directed spinelike process arising middle on dorsum; only shortly excised ventroapical; tergum VIII separated, truncate apical in dorsal view. Segment IX completely retracted within sternum VIII and characterized in lateral view with anteriorly elongate ventrum and without dorsum; pair of long setaless pointed digitiform sternal outgrowth developed on dorsal margin, functioning as brace structure for tergite VIII. Segment X indistinct. Paraprocts forming well-developed rounded plate, in ventral view, triangular in lateral view and connected somehow to sclerotized ventrolateral U-shaped band. Halfring gonopods fused to tip of ventral apical elongation of segment IX. Basal plate of gonopods (bilobed process) present as 2 pairs of slightly pigmented digitate processes with single terminal seta; one pair of long process connected to U-shaped band, other pair of short processes located directly on gonopod dorsum. Phallic organ without any paramere; short basal tube constricted; elongate apical 2 thirds with pair of dorsolateral sclerotized short rods continuing in pair of less pigmented apical processes truncate serrated; 2 long, slightly arching internal spines dominating entire phallic organ.



**Figs 35–38.** *Oxyethira nyultka* sp. n., holotype, male genitalia: 35 = lateral view, 36 = ventral view, 37 = phallus, lateral view, 38 = phallus, dorsal view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4° 32.833'N, 52° 11.452'W, 77 m, 24.I.2007, FRG 5, light trap, leg N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (91 males, NHRS, 16 males, OPC). Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg N. JÖNSSON (5 males, NHRS).

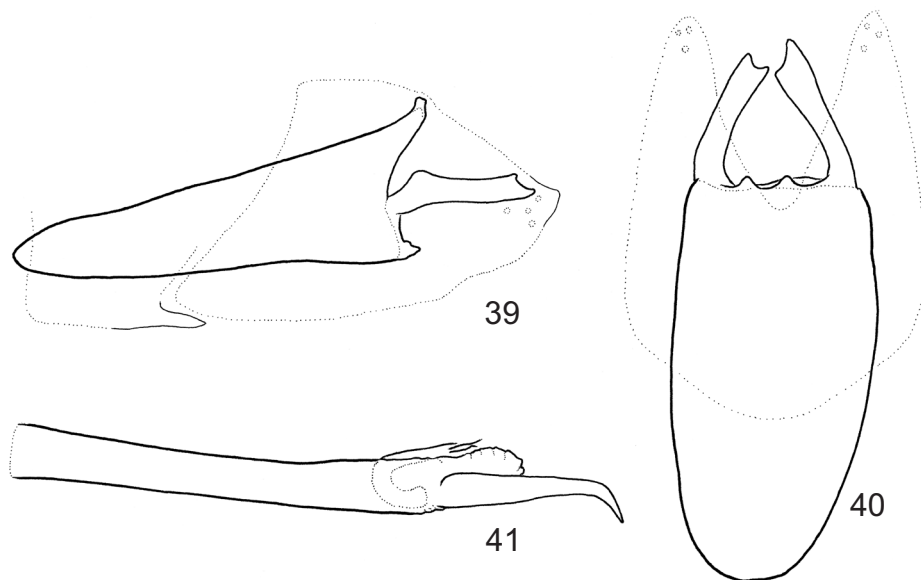
*Etymology* – *Nyultka*, from “nyúltka”, diminutive form of elongate in Hungarian, refers to the elongate structures of phallic organ and phallic spines.

### ***Oxyethira simanka* sp. n.** (Figs 39–41)

*Diagnosis* – This new species belongs to those species of the *O. quinquaginta* new species group, which have asymmetry only in paraprocts: *Oxyethira absona* FLINT, 1991 (Colombia), *O. quinquaginta* KELLEY, 1983 (Ecuador), *O. sierruca* HOLZENTHAL et HARRIS, 1992 (Costa Rica). Its genital structure is closest to *Oxyethira quinquaginta* KELLEY from Ecuador, but differs by having nearly straight dorsal margin of segment IX in lateral view, not highly concave; symmetrical paraprocts, not asymmetrical; phallic organ ending in a single stout spine, not bifid.

*Description* – Male (in alcohol). Forewing length 3.1 mm. 3 ocelli present. Postoccipital setal warts medium-sized, ovoid triangular, oblique between longitudinal and transversal, widely separated and without eversible globular scent organ. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible at tentorial pits, indiscernible between. Antennae broken with 36+ segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII with small pointed spine-like apicomese process.

*Male genitalia.* Segment VIII fused cylindrical and double long ventrally; long excised both in dorsum and in ventrum. Segment IX completely retracted within segment VII and VIII; characterized by anteriorly elongate ventrum and open dorsum; tergite IX reduced to produced dorsoapical corner appearing as more sclerotized small process directed mesad; anterior margin vertical. Segment X indistinct on cleared holotype. Paraprocts developed as pair of heavily sclerotized process fused from middle downward of vertical anterior margin of segment IX; paraproctal apices truncate, slightly bifid. Gonopods present as pair of very small triangular outgrowths fused to ventral margin of segment IX. Basal plate of gonopods reduced to very short rim fused to segment IX behind gonopods. Phallic organ forming uniform tube ending in single spinelike structure with almost right-angled apex; below this terminal spine there is U-shaped spinelike structure with longer ending dissolved into several threads of various length; paramere lacking.



**Figs 39–41.** *Oxyethira simanka* sp. n., holotype, male genitalia: 39 = lateral view, 40 = ventral view, 41 = phallus, lateral view

*Type material* – Holotype, male: **Ecuador**: Wild Sumaco, near Pacto Sumaco, 7–8.X. 2010, light trap, leg. J. OLÁH jr. (OPC).

*Etymology* – *Simanka*, from “sima”, simple or smooth in Hungarian, agglutinated with suffixes (“simankodik”), refers to the simplified genital structure with the highly reduced segment X, gonopods and basal plate of gonopods.

### *Oxyethira tica* HOLZENTHAL et HARRIS, 1992

*New records* – **French Guiana**: Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (2 males, NHRS, 2 males, OPC).

### *Oxyethira torza* sp. n.

(Figs 42–45)

*Diagnosis* – This new species belongs to those species of the *O. quinquaginta* new species group, which have asymmetry not only in the paraprocts: *Oxyethira arantala* sp. n. (French Guiana), *O. presilla* HARRIS et DAVENPORT, 1999 (Peru), *O. rareza* HOLZENTHAL et HARRIS, 1992 (Costa Rica), *O. sinistra* SANTOS, HENRIQUES-OLIVEIRA et NESSIMIAN, 2009 (Brazil). Having the basal plate of gonopods (bilobed processes) present may have relation to *O. sinistra* SANTOS, HENRIQUES-OLIVEIRA et NESSIMIAN, 2009, but differs by having symmetrical segment VIII, not asymmetrical; paraprocts fused, not separated; basal plate of gonopods short, not long.

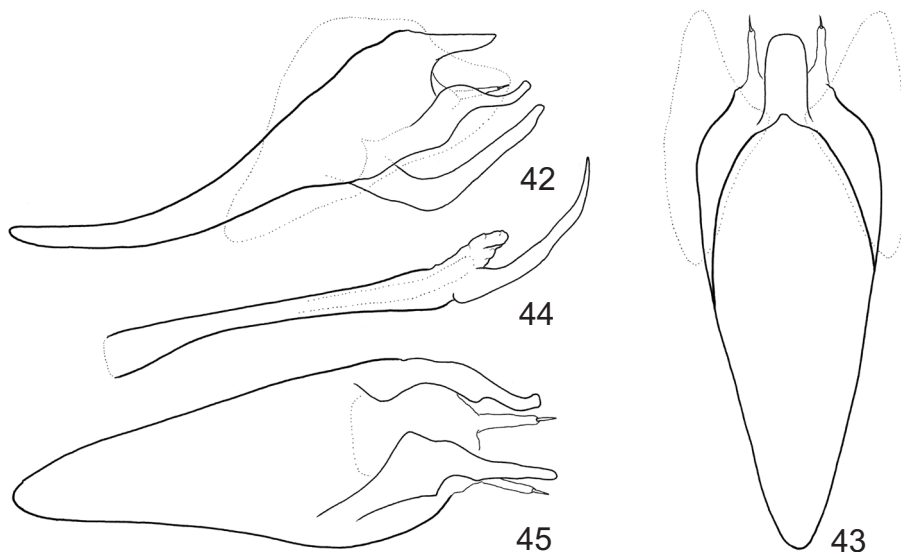
*Description* – Male (in alcohol). Forewing length 1.9 mm. 3 ocelli present. Postoccipital setal warts medium-sized. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible at tentorial pits, indiscernible between. Antennae with 37 segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide, each with whorled fimbriate setae; scapus fully packed with small sensilla placodea. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.

Male genitalia. Segment VIII short dorsally, long ventrally, deeply excised both in dorsum and ventrum, entire segment VIII reduced almost to huge triangular lateral setose plates covering in lateral view most of processes of segment IX. Segment IX with anteriorly elongate ventrum and without dorsum. Segment X sclerotized linguiform both in lateral and dorsal view. Paraprocts composed of pair of asymmetric processes originating from middle ventrum of segment IX, right side process longer and geniculate both in lateral and ventral view, representing longest genital structural element; left side paraproctal process

shorter and black-tipped, S-shaped in lateral view. Gonopods not visible. Basal plate of gonopods (bilobed processes) present as pair of short digitiform less sclerotized processes, their origin indistinct. Phallic organ terminating in inflated membranous apex with single long sclerotized spinelike process.

*Type material* – Holotype, male: **French Guiana**: Roura, Cacao, 4°33.639'N, 52°24.629'W, 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (1 male, NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC)

*Etymology* – *Torza*, from “torz”, distorted in Hungarian, refers to the highly asymmetrical genital structure.

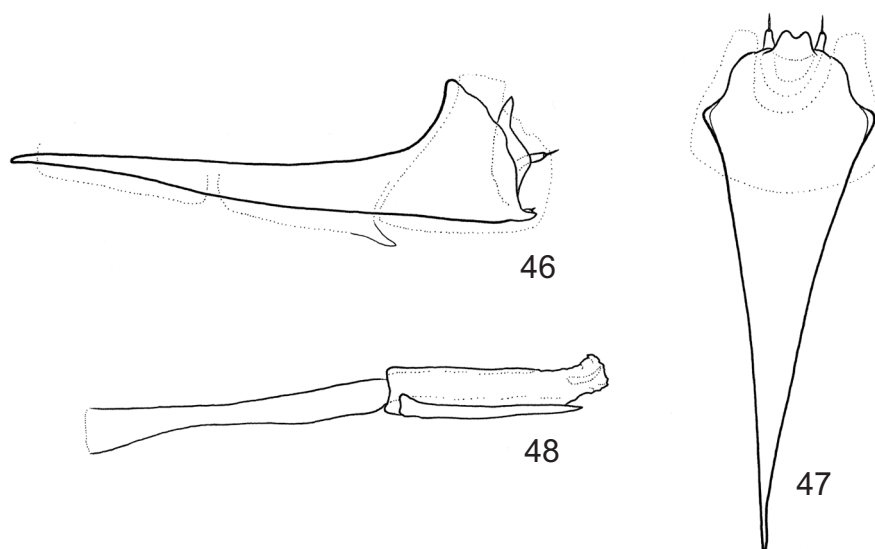


Figs 42–45. *Oxyethira torza* sp. n., holotype, male genitalia: 42 = lateral view, 43 = dorsal view, 44 = ventral view, 45 = phallus, lateral view

### ***Oxyethira tuveva* sp. n.** (Figs 46–48)

*Diagnosis* – Closest to *O. longissima* FLINT, 1974 from Suriname, it is a member of the subgenus *O. (Tanytrichia)* KELLEY, 1984, but differs by having segment VIII stepwise anteriorly in lateral view, not pointed into a small lobe; segment IX narrowing more, almost needle-like anteriorly in ventral view; free lobes of the fused gonopods very short in ventral view, not long and produced; basal plate of gonopods (bilobed processes) short and stout, not long and slender; phallic organ with a single large long spines and with a small spinelike structure embedded in the membranous apex, not with a pair of slender whip-like processes.

*Description* – Male (in alcohol). Forewing length 1.8 mm. 3 ocelli present. Postoccipital setal warts medium-sized, ovoid, oblique between longitudinal and transversal, widely separated and without eversible globular scent organ. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible only at tentorial pits; indiscernible between them. Antennae 28 segments; scapus longer than pedicel; pedicel only slightly longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide; basal whorl present. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII with small pointed spine-like apico-mesal process.



**Figs 46–48.** *Oxyethira tuveva* sp. n., holotype, male genitalia: 46 = lateral view, 47 = ventral view, 48 = phallus, lateral view

Male genitalia. Segment VIII fused, anterior margin oblique posterior margin with 3 steps in lateral view; in dorsal and ventral view apical almost quadrangular excision short on dorsum, slightly longer on ventrum. Segment IX completely retracted within sternum VI, VII and VIII and characterized in lateral view with anteriorly elongate ventrum and without dorsum; anteriorly elongate ventrum narrowing to needle-like pointed tip; apical section higher, enforced by dorsolateral shoulders. Segment X indistinct. Paraprocts just discernible as rounded plate, turning laterally upward along phallic organ. Gonopods fused to tip of ventral apical elongation of segment IX; pointed triangular in lateral view with narrow mesal excision in ventral view. Basal plate of gonopods (bilobed process) present as 2 pairs of slightly pigmented digitate processes with single terminal seta; one pair of

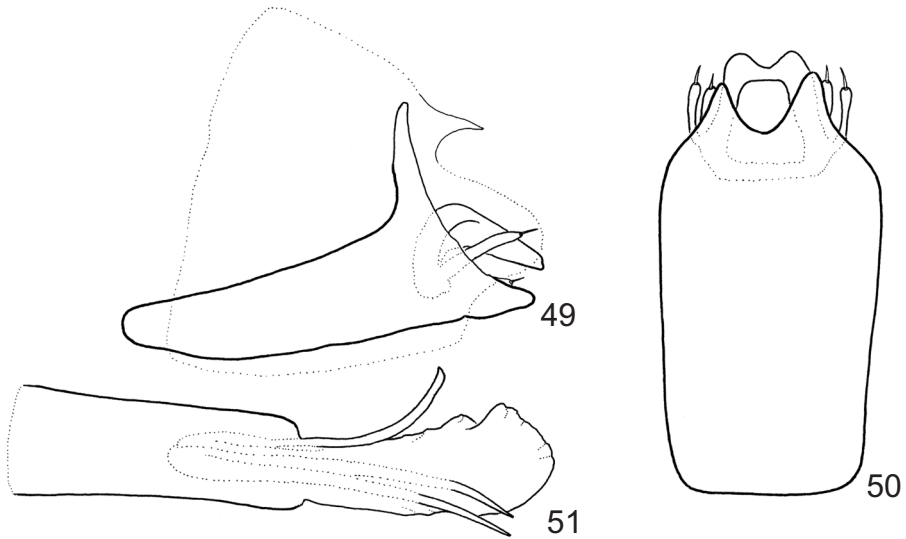
stout process connected mesally forming U-shaped structure in ventral view; other pair of short processes attached to gonopod dorsum. Phallic organ without any paramere; basal half tube shaped; distal half membranous wrapped in an additional membranous tube accompanied by single long spines, small spinelike structure visible freely suspended in membranous head.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4°32.833' N, 52° 11.452'W, 77 mao, 24.I.2007, FRG 5, light trap, leg. N. JÖNSSON (NHRS). Paratypes: same as holotype (2 males, NHRS, 2 males, OPC).

*Etymology* – *Tuveva*, from “tűvévált”, modified to needle in Hungarian, refers to the highly modified, diminished, needle-like segment IX.

***Oxyethira vaza* sp. n.**  
(Figs 49–51)

*Diagnosis* – This new species having dorsolateral process on segment VIII, short excision on venter VIII and fused paraprocts with subdistal bridge belongs to the subgenus *O.* (*Dampffitrichia*) MOSELY, 1937 and having robust phallic organ resembles *O. unispina* FLINT, 1974 from Suriname, but differs by having dorsolateral processes on segment VIII pointed, not blunt; vase-shaped segment IX with truncate anterior in ventral view, not narrowing; paraprocts differently shaped; phallic organ with 2 straight long spines beside bending paramere.



**Figs 49–51.** *Oxyethira vaza* sp. n., holotype, male genitalia: 49 = lateral view, 50 = ventral view, 51 = phallus, lateral view



*Description* – Male (in alcohol). Forewing length 1.8 mm. 3 ocelli present. Postocci-pital setal warts medium-sized. Coronal (midcranial) part of epicranial groove present reaching to anterior ocellus. Tentorium discernible at tentorial pits, indiscernible between. Antennae broken with 26+ segments; scapus longer than pedicel; pedicel longer than flagellomeres; flagellar segment cylindrical, slightly longer than wide, each with whorled fimbriate setae. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum subtriangular with anterior margin evenly convex, wide, not diamond-shaped and not narrow; transversal suture absent; metascutellum triangular. Tibial spurs 0,3,4. Sternum VII without apicomesal process.

Male genitalia. Segment VIII shorter dorsally than ventrally, short excised both in dorsum and ventrum; dorsolateral processes pointed. Segment IX cumbuliform with anteriorly elongate ventrum and with very short dorsum; dorsum reduced to short subapical bridle bending over phallic organ. Segment X indiscernible. Paraprocts forming complete and complex ring; its free slightly downward curving horizontal halfring, guiding trough under phallic organ characterized with excised apical margin; its vertical basal halfring recessed into segment IX. Gonopods fused to ventroapical margin of segment IX forming pair of widely separated triangular continuation; small less sclerotized bud with terminal seta present on dorsum of fused gonopods. Basal plate of gonopods (bilobed processes) present as pair of long digitiform less sclerotized processes, originating from ventrolateral corner of recessed basal halfring of paraprocts. Phallic organ robust, larger than entire segment IX together with all periphallal processes; membranous apex inflated, paramere simple bending, not coiled; 2 long straight spines present inside membranous shaft with free endings.

*Type material* – Holotype, male: **French Guiana**: Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (NHRS)

*Etymology* – *Vaza*, from “váza”, vase in Hungarian, refers to the regularly quadrangular, almost vase-shape of the segment IX in ventral view.

### *Oxyethira vipera* KELLEY, 1983

*New records* – **Chile**: Region de los Lagos (X), Isla Grande de Chiloé, stream along coastal road between Dalcahue and Quemchi, 24.5 km from Dalcahue, 42°17.153'S, 73°28.104'W, 102 m (Loc#14), light trap, leg. K. A. JOHANSON (1 male, NHRS). Region de los Lagos (X), 20 km N Valdivia, small lake near Rio Cruces, 39°43.850'S, 73°10.451'W (Loc#13), light trap, leg. K. A. JOHANSON (115 males, NHRS, 19 males, OPC).

## Tribe Leucotrichiini

*Celaenotrichia* genus cluster  
(Table 2)**Table 2.** Character states of genera in the *Celaenotrichia* genus cluster having modified spur number and without phallic median complex in the tribe Leucotrichiini

Genus	Number of ocelli	Antennae	Male cranial scent glands	Tibial spurs	Forewing air sacs	Male sternum VIII spine	Anterolateral apodemes of male segment IX	Posterolateral process on male segment X
<i>Alisotrichia</i>	2	modified	present	0.2.4	absent	present	long	absent
<i>Byrsopteryx</i>	3	unmodified	absent	0.3.4	present	absent	short	present
<i>Celaenotrichia</i>	3	unmodified	absent	1.3.4	absent	absent	short	present
<i>Cerasmotrichia</i>	3	unmodified	absent	1.3.4	absent	absent	short	present
<i>Mejicanotrichia</i>	3	unmodified	absent	0.2.4	present	absent	short	present
<i>Scelobotrichia</i>	3	modified	absent	0.2.3	absent	absent	long	present

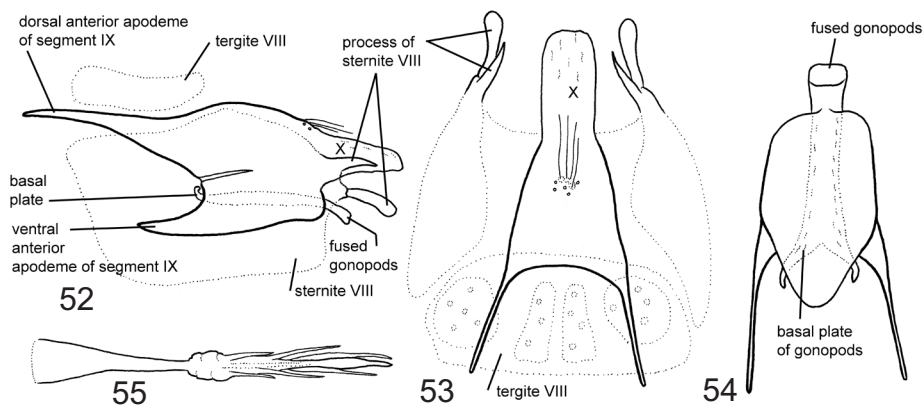
Genus *Alisotrichia* FLINT, 1964***Alisotrichia kantala* sp. n.**

(Figs 52–55)

*Diagnosis* – Like most *Alisotrichia* (*sensu lato*), this new species has a short metascutum-wide metascutellum with subpentagonal shape and integrates apomorphies of various species groups: forewing with sclerotized band at costal border (*A. arcane* BOTOSANEANU, 1977); a pair of heavy spines on dorsoapical region of sternite VIII (*A. aloyana* BOTOSANEANU, 1977, *A. chiquitica* BOTOSANEANU, 1977, *A. viuda* HARRIS et FLINT, 2002), but without dorsolateral process bearing long spinelike seta on sternite VIII (*A. orophila* group). In spite of the reduced spur number *A. kantala* sp. n. appears closest to *A. arizonica* species group and to *A. arizonica*, but differs by having vertexal tongue on the head dorsum between the enlarged scapes; reduced spur count; a pair of heavily sclerotized spines on dorsoapical region of sternite VIII; tergite VIII with two pairs of sclerites on tergite VIII fully packed with special setae; phallic organ with 3 pairs of spinelike process.

*Description* – Male (in alcohol). Small sized fuscous species with forewing length 1.5 mm; forewing without any light pattern in alcohol. Postoccipital setal warts elongate almost transversally without any eversible scent organ. Tentorium visible without bridge. Antennae with 18 segments; scapus modified, highly enlarged, flapping vertexal tongue-like structure developed between scapes. Maxillary palp formula I-II-III-IV-V, first two segments globular, extremely short, shorter than wide; fourth segment enlarged ovoid and flat covered with modified elongate setae. Mesoscutellum with transversal suture present; metascutellum short scutum-wide subpentagonal. Tibial spurs 0,2,2, there is no sign of any short and slightly sclerotized spur on foreleg and anteroapical spur on midleg very small stylate. Sternum VII without any apicomesal process.

Male genitalia. Tergite VIII depressed, almost concave and visible small in lateral view; in dorsal view more developed and patterned with 4 more chitinized sclerites bearing modified setae; lateral sclerites rounded, mesal pair of sclerites elongate longitudinally; sternite VIII visible enlarged both in lateral and ventral view, subquadrangular and producing 2 dorsoapical heavily sclerotized processes; upper process spinelike, lobelike lower process articulated to basal protuberance. Segment IX produced dorsal and ventral anterior apodemes, appearing as tergum and sternum; lateral tergal apodemes long and very thin; single mesal sternal apodeme lobelike. Segment X (dorsal plate) membranous, continuous with tergum IX, long quadrangular and roofing over phallic complex; 3 thread-like structure surrounded by alveoli of small setae discernible at about border of tergum IX and segment X. No paraprocts discernible. Small fused gonopods visible apicad on ventrum with quadratic shape in ventral view. basal plate developed as continuation of fused gonopod stretching and diverting anterad with free basal upward curving apices. Phallic organ weakly discernible without drawing out; visible as simple tube high at very base and ensheated on midway and composed afterwards of 3 pairs of lateral threadlike structures along tube.



**Figs 52–55.** *Alisotrichia kantala* sp. n., holotype, male genitalia: 52 = lateral view, 53 = dorsal view, 54 = ventral view, 55 = phallus, dorsal view

*Type material* – Holotype, male: **Peru:** San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kantala*, an imperfect anagram abbreviated for euphony of “sarkan-tyútlán”, spurless in Hungarian, refers to the unique reduced spur number of 0,2,2.

### *Alisotrichia kanukua* HARRIS et FLINT, 2002

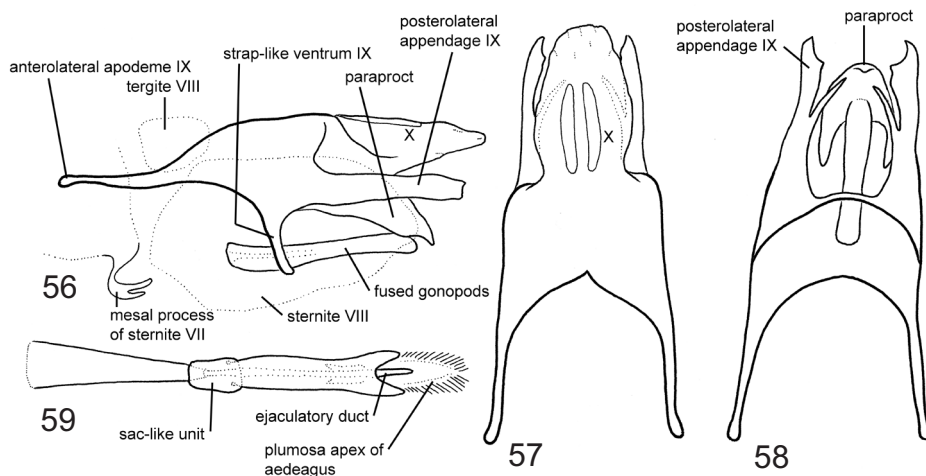
*New records* – **French Guiana:** Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.-7.II.2007, FRG MF3, leg. N. JÖNSSON (1 male, OPC).

### *Alisotrichia kevera* sp. n. (Figs 56–59)

*Diagnosis* – Several apomorphies of various species groups erected by HARRIS & HOLZENTHAL (1993) are mixed in this new species. Forewing with sclerotized band at costal border of the *A. arcana* species group, segment X with elongate lateral sclerites of *A. hirudopsis* species group, segment IX with elongate and thin posterolateral processes of *A. lobata* species group and ventral tubular process of *A. arizonica* species group are all represented in this species. Sternite VIII greatly enlarged and enforced, but without any synapomorphic posterolateral spinose processes of *hirudopsis-lobata-orophila-arcana* species

groups. Segment IX with very elongate anterolateral apodemes of *lobata-orophila-arcana* species groups. Posterolateral appendage-like process present and well-developed on segment IX. *Alisotrichia sensu stricto* is defined by synapomorphic loss of these appendages (HARRIS et HOLZENTHAL 1993), retained only at *A. chorra* FLINT, 1969 and characterising all the other genera of *Alisotrichia* genus cluster: *Byrsopteryx* FLINT, 1981, *Celaenotrichia* MOSELY, 1934, *Cerasmatrichia* FLINT, HARRIS et BOTOSANEANU, 1994, *Mejicanotrichia* HARRIS et HOLZENTHAL, 1997, *Scelobotrichia* HARRIS et BUENO-SORIA, 1993. The new species differs from *A. chorra* by having long anteroapical apodemes; fused gonopods in the form of the ventral tubular process; more developed and differently formed posterolateral appendage-like processes; phallic organ with plumose apex.

*Description* – Male (in alcohol). Fuscous species with forewing length 1.9 mm; forewing without any light pattern in alcohol, but with sclerotized band at costal border. Vertex with deep triangular concavity housing 2 longitudinally elongate setose scent organs; lateral rim of this vertexal depression armed with long scalelike setae, different from setae on scent organs. Postoccipital setal warts rounded elongate almost transversally without any eversible scent organ. Tentorium visible without bridge. Antennae with 18 segments; scapus modified, highly enlarged triangular; flagellar segment dorsoventrally flattened short and broad, broadest on middle, terminal segment stylate; fimbriate setae in basal whorl, flagellomeres fully packed with sensilla placodea. Maxillary palp formula I-II-III-IV-V, first two segments globular, extremely short, shorter than wide; fourth segment enlarged ovoid and flat covered with modified elongate setae. Mesoscutellum with transversal suture present; metascutellum short almost scutum-wide subpentagonal. Tibial spurs 0,2,4, antero subapical spur on hindleg very small, stylate. Sternum VII with curving bifid apicomese process.



**Figs 56–59.** *Alisotrichia kevera* sp. n., holotype, male genitalia: 56 = lateral view, 57 = dorsal view, 58 = ventral view, 59 = phallus, dorsal view

Male genitalia. Tergite VIII small, located at the anterior end of sternite VIII; sternite VIII enlarged almost ten times larger than its tergite in lateral view; subquadrangular and shortly excised both anteriorly and posteriorly. Segment IX sclerotically open ventrally, discernible only straplike sternite supporting the fused gonopods of the ventral tubular process; long anterolateral apodemes slightly capitate, not pointed; posterolateral appendage-like process large with truncate apex and with ventromesal spine arising midway and directed mesad. Segment X (dorsal plate) membranous, continuous with tergum IX, rounded apicad and roofing over the phallic complex; pair of elongate lateral sclerites moved mediad on segment X. Paraproctal plate fused with narrowing and downward curving apex and with 2 long lateral apodemes. Gonopods and basal plate of gonopods modified into long ventral tubular process supported anterad by the straplike sternum of segment IX. Both the paraprocts and gonopods seem suspended, not articulated sclerotically. Basal and apical half of phallic organ meeting middle in saclike unit; apical end deeply excised in dorsal view housing the free apex of ejaculatory duct; phallic apex characteristically plumose.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 19.I–4.II.2007, FRG MF 2, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (1 male, NHRS, 1 male, OPC). Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (3 males, NHRS). Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF 2, leg. N. JÖNSSON (3 males, OPC).

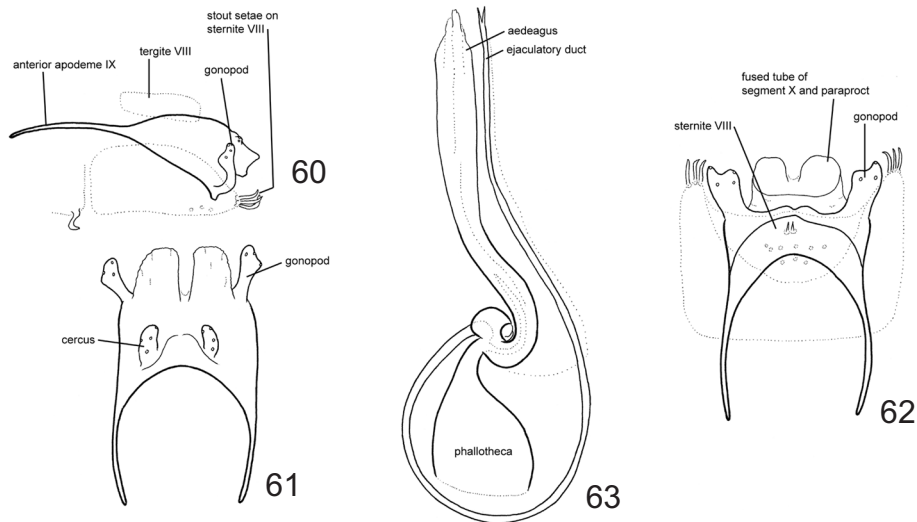
*Etymology* – *Kevera*, from “kevert”, mixed in Hungarian, refers to the mixed characters.

### ***Alisotrichia rugoka* sp. n.**

(Figs 60–63)

*Diagnosis* – Like most *Alisotrichia* this new species has a metascutum-wide metascutellum with short subpentagonal shape and close to *Alisotrichia chorra* FLINT, 1969 from Mexico, the only species of the genus *Alisotrichia sensu stricto* that HARRIS et HOLZENTHAL (1993) were unable to place into one of the known species groups. *Alisotrichia rugoka* sp. n. has resemblance also to *A. asta* HARRIS et FLINT, 2002 and *A. cuernita* HARRIS et FLINT, 2002 both from Panama, but differs from all these by having unusual genital substructures; well defined cerci; gonopods shifted laterally; a tubelike less sclerotized structure produced by the fusion of segment X and subphallic paraprocts giving an almost closed tubelike room to channel erection of the highly modified phallic organ; asymmetric phallic organ with modified spring forced ejaculatory duct entirely free from the distal shaft of the phallic organ, resembling the phallic model of the genus *Hydrobiosis* MCLACHLAN, 1868 (Hydrobiosidae).

*Description* – Male (in alcohol). Small sized fuscous species with forewing length 1.5 mm; forewing without any light pattern in alcohol; enlarged black tufts of setae present on forewing humeral area; smaller tuft directed downward, larger tuft upward. Postoccipital setal warts elongate almost transversally without any eversible scent organ. Tentorium visible without bridge. Antennae with 18 segments; scapus modified, highly enlarged, subquadrangular in dorsal view; densely covered anterodorsally with anteriorly directed, long modified black setae. Maxillary palp formula I-II-III-IV-V, first two segments globular, shorter than wide; fourth segment enlarged ovoid and flat covered with modified elongate setae. Mesoscutellum with transversal suture present; metascutellum short scutum-wide subpentagonal. Tibial spurs 0,2,2; proximal 2 thirds of hind tibia emarginate anteriorly by black long setal row. Sternum VII in lateral view with an S-shaped apicomeseal process.



**Figs 60–63.** *Alisotrichia rugoka* sp. n., holotype, male genitalia: 60 = lateral view, 61 = dorsal view, 62 = ventral view, 63 = phallus, dorsal view

*Male genitalia.* Tergite VIII short and small; sternite VIII enlarged both in lateral and ventral view, subquadrangular producing apicolateral lobes with 3 stout spinelike setae; pair of small spinelike setae is present apicoventrally of area covered by erect vestitural setae; this apicoventral area of segment VIII has some indiscernible membranous connection to short ventral band of segment IX, this membranous apical area of segment VIII covered by micritrichia. Segment IX producing long and thin slightly mesad arching anterior apodemes; dorsum long; ventrum almost open, reduced to short distal band. Segment X (dorsal plate) discernible as 2 broad, less sclerotized lobes fused ventrally to subphallic paraproctal plate forming tubelike structure from modified phallic organ. Cerci present as

2 setal lobes in dorsal view. Paraprocts fused with segment X to form semiclosed tube around phallic organ. Stalked and setose triangular plate of gonopods shifted laterally and completely fused to ventroapical corner of segment IX. No basal plates discernible. Phallic organ highly modified into spring forced structure; it consisting of 3 units; broad funnel-shaped proximal unit; slightly S-shaped distal shaft and spring forced ejaculatory duct disposed free from its normal house of distal shaft; thin and dark pigmented ejaculatory duct arising from meeting lobe of proximal and distal units, producing anteriorly large circle and turning backward along distal shaft; just discernible membranous larger tube encircling together distal shaft and backward turning section of ejaculatory duct.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (3 males, NHRS, 2 males, OPC). Approuaguekaw, Kaw Mt, 216 mao, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF 2, leg. N. JÖNSSON (1 male, NHRS).

*Etymology* – *Rugoka*, from “rugóka”, diminutive form of spring in Hungarian, refers to the spring-forced phallic organ.

## Genus *Cerasmatrichia* FLINT, HARRIS et BOTOSANEANU, 1994

### *Cerasmatrichia adunca* (FLINT, 1991)

*Rioptila adunca* FLINT, 1991: 44.

*Cerasmatrichia adunca*: FLINT *et al.* (1994): 377.

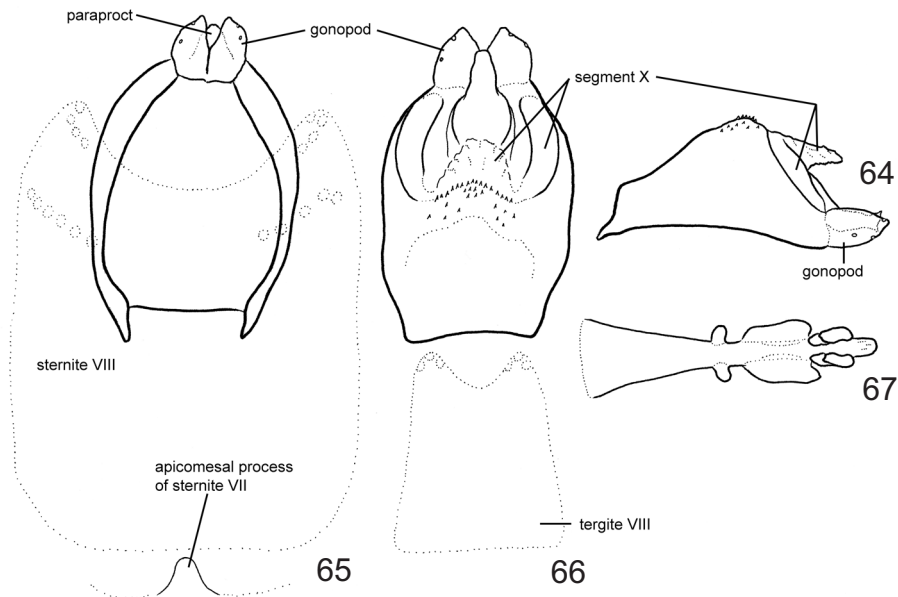
*New records* – **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (8 males, NHRS, 1 male, OPC). San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (5 males, OPC).

### *Cerasmatrichia fulika* sp. n. (Figs 64–67)

*Diagnosis* – This new species without typical median phallic complex belongs to the genus cluster of *Alisotrichia*. Having head, antennae and forewing without modification, spur count of 134, as well as tentorium with mesal gap that is the tentorial bridge vestigial this new species belongs to the genus *Cerasmatrichia* FLINT, HARRIS et BOTOSANEANU, 1994. However, the antennae with only 18 segments and the more complex phallic organ separate it from all the known species.



*Description* – Male (in alcohol). Small sized fuscous species with forewing length 1.8 mm; forewing without any light pattern in alcohol and without any modification. Tentorium incomplete, both anterior and posterior arms present as thin filament; vestigium of dorsal arm visible; tentorial bridge vestigial, divided mesally. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellar segment longer cylindrical, shortening apicad. Maxillary palp formula I-II-IV-V-III, first two segments globular, extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum wide subpentagonal. Tibial spurs 1,3,4, on foreleg sput is highly reduced. Sternum VII with small and blunt apicomeseal process. Sternum VII with small and blunt apicomeseal process.



**Figs 64–67.** *Cerasmatrixia fulika* sp. n., holotype, male genitalia: 64 = lateral view, 65 = dorsal view, 66 = ventral view, 67 = phallus, dorsal view

**Male genitalia.** Tergite and sternite VIII strongly sclerotized, sternite particularly enlarged and thickened; tergite VIII narrow elongate and excised apicad; lateral lobes of excision bearing 3 stout long spinelike setae directed posteriorly, parallel-sided and regular straight; sternite VIII enlarged, subquadrangular, excised apicad and enforced laterally by subapical and an apical rows of very stout and long spinelike setae; these extremely strong and black setae completely block light, preventing microscopic study of segment IX. Segment IX was removed from this cover: subpentagonal in lateral and oval in ventral view;

open ventrally with very short anteroventral apodemes; its dorsum more complex; anterior half low and concave; middle part producing an elevated V-shaped crossband densely packed with black microtrichia; posterior area fused and continuous with membranous segment X. Segment X (dorsal plate) its mesal area membranous just discernible on cleared holotype as short and roofing over phallic complex giving connection to pair of lateral slightly sclerotized sclerites; these lateral sclerites visible in lateral view as rims on posterior depression of segment IX. Paraprocts starts as U-shaped plate arising near lateral sclerites of segment X; fitting around phallic organ in subphallic position and joining below into mesal elongate structure between gonopods. Gonopods articulate on ventroapical tip of segment IX forming pair of stout subtriangular structures and met by small pons coxalis. Phallic organ without median complex, however its apical half is rather complex, starting with characteristic lateral pair of earlike lobe and continuing with lateral flanks, 2 pairs of partly overlapping blunt heavily sclerotized sclerites and ending in less sclerotized mesal lobe.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 4–12.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (12 males, NHRS, 7 males, OPC). Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF 2, leg. N. JÖNSSON (1 male, NHRS).

*Etymology* – *Fulika*, from “fülike”, diminutive form of small ear in Hungarian, refers to the small ear-shaped lobes on the phallic organ.

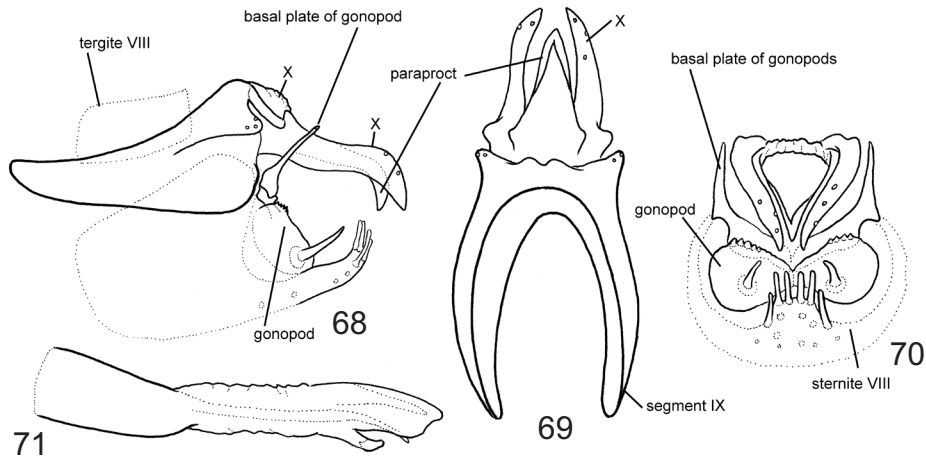
### ***Cerasmatrixia hidala* sp. n.**

(Figs 68–71)

*Diagnosis* – Comparing plesiomorphic and apomorphic character states in *Alisotrichia* genus cluster, this new species with its rather unusual genital structure belongs to the genus *Cerasmatrixia* FLINT, HARRIS et BOTOSANEANU, 1994. However, its modified forewing with “air sac” and its complete tentorial bridge without mesal gap are generic characters of *Mejicanotrichia* HARRIS et HOLZENTHAL, 1997, therefore the new species brings *Cerasmatrixia* and *Mejicanotrichia* genera even more close to each other, complicating further the generic status in the melange of *Alisotrichia* genus cluster. The gonopods-basal plate complex differentiates *C. hidala* sp. n. from all known species in the genus. The basal plate of the gonopods is much developed similarly to several other hydroptilid and psychomyioida genera.

*Description* – Male (in alcohol). Medium-sized fuscous species with forewing length 2.5 mm; forewing without any light pattern in alcohol, however air sac present in middle of remigium; air sac convex dorsally and covered ventrally by two fans of long setal rows along desclerotized transparent hyaline line on longitudinal vein M translocated to longitudinal vein A. Postoccipital setal warts elongate without any eversible scent organ. Tentorium

complete, both anterior and posterior arms present as thin filament; vestigium of dorsal arm visible; V-shaped tentorial bridge complete, not divided mesally. Antennae 20 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellar segment longer cylindrical, shortening apicad. Maxillary palp formula I-II-IV-V-III, first two segments globular, extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum subpentagonal. Tibial spurs 0,3,4, there is no sign of any short and slightly sclerotized spur on foreleg. Sternum VII without any apicomasal process.



**Figs 68–71.** *Cerasmatrixchia hidala* sp. n., holotype, male genitalia: 68 = lateral view, 69 = dorsal view, 70 = caudal view, 71 = phallus, lateral view

Male genitalia. Tergite VIII extremely small quadrangular; sternite VIII enlarged, subquadrangular, elongate posteroventrally and producing mesal lobe with 4 stout apical and 3–3 slender and longer lateral spines; moreover entire apicoventrum is fully covered with only slightly smaller spine-like setae. Segment IX produced anterolaterally, open dorsally and ventrally. Segment X (dorsal plate) membranous, short and roofing over phallic complex; its structure visible only if phallic organ pulled out from embracement produced by roofing membranous segment X and by subphallic paraprocts; pair of long sclerotized processes of segment X arises from dorsoapical area of segment IX. Paraprocts produced as fused subphallic plate with downward curving and tapering apex giving ventral support to phallic organ. Gonopods and its basal plate unusually formed, difficult to recognise articulations of periphallic organs and uncertain to detect their homology; similarly to stactobiid genital strategies of ventrally open segment IX, articulation of gonopods-basal plate complex seeming somehow detached or suspended on cleared genitalia; at this species sclerotic connection to segment IX indistinct and some kind of obscure membranous connection visible to sternite VIII; gonopods-basal plate complex visible properly only in caudal view, in ventral view they entirely covered by spinose mesal lobe of sternite VIII.

Gonopods in lateral view vertically elongate, less sclerotized, except its serrated dorsal part and strong black mesal spine; in ventral view rounded and separated and sclerotic components, central spines and serrated dorsum well visible. basal plate in lateral view visible as long spine attached to dorsoapical part of sternite VIII, but separated; in caudal view pair of long spines continuing mesally with well patterned dark pigmented mesal part meeting mediad as well as connected to basement of gonopods. Phallic organ consisting of high basal tube, middle membranous section and continuing into dorsal more sclerotized plate and pair of small sclerotized ventral sclerites; ejaculatory duct visible with only very short free apex.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC).

*Etymology* – *Hidala*, from “hidaló”, bridging in Hungarian, refers to the extremely well developed and unusually shaped basal plate of gonopods, the pond coxalis bridging the gonocoxa together.

### Leucotrichia genus cluster (Table 3)

**Table 3.** Character states of genera in the *Leucotrichia* genus cluster with modified spur number and with phallic median complex in the tribe Leucotrichiini. – = absent, + = present, a = appendages, f = fused, m = modified, p = plate, s = separate, u = unmodified

Genus	No. of ocelli	Head	Antennae	Wing	Sternum VIII spine	Process on segment IX	Para-procts	Vestigial cerci	Gonopods
<i>Abtrichia</i>	2	m	m	m	–	+	p	–	s
<i>Acostatrichia</i>	3	u	u	m/u	–/+	–/+	p/a	+/-	s
<i>Anchitrichia</i>	2	u	u	u	+	–	p	+	s
<i>Ascotrichia</i>	2	m	u	u	+	+	p	+	f
<i>Betrichia</i>	2–3	m/u	m/u	u	–/+	–	p	–	f
<i>Ceratotrichia</i>	2	m	m	u	+	–	p	–	s
<i>Costatrichia</i>	3	u	m/u	m/u	–/+	–/+	p/a	+/-	s
<i>Leucotrichia</i>	2–3	m/u	m/u	m/u	–	–	p/a	–	s/f
<i>Zumatrichia</i>	2	m	m	u	–/+	+	p	–	s/f

Genus *Abtrichia* MOSELY, 1939***Abtrichia veva* sp. n.**

(Figs 72–78)

*Diagnosis* – This new species with spur count of 134 and with median complex on phallic organ has modifications on the head, antennae and forewing, and its genital structure is very close to *Abtrichia antennata* MOSELY, 1939 from South Brazil (Santa Catarina), but differs by having lateral trilobed sclerites on segment X slender, not rounded; paraprocts small and differently shaped in lateral view; spine pattern on apical half of the phallic organ with three straight, long apical and two curved, short subapical spines, not with two straight, short apical and two straight, long subapical spines; median complex of the phallic organ differently constructed. The new species has combined head and antennal modifications similar to the 2 known species of the genus, if examined in released position.

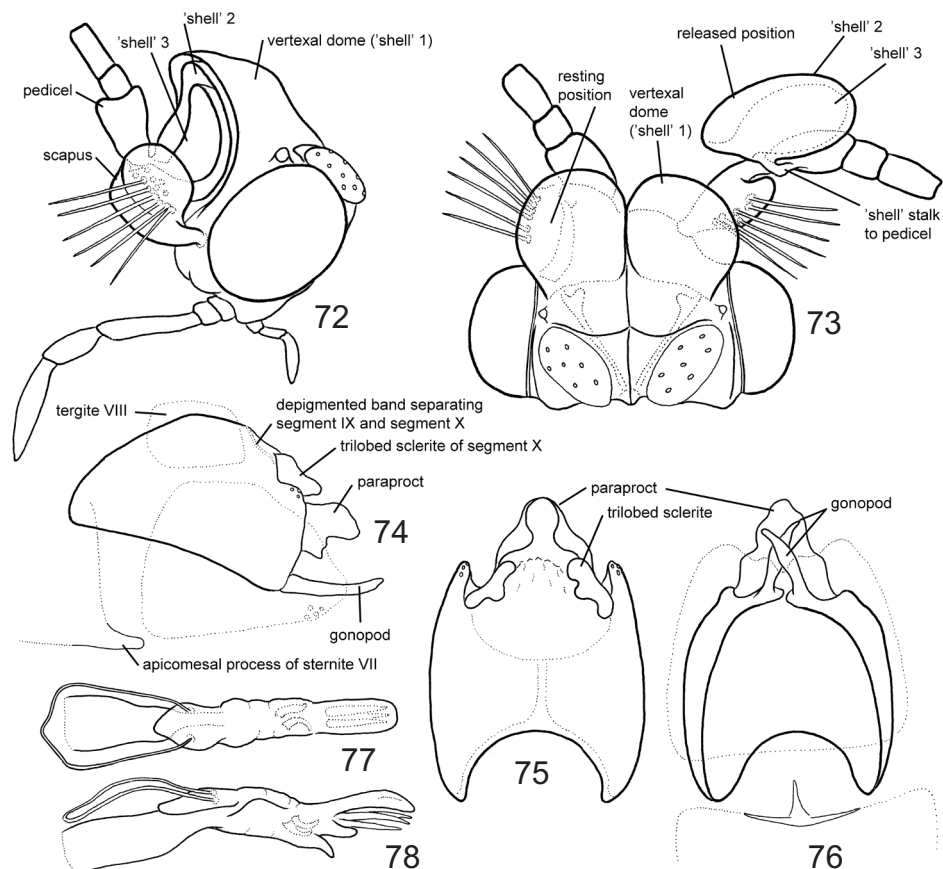
*Description* – Male (in alcohol). Medium-sized dark species with forewing length 3.1 mm; forewing strongly attenuate. 2 ocelli present. Above labrum, sensory pit dotted large triangular tapering mask bending over frons of head face; tapering mask head tipped with three small spine-like setae. Postoccipital setal warts pronounced, large ovoid, highly convex, without scent organ beneath. Tentorium with anterior and posterior arms present; tentorial bridge vestigial; vestigium of anterior arms represented by well developed dorso-lateral lobe. Antennae with 11 segmented including scapus and pedicel. Maxillary palp formula I-II-IV-(III,V), first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum pentagonal. Tibial spurs 1,3,4. Sternum VII with apicomeral process, blunt in lateral pointed in ventral view.

The combined cephalic and antennal modification of new species is remarkably developed into telescoping receiver, possibly to collect diluted pheromonal signals. At 2 known species (*A. antennata* MOSELY, 1939, *A. squamosa* MOSELY, 1939) modified head and antennal complex when described was examined only in resting position. In position gently released by fine-tipped forceps vertex produced mesally touching pair of vertexal domes representing first shell housing 2 gradually decreasing shells stalked to slightly enlarged pedicel. double-shelled pedicel with curved articulation hinging to scapus permits first antennal segment to stay in normal lateral position both in resting and in released position. scapus produced lateral lobe densely packed with large brush of long black setae. In resting position 2 shells of pedicel telescoped together into vertexal dome-like shell. Pedicel erection springs shells during telescoping release out from resting telescoped position and enlarging free inner concave surface of shells possibly to catch diluted pheromone volatiles.

Male genitalia. Tergite VIII small; sternite VIII enlarged strongly sclerotized, subtriangular with rounded angles in lateral view; shortly excised apically with undulating margin. Segment IX entirely open ventrally representing tergite IX; sternite reduced to very basement of gonopods. Segment X (dorsal plate) depressed concave halfcircular, delineated anteriorly from segment IX by less pigmented narrow band; pair of heavily sclerotized trilobed lateral sclerites bordering segment X laterally with apical end directed mesad.

Paraproct complex comprising ventrally fused less sclerotized shorter subphallic plate giving ventral support to phallic organ; this ventral V-shaped trough connected dorsolaterally to more sclerotized pair of lateral sclerites with rounded shape. Gonopods elongate, unbranched arising from short transversal band, from vestigial sternum IX. Phallic organ consisting of basal tube, median complex and less pigmented apical region; median region composed of dorsal anterad directed lobe and anterad directed looping filament; apical half covered dorsally by longer lobe and supported ventrally by two small median lobes, lower lobe more sclerotized; there are 3 straight and long apical, as well as 2 curved and short sub-apical spines among dorsal and ventral lobes.

*Type material* – Holotype, male: **French Guiana**: Maripasoula, Lawa River: Maripasoula, 83 mao 3°37.959'N, 54°1.426'W, 9.II.2007, light trap, FRG 15, leg. N. JÖNSSON (NHRS).



**Figs 72–73.** *Abtrichia veva* sp. n., holotype, male head: 72 = left lateral view, 73 = dorsal view; **Figs 74–78.** *Abtrichia veva* sp. n., holotype, male genitalia: 74 = lateral view, 75 = dorsal view, 76 = ventral view, 77 = phallus, dorsal view, 78 = phallus, lateral view

*Etymology* – *Veva*, from “vevő”, receiver in Hungarian, refers to the combined modification of cephalic and antennal structures forming together a telescoping receiver to collect aggregation or sex pheromones. Although this structure is similar to that of the two known species, its telescoping nature was first examined at this new species.

## Genus *Acostatrichia* MOSELY, 1939

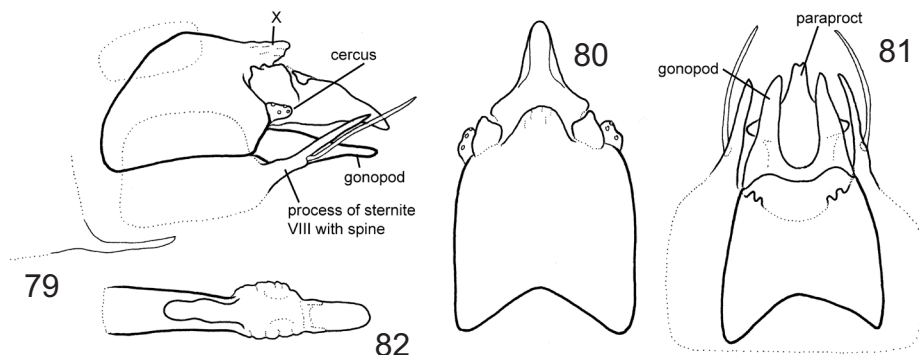
### *Acostatrichia buborektala* sp. n.

(Figs 79–82)

*Diagnosis* – This species without head, antennae and wing modifications and with 134 spur count, phallic median complex and well separated gonopods is similar to the genera *Costatrichia* MOSELY, 1937 and *Acostatrichia* MOSELY, 1939. Its genital structure relates it to *Acostatrichia*. However, having no bulla (a pouch filled with modified setae) on basocostal area of the forewing indicates again that such secondary modifications on head, antennae and wing are unreliable generic characters, they are rather specific features. This new species is closest to *A. brevipennis* FLINT, 1974 from Suriname, but differs by having no bulla; apicolateral processes on sternite VIII different; lateral sclerites of the paraprocts subquadratic, not elongate and pointed ventrally; gonopods straight both in lateral and ventral view without any angled apicodorsal slender process.

*Description* – Male (in alcohol). Medium-sized fuscous species with forewing length 2.5 mm; forewing without any light pattern in alcohol. Postoccipital setal warts rounded slightly elongate transversally without any eversible scent organ. Tentorium visible without bridge, but with some vestigial dorsal arm. Antennae damaged, 16+ segments; scapus unmodified, flagellomeres cylindrical. Maxillary palp formula I-II-IV-(III,V), fourth segment unusually shortened and third and fifth elongate. Mesoscutellum with transversal suture present; metascutellum nearly scutumwide subpentagonal. Tibial spurs 1,3,4. Sternum VII with long apicomeral process.

Male genitalia. Tergite VIII small; sternite VIII enlarged, subquadrangular, little elongate, almost as long as tall; its apicopleural region produced into long less pigmented process having very long and strong seta arising from its basal third; in ventral view slightly excised apicad and emarginate with 2–3 papillae on both sides. Segment IX subquadrangular, its anteroventral region slightly produced; segment IX open ventrally. Segment X (dorsal plate) short, membranous and roofing over abbreviated phallic complex. Paraproct complex comprising fused subphallic troughlike narrowing plate open dorsally and giving ventral support to phallic organ and connected laterally to heavily sclerotized pair of lateral subquadratic sclerites; paraproctal subphallic plate as long as gonopods with high basal and low distal portions; in ventral and dorsal view with basolateral widening. Gonopods separated and developed digitiform almost straight both in lateral and ventral view. Basal plate reduced to simple pons coxalis connecting gonopods mesad. Phallic organ consisting of basal tube, middle complex of dark sclerites with anterad directed looping filament and of membranous posterior half without any conspicuous spines.



**Figs 79–82.** *Acostatrachia buborektala* sp. n., holotype, male genitalia: 79 = lateral view, 80 = dorsal view, 81 = ventral view, 82 = phallus, dorsal view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga, at Pumarihri Huallaga Lodge, between Juan Guerra and Chazuta, 14 km (rd.) W Chazuta, 6°36.643'S, 76°12.555'W, light, loc. 10, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Buborektala*, from “buboréktalan”, without bulla in Hungarian, refers to the lack of basocostal bulla on forewing.

#### *Acostatrachia brevipenis* FLINT, 1974

*New records* – **French Guiana**: Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (12 males, NHRS, 5 males, OPC).

#### Genus *Anchitrichia* FLINT, 1970

#### *Anchitrichia trifurcata* ANGRISANO, 1984

*New records* – **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, 1 female, NHRS, 1 male, OPC).



Genus *Ascotrichia* FLINT, 1983*Ascotrichia frontalis* FLINT, 1983

*New records* – **Brazil**: Hung. Soil. Zool. Exp. II, S. Amer. No.B-B:No.360, Manaus (Amazonia), about 20 km S of city, singled material from miscellaneous habitats, 13.XI.1966, leg. J. BALOGH, S. MAHUNKA, A. ZICSI (2 males, HNHM).

*Ascotrichia surinamensis* (FLINT, 1974)

*Betrichia surinamensis* FLINT, 1974: 57.

*Ascotrichia surinamensis*: FLINT (1983): 36.

*New records* – **French Guiana**: Maripasoula, Lawa River: Maripasoula, 83 mao 3°37.959'N, 54°1.426'W, 9.II.2007, light trap, FRG 15, leg. N. JÖNSSON (2 males, NHRS, 1 male, OPC). Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (1 male, 1 female, NHRS).

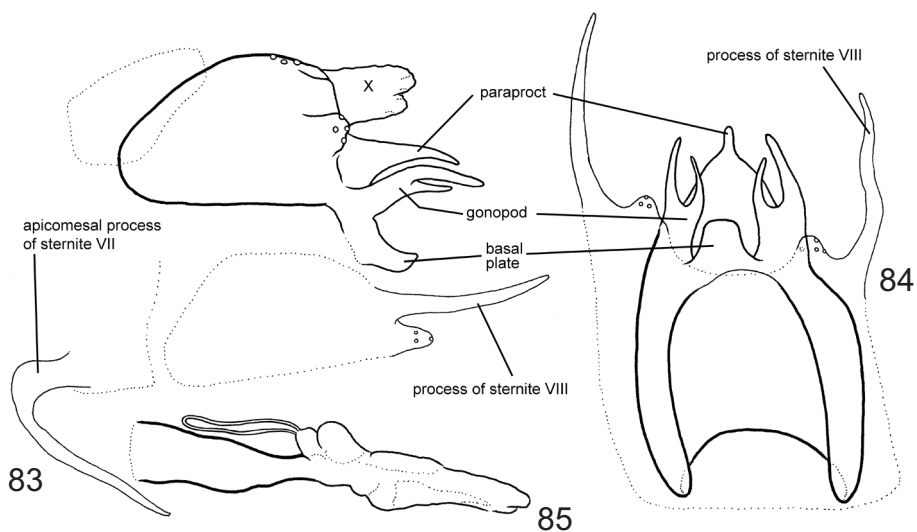
Genus *Ceratotrichia* FLINT, 1992*Ceratotrichia balra* sp. n.

(Figs 83–85)

*Diagnosis* – This fuscous species is most similar to *C. flavicoma* FLINT, 1992 from Venezuela, but differs by having dorsoapical processes on sternite VIII asymmetric, left longer straight arciform right crooked arciform, not symmetric and curving mesad almost semicircularly; the arms of the forked gonopods close to each others and straight, not far and curving; paraproctal plate digitate, not pointed mesoapically; apical third of the phallic organ without distinct mid-dorsal and mid-ventral, longitudinal sclerotized bands, and pair of small, lateral points.

*Description* – Male (in alcohol). Brown species with forewing length 3.1 mm. 2 ocelli present. Postoccipital setal warts large, hinged posteriorly opening underneath from front hiding erectile setaferous scent organ with many pale, scale-like setae. Tentorium with anterior and posterior arms; dorsal arm and tentorial bridge vestigial. Antennae 24 segmented; scapus normal, unmodified cylindrical and double long than pedicel; first flagellomers short gradually elongating middle flagellomers broadening and all covered with scattered tapered setae; terminal segment with blunt apex. Maxillary palp formula I-II- III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum pentagonal. Tibial spurs 1,3,4. Sternum VII with long curved apicomeral process.

Male genitalia. Tergite VIII small behind dorsum IX; sternite VIII substituting open ventrum IX, enlarged, subquadrangular both in lateral and ventral view; dorsoapical corners armed with single long and stout spine, spine on left corner longer straight arciform spine on right corner crooked arciform; ventroapical corners on sternite VIII with blunt lobe. Segment IX subquadrangular in lateral and dorsal view with rounded anterior margin in lateral view; open ventrally. Segment X (dorsal plate) membranous bipartite in lateral view, almost indiscernible on cleared animal. Paraprocts fused, broad basally with narrow medial digitiform process apically. Gonopods shifted laterally and forked, their arms close to each others and almost straight. Basal plate connecting gonopods projecting downward and posteriorly as rounded lobe. Phallic organ consists of basal tube, middle complex with anterad directed looping filament and dorsal windows, as well as membranous posterior third with pair of long mesal indistinct sclerites; complex phallic structure difficult to discern exactly without forceps manipulation.



**Figs 83–85.** *Ceratotrichia balra* sp. n., holotype, male genitalia: 83 = lateral view, 84 = ventral view, 85 = phallus, lateral view

*Type material* – **Bolivia:** Hung. Soil. Zool. Exp. II, S. Amer. No.B-B:No.493, Alcoche (La Paz), surroundings of Hotel, 600 m, lamping, 19.XII.1966, leg. J. BALOGH, S. MAHUNKA, A. ZICSI (1 male, HNHM).

*Etymology* – Name was given with reference to the asymmetric dorsoapical processes on sternite VIII, more developed on left side, left side “balra”, in Hungarian.

Genus *Betrichia* MOSELY, 1939*Betrichia hamulifera* FLINT, 1983

*New records* – **French Guiana**: Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (1 male, OPC). Maripasoula, Maroni River, Damason campo, Village, 4°35.112'N, 54°24.799'W 38 m, 7.II.2007, FRG 13, leg. N. JÖNSSON (4 males, NHRS, 2 males, OPC).

*Betrichia occidentalis* FLINT, 1974

*New records* – **French Guiana**: Approuaguekaw, Kaw Mt, 4°32.833'N, 52°11.452'W, 77 m, 24.I.2007, FRG 5, light trap, leg. N. JÖNSSON (6 males, NHRS, 4 males, OPC). Roura, Cacao, 4°33.639'N, 52°24.629'W, 66 m, 28.I.2007, FRG 8, leg. N. JÖNSSON (1 male, NHRS).

***Betrichia rovatka* sp. n.**

(Figs 86–88)

*Diagnosis* – This fuscous species is most similar to *B. occidentalis* FLINT, 1974 from Colombia, but differs by having long and strong spinelike seta on the dorsolateral corners and 2 little shorter spine-like setae on the ventrolateral corners of segment VIII; paraprocts S-forming with notched profile in lateral view; fused gonopod apex blunt both in lateral and ventral view, not pointed.

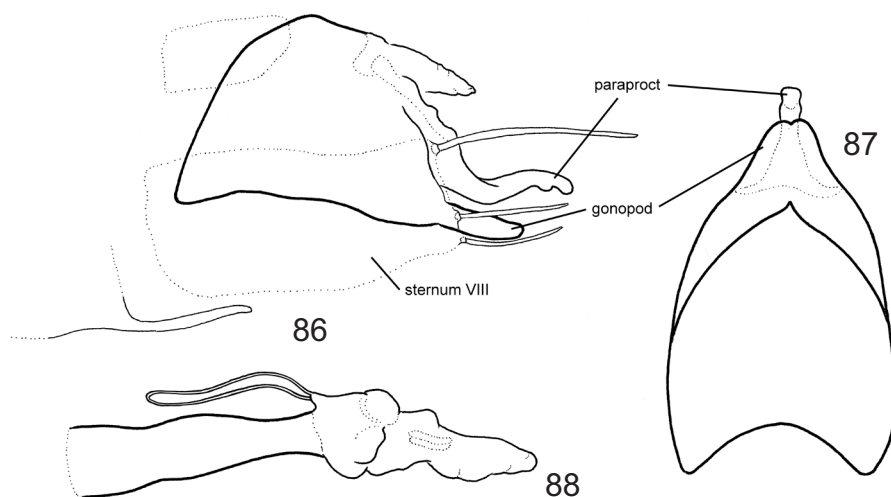
*Description* – Male (in alcohol). Fuscous species with forewing length 2 mm. 3 ocelli present. Postoccipital setal warts pronounced, large rounded. Tentorium with anterior and posterior arms; dorsal arm and tentorial bridge vestigial. Antennae with 19 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomers with scattered tapered setae; terminal segment with blunt apex. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum subpentagonal, almost convex. Tibial spurs 1,3,4. Sternum VII with long apicomesal process.

Male genitalia. Tergite VIII small behind dorsum IX; sternite VIII substituting open ventrum IX enlarged, quadrangular both in lateral and ventral view; dorsoapical corners armed with single long and stout spine; ventroapical corners with 2 shorter stout spines. Segment IX subquadrangular in lateral and dorsal view; open ventrally. Segment X (dorsal plate) membranous almost indiscernible on cleared animal, short linguiform. Paraprocts fused, broad basally and narrow apically; apical narrow part notched in lateral view; lateral profile of its basodorsal part humped. Gonopods completely fused, triangular in ventral view with blunt apex. Phallic organ consisting of basal tube, middle complex of dark sclerites

with anterad directed looping filament and of membranous posterior half with pair of short mesal sclerites.

*Type material* – Holotype, male: **French Guiana**: Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I.2007, FRG 8, leg N. JÖNSSON (NHRS).

*Etymology* – *Rovatka*, from “rovátkás”, notched in Hungarian, refers to the notched profile of the fused paraproctal apex in lateral view.



**Figs 86–88.** *Betrichia rovatka* sp. n., holotype, male genitalia: 86 = lateral view, 87 = ventral view, 88 = phallus, lateral view

### Genus *Leucotrichia* MOSELY, 1934

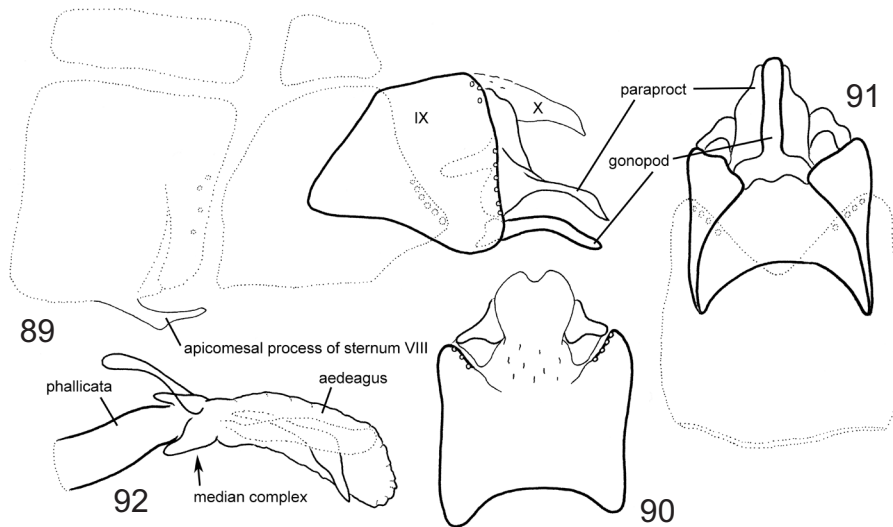
#### ***Leucotrichia forrota* sp. n.**

(Figs 89–92)

*Diagnosis* – This large fuscous species with bright light forewing pattern visible even in alcohol is most similar to *L. interrupta* FLINT, 1991 from Colombia, but differs by having short sternite VIII, not elongate; its posterior margin deep triangularly excised in ventral view, not shallow concave; segment IX subquadrangular, not subtriangular; subphallic plate of paraprocts downward curving in lateral view, not straight; gonopods completely fused without any median suture; gonopods digitiform and downward curving, not pointed and upward curving.

*Description* – Male (in alcohol). Large fuscous species with forewing length 5 mm; forewing with bright light pattern visible even in alcohol: longitudinal middle patch along basal half, larger costal and smaller anal spots on middle and at two thirds. 3 ocelli present. Postoccipital setal warts pronounced, large rounded. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae 26 segments; scapus normal, unmodified cylindrical and double long than pedicel; first 4 flagellomeres as long as wide, segment elongation starts at 5<sup>th</sup> flagellar segment and became long cylindrical, 3–4 times longer than wide. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum pentagonal. Tibial spurs 1,3,4. Sternum VII with angled apicomeresal process.

Male genitalia. Tergite VIII small; sternite VIII enlarged, subquadrangular, not elongate, about as long as tall; its apicopleural region produced slightly ventrally and emarginate with row of stout setae. Segment IX subquadrangular, its basopleural region produced; its straight anterior margin with row of stout setae; segment IX open ventrally. Segment X (dorsal plate) membranous basally, slightly sclerotized apically and roofing over phallic complex; its structure visible only if head and middle complex of phallic organ pulled out from embracement produced by roofing segment X and by subphallic paraprocts. Paraproct complex comprising fused subphallic plate giving ventral support to phallic organ and connected laterally to heavily sclerotized pair of lateral sclerites; paraproctal subphallic plate long and low in lateral view with high basal portion and wide in ventral view with narrower apical third. Gonopods completely fused digitiform, downward curving in lateral view. Phallic organ consisting of basal tube, middle complex of dark sclerites with anterad directed looping filament and of membranous posterior half with pair of long lateral sclerites and middle large spine with downward curving apex.



**Figs 89–92.** *Leucotrichia forrota* sp. n., holotype, male genitalia: 89 = lateral view, 90 = dorsal view, 91 = ventral view, 92 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: **Peru**: same as holotype (2 males, 2 females, NHRS, 1 male, OPC). **Ecuador**: Pastaza Puyo, riverside, at blacklights, 29.V.1975, leg. COHEN & LANGLEY (7 males, OPC). Pastaza Puyo, (3 km North), at blacklights, 30.V.1975, leg. COHEN & LANGLEY (7 males, NMNH). Past. Puyo, 30.I.1976, blacklight, leg. P. J. SPANGLER & al. (1 male, NMNH). Past. Puyo (3 km, W), 15.VII.1976, blacklight, leg. JEFFREY & COHEN (1 male, NMNH). Past. Puyo, 5.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (4 males, NMNH). Napo Puyo, 6.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (3 males, NMNH). Past. Puyo, 7.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (4 males, NMNH). Past. Puyo, 11.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (2 males, NMNH). Past. Puyo, 13.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (2 males, NMNH). Past. Puyo (1.5 km S), 14.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (1 male, NMNH). Past. Puyo, 15.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (1 male, NMNH). Past. Puyo, 16.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (2 males, NMNH). Past. Puyo, 21.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (4 males, NMNH, 1 male, OPC). Prov. Pastaza, Puyo (2 km N), 30.V.1975, blacklight, leg. LANGLEY & COHEN (7 males, NMNH, 2 males OPC). Past. Puyo, 30.I.1976, blacklight, leg. P. J. SPANGLER & al. (2 males, NMNH). Past. Puyo, 8–11.II.1976, blacklight, leg. P. J. SPANGLER & al. (1 male, NMNH). Napo, Tena, 25.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (1 male, NMNH). Napo, Tena, 26.V.1977, blacklight, leg. P. J. SPANGLER & D. R. GIVENS (1 male, NMNH). Napo, Pano, at stream, 580 m, 12.IX.1990, blacklight, leg. P. J. SPANGLER (2 males, OPC).

*Etymology* – *Forrota*, from “forrott”, fused in Hungarian, refers to the completely fused gonopods.

### **Leucotrichia laposka sp. n.** (Figs 93–96)

*Diagnosis* – This medium-sized fuscous species without any light forewing pattern in alcohol is distinguished from all the known species by its name giving broadened plate-like gonopods.

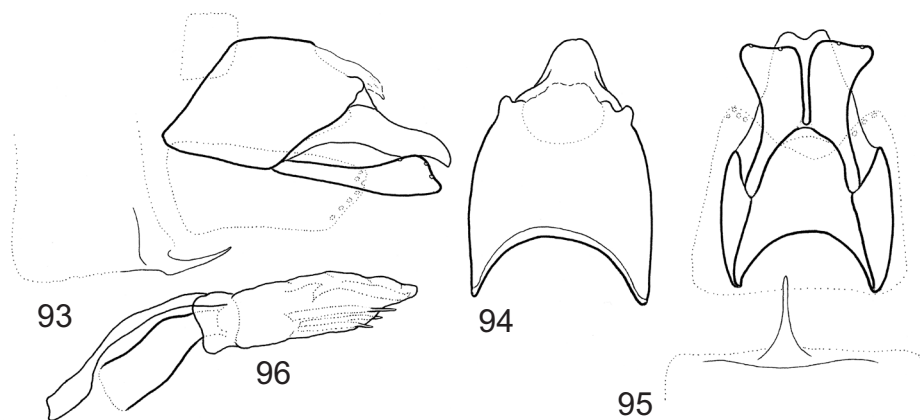
*Description* – Male (in alcohol). Medium-sized fuscous species with forewing length 2.4 mm; forewing without any light pattern in alcohol. 3 ocelli present. Postoccipital setal warts large rounded, ovoid subtriangular in oblique transverse position; opening underneath from anteriorly as hinged caps without any eversible scent organ. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae 20 segments; scapus normal, unmodified cylindrical and double long than pedicel; first 2 flagellomeres as long as wide, segment elongation starts at 3rd flagellar segment and became long cylindrical, 3–4 times longer than wide. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present;

metascutellum pentagonal. Tibial spurs 1,3,4. Sternum VII with slightly angled apicomesal process in lateral view.

Male genitalia. Tergite VIII extremely small; sternite VIII enlarged, subquadrangular and elongate in lateral view; V-shaped excision posteriorly in ventral view and emarginate with stout setae. Segment IX with anterior and posterior margin oblique posteriorly resulting in subparallelogramic shape in lateral view; its dorsum with less sclerotized apicomesal rounded area continuing or fused into membranous segment X; its ventrum open. Segment X (dorsal plate) membranous, short and roofing over phallic complex; its structure visible only if head and middle complex of phallic organ pulled out from embracement produced by roofing segment X and by subphallic paraprocts. Paraproct complex comprising fused subphallic plate giving ventral support to phallic organ and connected laterally to sclerotized pair of small lateral sclerites; paraproctal subphallic plate as long as gonopods. Gonopods articulate with slender stalk to segment IX; their apical half broadened plate-like spatulate shovel in ventral view. Phallic organ consisting of basal tube, of middle complex with dark sclerites and anteriorly directed long looping filament as well as of membranous posterior half with several spines located ventrally in lateral view.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: **Peru**: same as holotype (1 male, NHRS). San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, OPC). San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (10 males, NHRS, 7 males, OPC).

*Etymology* – *Laposka*, from “laposka”, diminutive form of flat in Hungarian, refers to the plate-like broadened gonopods.



**Figs 93–96.** *Leucotrichia laposka* sp. n., holotype, male genitalia: 93 = lateral view, 94 = dorsal view, 95 = ventral view, 96 = phallus, lateral view

Genus *Zumatrichia* MOSELY, 1937***Zumatrichia alarca* sp. n.**

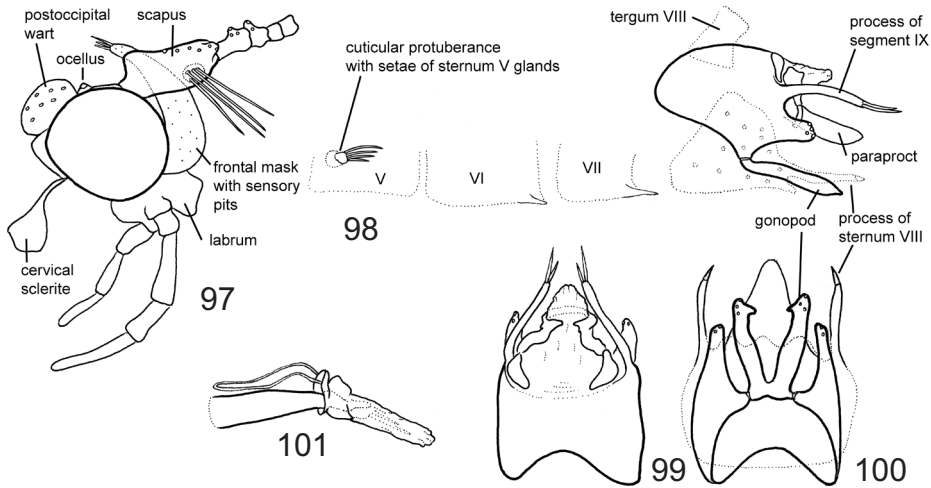
(Figs 97–101)

*Diagnosis* – According to the genital structure this new species is closest to *Z. palmaria* FLINT, 1969, but differs by having modified head with large triangular mask on the frontal area; sternite VIII triangular, not quadrangular in lateral view; posterior process on sternite VIII located low ventrally, not high dorsally; this process ends in a short spine, not in a long and right-angled second process; posterior process on tergite IX very long, not short bearing two short apical spines; paraproctal subphallic plate low, not high; paraprocts with mesad directed subapical lobes.

*Description* – Male (in alcohol). Medium-sized species with forewing length 2.3 mm; body milky white, except sclerotic edges and articulations; forewing strongly attenuate. 2 ocelli present. Above labrum, large triangular tapering mask dotted with sensory pits bending over frons of head face; tapering mask head tipped with three small spinelike setae. Postoccipital setal warts pronounced, large ovoid, highly convex, without scent organ beneath. Tentorium complete, anterior and posterior arms present; tentorial bridge vestigial; anterior arms with well developed dorsolateral outgrowth, vestigial projection of dorsal arms. Antennae with 18 segmented including scapus, scapus highly modified, enlarge cylindrical in lateral view with lateral subapical sensory wart of very long setae, pedicel and first flagelomer also modified with small setal lobes. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum pentagonal. Tibial spurs 1,3,4. Lateral pits on sternum V with pair of short lateral process bearing each several thin apical setae. Sternum VI and VII with pointed apicomeral process.

Male genitalia. Tergite VIII small; sternite VIII enlarged subtriangular, heavily setose and produced into long spine-like process posteriorly on each side, its ventroapical margin slightly trilobed with two short excision creating mesal lobe. Segment IX entirely open ventrally representing tergite IX; sternite reduced to very basement of gonopods. Segment X (dorsal plate) membranous along its entire length; there is pair of small subtriangular sclerotized sclerites laterally on border of tergites IX and X, delineated by unpigmented bands. Paraproct complex comprising ventrally fused less sclerotized subphallic plate giving ventral support to phallic organ and connected dorsolaterally to heavily sclerotized pair of lateral sclerites with irregular shape; this more pigmented component of paraprocts articulating to similarly well pigmented subphallic ring, as part of subphallic plate; paraproctal subphallic plate low in lateral view. Gonopods elongate fused basally; this short basal band may represent vestigial sternite IX; in ventral view gonopod apices producing small mesad directed processes. Phallic organ consisting of basal tube, median complex and membranous apical region; median region composed of ring, dorsal window, and anterad directed looping filament; membranous posterior half with two pairs of indistinct spines originating from median complex.





**Figs 97–101.** *Zumatrichia alarca* sp. n., holotype, male: 97 = head, right lateral view, 98 = abdomen and genitalia: lateral view, 99 = genitalia: dorsal view, 100 = genitalia: ventral view, 101 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratype: same as holotype (1 male, NHRS).

*Etymology* – *Alarca*, from “álarc”, mask in Hungarian, refers to the outstanding head modification, large triangular mask bending over the frons of head face.

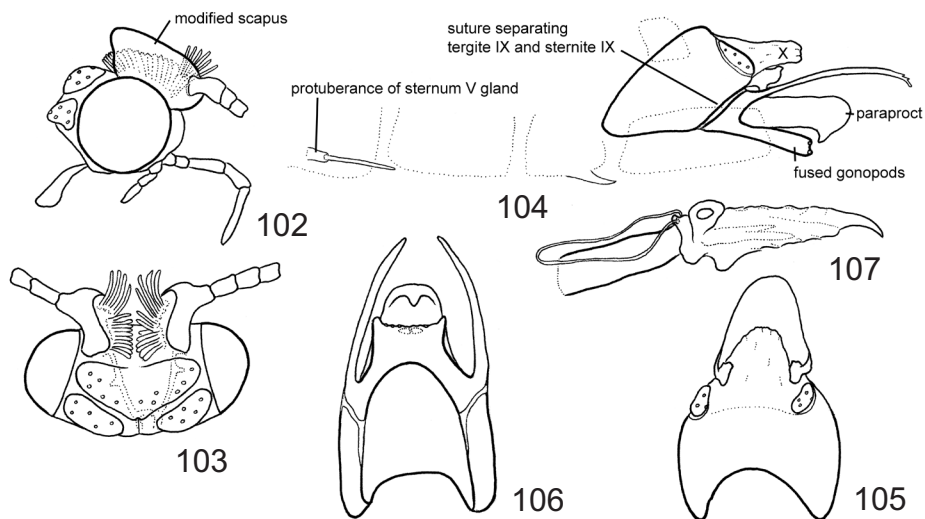
### ***Zumatrichia varrata* sp. n.**

(Figs 102–107)

*Diagnosis* – According to the genital structure this new species is closest to *Z. angulata* FLINT, 1969, but differs by having tergite IX higher than long, not longer than high, its ventral margin is especially short; tergite and sternite IX markedly separated by well-developed suture; membranous segment X blunt rounded apicad, not triangular; dorsolateral filiform process on sternite IX straight, not bending downward in right angle; apical marginal pattern of the fused gonopods differently elaborated; phallic organ different.

*Description* – Male (in alcohol). Medium-sized brown species with forewing length 2.3 mm; forewing strongly attenuate. 2 ocelli present. Postoccipital setal warts pronounced, large ovoid without scent organ beneath. Tentorium complete, both anterior and posterior arms as well as tentorial bridge present; anterior arms with well developed dorso-

lateral outgrowth, vestigial projection of dorsal arms. Antennae with 19 segmented including scapus, scapus highly modified, enlarge into subquadrangular plate in lateral view, their excavated mesal surface fully packed with modified setae of possible sensory function. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transversal suture present; metascutellum pentagonal. Tibial spurs 1,3,4. Lateral pits on sternum V with pair of short lateral process bearing each single long and stout apical seta. Sternum VII with pointed apicomeseal process.



**Figs 102–107.** *Zumatrixchia varrata* sp. n., holotype, male: 102 = head, right lateral view, 103 = head, dorsal view, 104 = abdomen and genitalia: lateral view, 105 = genitalia: dorsal view, 106 = genitalia: ventral view, 107 = phallus, lateral view

Male genitalia. Tergite VIII small; sternite VIII enlarged, elongate subquadrangular. Segment IX mostly open ventrally and subdivided into tergite and sternite by strongly developed suture; tergum higher than long in lateral view, sternum short, produced into long filiform dorsolateral process and ventrally coalescent with fused gonopod. Segment X (dorsal plate) slightly sclerotized at its very base, and membranous after along its entire length; pair of just discernible very thin setae originates beneath; there is pair of small ovoid setose sclerotized sclerites delineated by unpigmented circle laterally on border of tergites IX and X. Paraproct complex comprising ventrally fused subphallic plate giving ventral support to phallic organ and connected laterally to heavily sclerotized pair of lateral sclerites with irregular quadratic shape; paraproctal subphallic plate high in lateral view, its apex downward directed and hook-shaped; hook visible both in lateral and ventral view. Completely fused gonopods broad quadrangular in ventral view with slightly produced apicolateral corners and emarginate with seate on raised alveoli; two small ovoid highly sclerotized knob present medioapicad on dorsal surface. Phallic organ consisting of basal tube, median

complex and membranous apical region; median region composed of ring, dorsal window, ventral sclerotized short process and anterad directed looping filament; membranous posterior half with two pairs of spines originating from median complex and ending in single large indistinct spine with more distinct downward curving apex.

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Varrata*, from “varrat”, suture in Hungarian, refers to the outstanding suture fusing together tergite IX and sternite IX, distinctly discernible.

### Tribe Neotrichiini (Table 4)

**Table 4.** Character states of genera in the tribe Neotrichiini

Genus	No. of ocelli	No. of flagellomeres	Mesoscutellum shape	Metascutellum shape	Tibial spurs	Paraproct shape	Phallicata shape	Parameres
<i>Kumanskiella</i>	3	16	triangular	triangular	0,2,4	plate	tube	present
<i>Mayatrichia</i>	3	16–17	triangular	trapezoid	0,2,4	plate	tube	absent
<i>Neotrichia</i>	3	16–17	triangular	triangular	0,2,3	complex	complex	present
<i>Taraxitrichia</i>	0	21–22	spherical	triangular	0,3,4	plate	tube	absent

### Genus *Neotrichia* MORTON, 1905

*Genital terminology* – ROSS (1948) introduced the term “bracteole” for structures associated with the area dorsally of the base of gonopods. He found this structure present in quite a number of Hydroptilidae, especially in *Stactobiella* MARTYNOV, 1924. Later the bracteole at *Stactobiella* was considered as part of the gonopods (AREFINA *et al.* 2002, AREFINA 2004), and recently we listed bracteole under the various names used in literature for the basal plate of the gonopods (OLÁH & JOHANSON 2010). The term bracteole was rather consistently used at *Neotrichia* (KETH 2002, 2004) for structures with long foliform shape, exclusively setose and located posteriorly in ventrolateral position on segment IX. A pair of variously shaped paired or fused structures articulates mesally to them. These mesal structures with bare surface and with a few setae only are called as inferior appendages. However, we believe that at *Neotrichia* the setose bracteoles are the laterally shifted gonopods and the mesally located setaless structures is the much produced basal plate. The basal plate is variously developed, but rather permanent structure, frequently present with bizarre forms in several groups of caddisflies. Gonopods, as true segmental appendages of

limb podites are usually, setose and the basal plate, as secondary accessory structure are usually setaless, or armed only with a few sensory setae. Sometimes, especially when more processes are present and sutures or articulation lines are indiscernible, it is very difficult to visualize with the routine studies, whether the bracteole-like processes are the laterally shifted gonopods or simply a setose branch of segment IX.

*Species grouping* – MARSHAL (1979) listed *Neotrichia* species into six species groups, corresponding partim to genera erected by MOSELY (1937) and subsequently synonymized by ROSS (1944). The number of described *Neotrichia* species increased, making the species groupings of MARSHAL less clearly defined (FLINT & BUENO-SORIA 1999). Recently KETH (2002) integrated MARSHAL's *biuncifera*, *hiaspa* and *bifida* groups to others and erected 3 new species groups: *vibrans*, *aserradera* and *esmalda* (Table 5).

**Table 5.** Species groups of *Neotrichia* MORTON, 1905 (after MARSHAL 1979 and KETH 2002)

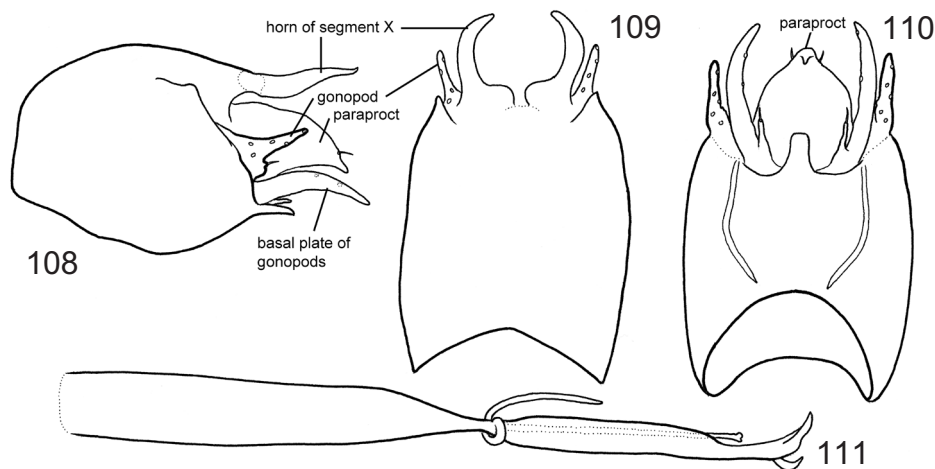
Species group	Characters
<i>Neotrichia vibrans</i> species group erected by KETH (2002); <i>biuncifera</i> group of MARSHAL (1979) transferred partim here by KETH (2002)	Sclerotized apicolateral extension of segment IX Tapered margins of segment X Tapered basal plate of gonopods Spatulate gonopods Elongate segment X Simple phallus apex
<i>Neotrichia collata</i> species group erected by MARSHAL (1979); <i>Lorotrichia</i> based <i>hiaspa</i> group of MARSHAL (1979) transferred partim here by KETH (2002); <i>biuncifera</i> group of MARSHAL (1979) transferred partim here by KETH (2002)	Phallus apex with sclerotized hooks Phallus hooks nearly equal in length Tapered basal plate of gonopods Elongate segment X Spatulate gonopods
<i>Neotrichia aserradera</i> species group erected by KETH (2002)	Serrate, rectangular gonopods Long sclerotized phallus spikes Reduced segment X Gonopods stalked (low basad, high distad in lateral view)
<i>Neotrichia canixa</i> species group erected by MARSHAL (1979) including <i>Dolotrichia</i> MOSELY, (1937); <i>Lorotrichia</i> based <i>hiaspa</i> group of MARSHAL (1979) transferred partim here by KETH (2002)	Segment X with sclerotized horns Gonopods slender, subdivided Basal plate of gonopods branched
<i>Neotrichia caxima</i> species group erected by MARSHAL (1979) including <i>Guerotrichia</i> MOSELY (1937); <i>bifida</i> group of MARSHAL 1979 transferred partim here by KETH (2002)	Basal plate of gonopods reduced Basal plate of gonopods not longer than wide Segment X wraps ventromesally around subgenital plate
<i>Neotrichia esmalda</i> species group erected by KETH (2002)	Sclerotized points/horns from apicolateral corner of segment X Phallus apex with sclerotized lateral process

**Neotrichia alsa** sp. n.  
(Figs 108–111)

*Diagnosis* – This new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), comprising of the following species: *N. alsa* sp. n., *N. canixa* (MOSELY, 1937), *N. corniculans* FLINT, 1968, *N. cuernuda* HARRIS, 1990, *N. dubitans* (MOSELY, 1939), *N. jarochita* BUENO-SORIA, 1999, *N. juani* HARRIS et TIEMANN, 1993, *N. kitae* ROSS, 1941, *N. malickyi* HARRIS et TIEMANN, 1993, *N. maria* BUENO-SORIA et HAMILTON, 1986, *N. sandyae* RUITER, 2007, *Neotrichia sogaga* sp. n. *N. tauricornis* MALICKY, 1980, *N. unamas* BOTOSANEANU, 1993, *N. xicana* (MOSELY, 1937). It is distinguishable from each member of the group by having hornlike processes on segment X; robust and mirror symmetric; presence of medium-sized median lobe of sternite IX; lower branch of the bilobed gonopods very short, almost vestigial; slender, elongate lobes of basal plate arching downward, not straight or upward curving.

*Description* – Male (in alcohol). Brown species with forewing length 1.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge visible. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apico-mesal process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded, almost subcircle in lateral view and long subquadrangular in ventral and dorsal view; ventrum and dorsum long; dorsal and ventral anterior excision short; parallel-sided truncate median lobe appears on middle of ventroposterior excision covering basement of basal plate, similar, but even longer median lobe on sternite IX present only at *N. sandyae*; upper apical corner of segment IX produced into lateral rim visible in lateral and dorsal view. Segment X (dorsal plate) modified as pair of broad-based lateral horn directed mesad. Paraprocts (subgenital plate) present as downward curving triangular plate, with two dorsal subterminal setae and located in subphallic position. Gonopods (bracteole) bilobed, composed of elongate digitiform slender upper process, and small, almost vestigial lower process; upper process more setose, lower with terminal setae only; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods quadrilobed; lateral lobes long and slender arching downward and curving mesad with 3–4 terminal sensory setae; mesal lobes smaller and armed with terminal seta. Phallic organ consisting of tall proximal half, terminated by middle constriction and of distal half with also tall middle; thread-like paramere present with single basal coil after middle constriction and curves laterally; bilobed apex with one large spine-like lobe and one small spur-like lobe turned perpendicular to phallic axis; ejaculatory duct with capitate apex extending beyond phallic body slightly before bilobed phallic apex.



**Figs 108–111.** *Neotrichia alsia* sp. n., holotype, male genitalia: 108 = lateral view, 109 = dorsal view, 110 = ventral view, 111 = phallus, lateral view

*Type material* – Holotype, male: **Peru:** San Martin Prov., Rio Negro, 37 km (rd.) W Moyobamba, near Olmos-Tarapoto rd., 6°00.278'S, 77°15.437'W, light, loc. 05, 6.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Alsia*, from “alsó”, lower in Hungarian, refers to the almost reduced vestigial lower arms of the gonopods.

### *Neotrichia bifida* FLINT, 1974

*New records* – **French Guiana:** Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (1 male, OPC).

### *Neotrichia bika* sp. n. (Figs 112–115)

*Diagnosis* – This new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), and is closest to *N. corniculans* FLINT, 1968 from Dominica, but differs by having segment IX with long ventrum; small horns on segment X; basal plate of gonopods slender in lateral view, not broad-based; gonopods arching mesad, not slightly bending; gonopods narrow parallel-sided, not tapering in ventral view.

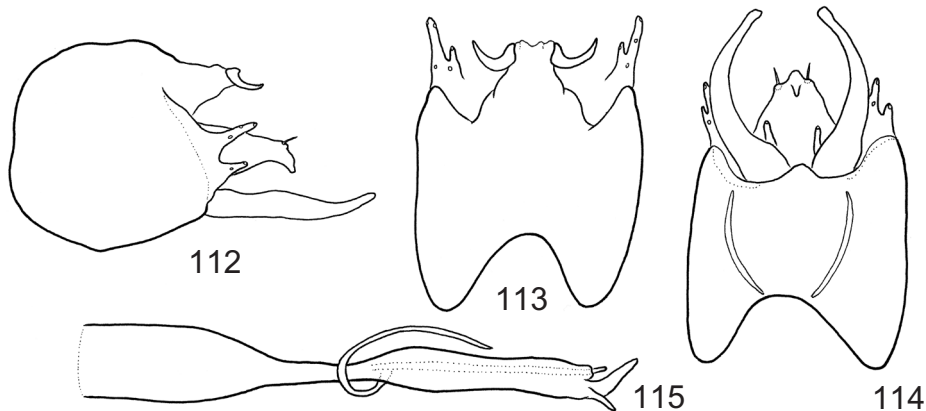
*Description* – Male (in alcohol). Brown species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior

and posterior arms; vestigial tentorial bridge visible. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convex, subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded, almost subcircle in lateral view and long subquadrangular in ventral and dorsal view; ventrum and dorsum long; dorsal and ventral anterior excision short; short triangular median lobe appears on middle of ventroposterior margin between basement of basal plate; upper apical corner of segment IX in combination with gonopod basement produced into lateral rim visible in lateral and dorsal view. Segment X (dorsal plate) armed with apicolateral horn directed laterally. Paraprocts (subgenital plate) present as downward curving triangular plate, with two dorsal subterminal setae and located in subphallic position. Gonopods (bracteole) bilobed, composed of elongate digitiform slender upper process and smaller, half-sized lower process; bilobed gonopods broad-based extending dorsally and forming lateral rim with segment IX; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods arching mesad in ventral view and slender in lateral view; apical two thirds parallel-sided, not narrowing; basal area only slightly broadening. Phallic organ with bifid apex; ejaculatory duct with short free apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratype: **French Guiana**: same as holotype (1 male, OPC).

*Etymology* – *Bika*, from “bika”, bull in Hungarian, refers to the horned structure on segment X.



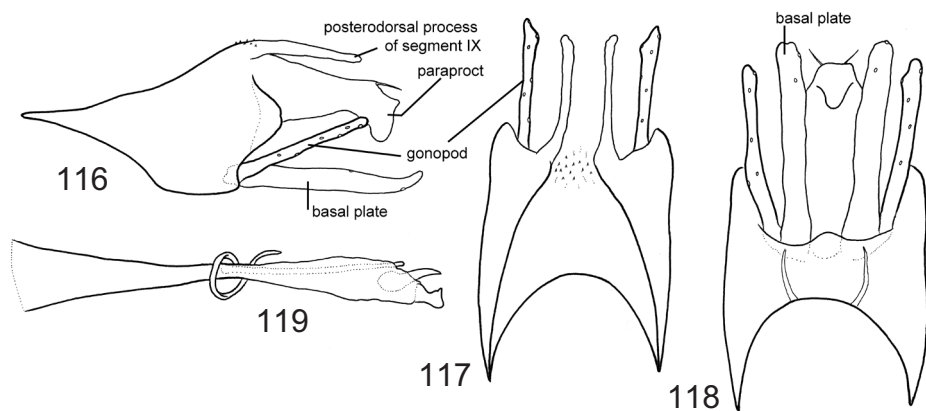
**Figs 112–115.** *Neotrichia bika* sp. n., holotype, male genitalia: 112 = lateral view, 113 = dorsal view, 114 = ventral view, 115 = phallus, lateral view

**Neotrichia botka sp. n.**

(Figs 116–119)

*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and more similar to *N. kampoka* sp. n., but differs by having posterodorsal processes shorter than basal plate of gonopods; paraproctal apex downward directed in lateral view, not simply backward; paraproctal apex not excised in ventral view; gonopods slender rod-shaped, not spatulate, basal plate of gonopods longer than gonopods and not tapering apicad.

*Description* – Male (in alcohol). Pale species with forewing length 1.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae with 18 segments present; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.



**Figs 116–119.** *Neotrichia botka* sp. n., holotype, male genitalia: 116 = lateral view, 117 = dorsal view, 118 = ventral view, 119 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular with short anterior apodeme and sinuous dorsum in lateral view; deep rounded proximal excision present both in ventrum and dorsum in dorsal and ventral view, dorsal excision almost double long, and followed in membranous mesal area; posterodorsal processes rod-shaped with blunt apex. Segment X (dorsal plate) almost indiscernible membranous covered with microtrichia around where fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) with downward directed apex in lateral view and shoulder flanges. Gonopods setose elongate rod-shaped processes



clearly discernible how they fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes. Phallic organ consisting of basally tall proximal half, and low parallel-sided distal half; distal half armed with 2 apical hooks of different forms; ejaculatory duct sclerotized with short free apex, paramere with one coil.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4°33.035'N, 52°11.661'W, 104 mao, 23.I.2007, FRG 4, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (1 male, 2 associated possible females, NHRS). Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (1 male, OPC).

*Etymology* – *Botka*, from “botka”, diminutive form of rod in Hungarian, refers to the three rod-shaped structures: posterodorsal processes, gonopods and basal plate of gonopods.

### *Neotrichia bullata* FLINT, 1974

*New records* – **French Guiana**: Maripasoula, Maroni River, Damason campo, Village, 4°35.112'N, 54°24.799'W, 38 m, 7.II.2007, FRG 13, leg. N. JÖNSSON (1 male, OPC).

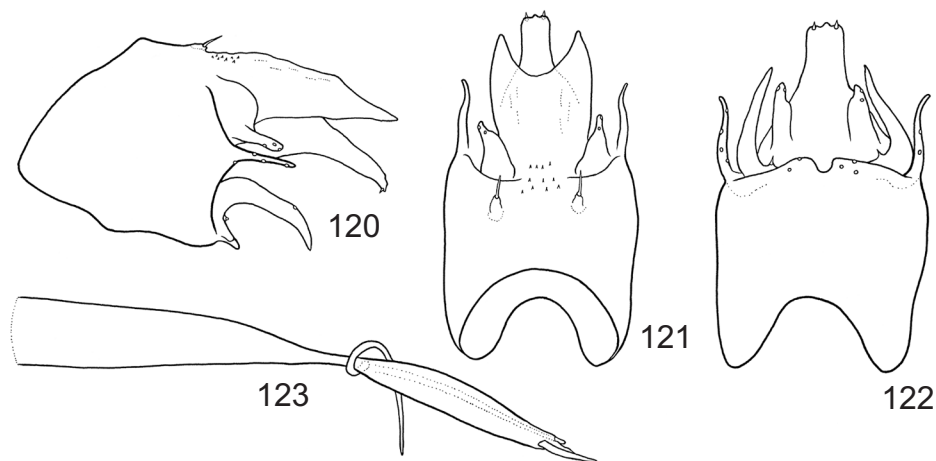
### ***Neotrichia farkoska* sp. n.** (Figs 120–123)

*Diagnosis* – This new species with a cercus-like lobe on posterodorsal position, with thin gonopods (bracteoles) and its segment IX without significant anterior apodemes seems to have relation to *N. kitae* ROSS, 1941 from USA, *N. ovona* (MOSELY, 1939) from Brazil and to several species from Venezuela: *N. botonia* HARRIS, 1990, *N. dientera* HARRIS, 1990 and *N. negroensis* HARRIS, 1990. All of these species exhibit some kind of cercus-like process. The digitiform gonopods and falciform basal plate of gonopods of the new species differentiate it from all.

*Description* – Male (in alcohol). Dark brown species with forewing length 1.5 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge. Antennae broken 18 segments; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified: not annular, tergum and sternum separated, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded subquadrangular in lateral view and long subquadrangular in ventral and dorsal view; ventrum slightly longer than dorsum; its ventroposterior margin

with wide median lobe divided by cleft: smaller ventral branch of basal plate of gonopods fits into its dorsum. Segment X (dorsal plate) discernible as membranous hood over phallic organ; its base partially microtrichia covered, its apex long excised; there are some narrow longitudinal folds present between; pair of small anterior tubercles armed with terminal seta located on fused border between segments IX and X. Paraprocts (subgenital plate) long and curving slightly downward in lateral view; its apex truncate in ventral view housing short and stout twin setae separated by minute middle lobe. Gonopods (bracteole) very slender accompanied by small setose hump on dorsal base. Lobes of basal plate of gonopods falciform in ventral view, its short ventral branch fits into dorsum of median lobes of segment IX. Phallic organ consisting of tall proximal and tall distal halves, separated by middle constriction; apex with single black spine, ejaculatory duct sclerotized with very short free apex; long paramere present with single coil.



**Figs 120–123.** *Neotrichia farkoska* sp. n., holotype, male genitalia: 120 = lateral view, 121 = dorsal view, 122 = ventral view, 123 = phallus, lateral view

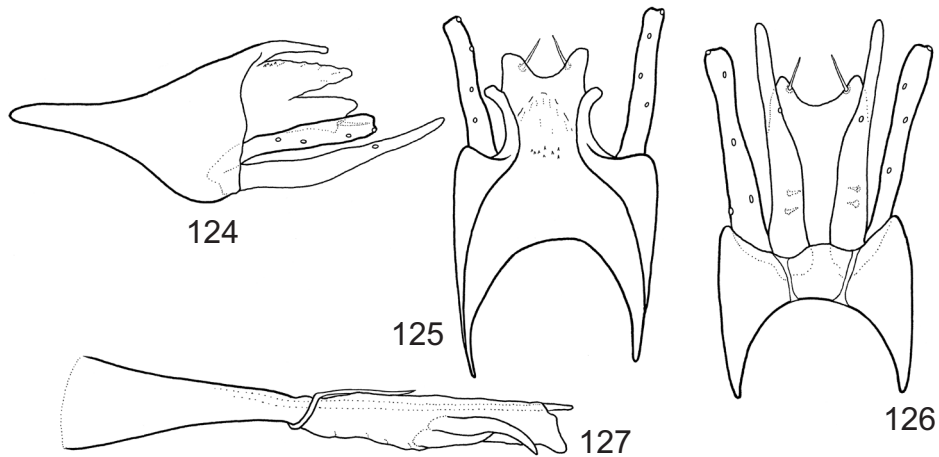
*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 4–12.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Farkoska*, from “farkoska”, diminutive form of tail in Hungarian, refers to the cercus-like structure; cercus = tail.

**Neotrichia felkurta** sp. n.  
(Figs 124–127)

*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and with its open dorsum IX similar to *N. kampa* sp. n., *N. kampoka* sp. n. and *N. kurtitva* sp. n., but differs from all by having medium-sized posterodorsal process on segment IX; narrow elongate anterior apodeme on segment IX, not triangular; and differently shaped paraprocts.

*Description* – Male (in alcohol). Small species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae with 18 segments present; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.



**Figs 124–127.** *Neotrichia felkurta* sp. n., holotype, male genitalia: 124 = lateral view, 125 = dorsal view, 126 = ventral view, 127 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX triangular with narrow and long anterior apodeme and sinuous dorsum and ventrum in lateral view; deep rounded proximal excision present both in ventrum and dorsum; dorsal excision almost double long, and followed in membranous mesal area; posterodorsal processes abbreviated to half length of gonopods, clasping apex less produced. Segment X (dorsal plate) membranous covered with microtrichia, discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) long excised apicomeresally discernible both in dorsal and ventral view armed with long stout seta on mesal sides of lateral lobes. Gonopods setose elongate processes fused basally to basal

plate. Basal plate of gonopods elongate pair of completely separated thin digitiform processes. Phallic organ consisting of basally tall proximal half, and lower parallel-sided distal half; distal half armed with 2 partially overlapping subapical short stout spines; ejaculatory duct straight sclerotized with free ending; paramere thin.

*Type material* – Holotype, male: **French Guiana**: Sinnamary, Petit Saut, N 05° 03.853', W 053°02.814', 9 mao, 30.I.2007, FRG 9, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (1 male, 1 associated possible female, NHRS).

*Etymology* – *Felkurta*, from “félkurta”, abbreviated to half in Hungarian, refers to the posterodorsal processes abbreviated to half of the length of gonopods on segment IX.

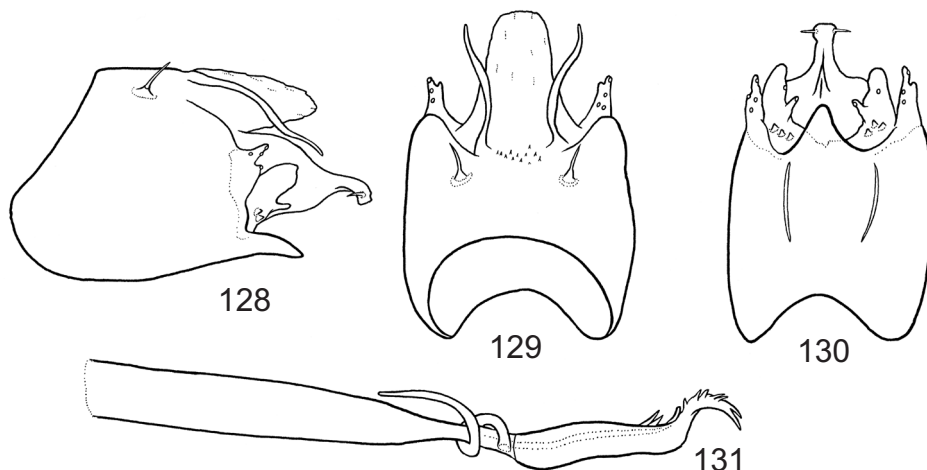
### **Neotrichia fogaka** sp. n. (Figs 128–131)

*Diagnosis* – This new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), and is closest to *Neotrichia alsa* sp. n., but differs by having dorsum IX shorter than its ventrum, not longer; apicomedian lobe on sternite IX triangular in ventral view, not quadrangular; basal horns on segment X modified into long strongly sclerotized undulating process; paraprocts aviform both in lateral and ventral view, not simple downcurving plate; basal plate of gonopods short and robust, not long and slender, phallus apex dentate.

*Description* – Male (in alcohol). Brown species with forewing length 1.2 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomedeal process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded subtriangular in lateral view and long subquadrangular in ventral and dorsal view; ventrum longer than dorsum; ventral anterior excision present and short; dorsal excision lacking; median lobe developed ventroposteriorly; upper apical corner of segment IX produced into lateral rim visible in lateral and dorsal view. Segment X (dorsal plate) comprised of pair of basolateral undulating highly sclerotized thin and long processes and of median less sclerotized long plate quadrangular in dorsal view. Paraprocts (subgenital plate) aviform both in lateral and dorsal view; twin setae located on head and directed laterally. Gonopods (bracteole) bilobed, composed of elongate digitiform slender upper process, and smaller lower process; upper process more setose, lower with less setae; indiscernible how gonopods fused basally to basal plate. Lobes of basal plate of gonopods shifted laterally, short and robust;

heavily sclerotized and dark pigmented, an additional small digitiform process located ventromesad on both lobes accompanied by several small alveoli. Phallic organ consisting of tall proximal longer half, terminated by middle constriction and of distal half with also tall middle; long paramere present with single coil and free shaft curving anterad; its very apex curving and armed with several teeth.



**Figs 128–131.** *Neotrichia fogaka* sp. n., holotype, male genitalia: 128 = lateral view, 129 = dorsal view, 130 = ventral view, 131 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4° 33.235' N, 52° 11.988' W, 225 mao, 20.I.2007, FRG 3, leg. N. JÖNSSON (NHRS). Paratype: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4° 33.035' N, 52° 11.661' W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (1 male, OPC).

*Etymology* – *Fogaka*, from “fogak”, teeth in Hungarian, refers to the dentate apex of the phallus.

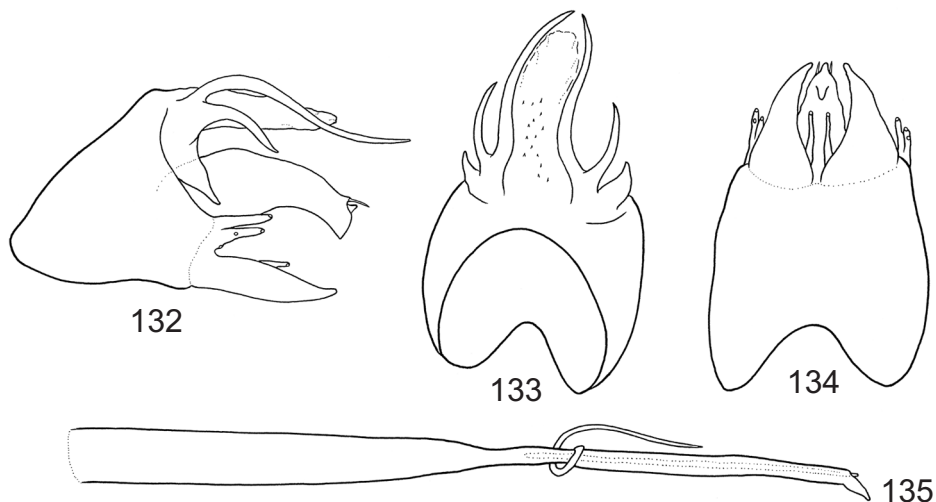
### ***Neotrichia hajla* sp. n.**

(Figs 132–135)

*Diagnosis* – This species differs from all the known species by having sclerotized apicolateral extensions of *Neotrichia vibrans* species group on segment X and by the slender subdivided or branched gonopods of *Neotrichia canixa* species group. It is easy to recognise even the uncleared specimens by the outstanding apicolateral extensions of dark sclerotized slender bending shape.

*Description* – Male (in alcohol). Smaller species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae with 18 segmented, scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular in lateral view without any anterior apodeme; dorsum short, long excised, ventrum long with short V-shaped anterior excision; sclerotized apicodorsal extension 3-armed; dorsal arm longest, thin S-shaped. Segment X (dorsal plate) membranous covered with microtrichia, discernible between dorsal arms of apicolateral extension. Paraprocts (subgenital plate) fused and long aviform in lateral view. Gonopods composed of 2 slender digiform processes and fused basally to basal plate. Basal plate of gonopods broad based long triangular; apex narrowing; basomesal digitiform process and mesad directed large dark tooth-like process present. Phallic organ simple with small hook on apex.



**Figs 132–135.** *Neotrichia hajla* sp. n., holotype, male genitalia: 132 = lateral view, 133 = dorsal view, 134 = ventral view, 135 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: same as holotype (8 males, NHRS, 4 males, OPC).

*Etymology* – *Hajla*, from “hajló”, bending in Hungarian, refers to the bending shapes of sclerotized apicolateral extensions on segment X.

*Neotrichia hiaspa* (MOSELY, 1937)

*Lorotrichia hiaspa* MOSELY, 1937: 181.

*Neotrichia hiaspa*: ROSS (1944): 154.

*New records* – **Mexico**: State of Veracruz, Los Tuxtlas, around the Estacion the Biologia Los Tuxtlas, N 18°35.213', W 095°04.462', 30 mao, 26.VI.2006, net & hand pick [M. ESPELAND & T. MALM leg.] (1 male, NHRS).

***Neotrichia horgoska* sp. n.**  
(Figs 136–139)

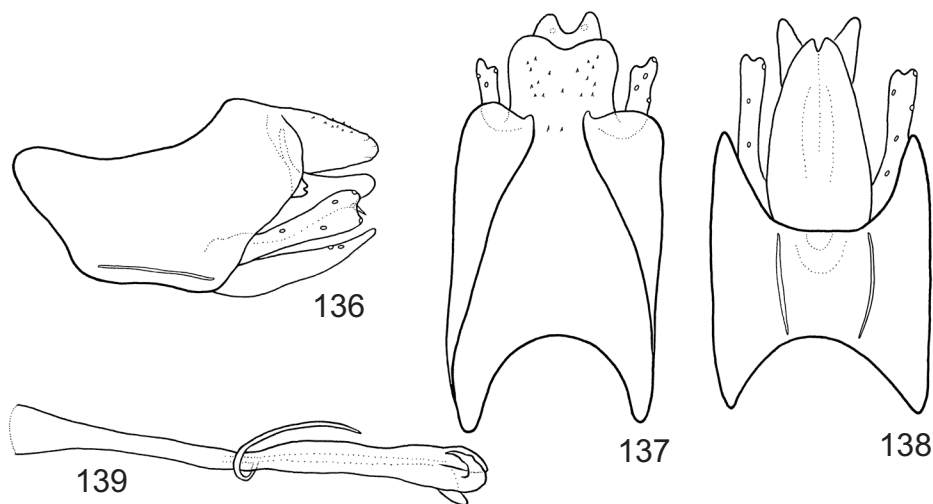
*Diagnosis* – It is close to *N. juntada* HARRIS et DAVENPORT, 1992 described from Peru and Venezuela, but differs by having segment IX with deeply concave dorsum in lateral view; heavily sclerotized lateral sclerite of segment X bidentate ventral corner; gonopods bifid; apex of basal plate of gonopods simply tapering, phallic head trifid with well-developed hook.

*Description* – Male (in alcohol). Large species with forewing length 1.8 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae with 18 segmented, scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeres process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subpentagonal with short anterior apodeme; dorsum deeply concave; deep rounded proximal excision present both in ventrum and dorsum in dorsal and ventral view, dorsal excision almost double long, and followed in membranous mesal area. Segment X (dorsal plate) membranous covered with microtrichia, discernible as fused to membranous mesal area of segment IX; quadrangular in dorsal view with slightly excised and rounded apical margin. Paraprocts (subgenital plate) excised apically, twin setae or located subventrally. Gonopods setose elongate processes with bifid apex and fused basally to basal plate. Basal plate of gonopods long triangular completely fused. Phallic organ with trilobed apex, one lobe recurved in hook and spine formation.

*Type material* – Holotype, male: **French Guiana**: Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (NHRS).

*Etymology* – *Horgoska*, from “horgoska”, diminutive form of hooked in Hungarian, refers to the recurved hook formation on the phallic head.



**Figs 136–139.** *Neotrichia borgoska* sp. n., holotype, male genitalia: 136 = lateral view, 137 = dorsal view, 138 = ventral view, 139 = phallus, lateral view

### ***Neotrichia ismetla* sp. n.**

(Figs 140–143)

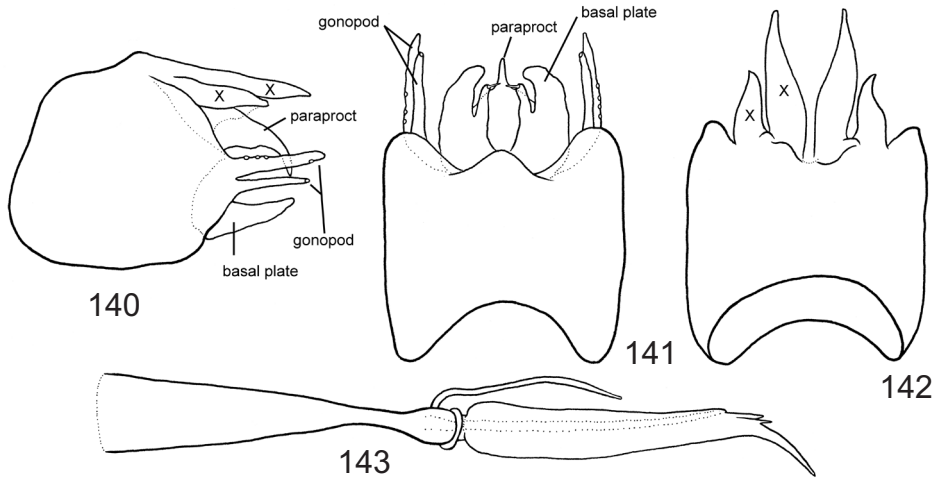
*Diagnosis* – Having bilobed gonopods this new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979). Closest to *Neotrichia unamas* BOTOSANEANU, 1993 from Tobago, but differs by segment X quadrilobed, not bilobed; mesal lobes straight, not mesad hooked; basal plate of gonopods short and stout, not long and slender; mesal lobe of basal plate fused to lateral lobes without any suture; phallic apex single pointed spine, not double spined.

*Description* – Male (in alcohol). Pale species with forewing length 1.0 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament, tentorial bridge vestigial. Antennae with 18 segments present; scapus normal, unmodified cylindrical and twice longer than pedicel; flagellomeres as long as wide with basal whorle of fimbriate setae. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX rounded in lateral and quadrangular in ventral view; dorsum and ventrum with almost equal length; upper apical corner of segment IX developed lateral flap, its inner base more sclerotized. Segment X (dorsal plate) quadrilobed; mesal lobes straight



tapering, longer; lateral lobes shorter. Paraprocts (subgenital plate) present as downward directed plate in lateral view and tapering in ventral view. Gonopods (bracteole) bilobed composed of elongate digitiform slender processes; upper process more setose, lower process with terminal setae only and little shorter; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods heavily sclerotized quadrilobed; lateral lobes large robust, mesad curving; mesal lobes shorter and less pigmented; mesal lobes fully fused to lateral lobes. Phallic organ with single pointed spinelike apex, strongly sclerotized ejaculatory duct and with two tiny teeth subapical closely adhering to shaft.



**Figs 140–143.** *Neotrichia ismetla* sp. n., holotype, male genitalia: 140 = lateral view, 141 = dorsal view, 142 = ventral view, 143 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 216 mao, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF2, leg. N. JÖNSSON (NHRS).

*Etymology* – *Ismetla*, from “ismétlő”, repeating in Hungarian, refers to the doubling of bifid or bilobed periphallic organs, both gonopods and basal plate of gonopods developed two-branched, doubling.

### *Neotrichia jarochita* BUENO-SORIA, 1999

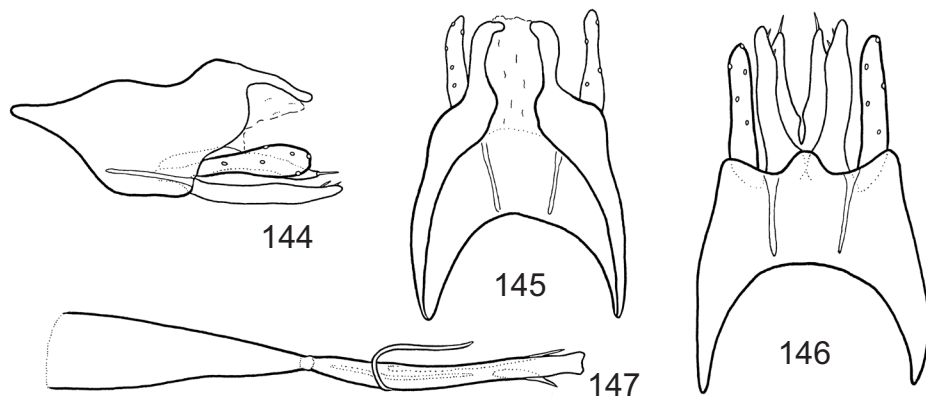
*New records* – **Mexico**: State of Veracruz, Los Tuxtlas, around the Estacion the Biología Los Tuxtlas, N 18°35.213', W 095°04.462', 30 mao, 26.VI.2006, net & hand pick, leg. M. ESPELAND & T. MALM (6 males, NHRS, 6 males, OPC).

**Neotrichia kampa** sp. n.

(Figs 144–147)

*Diagnosis* – Pronounced intact character of this pale animal, well visible in non-cleared specimens, is the dark pigmented two spines on the phallic organ: one short, stout subapical and one long, slender along its apical half. Belongs to the *N. collata* species group of MARSHAL (1979) and more similar to *N. kampoka* sp. n., but differs by having in lateral view the dorsum of segment IX undulating, not concave; posterodorsal processes on segment IX stout, not slender; paraprocts separated, not fused; terminal pair of phallic spines differently sized and shaped.

*Description* – Male (in alcohol). Pale species with forewing length 1.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae broken, 16 segments present; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomesal process.



**Figs 144–147.** *Neotrichia kampa* sp. n., holotype, male genitalia: 144 = lateral view, 145 = dorsal view, 146 = ventral view, 147 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular with short anterior apodeme and sinuous dorsum in lateral view; deep rounded proximal excision present both in ventrum and dorsum in dorsal and ventral view, dorsal excision almost double long, and followed in membranous mesal area; posterodorsal processes with clasping mesad directed blunt apex. Segment X (dorsal plate) membranous discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) present as pair of elongate less sclerotized process fused basally, ending in terminal seta and located in subphallic position. Gonopods setose elongate

processes indiscernible how they fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes. Phallic organ consisting of basally tall proximal half, and low parallel-sided distal half; distal half armed with subapical short stout spine and with long slender spine; paramere thin.

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Mayo, 11 km (rd.) E Mayobamba, 6°04.989'S, 76°53.065'W, light, loc. 06, 6.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: **Peru**: same as holotype (3 males, NHRS, 2 males, OPC). San Martin Prov., Rio Huallaga, at Pumarihri Huallaga Lodge, between Juan Guerra and Chazuta, 14 km (rd.) W Chazuta, 6°36.643'S, 76°12.555'W, light, loc. 10, 9.I.2009, leg. T. MALM & K. A. JOHANSON (3 males, NHRS, 3 males, OPC).

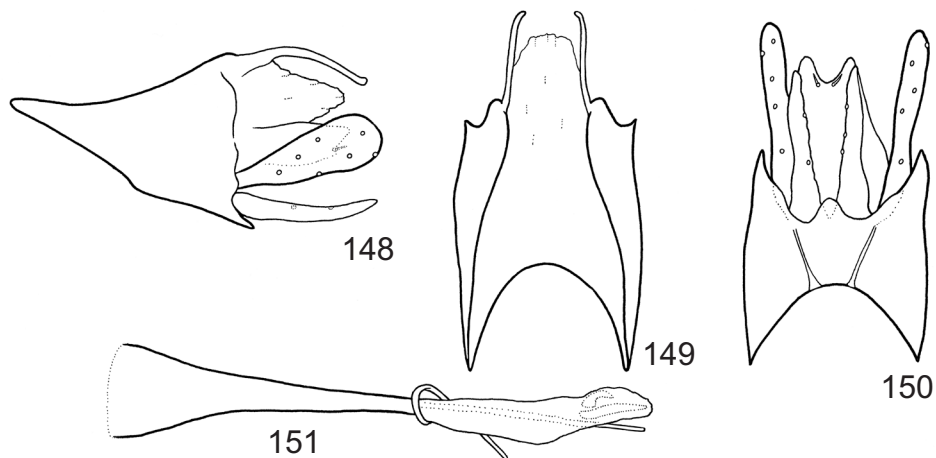
*Etymology* – *Kampa*, from “kampó”, clasp in Hungarian, refers to the clasping apex of the posterodorsal processes on segment IX.

### ***Neotrichia kampa* sp. n.** (Figs 148–151)

*Diagnosis* – Pronounced intact character of this pale animal, well visible in non-cleared specimens, is the dark pigmented two spines on the phallic organ: one short and hooked-shaped, as well as one longer, and straight. Belongs to the *N. collata* species group of MARSHAL (1979) and more similar to *N. kampa* sp. n., but differs by having in lateral view the dorsum of segment IX slightly concave, not undulating; posterodorsal processes on segment IX slender, not stout; paraprocts fused basad, not separated; terminal pair of phallic spines different.

*Description* – Male (in alcohol). Pale species with forewing length 1.8 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX triangular with short anterior apodeme and slightly concave dorsum in lateral view; dorsum open in dorsal view; thin posterodorsal well sclerotized processes with clasping apex directed mesad. Segment X (dorsal plate) membranous discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) present as fused plate with deep, V-shaped mesal excision two setae located on bottom of excision. Gonopods (bracteoles) setose foliform spatulate processes connected and fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes. Phallic organ consisting of basally tall short section, and low parallel-sided distal half; distal half armed with subapical short stout hook-shaped spine and with longer straight spine; paramere with single coil.



**Figs 148–151.** *Neotrichia kampoka* sp. n., holotype, male genitalia: 148 = lateral view, 149 = dorsal view, 150 = ventral view, 151 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Negro, 37 km (rd.) W Moyobamba, near Olmos-Tarapoto rd., 6°00.278'S, 77°15.437'W, light, loc. 05, 6.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratype: **Peru**: same as holotype (1 male, NHRS).

*Etymology* – *Kampoka*, from “kampóka”, small clasp in Hungarian, refers to the slender clasping apex of the posterodorsal processes on segment IX.

### ***Neotrichia kehelia* sp. n.**

(Figs 152–155)

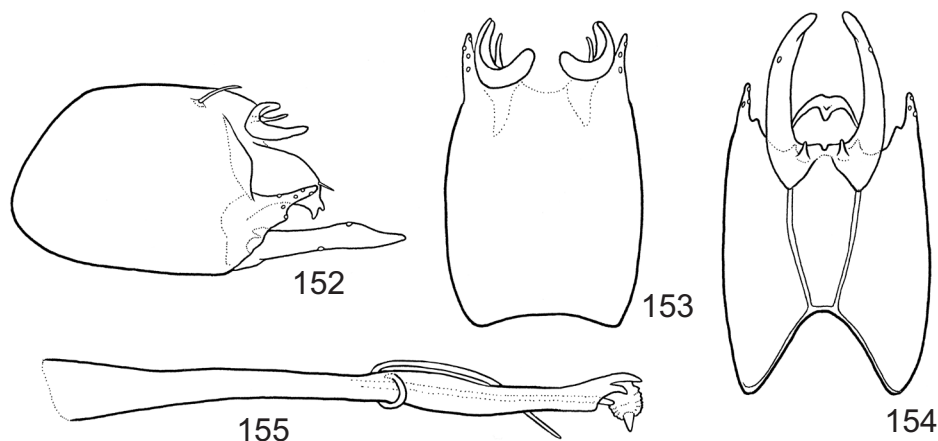
*Diagnosis* – This new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), most similar to *N. corniculans* FLINT, 1968 from Dominica, but differs by having sclerotized processes on segment X chaliceform, not horn-like; paraproctal apex bilobed in lateral view, not monolobed; lower branch of gonopods small, not long; apical end of phallic organ differently formed.

*Description* – Male (in alcohol). Brown species with forewing length 1.34 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge visible. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres quadrangular to slightly long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded, almost subcircle in lateral view and long subquadrangular in ventral and dorsal view; ventrum and dorsum long; dorsal anterior excision short; ventral anterior excision long triangular; upper apical corner of segment IX produced into lateral rim visible in lateral and dorsal view. Segment X (dorsal plate) modified as pair of sclerotized chalice structures with thin digitate process arising from inside chalice. Paraprocts (subgenital plate) located in subphallic position forming downward curving triangular plate with bilobed apex in lateral view, two dorsal subterminal setae present. Gonopods (bracteole) trilobed, composed of elongate digitiform slender upper process, small, blunt almost vestigial middle process and small pointed basal process covered by lateral lobes of basal plates; upper process more setose, middle with terminal setae only; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods quadrilobed; lateral lobes long, slender and straight in lateral view and arching mesad in ventral view armed with few sensory setae only; minute lobes of small triangular processes present on very basoventral surface of lateral lobes. Phallic organ consisting of proximal half, terminated by middle constriction and of distal half; thread-like paramere arising near this constriction with single basal coil and curves laterally; spinelike bifid apex accompanied by membranous ball-like head capped with small black peg; ejaculatory duct sclerotized with very short free end.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kehelia*, from “kehely”, chalice in Hungarian, refers to the chalice-shaped sclerotized processes of segment X.

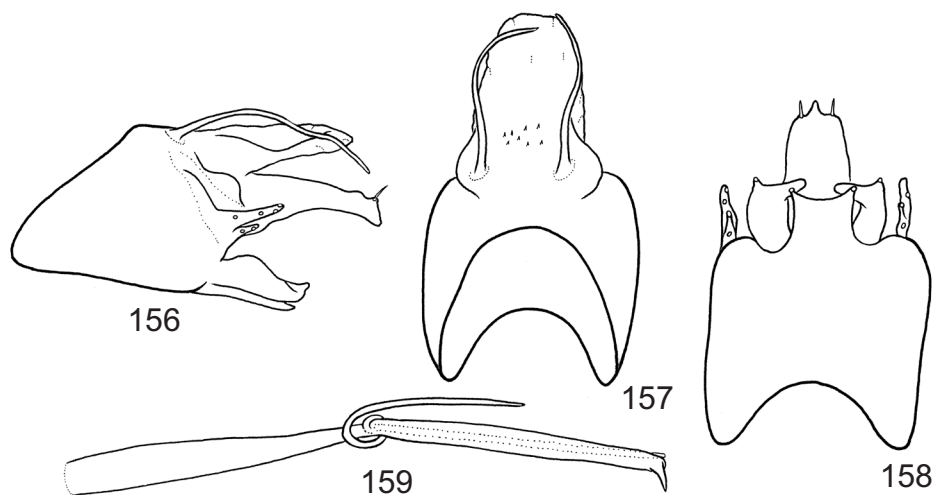


**Figs 152–155.** *Neotrichia kehelia* sp. n., holotype, male genitalia: 152 = lateral view, 153 = dorsal view, 154 = ventral view, 155 = phallus, lateral view

***Neotrichia ketaguka* sp. n.**  
(Figs 156–159)

*Diagnosis* – Having digitiform divided gonopods this new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), but differs from all the known species by the very specialised ventromesal plate of segment IX and by the two-branched basal plate of gonopods.

*Description* – Male (in alcohol). Brown species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge visible. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeresal process.



**Figs 156–159.** *Neotrichia ketaguka* sp. n., holotype, male genitalia: 156 = lateral view, 157 = dorsal view, 158 = ventral view, 159 = phallus, lateral view

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; subtriangular in lateral view; dorsum short ventrum long; dorsal anterior excision long ventral excision short; large median plate appears on middle of ventroposterior margin as long as basal plate of gonopods and producing pointed lateral corners tipped with single stout and short seta; upper apical corner of segment IX in combination with gonopod basement producing lateral rim. Segment X (dorsal plate) long membranous plate marginated with long and thin lateral

spineslike processes; basolateral small wing-shaped lobe present. Paraprocts (subgenital plate) long downcurving plate, with small mesal process and with two dorsal subterminal setae. Gonopods (bracteole) composed of elongate digitiform slender upper process and smaller, half-sized lower process; bilobed gonopods broad-based extending dorsally and forming lateral rim with segment IX; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods short with small lateral and larger mesad directed inner lobes. Phallic organ with single oblique terminal lobe; ejaculatory duct with short free apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Ketaguka*, from “kétágúka”, diminutive form of two-armed in Hungarian, refers to the two arms developed on the basal plate of gonopods.

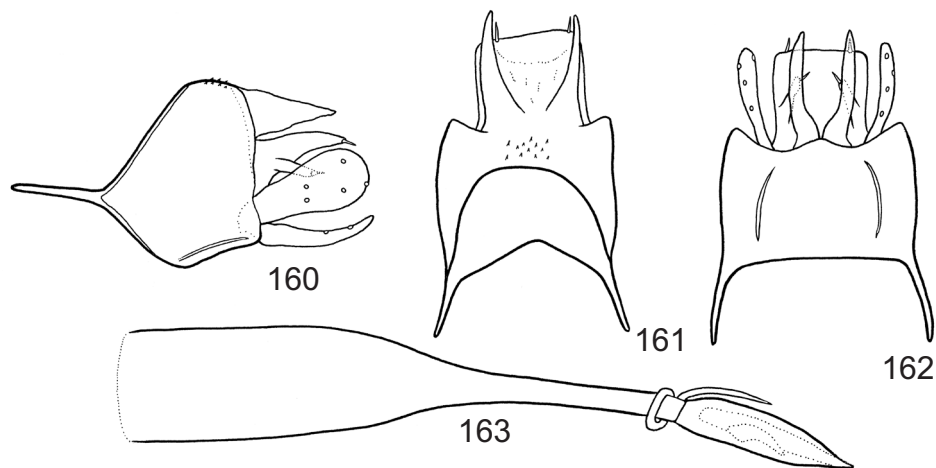
### ***Neotrichia kurta* sp. n.** (Figs 160–163)

*Diagnosis* – Intact character of this pale animal, well visible in non-cleared specimens, is the dark pigmented “single” spine on the apex of phallic organ. The overlapping two spines appear as a single spine in intact specimen. This tiny new species belongs to the *Neotrichia collata* species group of MARSHAL (1979). In the cleared genitalia it is more similar to *N. tuxtla* BUENO-SORIA, 1999, but differs by having shorter anterior apodeme on segment IX, paraproctal plate quadrangular in ventral view, not excised; paraproctal digitiform processes long, not short; gonopods (bracteole) broad foliform, not spatulate; processes of basal plate low slender in lateral view, not tall, phallic organ with abruptly low middle section, not gradually lowering.

*Description* – Male (in alcohol). Pale minute species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Both anterior and posterior tentorial arms present, tentorial bridge vestigial. Antennae broken; scapus unmodified, arching cylindrical, slightly longer than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX pentagonal in lateral view with short anterior triangle and pointed apodeme. Segment X (dorsal plate) membranous mesad as fused to less pigmented mesal area of segment IX and sclerotized laterally forming lateral plates appears pointed both in dorsal and ventral view. Paraprocts (subgenital plate) present as single highly sclerotized plate broad quadrangular in ventral view; pair of less sclerotized digitiform process with terminal seta arisen from basolateral area and directed ventromesad. Setose gonopods (bracteoles) appear broad foliform, their connection to basal plate discernible.

Basal plate of gonopods elongate pair of completely separated digitiform processes, broad-based and arching laterally in ventral view. Phallic organ consisting of basally tall proximal half, and low distal half; apex armed with overlapping short curved and longer straight sub-apical spines; paramere with single coil.



**Figs 160–163.** *Neotrichia kurta* sp. n., holotype, male genitalia: 160 = lateral view, 161 = dorsal view, 162 = ventral view, 163 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kurta*, from “kurta”, short in Hungarian, refers to the short segment IX, compared to the related species *N. tuxtla*.

### ***Neotrichia kurtika* sp. n.**

(Figs 164–167)

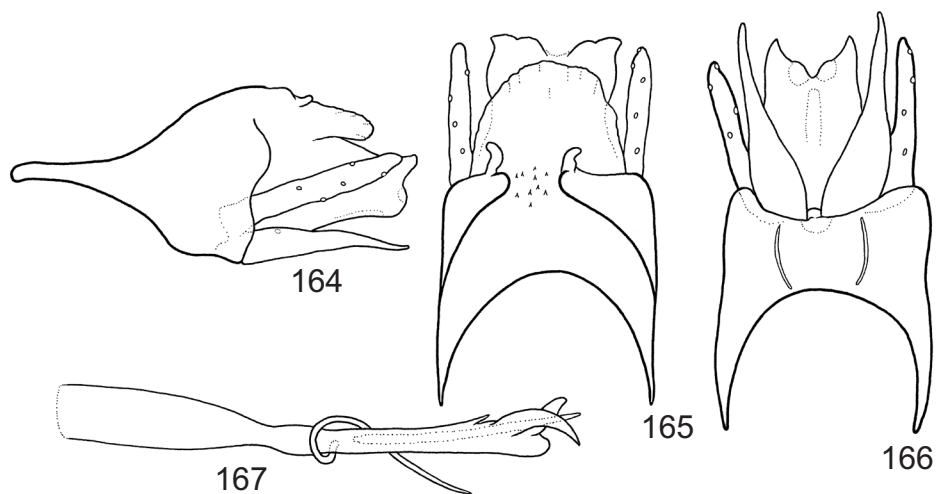
*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and with its open dorsum IX similar to *N. kurtitva* sp. n., but differs by having a basal protuberance on the posterodorsal process on segment IX; anterior apodeme located laterally, not ventrally; paraprocts differently shaped; basal plate of gonopods very broad based.

*Description* – Male (in alcohol). Small species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae with 18 segmented, scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical.



Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular with medium-sized anterior apodeme; concave dorsum and ventrum in lateral view resulting apodeme in lateral position; deep rounded proximal excision present both in ventrum and dorsum in dorsal and ventral view, dorsal excision almost double long, and followed in membranous mesal area; posterodorsal processes abbreviated, mesad curving arising from basal protuberance. Segment X (dorsal plate) membranous covered with microtrichia, discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) present as pair of wing-shaped complex with distomesal circular humps on both sides without discernible twin setae or setal alveoli. Gonopods setose elongate processes fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated long broad-based processes. Phallic organ consisting of basally tall proximal half, and low parallel-sided distal half; distal half armed with 1 subapical short stout spines, and 2 membranous lobes, ejaculatory duct visible as long dark-pigmented spine; paramere thin.



**Figs 164–167.** *Neotrichia kurtika* sp. n., holotype, male genitalia: 164 = lateral view, 165 = dorsal view, 166 = ventral view, 167 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (NHRS).

*Etymology* – *Kurtika*, from “kurtika”, diminutive form of short in Hungarian, refers to the short posterodorsal processes on segment IX.

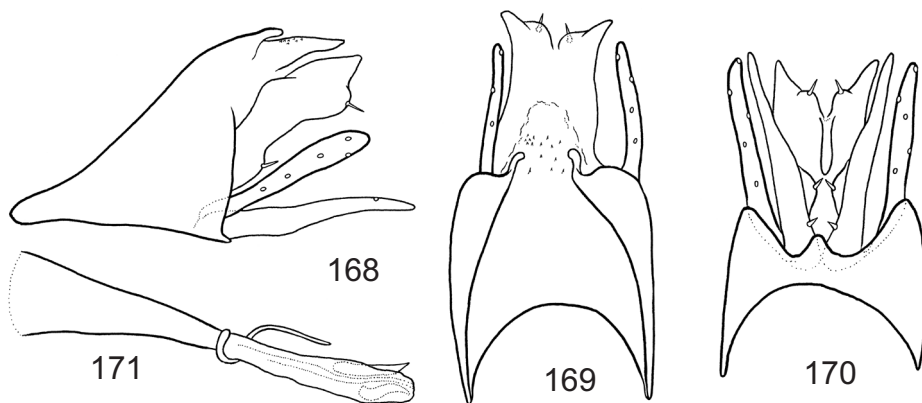
***Neotrichia kurtitva* sp. n.**

(Figs 168–171)

*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and with its open dorsum IX similar to *N. kampa* sp. n. and *N. kampoka* sp. n., but differs from both by having very short posterodorsal process on segment IX and differently shaped paraprocts.

*Description* – Male (in alcohol). Small species with forewing length 1.2 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae broken, 8+ segments present; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular with short anterior apodeme and sinuous dorsum in lateral view; deep rounded proximal excision present both in ventrum and dorsum in dorsal and ventral view, dorsal excision almost double long, and followed in membranous mesal area; posterodorsal processes abbreviated, clasping apex less produced. Segment X (dorsal plate) membranous covered with microtrichia, discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) present as pair of wing-shaped complex with distomesal and basomesal circular humps on both sides bearing each stout central seta. Gonopods setose elongate processes fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated thin digitiform processes. Phallic organ consisting of basally tall proximal half, and low parallel-sided distal half; distal half armed with 2 subapical short stout spines, one almost straight little longer, other slightly S-shaped, ejaculatory duct running between them; paramere thin.



**Figs 168–171.** *Neotrichia kurtitva* sp. n., holotype, male genitalia: 168 = lateral view, 169 = dorsal view, 170 = ventral view, 171 = phallus, lateral view

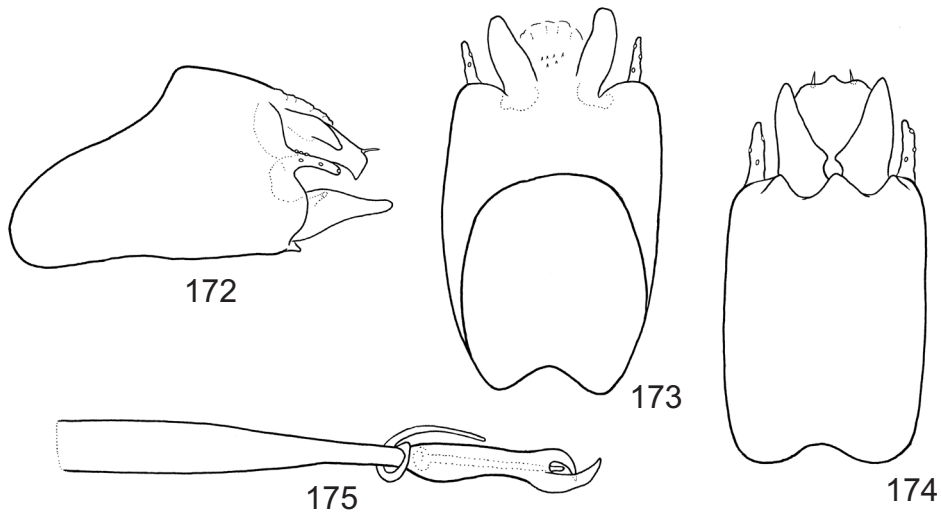
*Type material* – Holotype, male: Peru: San Martin Prov., Rio Huallaga, at Pumarihri Huallaga Lodge, between Juan Guerra and Chazuta, 14 km (rd.) W Chazuta, 6°36.643'S, 76°12.555'W, light, loc. 10, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kurtitva*, from “kurtitva”, abbreviated in Hungarian, refers to the abbreviated posterodorsal processes on segment IX.

***Neotrichia lefela* sp. n.**  
(Figs 172–175)

*Diagnosis* – This species differs from all known species by having small gonopods with unusual direction. Usually the gonopods (bracteole) are directed obliquely upward; this new species has obliquely downward directed gonopods.

*Description* – Male (in alcohol). Small species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae with 18 segmented, scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomasal process.



**Figs 172–175.** *Neotrichia lefela* sp. n., holotype, male genitalia: 172 = lateral view, 173 = dorsal view, 174 = ventral view, 175 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX with short dorsum and long ventrum; regular quadrangular in ventral view; anterior margin forming ridge or free flapping plate together with gonopod basement. Segment X (dorsal plate) indistinct membranous mesal area covered with microtrichia, discernible between more visible, but pale lateral lobes. Paraprocts (subgenital plate) fused; long aviform in lateral view and broad in ventral view. Gonopods small digitiform, slightly downward directed; its basodorsum covered by raised alveoli of strong setae. Basal plate of gonopods long triangular with basomesal digitiform process. Phallic organ with bifid apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Lefela*, from “lefelé”, downward in Hungarian, refers to the unique gonopods of reduced size and with unusual downward direction.

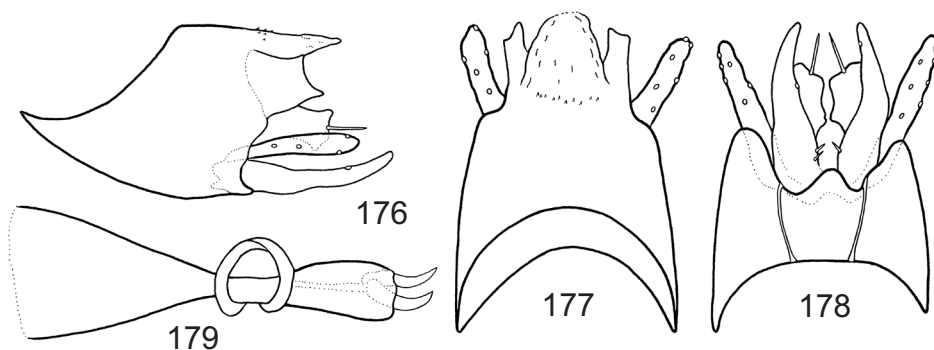
### ***Neotrichia oldalia* sp. n.**

(Figs 176–179)

*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and most similar to *N. biuncifera* FLINT, 1974 from Suriname and *N. margaritena* BOTOSANEANU, 2002 from Venezuela, but differs from both by having a heavily sclerotized apicolateral platelike extension of segment IX.

*Description* – Male (in alcohol). Small species with forewing length 1.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with anterior and posterior arms present, tentorial bridge vestigial. Antennae broken, 6+ segments present; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular with short pointed anterior apodeme and sinuous dorsum in lateral view; deep rounded proximal excision present both in ventrum and dorsum; highly sclerotized extension developed on apicolateral region. Segment X (dorsal plate) membranous covered with microtrichia, discernible as fused to mesal area of segment IX. Paraprocts (subgenital plate) present as pair of subrectangular plate both in lateral and ventral view with very long seta on both sides. Gonopods setose elongate processes clearly fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes. Phallic organ consisting of basally very tall proximal half, and low parallel-sided distal half; distal half armed with 2 subapical short stout curved spines, ejaculatory duct running between them; paramere rather thick and discernible as looping, not coiling at middle constriction.



**Figs 176–179.** *Neotrichia oldalia* sp. n., holotype, male genitalia: 176 = lateral view, 177 = dorsal view, 178 = ventral view, 179 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., Rio Huallaga, at Pumarihri Huallaga Lodge, between Juan Guerra and Chazuta, 14 km (rd.) W Chazuta, 6°36.643'S, 76°12.555'W, light, loc. 10, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Oldalia*, from “oldal”, side in Hungarian, refers to the sclerotized apico-lateral plate-like extension of segment IX.

### ***Neotrichia parany* sp. n.**

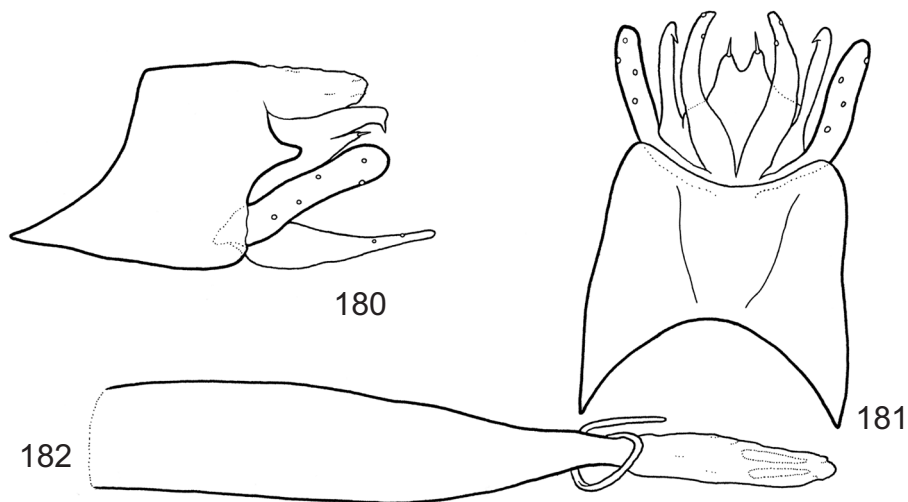
(Figs 180–182)

*Diagnosis* – Pronounced intact character of this pale animal, well-visible in non-cleared specimens, is the dark pigmented two spines on the phallic organ with similar short and stout shape. *Neotrichia kampa* has similar intact character of spines, but of different size and shape. This tiny new species belongs to *Neotrichia collata* species group of MARSHAL (1979). According to the cleared genitalia more similar to *N. tertia* MOSELY, 1939, but differs by having gonopods (bracteole) digitiform, not spatulate gradually dilating from a slender base to a broad, rounded apex; processes of basal plate without upturning apices; phallic apex with a similarly sized and shaped spines.

*Description* – Male (in alcohol). Pale minute species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Both anterior and posterior tentorial arms present, tentorial bridge vestigial. Antennae broken; scapus unmodified, arching cylindrical, slightly longer than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than

segment VII. Segment IX subquadrangular in lateral view with short anterior pointed apodeme ventrally and with small blunt lobe on middle of apical margin. Segment X (dorsal plate) membranous discernible as fused to membranous mesal area of segment IX. Paraprocts (subgenital plate) present as pair of highly sclerotized lateral process with bird beak shaped apex in lateral view connected mesobasally to less sclerotized mesal pair of processes each with terminal seta. Gonopods (bracteoles) setose elongate processes indiscernible how they fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes, broadening basally and arching laterally in ventral view. Phallic organ consisting of basally tall proximal half, and lower distal half; distal half armed with two subapical short stout spines of similar size and shape; paramere with single coil.



**Figs 180–182.** *Neotrichia parany* sp. n., holotype, male genitalia: 180 = lateral view, 181 = ventral view, 182 = phallus, lateral view

*Type material* – Holotype, male: **Peru:** Amazonas Prov., Rio Utcabamba, Bajra Grande, at Rio Hotel, 5°45.824'S, 78°25.414'W, light, loc. 14, 12.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

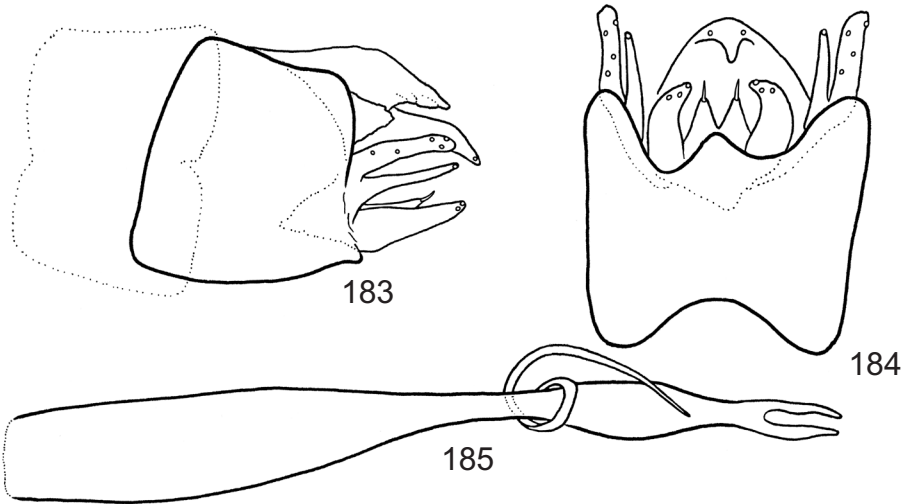
*Etymology* – *Parany*, from “parány”, tiny in Hungarian, refers to the extremely small size.

### ***Neotrichia sokaga* sp. n.**

(Figs 183–185)

*Description* – Male (in alcohol). Pale species with forewing length 1.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae with 18 segments present; scapus normal, unmodified cylindrical and 1.5 long of pedicel; flagellomeres as long as wide.

Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.



**Figs 183–185.** *Neotrichia sokaga* sp. n., holotype, male genitalia: 183 = lateral view, 184 = ventral view, 185 = phallus, lateral view

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX subquadrangular both in lateral and ventral view; its dorsum short; in ventral view shorter anterior and longer posterior excision present; on middle of posterior excision small triangular projection covering basement of basal plate; upper apical corner of segment IX developed lateral flap; its inner base more sclerotized and somehow produced an elaborate more sclerotized extension, difficult to discern under cover of laterally shifted gonopods. Segment X (dorsal plate) discernible as pair of down and laterad-curving, less sclerotized membranous processes. Paraprocts (subgenital plate) present as downward curving triangular plate, with two subterminal setae and located in subphallic position. Gonopods (bracteole) bilobed composed of elongate digitiform slender processes; upper outer more setose, lower inner with terminal setae only; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods quadrilobed; lateral lobes robust falciform with 4–5 terminal sensory setae; mesal lobes smaller, more triangular and touching or fused basad. Phallic organ consisting of tall proximal half, terminated by middle constriction and of distal half with also tall middle; distal half with bilobed apex; apical arms symmetric and directed straight backward; thread-like paramere present with single basal coil.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Sokaga*, from “sokágú”, many-branched in Hungarian, refers to the multitude of various genital processes or branches: a pair of lateral processes rooting behind the lateral flap on segment IX; a pair of downward curving processes on segment X; single plate-like process of paraprocts; altogether four processes of gonopods; four processes of basal plate of the gonopods.

***Neotrichia tompa* sp. n.**  
(Figs 186–189)

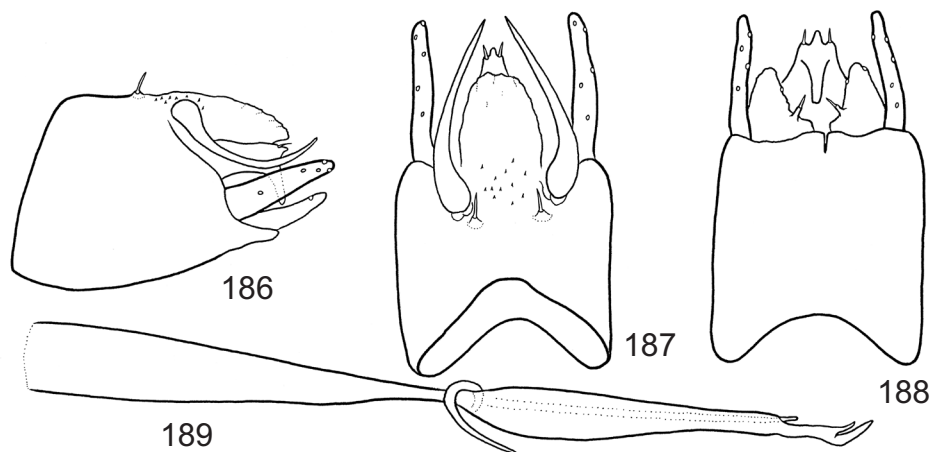
*Diagnosis* – This new species having reduced basal plate of gonopods, segment X wrapping laterally, resembles species in the *N. caxima* species group, but differs from this group by the almost regular quadrangular shape of segment IX without any anterior apodemes. *Neotrichia tompa* sp. n. has a pair of long, slender posterodorsal processes on segment IX similar to *N. cayada* HARRIS et DAVENPORT, 1992 from Venezuela also without apodemes, but differs by all the other genital structures.

*Description* – Male (in alcohol). Small species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge. Antennae broken with 5+ segments; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded subquadrangular in lateral view and long subquadrangular in ventral and dorsal view; ventrum slightly longer than dorsum; its ventroposterior margin with wide median lobe divided by cleft; heavily sclerotized long and slender process arising from bulbous base from both posterodorsal corners curving mesad. Segment X (dorsal plate) discernible as membranous, partially microtrichia covered hood over phallic organ with pair of small anterior tubercles with terminal seta. Paraprocts (subgenital plate) with very long beaklike process in lateral view. Gonopods (bracteole) long setose parallel-sided lobes. Lobes of basal plate of gonopods short and blunt accompanied by short mesal additional lobe with terminal seta. Phallic organ consisting of tall proximal and tall distal halves, separated by middle constriction; apex bilobed, ejaculatory duct sclerotized with very short free apex; long paramere present with single coil.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 4–12.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (12 males, NHRS, 8 males, OPC).





Figs 186–189. *Neotrichia tompa* sp. n., holotype, male genitalia: 186 = lateral view, 187 = dorsal view, 188 = ventral view, 189 = phallus, lateral view

*Etymology* – *Tompa*, from “tompá”, blunt in Hungarian, refers to the short blunt basal plate of gonopods.

### ***Neotrichia vekonyka* sp. n.**

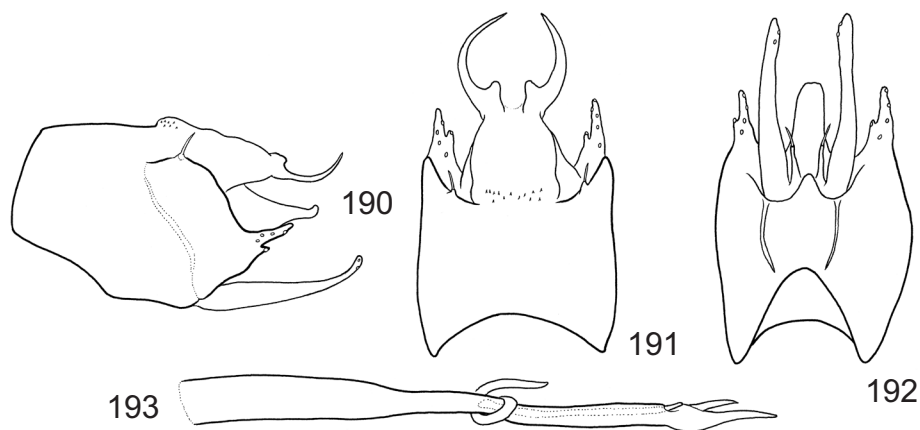
(Figs 190–193)

*Diagnosis* – This new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979), its mirror symmetric horn-like processes on segment X relates it to *Neotrichia alsa* sp. n., but differs by having very slender horn; produced basal part of segment X; paraproctal apex upward turning, not downward; basal plate of gonopods straight, not mesad curving.

*Description* – Male (in alcohol). Brown species with forewing length 1.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium with thin anterior and posterior arms; vestigial tentorial bridge visible. Antennae with 18 segments present; scapus normal, unmodified cylindrical, slightly longer than pedicel; flagellomeres of pedicel size long cylindrical. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX fused annular appearing as complete cylinder; rounded ovoid in lateral view and subquadrangular in ventral and dorsal view; ventrum shorter; dorsal anterior excision short; ventral anterior excision long V-shaped; blunt triangular median lobe appears on middle of ventroposterior excision between basement of basal plate; upper apical

corner of segment IX produced into lateral long rim visible in lateral and dorsal view. Segment X (dorsal plate) modified as pair of slender lateral horn directed mesad. Paraprocts (subgenital plate) present as elongate plate, with upward directed tip in lateral view and located in subphallic position. Gonopods (bracteole) bilobed, composed of elongate digitiform slender upper process, and small, almost vestigial lower process; upper process more setose, lower with terminal setae only; indiscernible how gonopods fused basally to basal plate. Basal plate of gonopods quadrilobed; lateral lobes long and straight slender in ventral view, its apex curving slightly upward in lateral view armed with 3–4 terminal sensory setae; mesal lobes smaller and armed with terminal seta. Phallic organ consisting of tall proximal half, terminated by middle constriction and of distal half lower half; thread-like paramere present with single basal coil after middle constriction and curves laterally; bilobed apex with one large spine-like lobe and one small subapical spine; ejaculatory duct with short free apex extending beyond phallic body slightly before bilobed phallic apex.



**Figs 190–193.** *Neotrichia vekonyka* sp. n., holotype, male genitalia: 190 = lateral view, 191 = dorsal view, 192 = ventral view, 193 = phallus, lateral view

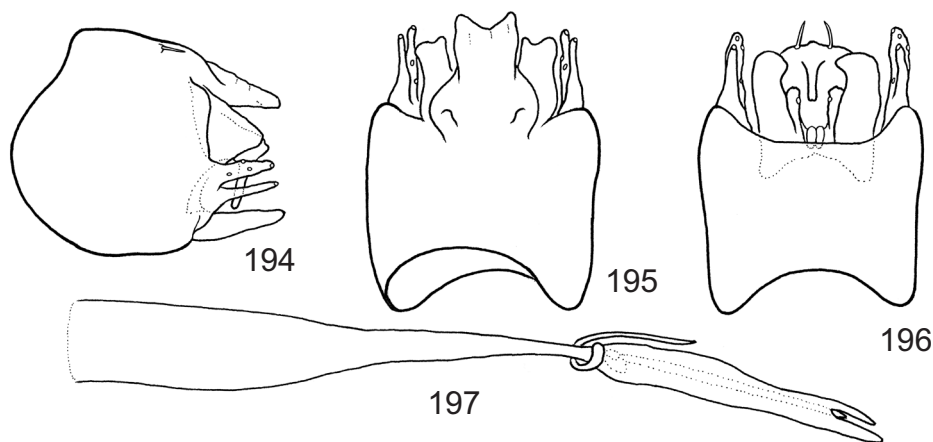
*Type material* – Holotype, male: **French Guiana:** Approuaguekaw, Kaw Mt, 4°33.035' N, 52°11.661'W, 104 mao, 23.I.2007, FRG 4, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana:** Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 4–12.II.2007, FRG MF3, leg. N. JÖNSSON (1 male, NHRS). Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 19.i–4.II.2007, FRG MF 2, leg. N. JÖNSSON (1 male, NHRS, 1 male, OPC). Approuaguekaw, Kaw Mt, 4°32.833'N, 52°11.452' W, 77 mao, 24.I.2007, FRG 5, light trap, leg N. JÖNSSON (2 males, NHRS, 1 male, OPC). Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (9 males, NHRS). Approuaguekaw, Kaw Mt, 216 mao, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF2, leg. N. JÖNSSON (5 males, NHRS).

*Etymology* – *Vekonyka*, from “vékonyka”, diminutive form of thin in Hungarian, refers to the very slender attenuated horns on segment X.

***Neotrichia villa* sp. n.**  
(Figs 194–197)

*Diagnosis* – Having bilobed gonopods this new species belongs to the *Neotrichia canixa* species group of MARSHAL (1979). It is closest to *Neotrichia sokaga* sp. n., but differs by segment IX in lateral view rounded, not quadrangular; paraprocts with very long downward directed rostrum and differently formed gonopods.

*Description* – Male (in alcohol). Pale species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present as thin filament. Antennae with 18 segments present; scapus normal, unmodified cylindrical and 1.5 long of pedicel; flagellomeres as long as wide. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.



**Figs 194–197.** *Neotrichia villa* sp. n., holotype, male genitalia: 194 = lateral view, 195 = dorsal view, 196 = ventral view, 197 = phallus, lateral view

Male genitalia. Segment VIII unmodified, slightly shorter and lower than segment VII. Segment IX rounded in lateral and quadrangular in ventral view; dorsum and ventrum with equal length; upper apical corner of segment IX developed lateral flap, its inner base more sclerotized; basoventral dark pigmented plates discernible mesad of lateral flap, triangular in lateral and with forked apex in dorsal view. Segment X (dorsal plate) membranous, its mesal area longer with short triangular apical margin and accompanied by wing-shaped basolateral plates; Paraprocts (subgenital plate) present as rounded plate in ventral view with very long subapical vertical rostrum in lateral view. Gonopods (bracteole) bilobed composed of elongate digitiform slender processes; upper process more setose, lower process with terminal setae only; indiscernible how gonopods fused basally to basal plate.

Basal plate of gonopods heavily sclerotized quadrilobed; lateral lobes large robust, mesal lobes shorter and less pigmented; pair of small kidney-shaped structures visible at fusion of lobes. Phallic organ with forked apex and with strongly sclerotized ejaculatory duct having short free apex at base of fork.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Villa*, from “villa”, fork in Hungarian, refers to the forks present on phallic apex and on the heavily sclerotized processes on the dorsoapical corner of segment IX.

### ***Neotrichia vissa* sp. n.**

(Figs 198–201)

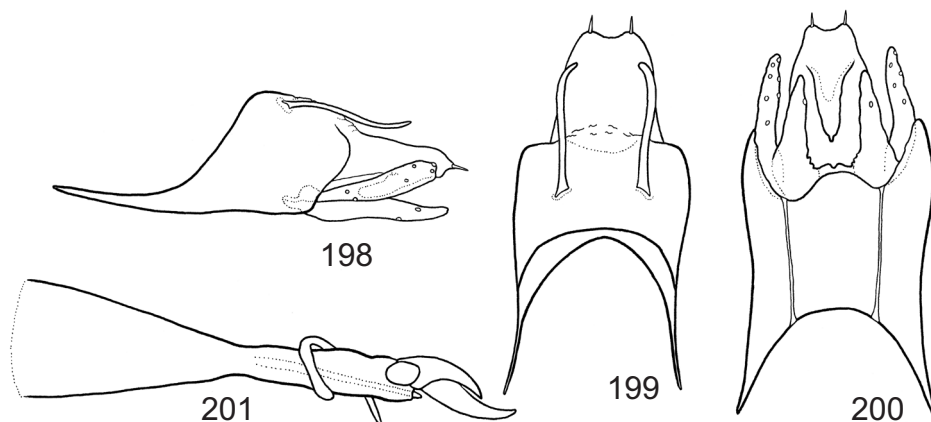
*Diagnosis* – It belongs to the *N. collata* species group of MARSHAL (1979) and more similar to *N. colombiensis* HARRIS, 1990 from Colombia, but differs by having a pair of dorsal processes on segment IX very long, dominating on the genital dorsum; paraprocts short excised between the 2 setae, not with long V-shaped excision; paraprocts with a long ventral median process; terminal pair of phallic spines different.

*Description* – Male (in alcohol). Pale species with forewing length 1.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present, bridge vestigial. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres subquadratic. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment IX subquadrangular with pair of long ventrolateral anterior apodeme; both dorsum and ventrum long excised; long dorsal digitiform processes present midway on segment, slightly S-shaped in lateral view. Segment X (dorsal plate) membranous indiscernible. Paraprocts (subgenital plate) present as fused plate with short, V-shaped mesal excision between two setae. Gonopods (bracteoles) setose slender slightly spatulate processes connected and fused basally to basal plate. Basal plate of gonopods elongate pair of completely separated digitiform processes. Phallic organ consisting of basally tall short section, and low parallel-sided distal half; distal half armed with 2 subapical short stout hook-shaped spines; paramere with single coil; ejaculatory duct with short free end.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Vissa*, from “vissza”, backward in Hungarian, refers to the ventral median process on paraprocts turning backward anteriorly.



**Figs 198–201.** *Neotrichia vissa* sp. n., holotype, male genitalia: 198 = lateral view, 199 = dorsal view, 200 = ventral view, 201 = phallus, lateral view

### ***Neotrichia vonza* sp. n.**

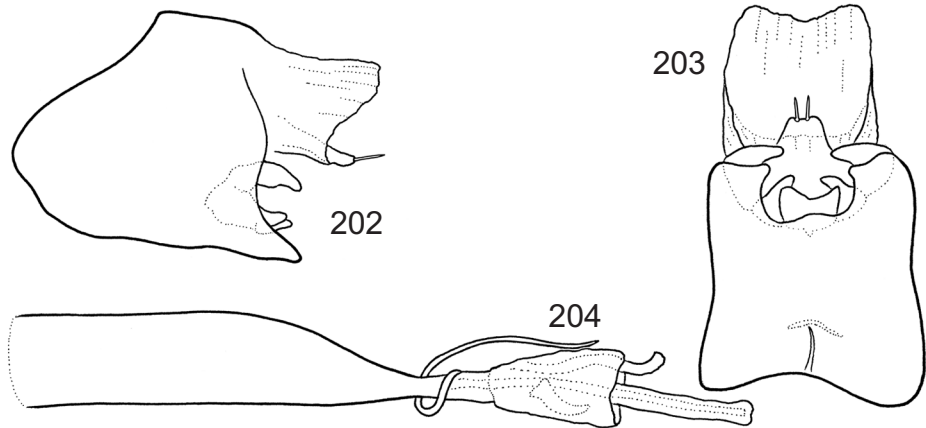
(Figs 202–204)

*Diagnosis* – It belongs to the *N. caxima* species group of MARSHAL (1979) and more similar to *N. botonia* HARRIS, 1990 from Venezuela, but differs by having no dorsolateral long seta with enforced papilla-like alveoli on segment IX; many-folded segment X clearly wrapping below paraprocts; paraprocts with narrow apex; gonopods with two mesad turning black headed processes; basal plate of gonopods shorter than wide; phallic organ with different subapical spines.

*Description* – Male (in alcohol). Pale species with forewing length 1.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete, both anterior and posterior arms present, bridge vestigial. Antennae broken with 13+ segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres subquadratic. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum without transverse suture, its anterior margin convex; metascutellum convexly subtriangular. Tibial spurs 0,2,3. Sternum VII without apicomeral process.

Male genitalia. Segment IX subquadrangular with rounded anterior pleura, without slender apodeme; shorter dorsally than ventrally. Segment X (dorsal plate) membranous with many narrow longitudinal folds and wrapped below phallic organ and possibly below paraprocts. Paraprocts (subgenital plate) present as fused plate with narrow truncate apical margin bearing two setae. Bracteole type gonopods modified into 2 strongly chitinised, black-headed and mesad directed short broad based processes connected to basal plate of gonopods. Basal plate of gonopods short triangular lobes, fused basally. Phallic organ

consisting of tall long basal section followed by constriction with paramere and an articulated distal section starting with tall short tube housing short spinelike and long curving ribbonlike processes and shaft with embedded dark and slightly twisted ejaculatory duct.



**Figs 202–204.** *Neotrichia vonza* sp. n., holotype, male genitalia: 202 = lateral view, 203 = ventral view, 204 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Maripasoula, Maroni River, Dama-son campo, Village, 4°35.112'N, 54°24.799'W, 38 m, 7.II.2007, FRG 13, leg. N. JÖNSSON (NHRS). Paratype: same as holotype (1 male, OPC).

*Etymology* – *Vonza*, from “vonz”, attract in Hungarian, refers to the inside directed or attracted processes of the gonopods and ventrolateral lobes of segment IX.

### *Neotrichia xicana* (MOSELY, 1937)

*Dolotrichia xicana* MOSELY, 1937: 178.

*Neotrichia xicana*: ROSS (1944): 154.

*New records* – **Mexico**: State of Veracruz, Los Tuxtlas, around the Estacion the Biologia Los Tuxtlas, N 18°35.213', W 095°04.462', 30 m, 26.VI.2006, net & hand pick, leg. M. ESPELAND & T. MALM (1 male, NHRS, 1 male, OPC).

Tribe Ochrotrichiini  
(Table 6)

Table 6. Character states of genera in the tribe Ochrotrichiini

Genus	Ocelli	Metascutellum shape	Tentorial bridge	Maxillary palp segment 1 and 2 length over breadth	Antennal setae shape	Apical flagellomere shape	Tibial spurs	Modified abdominal setae/sac/pouch
<i>Caledonotrichia</i>	present	triangular	present	>1	tapering	stylate	0,3,4	absent
<i>Dibusa</i>	absent	pentagonal	present	>1	tapering	stylate	1,3,4	absent
<i>Maydenoptila</i>	present	pentagonal	present	>1	tapering	stylate	0,3,4	absent
<i>Merrichia</i>	present	triangular	absent	≤1	whorled/fimbriate	stylate	1,3,4	present
<i>Nothotrichia</i>	present	convex	present	>1	tapering	blunt	1,3,4	absent
<i>Ochrotrichia</i>	present	convex	present	≤1	tapering	blunt	0,3,4	absent
<i>Angrisañoia</i>	present	triangular	absent	≤1	tapering	blunt	1,3,4	absent
<i>Ragatrichia</i>	present	triangular	absent	≤1	whorled/fimbriate	stylate	1,3,4	present
<i>Rhyacopsyche</i>	present	pentagonal	absent	≤1	tapering	blunt	1,3,4	absent

(continued)

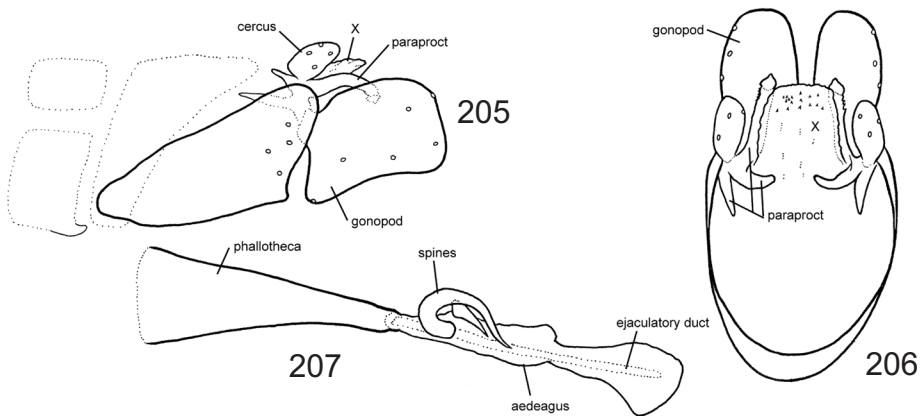
Genus	Dorsolateral lobes on segment IX	Shape of segment X	Segment X	Cerci	Paraprocts below phallic organ	Harpagones	Distal phallic hooks
<i>Caledonotrichia</i>	absent	cylindrical	indistinct	absent	separate	absent	absent
<i>Dibusa</i>	absent	cylindrical	distinct	present	separate	absent	absent
<i>Maydenoptila</i>	absent	cylindrical	distinct	absent	fused	absent	absent
<i>Merrichia</i>	absent	cumbuliform	indistinct	present	separate	absent	present
<i>Nothotrichia</i>	absent	cylindrical	distinct	absent	fused	absent	absent
<i>Ochrotrichia</i>	absent	nearly cylindrical	distinct	absent	indistinct/modified	absent	absent
<i>Angrisañoia</i>	absent	cumbuliform	indistinct	absent	fused	absent	absent
<i>Ragatrichia</i>	absent	cylindrical	indistinct	absent	fused	present	absent
<i>Rhyacopsyche</i>	present	nearly cylindrical	indistinct	absent	fused	absent	absent

Genus *Metrichia* ROSS, 1938***Metrichia alhoma* sp. n.**

(Figs 205–207)

*Diagnosis* – It is most similar to *M. brevitars* BUENO-SORIA et SANTIAGO DE FRAGOSO, 2002 from Panama but differs having more quadratic lateral shape of gonopods; concave ventrum of gonopods; posterior paraproctal rod slender, not robust; distal apex of paraproctal rod caped, not T-shaped.; phallic organ with a long and a short curved spines located middle and without subapical spines.

*Description* – Male (in alcohol). Small, light brown species with forewing length 1.6 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae broken with 12+ segments; scapus normal, unmodified curving cylindrical with bulbous apical half, longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 1,3,4. Abdominal terga with few modifications; pair of small dark rounded circular bodies (sack?) present between terga V and VI. Sternum VII with short blunt apicomeres process.



**Figs 205–207.** *Metrichia alhoma* sp. n., holotype, male genitalia: 205 = lateral view, 206 = dorsal view, 207 = phallus, lateral view

Male genitalia. Segment VIII fused shorter ventrally, longer dorsally compensating cover function over open dorsum of segment IX. Segment IX elongate suboval positioned oblique in lateral view; its dorsum entirely open; its tergum reduced to pair of small lateral



rod attached to complex of cerci, paraprocts and dorsoapical corner of segment IX. Segment X (dorsal plate) reduced to less sclerotized plate appearing as an upper cover of phallic organ; its apical half densely covered with microtricha. Paraprocts composed of pair of black heavily sclerotized horizontal rod fused to cerci; straight and tapering anterad of cerci and downward directed posteriorly of cerci; apical apex of paraprocts caped and serrated subapically; pair of ventral strap connecting paraproct to basal plate of gonopods is short, functioning as ventral guide of phallic organ. Cerci are ovoid and directed posteriorly. Gonopods rounded quadratic in lateral view with concave ventrum. Basal plate of gonopods indistinct. Phallic organ with high basal and low apical half without paramer; apical half with broad-lobed apex; long convoluted spine and short curved line almost overlapping arising from middle; dark sclerotized internal ejaculatory duct present.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Alhoma*, an imperfect anagram abbreviated for euphony of the Hungarian words “alul homorú”, meaning concave below. It refers to the shape of the gonopods, its ventral margin concave in lateral view.

### *Metrichia cuspidata* (BUENO-SORIA et HOLZENTHAL, 2004)

*Ochrotrichia cuspidata* BUENO-SORIA et HOLZENTHAL, 2004: 57.

*Metrichia cuspidata*: WIGGINS (1996): 92.

*New records* – **Mexico**: State of Veracruz, Los Manantiales, Tlilapan, N 18°47.944', W 097°06.270', 1171 mao, 25.VI.2006, light trap, leg. M. ESPELAND & T. MALM (6 males, NHRS, 4 males, OPC). State of Veracruz, Los Manantiales, Tlilapan, N 18°47.944', W 097°06.270', 1171 mao, 25.VI.2006, light trap, leg. M. ESPELAND & T. MALM (80 males, NHRS)

### *Metrichia eltera* sp. n.

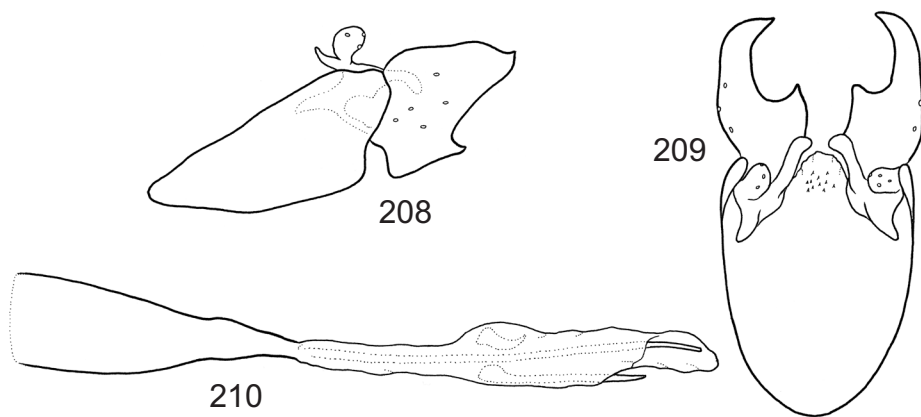
(Figs 208–210)

*Diagnosis* – It is most similar to *M. lenophora* (FLINT, 1991) from Colombia, but differs having posterior rod of paraproctal complex short with downward bending apex, not long and straight; ventral margin of gonopods short, not long; phallic organ with two hooks of highly different size, not of the similar size.

*Description* – Male (in alcohol). Small, dark species with forewing length 1.6 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae with 18 segments; scapus normal, unmodified

curving cylindrical with bulbous apical half, longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base; terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum triangular. Tibial spurs 1,3,4. Abdominal terga with few modifications; pair of small dark rounded circular mesal bodies and lateral erectile pouses present between terga VI and VII. Sternum VII without apicomesal process.

Male genitalia. Segment VIII fused shorter ventrally, longer dorsally compensating cover function over open dorsum of segment IX. Segment IX cumbuliform, elongate semi-oval in ventral view; its dorsum entirely open; its tergum reduced to pair of small lateral rod attached to complex of cerci, paraprocts and dorsoapical corner of segment IX. Segment X (dorsal plate) reduced to less sclerotized plate appearing as an upper cover of phallic organ; its apical half densely covered with microtricha. Paraprocts composed of pair of black heavily sclerotized rod complex fused to cerci; tapering anterad of cerci and downward directed posteriorly of cerci; pair of ventral strap connecting paraproct to basal plate of gonopods is short, functioning as ventral guide of phallic organ. Cerci are ovoid and directed posteriorly. Gonopods broad vertical plate with excised asymmetric apical margin; dorsal lobe of excision longer than ventral in lateral view, both pointed apically. Phallic organ with high basal and low longer apical half without paramer; longer apical half irregular; ejaculatory duct dark pigmented; apical hooks differing in length.



**Figs 208–210.** *Metrichia eltera* sp. n., holotype, male genitalia: 208 = lateral view, 209 = dorsal view, 210 = phallus, lateral view

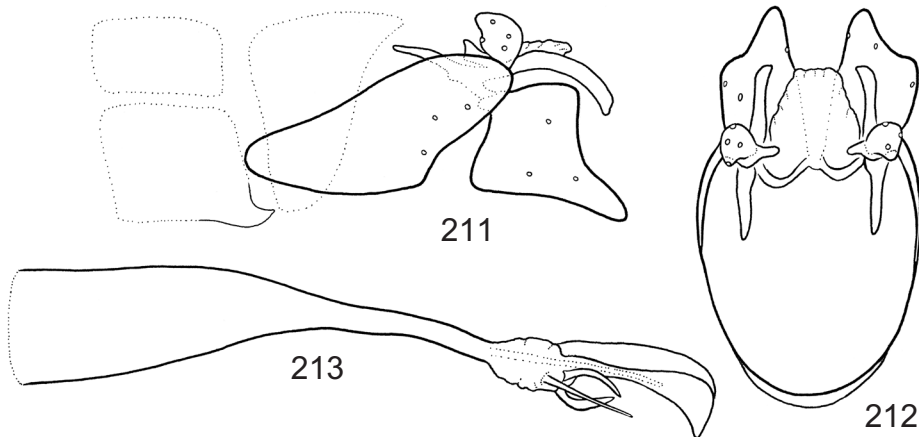
*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratype: **French Guiana**: same as holotype (1 male, OPC).

*Etymology* – *Eltera*, from “eltérő”, different in Hungarian, refers to the phallic hook-like spines; the two hooks are greatly different in this species.

***Metrichia fugga* sp. n.**  
(Figs 211–213)

*Diagnosis* – Its genital structure is most similar to *M. cuenca* (HARPER et TURCOTTE, 1985) from Ecuador, but differs by having segment IX long ovoid, not dropp-shaped; ventroapical fingerlike lobe on gonopods in lateral view; paraproctal rod arching, not hook-shaped in lateral vies; the apex of the phallic organ different.

*Description* – Male (in alcohol). Small light brown species with forewing length 1.8 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae with 18 segments; scapus normal, unmodified curving cylindrical with bulbous apical half, little longer than pedicel; pedicel as long as flagellomeres, but without whorled fimbriate setae; flagellomeres long cylindrical, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla, terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 1,3,4. Abdominal terga with few modifications; pair of small dark rounded circular bodies present between terga V and VI; tergum VI with mesal light elongate band and there is pair of dark spots on posterior margin of tergum VI. Sternum VII with short apicomeres process.



**Figs 211–213.** *Metrichia fugga* sp. n., holotype, male genitalia: 211 = lateral view, 212 = dorsal view, 213 = phallus, lateral view

Male genitalia. Segment VIII fused shorter ventrally, longer dorsally compensating cover function over open dorsum of segment IX. Segment IX elongate suboval positioned oblique in lateral view; its dorsum entirely open; its tergum reduced to pair of small lateral rod attached to cerci and to dorsoapical corner of segment IX. Segment X (dorsal plate)

reduced to less sclerotized plate appearing as an upper cover of phallic organ. Cerci circular, slightly produced anterad. Paraprocts composed of pair of black heavily sclerotized horizontal rod downward directed apicad and ventral strap connecting paraproctal rod to basal plate of gonopods, appearing as ventral guide of phallic organ. Gonopods subquadrate in lateral view with ventroapical fingerlike lobe and with dorsobasal articulation to basal plate. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ with high basal and low apical half without paramer; apical half with lobed apex, with dark sclerotized internal ejaculatory duct and with two black subapical curving spines; slender lateral process arose near curved spines.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Fugga*, from “függő”, hanging in Hungarian, refers to the dorsobasal articulation of gonopods appearing as hanging on this dorsal articulation.

### **Metrichia gomboska sp. n.**

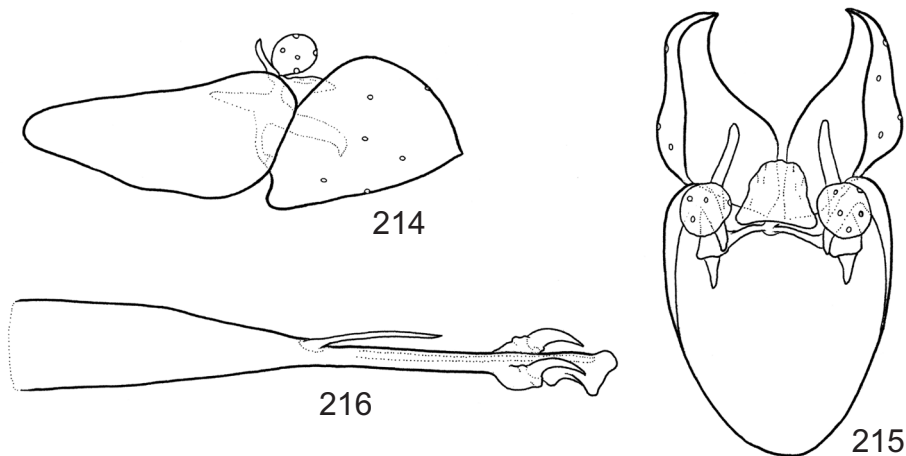
(Figs 214–216)

*Diagnosis* – Its genital structure is most similar to *M. arenifera* (FLINT, 1980) from Peru, but differs by having circular cercus both in lateral and dorsal view, not erect in lateral view; paraprocts apex downward directed hook, not straight-cut in lateral view; gonopods without strong black apical spine in lateral view; phallic organ with two hooks and without any ill-defined spine. Various neoformations and modifications are present on abdominal terga also differentiating *M. gomboska* sp. n. from *M. arenifera*.

*Description* – Male (in alcohol). Dark species with forewing length 3.1 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae 20 segments; scapus normal, unmodified curving cylindrical with bulbous apical half, little longer than pedicel; pedicel as long as flagellomeres, but without whorled fimbriate seate; flagellomeres long cylindrical, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla, terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 1,3,4. All terga strongly sclerotized, flat or even concave, not convex as usual; terga III-VIII modified with various neoformations: terga III-V with lateral brush rows of enforced mesad directed setae; long sacs between V and VI terga, however everted in holotype as membranous tubes with granulosed reticulated apex; tergum VI most modified: heavily sclerotized and enlarged, anterior margin with long (deep) and very narrow mesal excision, under posterior margin two lateral oval pouches with darker rounded middle spot; tergum VII very short, its dark line of antecosta heavily sclerotized, its entire surface fully packed with enforced emerged setae; tergum

VIII only little longer than tergum VII and similarly fully packed with enforced emerged setae. Sternum VII with short apicomeseal process.

Male genitalia. Segment IX elongate subtriangular in lateral view; its dorsum entirely open; its tergum reduced to pair of lateral black rod attached to cerci and to dorsoapical corner of segment IX. Segment X (dorsal plate) reduced to less sclerotized plate appearing as an upper cover of phallic organ. Cerci circular both in lateral and dorsal view. Paraprocts composed of pair of black heavily sclerotized horizontal rod with downward directed apical hook and ventral strap connecting paraproctal rod to basal plate of gonopods, appearing as ventral guide of phallic organ. Gonopods subtriangular in lateral view with small mesad pointed apical tip. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ with high basal and low apical half without paramer; apical half with lobed apex, with dark sclerotized internal ejaculatory duct and with two black subapical hooks; slender lateral process arose where basal half starts to broaden.



Figs 214–216. *Metrichia gomboska* sp. n., holotype, male genitalia: 214 = lateral view, 215 = dorsal view, 216 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: Huanuco, Tomayquichua Distr. River Tomayquichua, 2041 m, humid subtropical forest 10°04'27"S, 76°12'36"W, 29.X.–6.XI.2005, light trap, leg. FAVIOLA MONTES CARLOS (NHRS).

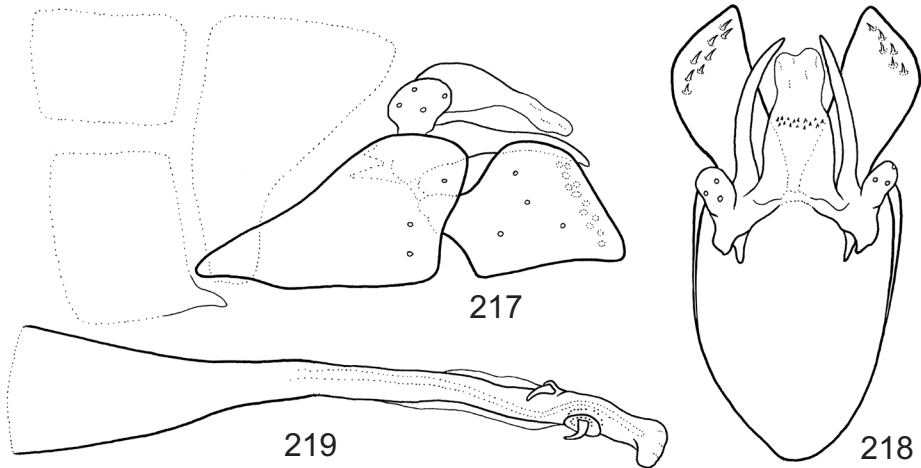
*Etymology* – *Gomboska*, from “gömböcske”, globule in Hungarian, refers to the small globule-shaped cerci.

**Metrichia haranga** sp. n.

(Figs 217–219)

*Diagnosis* – Having quadratic shaped gonopods in lateral view appears most similar to *M. kocka* sp. n. from Peru, but differs having no any abdominal modifications; segment X hooded very long above phallic organ; cerci rounded, not elongate; dorsum of gonopods rounded, not straight; subapical short spines on phallic organ without additional teeth; one of the subapical teeth arisen from a short campaniform structure.

*Description* – Male (in alcohol). Light brown species with forewing length 2 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae 22 segments; scapus normal, unmodified curving cylindrical with bulbous apical half, little longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla; terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 1,3,4. Abdominal terga without any modifications. Sternum VII with short apicomesal blunt process.



**Figs 217–219.** *Metrichia haranga* sp. n., holotype, male genitalia: 217 = lateral view, 218 = dorsal view, 219 = phallus, lateral view

Male genitalia. Segment VIII fused shorter ventrally, longer dorsally compensating cover function over open dorsum of segment IX. Segment IX elongate subtriangular positioned oblique in lateral view; its dorsum entirely open; its tergum reduced to pair of small lateral rod attached to complex of cerci, paraprocts and dorsoapical corner of segment IX.

Segment X (dorsal plate) forming long hood over phallic organ; its basal half elevated, its apical half membranous, almost indiscernible as forming lateral lobes after basal constriction. Paraprocts composed of pair of black heavily sclerotized horizontal rod downward directed apicad and ventral strap connecting paraproctal rod to basal plate of gonopods, appearing as ventral guide of phallic organ. Cerci rounded, almost circular. Gonopods subquadratic in lateral view with middle articulation to basal plate. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ with high basal and low apical half without paramer; apical half with lobed apex and with dark sclerotized internal ejaculatory duct; two subapical short curving spines present, one arising from campaniform less sclerotized structure.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRs). Paratype: same as holotype (1 male, OPC).

*Etymology* – *Haranga*, from “harang”, bell in Hungarian, refers to the bell-shaped structure attached to one of the two subapical spines.

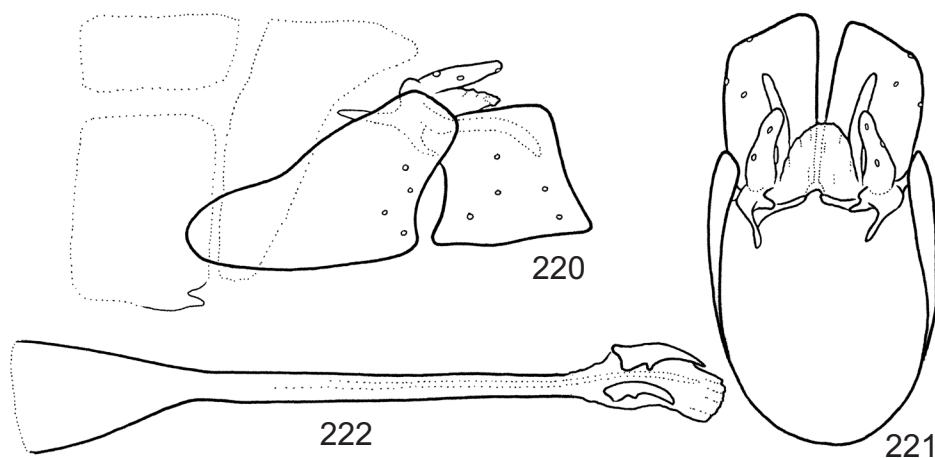
### ***Metrichia kocka* sp. n.** (Figs 220–222)

*Diagnosis* – Its genital structure is most similar to *M. helenae* FLINT et BUENO-SORIA, 1998 from Ecuador, but differs in abdominal modifications having no lateral setal brushes between segments V and VI, but having pair of internal sacks between segment V and VI and there is pair of smaller round darker mark an posterior margin of segment VI, cerci elongate, not rounded; posterior paraproctal rod tapering, not truncate; gonopods regular quadratic, not irregular.

*Description* – Male (in alcohol). Light brown species with forewing length 2.2 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae with 19 segments; scapus normal, unmodified curving cylindrical with bulbous apical half, little longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla; terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 1,3,4. Abdominal terga with few modifications; pair of small dark rounded circular bodies (sack?) present between terga V and VI; there is pair of dark spots on posterior margin of tergum VI. Sternum VII with short apicomeral process.

Male genitalia. Segment VIII fused shorter ventrally, longer dorsally compensating cover function over open dorsum of segment IX. Segment IX elongate suboval positioned oblique in lateral view; its dorsum entirely open; its tergum reduced to pair of small lateral rod attached to cerci and to dorsoapical corner of segment IX. Segment X (dorsal plate)

reduced to less sclerotized plate appearing as an upper cover of phallic organ. Paraprocts composed of pair of black heavily sclerotized horizontal rod downward directed apical and ventral strap connecting paraproctal rod to basal plate of gonopods, appearing as ventral guide of phallic organ. Cerci elongate and directed posteriorly. Gonopods regular quadratic in lateral view with dorsal articulation to basal plate. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ with high basal and low apical half without paramer; apical half with lobed apex and with dark sclerotized internal ejaculatory duct; two subapical short curving spines present, both having teeth on inner curving.



**Figs 220–222.** *Metrichia kocka* sp. n., holotype, male genitalia: 220 = lateral view, 221 = dorsal view, 222 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Kocka*, from “kocka”, cube in Hungarian, refers to the regular quadratic shape of the gonopods, with base slightly enlarged, like a cube standing firm on the ground.

### *Metrichia nigritta* (BANKS, 1907)

*Orthotrichia nigritta* BANKS, 1907: 163.

*Metrichia nigritta*: ROSS (1938): 9–10. Type species of *Metrichia*, lectotype.

*Ochrotichia (Metrichia) nigritta*: FLINT (1968): 48. To status of subgenus in *Ochrotichia*.

*Metrichia nigritta*: WIGGINS (1996): 92. Returned to full generic status.



*New records* – **Mexico:** State of Veracruz, Tecomaluca, Sierra de agua, N 18°44.977' W 097°14.576', 1420 mao, 25.VI.2006, net & hand pick, leg. M. ESPELAND & T. MALM (12 males, NHRS, 10 males, OPC). State of Veracruz, Los Manantiales, Tlilapan, N 18°47.944' W 097°06.270', 1171 mao, 25.VI.2006, light trap, leg. M. ESPELAND & T. MALM (1 male, NHRS). State of Veracruz, Los Manantiales, Tlilapan, N 18°47.944', W 097°06.270', 1171 mao, 25.VI.2006, light trap, leg. M. ESPELAND & T. MALM (5 males, NHRS)

### *Metrichia patagonica* (FLINT, 1983)

*Ochrotrichia patagonica* FLINT, 1983: 41.

*Metrichia patagonica*: ROSS (1938): 9.

*New records* – **Chile:** Region de los Lagos (X), PN Vicente Rosales, 6 km SW Petrohué, 200 m downstream Saltos de Petrohué, stream parallel to Rio Petrohué, 41°10.378' S, 72°27.057'W, 110 m (Loc#18), Malaise trap 12–13.I.2006, leg. K. A. JOHANSON (1 male, NHRS, 1 male, OPC). **Peru:** Cuzco, Pitilcopata, 600 m, premontane moist forest, 11–14.XII.1979 leg. J. B. HEPPNER (1 male, NMNH).

### Genus *Nothotrichia* FLINT, 1967

#### *Nothotrichia cautinensis* FLINT, 1983

*New records* – **Chile:** Region de los Lagos (X), PN Vicente Rosales, 200 m downstream Saltos de Petrohué, 6 km SW Petrohué and Lago Todo los Santos, stream parallel to Rio Petrohué, 41°10.378'S, 72°27.057'W, 110 m (Loc#18), light trap, 12.I.2006, leg. K. A. JOHANSON (3 males, 2 females, NHRS, 2 males, OPC).

### Genus *Ochrotrichia* MOSELY, 1934

*Characters* – Based upon our selection of 15 plesiomorphic and apomorphic character states, the genus *Ochrotrichia* is defined in the tribe Ochrotrichiini as having (1) 3 ocelli present; (2) metascutellum convex; (3) tentorium complete with tentorial bridge; (4) length of first and second segments of maxillary palp shorter than wide; (5) clothing antennal setae scattered tapered; (6) terminal antennal segment with blunt apex; (7) spur count 0,3,4; (8) abdominal segments unmodified; (9) dorsolateral lobes on segment IX absent; (10) segment IX semicylindrical; (11) segment X distinct; (12) cerci absent; (13) paraprocts highly modified; (14) harpagones absent; (15) phallic distal hooks absent.

In this genus of the primitive Ochrotrichiini tribe only a single periphallic organ, the gonopod is distinguished. No cerci (preanal appendages), no paraprocts (subgenital plate) and no basal plate of gonopods (bilobed process) have been recorded or discussed in

previous studies. In this paper we follow our working hypothesis discussed in our appendicular and functional genital terminology (OLÁH & JOHANSON 2008). At the examined species we recognised the sternite IX having short strap or bridle-like dorsum representing together the entire segment IX. As a result we believe that the tergum IX of previous papers is the segment X and segment X of the previous papers is the paraprocts. In this genus the basal plate of gonopods is present mostly in the plesiomorphic state of a simple sclerotized pons coxalis. Its apomorphic state, the bilobed process or dorsal process of the gonopods is not developed.

*Species grouping* – *O. xena* group: Simplest, segment IX with continuous dorsal and lateral margins, anterior margin not produced; segment X simple flap with a few small spines, aedeagus simple or with various processes. *O. aldama* group: Segment X simple, divided; gonopods elongate, parallel-sided. *O. tarsalis* group: Segment X with a broad plate, covering much dorsum; gonopods elongate, parallel-sided. *O. arranca* group: Segment X with enlarged black seta on middorsal process and bifurcate midapical process; gonopods sigmoid with several enlarged black spines on ventral margin. *O. tenanga* group: Segment X with numerous long processes; gonopods elongate parallel-sided. *O. cruces* group: Segment X with black-tipped middorsal process and apical process overlying a thin plate-like lobe in addition to various other spines; gonopods short triangular. *O. lometa* group: Segment X with many processes, apical process associated with flat plate-like lobe; gonopods elongate, parallel-sided, but narrowing to a pointed apex.

### **Ochrotrichia balra sp. n.**

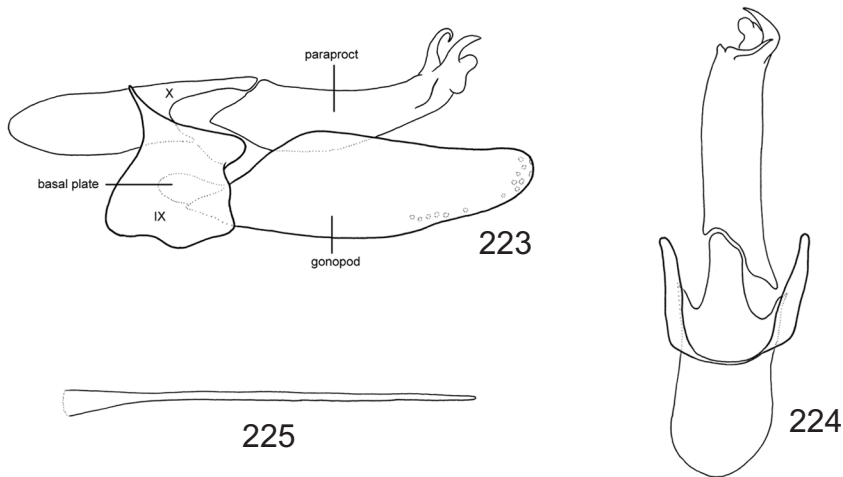
(Figs 223–225)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate parallel-sided gonopods this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. csiga* sp. n., but differs by having a pair of curving spines on paraproctal apex; paraprocts with anterad protruding anterior lobe, not lateral lobe on the middle; gonopods more stout, not slender.

*Description* – Male (in alcohol). Brown species with forewing length 2.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium without bridge. Antennae with 39 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and gradually elongating cylindrical apicad; clothing setae scattered tapered, terminal segment with blunt apex. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX quadrangular in lateral view with short dorsolaterally produced apical corner; this enforced corner is strengthened by fused lower processes of segment X. Segment X (dorsal plate) depressed horizontally and deeply recessed under tergum VIII

and embraced dorsally by short bridle-like dorsum of segment IX; its ventral processes fused to dorsolateral apical corner of segment IX; its posterior dorsomesal lobe subquad-rangular in dorsal view and obliquely cut posteromost by suture separating from paraprocts. Paraprocts forming dominating structure and present as an elongate sclerotized plate with pair of curving spines; anterior part asymmetric protruding leftside into obliquely truncate lobe. Gonopods elongate slightly narrowing apicad; in lateral view pattern of peg-like mesal setae discernible as marginal ventral subapical row connected to apical path of peg-like setae. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ simple tube without paramere.



**Figs 223–225.** *Ochrotrichia balra* sp. n., holotype, male genitalia: 223 = lateral view, 224 = dorsal view, 225 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

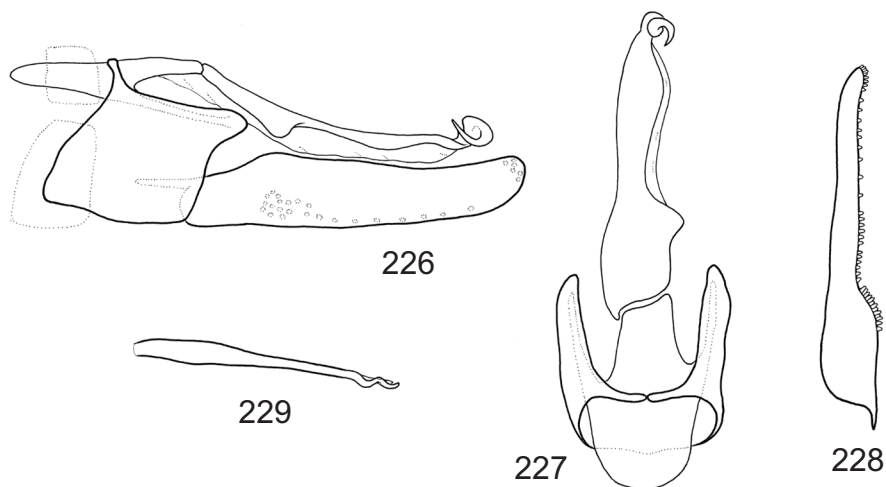
*Etymology* – *Balra*, from “balra”, to the left in Hungarian, refers to the anterad protruded lobe of paraprocts on the left side.

### ***Ochrotrichia csiga* sp. n.** (Figs 226–229)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate parallel-sided gonopods this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. harmasa* sp. n., but differs by having a helix on paraproctal apex and aedeagus with spiralling apical end.

*Description* – Male (in alcohol). Brown species with forewing length 2.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete. Antennae with 38 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and gradually elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without apicomeres process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX quadrangular in lateral view with short dorsolaterally produced apical corner; this enforced corner is strengthened by fused lower processes of segment X. Segment X (dorsal plate) depressed horizontally and deeply recessed under tergum VIII and embraced dorsally by short bridle-like dorsum of segment IX; its ventral processes fused to dorsolateral apical corner of segment IX; its posterior dorsomesal lobe subquadrangular in dorsal view and obliquely cut posteromost by suture separating from paraprocts. Paraprocts forming dominating structure and present as an elongate sclerotized plate with helix on its apex. Gonopods elongate almost parallel-sided; in lateral view pattern of peg-like mesal setae discernible as ventral patch around mesal sholder connected to apical path of peg-like setae. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ simple tube with spiralling apex and without paramere.



**Figs 226–229.** *Ochrotrichia csiga* sp. n., holotype, male genitalia: 226 = lateral view, 227 = dorsal view, 228 = gonopod, ventral view, 229 = phallus, lateral view

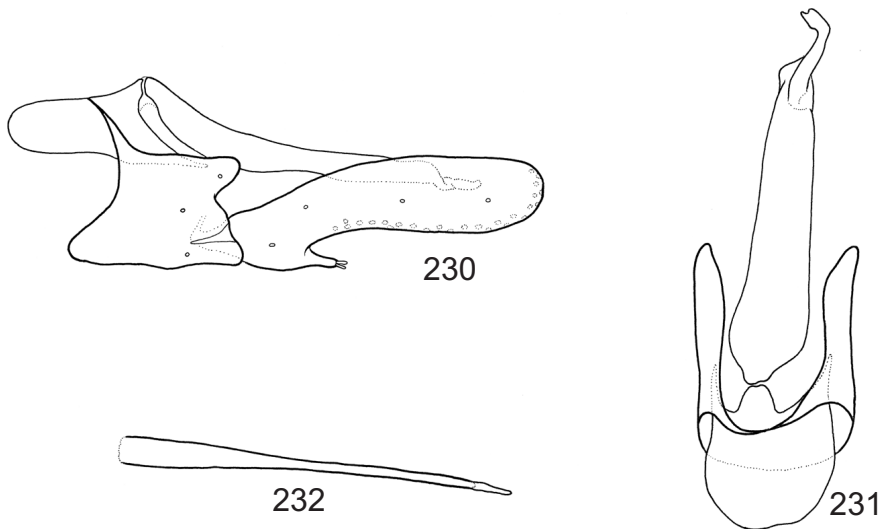
*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS, 1 male, OPC).

*Etymology* – *Csiga*, from “csiga”, helix in Hungarian, refers to the presence of a helical structure on the paraproctal apex.

***Ochrotrichia fioka* sp. n.**  
(Figs 230–232)

*Diagnosis* – Having paraprocts with a simple long dorsal plate without various spines or processes this new species belongs to the *O. xena* species group of FLINT (1972). It appears distantly related to *O. silva* BUENO-SORIA et HOLZENTHAL, 1998 from Costa Rica, but differs by having simple paraprocts without short, strong hook-like process on base of right side and without long spinelike process on left side; gonopods with characteristic basoventral small fingerlike process missing at *O. silva* and at any member of *xena* species group.

*Description* – Male (in alcohol). Brown species with forewing length 2.6 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete with V-shaped tentorial bridge. Antennae 40 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and slightly elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.



Figs 230–232. *Ochrotrichia fioka* sp. n., holotype, male genitalia: 230 = lateral view, 231 = dorsal view, 232 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subquadrangular in lateral view with short dorsolaterally produced apical corner and slightly developed anteroventrally; its dorsum thread-like crossing over segment X. Segment X (dorsal plate) long with mesal lobe articulating posteriorly to paraprocts. Paraprocts forming elongate, almost parallel-sided plate, slightly narrowing apicad and with an apical narrow process turning right side and ending in bifid apex. Gonopods elongate almost parallel-sided, slightly S-shaped and with small basoventral finger-like process with two black terminal peglike setae well visible both in lateral and ventral view; peglike mesal setal pattern present on apical and ventral margin. Basal plate of gonopods visible as short sclerotized pons coxalis. Phallic organ forming simple thin tube.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratype: same as holotype (1 male, NHRS).

*Etymology* – *Fioka*, from “fióka”, chick in Hungarian, refers to the presence of the basoventral finger-like process on the gonopods, copying it, produced like a minute gonopod.

### *Ochrotrichia ecuatoriana*

BUENO-SORIA et SANTIAGO DE FRAGOSO, 1992

*New records* – **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, OPC).

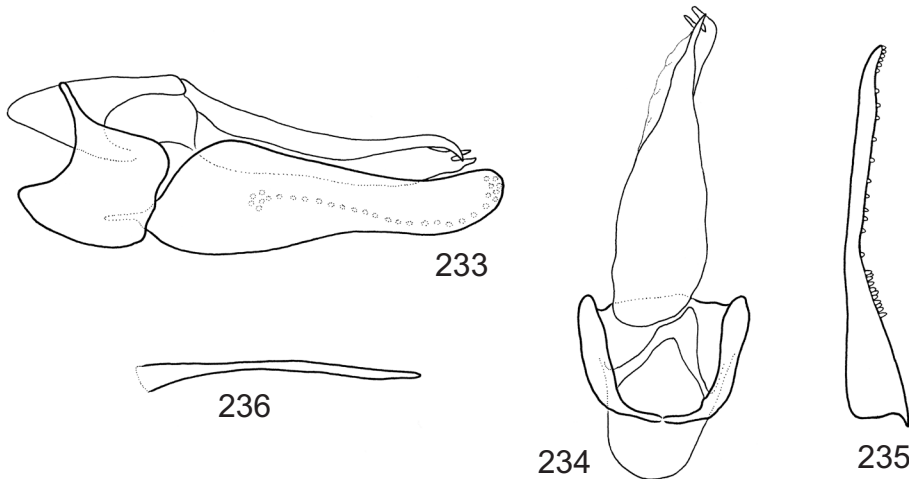
### *Ochrotrichia harmas* sp. n.

(Figs 233–236)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate parallel-sided gonopods this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. csiga* sp. n., but differs by having triple spine complex on paraproctal apex and aedeagus without spiralling apical end.

*Description* – Male (in alcohol). Brown species with forewing length 2.2 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete. Antennae 41 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and gradually elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX quadrangular in lateral view with rounded dorsolateral apical corner; this corner is strengthened by fused lower processes of segment X. Segment X (dorsal plate) deeply recessed under tergum VIII and embraced dorsally by short bridle-like dorsum of segment IX; its ventral processes fused to dorsolateral apical corner of segment IX; its posterior dorsomesal lobe triangular in dorsal view with heavily sclerotized margin and separated by suture from paraprocts. Paraprocts forming dominating structure and present as an elongate sclerotized convex plate with broad basal half, gradually narrowing to pointed apex and under imposed by apical left turning double spines; altogether paraproctal apex exhibits 3 pointed arms. Gonopods elongate parallel-sided with broader basal half; in lateral view pattern of peg-like mesal setae discernible as narrow line connected to apical path. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ simple tube without paramere.



Figs 233–236. *Ochrotrichia harmas* sp. n., holotype, male genitalia: 233 = lateral view, 234 = dorsal view, 235 = gonopod, ventral view, 236 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

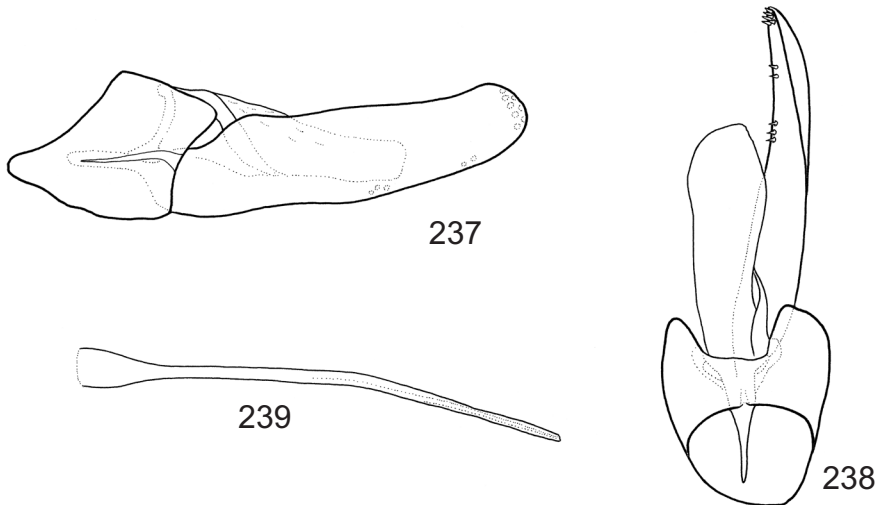
*Etymology* – *Harmas*, from “hármas”, triple in Hungarian, refers to the paraproctal apex with three spine-like panted arm.

**Ochrotrichia hata** sp. n.

(Figs 237–239)

*Diagnosis* – The annular segment IX and the simple long dorsal plate (fused complex of segment X and paraprocts) relates this species to the *O. xena* (*sensu stricto*) species group of FLINT (1972). *O. hata* sp. n. is closest to *O. machiguenga* FLINT et BUENO-SORIA, 1999 from Peru and *O. glabra* BUENO-SORIA et SANTIAGO DE FRAGOSO, 1997 from Panama, but differs from both by having anterior margin of segment IX being more produced ventrally; segment X without subapical knob and not tapering apicad; gonopods differently shaped; phallic organ not bifid apicad.

*Description* – Male (in alcohol). Light brown species with forewing length 2.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete with V-shaped tentorial bridge; vestigium of dorsal arm lacking. Antennae 28 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subquadrangular. Tibial spurs 0,3,4. Sternum VII with apico-mesal triangular keel.



**Figs 237–239.** *Ochrotrichia hata* sp. n., holotype, male genitalia: 237 = lateral view, 238 = dorsal view, 239 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular in lateral view with ventrally produced anterior margin; dorsum not reduced to threadlike bridle, but forming complete annulus with more



developed ventrum; ventropleural longitudinal suture at gonopods well-developed. Segment X forming almost entire tongue-shaped dorsal plate less sclerotized and simple without any projection or processes. Paraprocts reduced to more sclerotized strap arising left side from basal area and turning downward below segment X discernible in cover of left gonopod in S-shaped form in lateral view. Gonopods long and parallel-sided; peglike mesal setal pattern limited mostly to apical margin with few scattered setae on ventral margin midwax. Less sclerotized basal plate of gonopods discernible as long vertical mesal plate with pair of vertical straplike process connecting gonopods to base of segment X, giving ventral support to phallic organ as part of phallocrypt. Phallic organ present as simple thin tube with visible ejaculatory duct.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4°33.072' N, 52° 12.462'W, 270 m, Malaise trap, 5–12.II.2007, FRG MF8, leg. N. JÖNSSON (NHRS).

*Etymology* – *Hata*, from “hát”, dorsum in Hungarian, refers to the well-developed dorsum of segment IX.

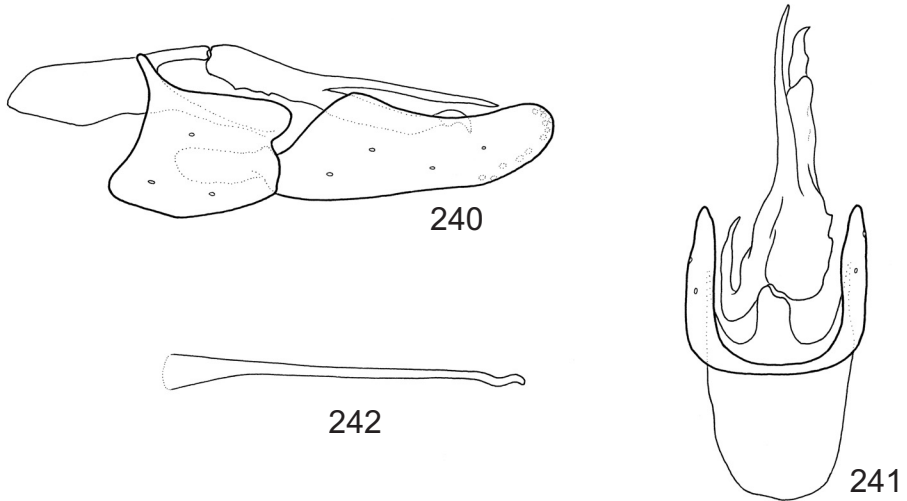
### ***Ochrotrichia jonssoni* sp. n.** (Figs 240–242)

*Diagnosis* – Having divided paraprocts belongs to the *O. aldama* species group of FLINT (1972). Similar to *O. catarina* BUENO-SORIA et HOLZENTHAL, 2004 from Mexico, but differs by having segment IX longer than tall, not taller than long; paraprocts differently shaped, gonopods with concave dorsal margin.

*Description* – Male (in alcohol). Brown species with forewing length 2.0 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid, hinged laterally. Tentorium complete with well-developed V-shaped tentorial bridge. Antennae with 37 segments; scapus normal, unmodified rounded cylindrical and double long than pedicel; flagellomeres longer than wide and gradually elongate apicad. Maxillary palp formula I-II-III-IV-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII with apicomeral ridge, like narrow keel visible in lateral view.

Male genitalia. Tergite VIII and sternite VIII unmodified, much shorter than segment VII. Segment IX subquadrangular with rounded dorsolateral apical corner; short thread-like dorsum of segment IX moved to anteriodorsal corner embracing segment X. Segment X rounded broad anteriorly and short and narrow posteriorly separated by sulcus from paraprocts; ventroapical corner articulates to dorsoapical corner of segment IX. Paraprocts forming dominating structure and present as two-branched elongate sclerotized process; its broad basal half starts from sulcus with basal right lateral hook; apical half divided into straight and slender left spine and into broader right arm headed by downward curving stout black spine. Gonopods elongate subtriangular tapering and upward curving apicad in lateral view; its dorsum concave; pattern of peg-like mesal setae very characteristic in

lateral view; concentrating on apex and ventrally subapical. basal plate of gonopods exhibits an elongate vertically flat mesal plate. Phallic organ forming simple tube without any parameres, with S-shaped apex.



**Figs 240–242.** *Ochrotrichia jonssoni* sp. n., holotype, male genitalia: 240 = lateral view, 241 = dorsal view, 242 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4°33.133'N, 52°12.205'W, 263 m, Malaise trap, 19–25.I.2007, FRG MT1, leg. N. JÖNSSON (NHRS). Paratypes: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (1 male, OPC). Approuaguekaw, Kaw Mt, 216 mao, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF 2, leg. N. JÖNSSON (1 male, NHRS).

*Etymology* – We are very pleased to name this species after Mr NIKLAS JÖNSSON, who collected the type specimens.

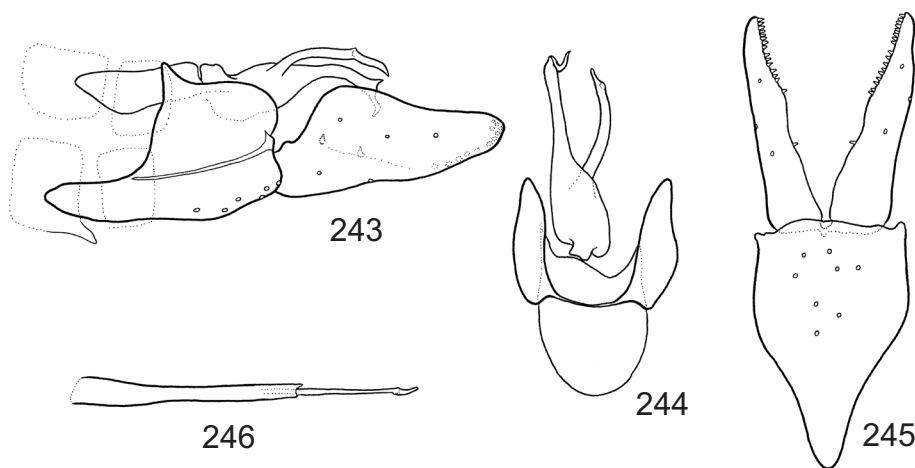
### ***Ochrotrichia ketaga* sp. n.**

(Figs 243–246)

*Diagnosis* – This new species is similar to *O. aldama* (MOSELY, 1937) described from Mexico (Chiapas). *O. aldama* was not clearly related to any other known species, thus forming its own *O. aldama* species group (FLINT 1972). It was newly recorded from Mexico (Tabasco) and Panama (Barro Colorado) by BUENO-SORIA & HOLZENTHAL (2004), however, their drawings seem rather different from the holotype's drawings. WEELS & WICHARD (1989) reported the species from Dominican Miocene amber with excellent ventral view of

the genitalia. Later several new species were described and related to *aldama* species group. *Ochrotrichia ketaga* sp. n. differs from all by having segment IX with very long anteroventral lobe; small segment X; tapering gonopods and differently formed shape of two branched paraprocts both in lateral and dorsal view.

*Description* – Male (in alcohol). Brown species with forewing length 2.3 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid, hinged laterally. Tentorium complete with well-developed V-shaped tentorial bridge. Antennae 29 segments; scapus normal, unmodified rounded cylindrical and double long than pedicel; flagellomeres longer than wide and gradually elongate apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII with apicomasal ridge, like narrow keel visible in lateral view.



**Figs 243–246.** *Ochrotrichia ketaga* sp. n., holotype, male genitalia: 243 = lateral view, 244 = dorsal view, 245 = ventral view, 246 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, much shorter than segment VII. Segment IX subquadrangular with long anteroventral lobe in lateral view and rounded dorsolateral apical corner; short thread-like dorsum of segment IX moved to anterior-dorsal corner embracing segment X. Segment X rounded anteriorly and separated by sulcus from paraprocts. Paraprocts forming dominating structure and present as two-branched elongate sclerotized process; its broad basal half starts from sulcus by narrow highly sclerotized dark downward directed sclerite; basal part forms slightly longer straight right branch with bifid apex; ventral spine-like lobe of bifid apex curving downward and laterally; left branch articulates ventrally to basal half and curving laterad. Gonopods elongate subtriangular tapering apicad in lateral view; pattern of peg-like mesal setae very characteristic in lateral view; concentrating on apex and ventrally subapicad and two peg-like

setae located middle. Basal plate of gonopods discernible as short sclerotized pons coxalis. Phallic organ forming simple tube without any parameres; ejaculatory duct emerging free from tube and ending in small terminal lobe.

*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I. 2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC).

*Etymology* – *Ketaga*, from “kétágú”, two-branched in Hungarian, refers to the two-branched shape of the paraprocts.

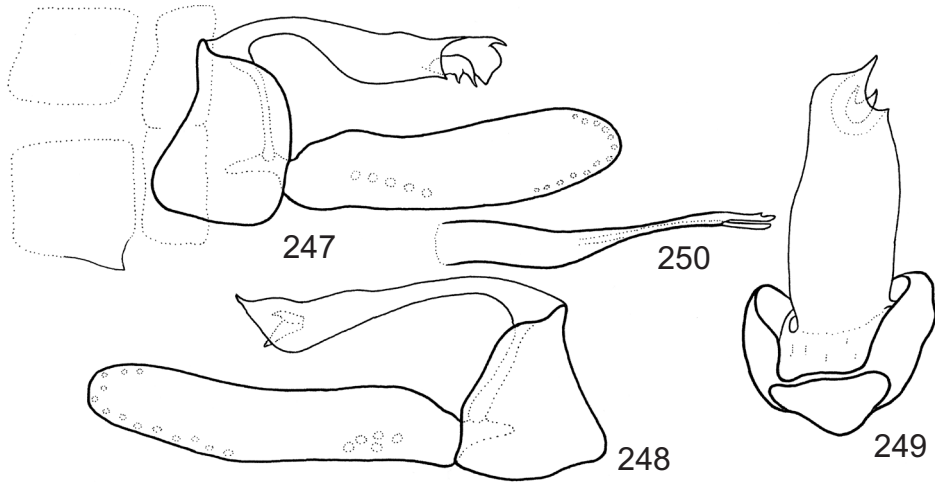
### **Ochrotrichia ketarca sp. n.**

(Figs 247–250)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate parallel-sided gonopods this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. hamatilis* FLINT et BUENO-SORIA, 1999, but differs by having segment IX triangular with short dorsum in lateral view; different apical structure of the paraprocts as visible in dorsal, left lateral and right lateral view; paraprocts without ventrobasal lobe in lateral view, so much developed at *O. hamatilis*; different peg-like mesal setal pattern of gonopods.

*Description* – Male (in alcohol). Brown species with forewing length 2.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete. Antennae broken; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII with apicomesal ridge, visible in lateral view.

Male genitalia. Tergite VIII and sternite VIII unmodified, much shorter than segment VII. Segment IX triangular in lateral view, more triangular in right lateral view; with short dorsolateral produced apical corner; short bridle-like dorsum of segment IX moved to anterior margin. Segment X fused to paraprocts. Paraprocts forming dominating structure and present as an elongate sclerotized plate of half cylinder with left turning pointed apex; secondary small bifid unit embedded in apical hood of paraprocts giving second face of paraproctal apex; basal lateral area of paraprocts produced long sclerotized staps directed downward and connecting paraprocts to pons coxalis of gonopods, encircling phallic organ. Gonopods elongate almost parallel-sided; in lateral view two lines of peg-like mesal setae discernible; oblique basal line composed of anterad directed larger pegs and apical marginal line of smaller mesad directed pegs. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ simple tube with high basal and low distal half, without any parameres; its apex slightly bifid and touching along free termination of ejaculatory duct.



**Figs 247–250.** *Ochrotrichia ketarca* sp. n., holotype, male genitalia: 247 = left lateral view, 248 = right lateral view, 249 = dorsal view, 250 = phallus, lateral view

*Type material* – Holotype, male: **Peru:** Chontachaca, Kosnipata-Cusco, 700 m, humid subtropical forest, 13°01'25"S, 71°28'03"W, 16–17.III.2006, Malaise trap, leg. FAVIOLA MONTES CARLOS (NHRS). Paratype: same as holotype (1 male, NHRS).

*Etymology* – *Ketarca*, from “kétarcú”, double-faced in Hungarian, refers to the asymmetry of the paraprocts well visible in dorsal left and right lateral view; however, this frequent asymmetry is emphasized at this species by the double-faced apex of the paraprocts.

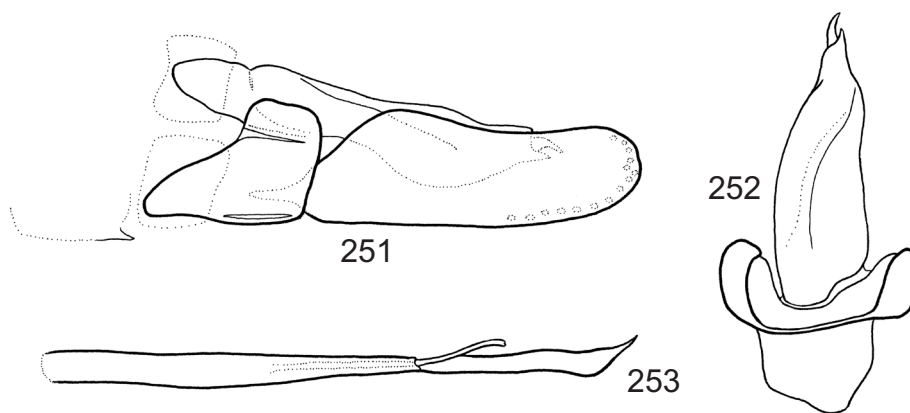
### ***Ochrotrichia kettes* sp. n.** (Figs 251–253)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate parallel-sided gonopods this new species belongs to the *O. xena* species group of FLINT (1972). Having suture present well visible between segment X and paraprocts it is closest to *O. harmasa* sp. n., but differs by having only double spine complex on paraproctal apex; gonopods not narrowing apicad; gonopods with simple peg-like setal pattern on the mesal surface, more developed phallic organ with free apical end of ejaculatory duct.

*Description* – Male (in alcohol). Brown species with forewing length 2.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium complete. Antennae 41 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and gradually elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with

transverse suture; metascutellum convex subtriangular. Tibial spurs 0,3,4. Sternum VII with samm apicomeral ridge.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and little lower than segment VII. Segment IX with triangular anterior and quadrangular posterior half in lateral view; possible vestigial lateral sternal suture of fused segment IX well developed in lateral view; pair of sternal submedial suture present and well developed. Segment X (dorsal plate) deeply recessed under tergum VIII and; its apico ventral processes fused to dorsolateral apical corner of segment IX; its posterior margin concave in dorsal view and separated by suture from paraprocts. Paraprocts forming dominating structure and present as an elongate sclerotized convex plate with broad basal half, gradually narrowing to pointed apex and superimposed by more sclerotized left side flap; narrowing apex open below, its left lower corner pointed, altogether paraproctal apex with 2 pointed arms. Gonopods rather high, elongate parallel-sided; in lateral view linear peg-like mesal setae located along its apical margin and spreading more anteriorly on its ventral margin. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ rather developed, its pointed apex slightly directed laterally; with free ejaculatory duct emerges from small ridge well before apex.



Figs 251–253. *Ochrotrichia kettes* sp. n., holotype, male genitalia: 251 = lateral view, 252 = dorsal view, 253 = phallus, lateral view

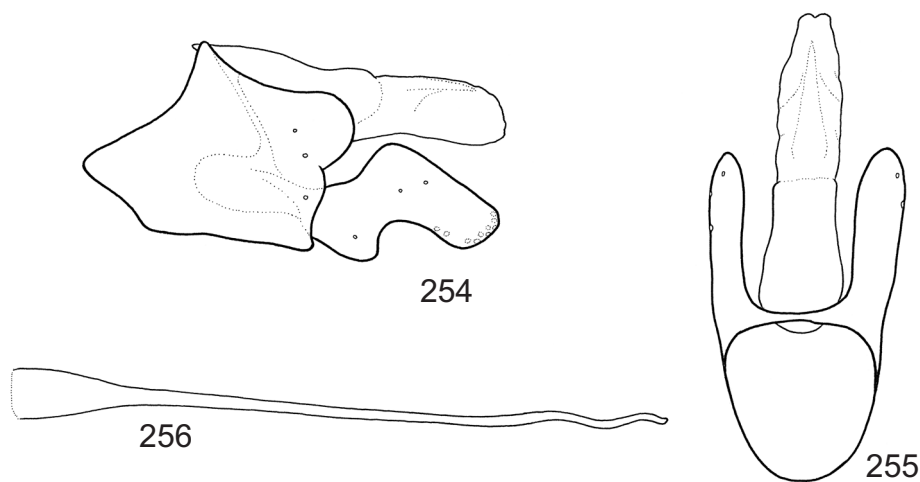
*Type material* – Holotype, male: **Peru**: San Martin Prov., creek crossing rd. Juan Guerra-Chazuta, 14 km (rd.) E Colombia Bridge, 6°35.594'S, 76°13.172'W, light, loc. 09, 9.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC).

*Etymology* – *Kettes*, from “kettős”, double in Hungarian, refers to the paraproctal apex with two apices.

***Ochrotrichia labafura* sp. n.**  
(Figs 254–256)

*Diagnosis* – Having paraprocts with a simple long dorsal plate without various spines or processes this new species belongs to the *O. xena* species group of FLINT (1972). Its gonopods are unusually developed resembling *O. concha* BUENO-SORIA et SANTIAGO DE FRAGOSO, 1992 from Brasil and *O. jolandae* BUENO-SORIA et HOLZENTHAL, 2008 from Costa Rica, but differs by having undivided complex of segment X and paraprocts.

*Description* – Male (in alcohol). Dark brown species with forewing length 2.2 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete with V-shaped tentorial bridge. Antennae with 35 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V; first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subquadrangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.



**Figs 254–256.** *Ochrotrichia labafura* sp. n., holotype, male genitalia: 254 = lateral view, 255 = dorsal view, 256 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subquadrangular in lateral view slightly developed anteroventrally; dorsum reduced to short band, but forming complete annulus with more developed ventrum. Segment X forming basal half of tongue-shaped dorsal plate more sclerotized and delineated by indistinct suture; less sclerotized apical half of dorsal plate characterized by long V-shaped internal ridgelike structure, paraproctal apex slightly excised. Gonopods

inverted Z-shaped in lateral view; peglike mesal setal pattern limited to dorsoapical margin, few setae present ventrally subapicad. Less sclerotized basal plate of gonopods discernible as large rounded vertical mesal plate with pair of straplike process connecting gonopods to base of segment X, giving ventral support to phallic organ as part of phallocrypt. Phallic organ present as simple thin tube with undulating apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 4–12.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratypes: same as holotype (1 male, NHRS). **French Guiana**: Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 19.i–4.II. 2007, FRG MF2, leg. N. JÖNSSON (3 males, NHRS). Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (4 males, OPC). Approuaguekaw, Kaw Mt, 216 m, 4°33.257'N, 52°11.920'W, Malaise trap, 4–12.II.2007, FRG MF2, leg. N. JÖNSSON (2 males, NHRS).

*Etymology* – *Labafura*, from “láb”, leg and “fura”, unusual in Hungarian, refers to the unusual shape of gonopods.

### **Ochrotrichia legeza** sp. n.

(Figs 257–259)

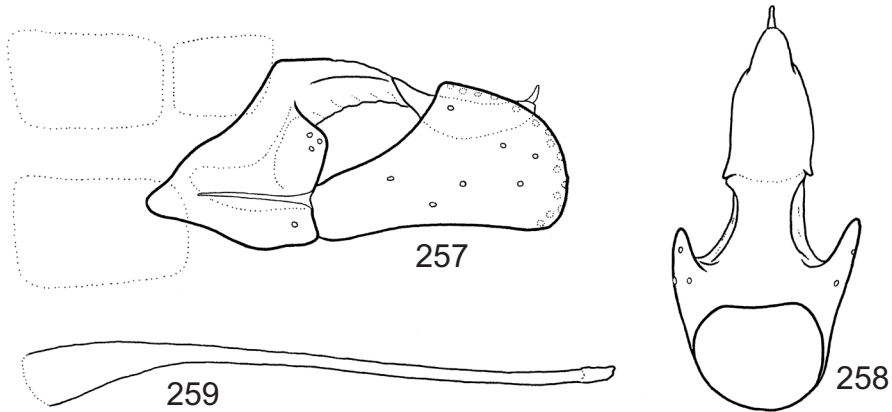
*Diagnosis* – The annulate segment IX and the simple long dorsal plate (fused complex of segment X and paraprocts) relate this species to the *O. xena* (*sensu stricto*) species group of FLINT (1972). *O. legeza* is closest to *O. unica* BUENO-SORIA et SANTIAGO DE FRAGOSO, 1992 from Colombia, but differs by having dorsal plate and gonopods differently formed, gonopods flabellate.

*Description* – Male (in alcohol). Light brown species with forewing length 2.1 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete with V-shaped tentorial bridge. Antennae 49 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, entire palp fully packed with strong black setae; first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subquadrangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX triangular in lateral view slightly developed anteroventrally; dorsum not reduced to threadlike bridle, but forming complete annulus with more developed ventrum; ventropleural longitudinal suture at gonopods well-developed. Segment X forming basal half of tongue-shaped dorsal plate less sclerotized and without anterior projection; more sclerotized apical half of dorsal plate represents paraprocts delineated from segment X by suture and by pair of lateral flanges, paraproctal apex produced into small finger upward directed in lateral view. Gonopods large and fan-shaped in lateral view;



peglike mesal setal pattern limited to dorsoapical margin. Less sclerotized basal plate of gonopods discernible as broad vertical mesal plate with pair of straplike process connecting gonopods to base of segment X, giving ventral support to phallic organ as part of phallocrypt. Phallic organ present as simple thin tube.



**Figs 257–259.** *Ochrotrichia legeza* sp. n., holotype, male genitalia: 257 = lateral view, 258 = dorsal view, 259 = phallus, lateral view

*Type material* – Holotype, male: **Peru:** San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC).

*Etymology* – *Legeza*, from “legyező”, fan in Hungarian, refers to the fan-shaped gonopod.

### *Ochrotrichia longispina* BUENO-SORIA et HOLZENTHAL, 2004

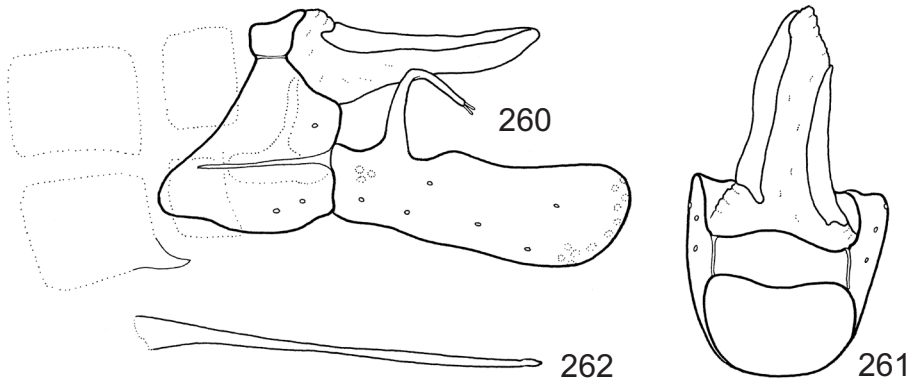
*New records* – **Peru:** San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, NHRS).

### ***Ochrotrichia maga* sp. n.** (Figs 260–262)

*Diagnosis* – The simple long dorsal plate (fused complex of segment X and paraprocts) relates this species to the *O. xena* (*sensu lato*) species group of FLINT (1972). Originally (*sensu stricto*) this simplest species group was characterized by annular segment IX

where dorsal and lateral margins are generally continuous like at *O. brayi* FLINT, 1968, *O. caligula* FLINT, 1968, *O. flagellata* FLINT, 1972, *O. gurneyi* FLINT, 1964, *O. marica* FLINT, 1964, *O. pectinata* FLINT, 1972, *O. spinosissima* FLINT, 1964, *O. unio* (ROSS, 1941), *O. verda* FLINT, 1968 and *O. xena* (ROSS, 1938). Later, when the simple dorsal plate became almost the single criteria more species were transferred to *xena* species group. *O. maga* sp. n. differs from all *Ochrotrichia* species by the basodorsal arm on left gonopods and by the fromation of the fused segment X and paraproct complex.

*Description* – Male (in alcohol). Brown species with forewing length 2.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete with V-shaped bridge. Antennae 49 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and slightly elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII with small keellike apicomasal process.



**Figs 260–262.** *Ochrotrichia maga* sp. n., holotype, male genitalia: 260 = lateral view, 261 = dorsal view, 262 = phallus, lateral view

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subtriangular in lateral view slightly developed anteroventrally; dorsum not reduced to threadlike bridle, but forming complete annulus with more developed ventrum; smaller tergum delineated by longitudinal dorsopleural suture on both side; ventropleural longitudinal suture at gonopods well-developed. Segment X (dorsal plate) membranous without anterior projection; its membranous body forming tongue-like simple roof over threadlike phallic organ together with sclerotized bands of paraprocts. Paraproctal bands or lateral straps are fused to membranous body of segment X. Gonopods elongate subquadrangular in lateral view; left gonopod developed an unusual basodorsal upward and backward curving arm, not present at any known species; right gonopod lacking this arm; peglike mesal setal patch present at apical margin and 3 larger pelike setae present basomesally. Less sclerotized basal plate of gonopods discernible as broad vertical

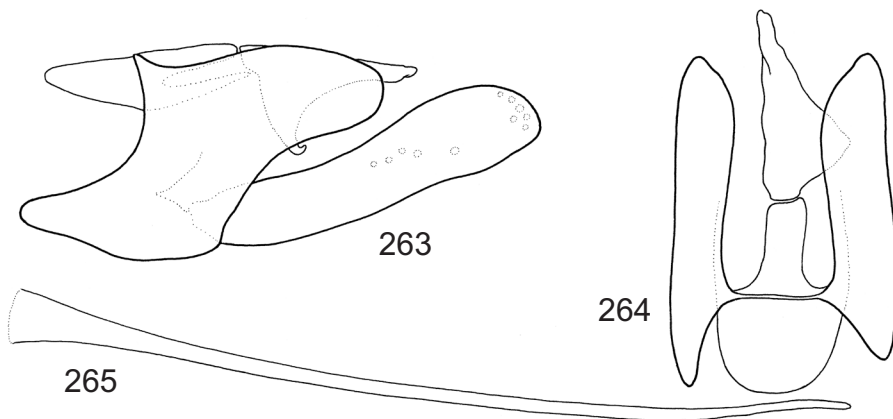
mesal plate with pair of straplike process connecting gonopods to base of segment X and paraproct complex, giving ventral support to phallic organ as part of phallocrypt. Phallic organ present as simple thin tube.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS).

*Etymology* – *Maga*, from “maga”, itself or in Hungarian, refers to the unique primitive dorsum of segment IX and to the odd basodorsal arm developed on left gonopod.

***Ochrotrichia oldala* sp. n.**  
(Figs 263–265)

*Diagnosis* – Having paraprocts with a broad dorsal plate and elongate almost parallel-sided gonopods, this new species belongs to the *O. xena* species group of FLINT (1972). Elongate dorsoapical lobes on segment IX, an apomorphic morphological character state of the genus *Rhyacopsyche* MÜLLER, 1879 is present at *O. oldala* sp. n. However all other generic characters and specialised genital structural units of segment X, paraprocts and gonopods clearly relate this species to genus *Ochrotrichia*. An apparently similar elongation of the dorsoapical region on segment IX is detected at *Ochrotrichia ponta* FLINT, 1968 from Dominica, however, it is the result of a deep excision developed on the posterior margin of segment IX. It is not a real elongation like at *O. oldala* sp. n. This unique dorsoapical elongation differentiates *O. oldala* sp. n. from all known species.



**Figs 263–265.** *Ochrotrichia oldala* sp. n., holotype, male genitalia: 263 = lateral view, 264 = dorsal view, 265 = phallus, lateral view

*Description* – Male (in alcohol). Small brown species with forewing length 1.6 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid. Tentorium without bridge. Antennae 28 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and gradually elongating cylindrical apicad; clothing setae scattered tapered, terminal segment with blunt apex. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX S-shaped in lateral view due to ventrobasal and dorsoapical elongations; dorsoapical elongation is generic character of *Rhyacopsyche*. Segment X (dorsal plate) depressed horizontally and deeply recessed under tergum VIII and embraced dorsally by short bridle-like dorsum of segment IX; its ventral processes fused to basal part of dorsolateral apical lobe of segment IX; its posterior dorsomesal lobe narrow quadrangular in dorsal view and cut posteromost by suture separating it from paraprocts. Paraprocts forming dominating structure and present as sclerotized asymmetric tapering plate with left-side lobe turning and tapering below phallic organ. Gonopods elongate slightly clavate apicad; in lateral view pattern of peg-like mesal setae discernible as few short black pointed setae middle connected to apical path of peg-like setae. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ simple tube without paramere.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Oldala*, from “oldala”, its side in Hungarian, refers to the unique elongation of dorsoapical lobe on both sides of segment IX.

### **Ochrotrichia ostoroska sp. n.**

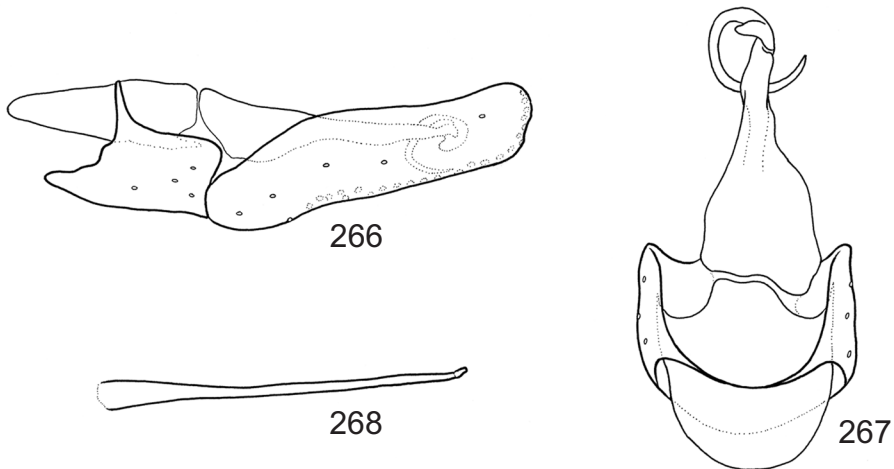
(Figs 266–268)

*Diagnosis* – Having paraprocts with a simple long dorsal plate with only terminal spines or processes this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. regina* BUENO-SORIA et SANTIAGO DE FRAGOSO, 1997 from Panama, but differs by having terminal spine on paraproctal apex curving anterad with an entire circle; gonopods much longer and S-shaped.

*Description* – Male (in alcohol). Brown species with forewing length 2.4 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete. Antennae broken, 34+ segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres as long as wide and slightly elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter

than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII without any apicomeral process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subquadrangular in lateral view with short dorsolaterally produced apical corner and slightly developed anteroventrally; its dorsum thread-like crossing over segment X. Segment X (dorsal plate) long, rounded anteriorly in dorsal view with mesal quadrangular lobe articulating posteriorly with paraprocts with suture. Paraprocts broad based narrowing from midway; its apex with and articulated anterad curving whip-shaped spine. Gonopods robust, elongate and S-shaped in lateral view; peg-like mesal setae restricted to apical and ventral margins. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ present as simple thin tube.



**Figs 266–268.** *Ochrotrichia ostoroska* sp. n., holotype, male genitalia: 266 = lateral view, 267 = dorsal view, 268 = phallus, lateral view

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (2 males, NHRS, 2 males, OPC).

*Etymology* – *Ostoroska*, from “ostoroska”, diminutive form of whip-shaped in Hungarian, refers to the presence of anterad circling long whip-like spines on the paraproctal apex.

*Ochrotrichia patulosa* (WASMUND et HOLZENTHAL, 2007),  
**comb. n.**

*Rhyacopsyche patulosa* WASMUND et HOLZENTHAL, 2007: 18.

*Remarks* – Based upon genital structure this is a typical *Ochrotrichia* species. Dorsolateral lobes on dorsum IX, even their abbreviated form are completely lacking, dorsum IX is reduced to a very short transversal band. Paraprocts is present as a pair of narrow straps composing phallocrypt.

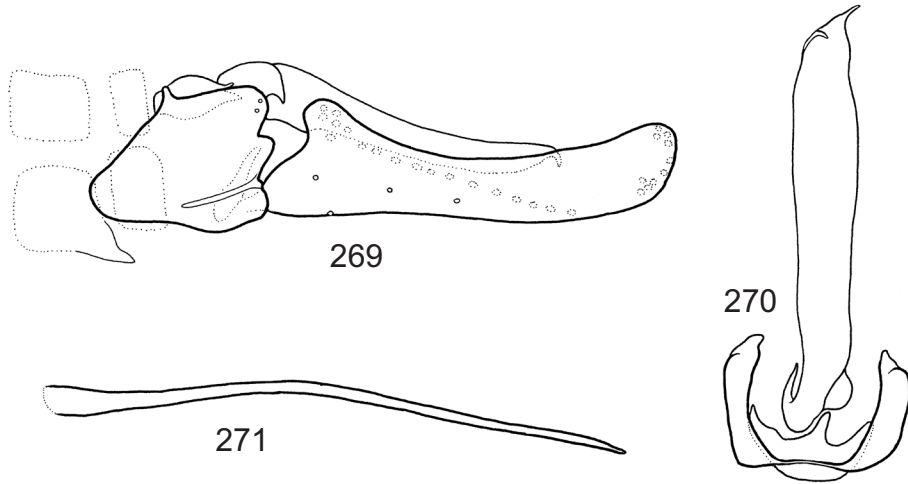
***Ochrotrichia puposa* sp. n.**  
(Figs 269–271)

*Diagnosis* – Having paraprocts with a simple long dorsal plate without various spines or processes this new species belongs to the *O. xena* species group of FLINT (1972). It is closest to *O. machiguenga* FLINT et BUENO-SORIA, 1999 from Peru, but differs by having segment IX less produced anteriorly; gonopods with characteristic basodorsal hump-like lobe; small processes at the base of paraprocts; simple not apically bifid phallic tube.

*Description* – Male (in alcohol). Brown species with forewing length 2.6 mm. 3 ocelli present. Postoccipital setal warts pronounced, large ovoid hinged laterally. Tentorium complete. Antennae with 39 segments; scapus normal, unmodified cylindrical and twice longer than pedicel; flagellomeres as long as wide and slightly elongate cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum convexly subtriangular. Tibial spurs 0,3,4. Sternum VII with apicomeral keel-like process.

Male genitalia. Tergite VIII and sternite VIII unmodified, shorter and lower than segment VII. Segment IX subquadrangular in lateral view with short dorsolaterally produced apical corner and slightly developed anteroventrally; its dorsum thread-like crossing over segment X. Segment X (dorsal plate) very short, trifid posteriorly. Paraprocts forming dominating parallel-sided and elongate sclerotized plate with two small left-turning thin pointed apical processes. Gonopods elongate almost parallel-sided with upward turning apical half and with well-developed basodorsal lobe in lateral view; pattern of peg-like mesal setae discernible as two small apical patches and setal line connecting apicoventral corner to basodorsal lobe; basodorsal lobe fully packed mesally with setae. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ present as simple thin tube with downward curving apical half.

*Type material* – Holotype, male: **Peru**: San Martin Prov., La Catarata de Ahuashiyascu, 6°27.544'S, 76°18.192'W, light, loc. 07, 7.I.2009, leg. T. MALM & K. A. JOHANSON (NHRS). Paratypes: same as holotype (2 males, NHRS, 1 male, OPC).



Figs 269–271. *Ochrotrichia puposa* sp. n., holotype, male genitalia: 269 = lateral view, 270 = dorsal view, 271 = phallus, lateral view

*Etymology* – *Puposa*, from “púpos”, humped in Hungarian, refers to the presence of the hump-like basodorsal lobe on the gonopods.

### Genus *Angrisanoia* ÖZDIKMEN, 2008

*Ochrotrichia* (*Paratrachia*) ANGRISANO, 1995: 507. Type species: *Ochrotrichia* (*Paratrachia*) *cebollati*, monotypic.

*Paratrachia*: ANGRISANO 2002: 405. As valid genus.

*Angrisanoia* ÖZDIKMEN, 2008: 615. As nom. nov.

*Redescription* – Three ocelli present. Tentorium with anterior and posterior arm present, tentorial bridge absent. Segment 1 and 2 of maxillary palp shorten than wide. Number of antennal segments not reduced; scapus unmodified, curving cylindrical, little longer than pedicel; flagellomeres elongating apicad, each with scattered tapered clothing setae; terminal segment with blunt apex. Mesoscutellum with transversal suture, metascutellum triangular. Tibial spur count 1,3,4, spur on front tibia small. Wings narrowing to pointed apex. Abdominal segments without modifications.

Male genitalia. Segment IX cumbuliform, ventrum long anteriorly, dorsum open. Segment X indistinct membranous. Cerci absent. Paraprocts fused below phallic organ. Gonopods composed of monolobed or bilobed coxopodite. Phallic organ long without apical hooks; distal part halfcomposed of dark ejaculatory duct and rodlike lateral process.

*Diagnosis* – Differs from *Ochrotrichia* by having triangular metascutellum, not convex; tentorium without tentorial bridge; spur count 1,3,4, not 0,3,4; segment IX cumbuliform, not semicylindrical; segment X indistinct, not distinct. Differs from *Metrichia* by having clothing antennal setae scattered tapered, not whorled fimbriate; terminal antennal segment with blunt apex, not stylate; abdominal segments not modified; cerci absent, not present; paraprocts fused below phallic organ, not separated digitiform. Differs from *Ragatrichia* gen. n. by having clothing antennal setae scattered tapered, not whorled fimbriate; terminal antennal segment with blunt apex, not stylate; abdominal segments not modified; segment IX cumbuliform, not cylindrical; gonopods with coxopodite only, not bisegmented.

*Remarks* – ANGRISANO (1995) erected *Paratrichia* as a subgenus of the genus *Ochrotrichia* that was previously divided into the subgenera *Metrichia* ROSS, 1938 and *Ochrotrichia* MOSELY, 1934. FLINT & BUENO-SORIA (1998) recognised *Metrichia* and *Ochrotrichia* as independent genera. ANGRISANO (2002) proposed to raise the subgenus *Paratrichia* to genus rank. ÖZDIKMEN (2008) found that *Paratrichia* was a junior homonym of a Diptera genus within Scenopinidae (KELSEY 1969).

Comprehensive comparative studies among described species in various genera in the tribe Ochrotrichiini may produce more species belonging to the *Angrisanoia*. For instance *Nothotrichia tupi* HOLZENTHAL et HARRIS from Brazil exhibits several characters similar to the genus *Angrisanoia*.

*Angrisanoia acuti* (ANGRISANO et SGANGA, 2009),  
**comb. n.**

*Paratrichia acuti* ANGRISANO et SGANGA, 2009: 62–63.

*Remarks* – ANGRISANO & SGANGA (2009) described this species from Argentina as closely related to *Angrisanoia cebollati* (ANGRISANO, 1995) from Uruguay.

***Angrisanoia agazoka* sp. n.**  
(Figs 272–274)

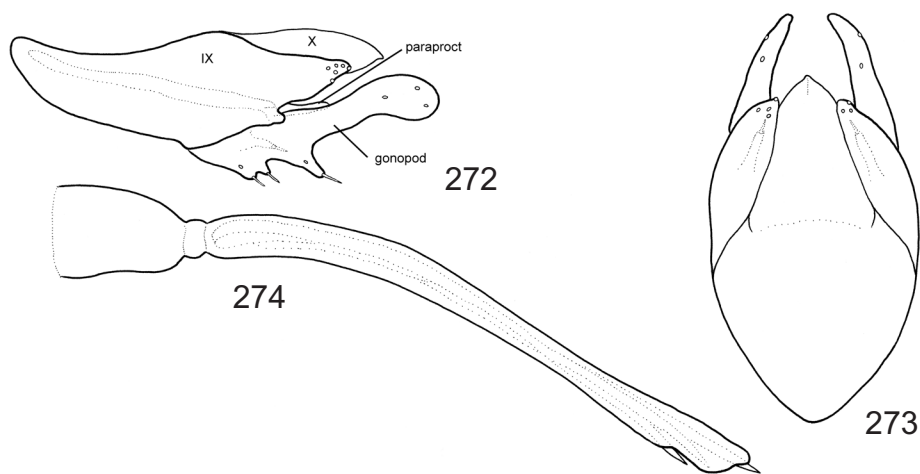
*Diagnosis* – It is close to *Angrisanoia cebollati* (ANGRISANO, 1995) from Uruguay, but differs by having the dorsoapical extension of segment IX present, absent at *A. cebollati*; less sclerotized, membranous segment X triangular in dorsal view, not with laterad-directed apicolateral corners; gonopods with 3 small arms on basoapical margin.

*Description* – Male (in alcohol). Small light brown species with forewing length 1.9 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae 29 segments; scapus normal, unmodified



curving cylindrical with bulbous apical half, little longer than pedicel; pedicel longer than flagelomeres; flagellomeres getting elongated cylindrical posteriorly, terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum triangular. Tibial spurs 1,3,4. Abdominal terga without modifications. Sternum VII without any apicomeral process.

Male genitalia. Segment VIII forming unmodified tergite and sternite. Segment IX elongate suboval cumbuliform (boat-shaped), positioned oblique in lateral view; its dorsum entirely open; its tergum reduced to dorsoapical extension. Segment X (dorsal plate) less sclerotized produced triangular in dorsal view with depressed lateral margin appearing as an upper cover of phallic organ. Paraprocts indistinctly modified into lateromesal elongate structure articulated to basal palet of gonopods and to long lateral brace visible along lateral mesal surface of pleuron IX. Gonopods slender elongate with clavate apex and 3 small arms on basoapical margin. Basal plate of gonopods present as short sclerotized pons coxalis. Phallic organ having short high basal tube and asymmetric shaft curving from right to left in dorsal view, shaft filled almost completely with 3 long spines including ejaculatory duct.



Figs 272–274. *Angrisanoia agazoka* sp. n., holotype, male genitalia: 272 = lateral view, 273 = dorsal view, 274 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4° 32.833'N, 52° 11.452'W, 77 m, 24.I.2007, FRG 5, light trap, leg. N. JÖNSSON (NHRS). Paratype: same as holotype (1 male, NHRS).

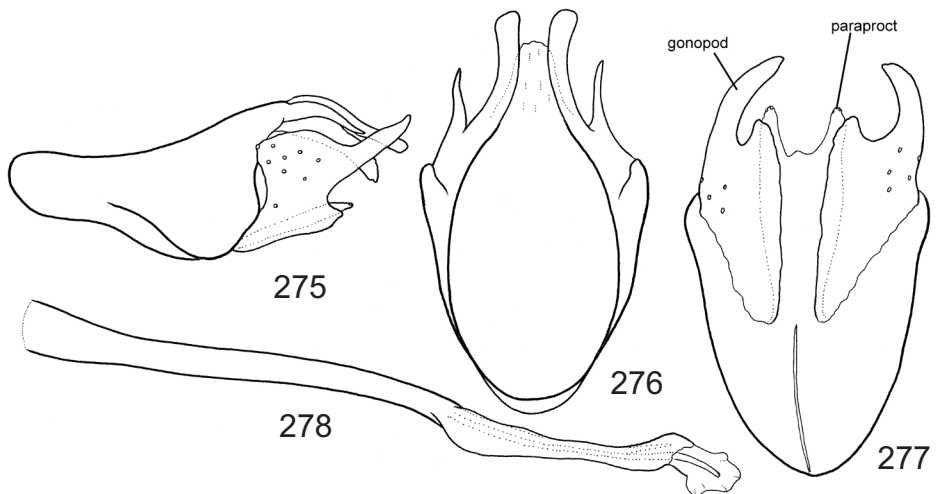
*Etymology* – *Agazoka*, from “ágazóka”, diminutive form of branched in Hungarian, refers to the gonopods with three small arms on their basoapical margin.

*Angrisanoia cebollati* (ANGRISANO, 1995)*Ochrotrichia cebollati* ANGRISANO, 1995: 509.*Angrisanoia cebollati* (ANGRISANO, 1995): ÖZDIKMEN (2008): 614.*Distribution* – Uruguay.***Angrisanoia lemeza* sp. n.**

(Figs 275–278)

*Diagnosis* – It is close to *Angrisanoia otarosa* (WASMUND et HOLZENTHAL, 2007) from Venezuela, but differs by having the dorsoapical extension of segment IX bilobed, not monolobed; gonopods differently shaped both in lateral and dorsal view.

*Description* – Male (in alcohol). Small light brown species with forewing length 2 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms, tentorial bridge absent. Antennae 28 segments; scapus normal, unmodified curving cylindrical, little longer than pedicel; pedicel longer than flagellomeres; flagellomeres getting elongate cylindrical posteriorly; segments with scattered tapered clothing setae; terminal segment with blunt apex. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum triangular. Tibial spurs 1,3,4. Abdominal terga without modifications. Sternum VII without any apicomese process.



**Figs 275–278.** *Angrisanoia lemeza* sp. n., holotype, male genitalia: 275 = lateral view, 276 = dorsal view, 277 = ventral view, 278 = phallus, lateral view

Male genitalia. Segment VIII forming unmodified tergite and sternite. Segment IX cumbuliform (boat-shaped) unsetosed; its dorsum entirely open; its tergum reduced to dorsoapical extension; longitudinal mesal suture present and visible in ventral view; unique ventroapical long quadrangular plate with deep mesal excision visible above ventromesal margin of gonopods. Segment X (dorsal plate) less sclerotized basad, more sclerotized apicad, that is downward bending apex appearing as an upper cover of phallic organ. Paraprocts indistinct. Gonopods appear as large very setose plate in lateral view producing long spinelike dorsal and short ventral triangular lobe. Phallic organ asymmetric, apical half with dark ejaculatory duct along with another long structure embedded in phallic shaft, phallic apex with irregular lobe.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS). Paratype: same as holotype (1 male, OPC).

*Etymology* – *Lemeza*, from “lemez”, plate in Hungarian, refers to the unique long quadrangular plate discernible as the ventromesal process of segment IX.

*Angrisanoia otarosa* (WASMUND et HOLZENTHAL, 2007),  
**comb. n.**

*Rhyacopsyche otarosa* WASMUND et HOLZENTHAL, 2007: 17.

*Remarks* – WASMUND & HOLZENTHAL (2007) described this species from Venezuela with the note that it is unique within *Rhyacopsyche* MÜLLER, 1879.

**Ragatrichia gen. n.**

*Diagnosis* – Having clothing antennal setae whorled fimbriate as well as modified abdominal segments *Ragatrichia* gen. n. is closer to genus *Metrichia* ROSS, 1938, but differs by having segment IX cylindrical, not cumbuliform; cerci lacking, not present; paraprocts fused basad, not digitiform; gonopods two segments, both coxopodite and harpago present; phallic organ without apical hooks. The presence of harpago on the bisegmented gonopods is unique in Hydroptilidae.

*Description* – Fuscous animals. Ocelli present, close to eye. Tentorium with anterior and posterior arm present, tentorial bridge absent. Segment 1 and 2 of maxillary palp shorter than wide. Number of antennal segments reduced (22 on type species); scapus unmodified, curving cylindrical, little longer than pedicel; flagellomeres quadratic, each with whorled blunt fimbriate setal base, rest area fully packed with large sensilla placodea sprinkled by few of smaller sensilla; terminal segment stylate. Mesoscutellum with transversal suture, metascutellum triangular. Tibial spur count 1,3,4, spur on front tibia small.

Wings narrowing to pointed apex. Abdominal segments with some modifications: type species has tufts of long setae on apicolateral lobes on tergite and sternite VIII, erectile pouches between tergites VII and VIII.

Male genitalia. Segment IX fused cylindrical, ventrum longer anteriorly, pleural suture present. Segment X indistinct membranous. Cerci absent. Paraprocts forming pair of long triangular lobes fused basad and tipped with few terminal setae. Short triangular mesal structure located below paraprocts and between gonopods (basal plate of gonopods?). Gonopods composed of platelike coxopodite and mesally articulated monolobed or bilobed harpago. Phallic organ long without apical hooks; distal third composed of dark ejaculatory duct and ribbon-, rod- or spine-like lateral process; apex and/or lateral process twisted.

*Type species* – *Ragatrichia ragada* sp. n.

*Etymology* – *Ragatrichia*, coined from “ragad”, grab in Hungarian, and “trichos”, hair in Greek, refers to the retained harpago on the gonopods (harpago = grabbing in Greek).

*Remarks* – Comprehensive comparative studies among described species in various genera in the tribe Ochrotrichiini may produce described species belonging to the *Ragatrichia* gen. n.

### ***Ragatrichia angrisanæ* sp. n.**

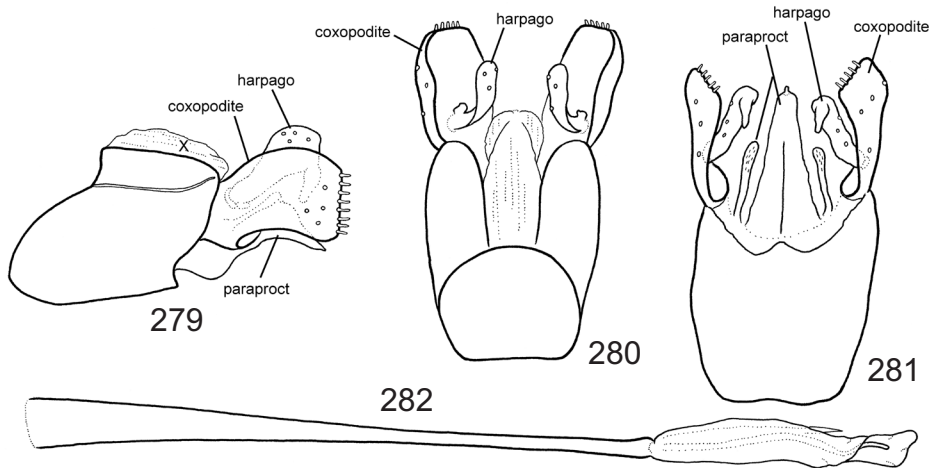
(Figs 279–282)

*Diagnosis* – This new species is close to *Ragatrichia dietzi* (FLINT, 1974) from Guyana, but differs by having striate segment X; differently shaped fused paraprocts; bisegmented gonopod complex of broad arching plate in lateral view, not subtriangular; phallic organ with apical shaft surrounded by a scaly sheath.

*Description* – Male (in alcohol). Light brown species with forewing length 1.3 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms present, tentorial bridge absent. Antennae 26 segments; scapus normal, unmodified curving cylindrical, little longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla; terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum triangular with tendency to pentagonal. Tibial spurs 1,3,4. Abdominal terga without modifications. Sternum VII with pointed slender apicomeres process.

Male genitalia. Abdominal segments without discernible modifications. Segment IX formed as closed cylinder with longer ventrum separated from shorter dorsum by longitudinal suture, entire dorsomesal area occupied by membranous segment X. Segment X (dorsal plate) visible in this dorsal excision longitudinally striated, its apical end emarginate by similarly striated lateral lobes. Paraprocts forms well sclerotized long triangular

ventral plate in ventral view located in subphallic position and accompanied laterally by slender clavate tomentose processes; paraprocts with an S-shaped ventral margin in lateral view due to median keel. No cerci discernible. Gonopods consist of broad arching coxopodit and ribbonlike bending harpago articulated ventromesad to coxopodit and bearing dark ventrally directed subapical lobe; harpago with rounded apex in lateral view; straight apical margin of coxopodit emarginate by short peglike setae surrounded by long strong setae. Phallic organ forming long thin tube with short apical articulated section; there is an unusual tubelike sheath of unknown function covered by scale; apical articulated section composed of ejaculatory duct with twisted apex, subapical spinelike thread and lobulate apex.



**Figs 279–282.** *Ragatrichia angrisanae* sp. n., holotype, male genitalia: 279 = lateral view, 280 = dorsal view, 281 = ventral view, 282 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 m, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – We named this species for ELISA B. ANGRISANO in recognition of her contribution to caddisfly systematics in the Neotropical Faunal Region.

*Ragatrichia dietzi* (FLINT, 1974), **comb. n.**

*Ochrotrichia* (*Metrichia*) *dietzi* FLINT, 1974: 63–64.

*New records* – **French Guiana**: Roura, Cacao, 4°33.639'N, 52°24.629'W 66 m, 28.I. 2007, FRG 8 leg N. JÖNSSON (3 males, NHRS, 3 males, OPC).

*Remarks* – FLINT (1974) described this species totally unlike any other species in the subgenus *Ochrotrichia* (*Metrichia*), due to its unique genitalia. FLINT did not report but we found scale-covered short sheath present on the subapical part of the phallic organ. Scale or microtrichia covered sheath is present also on the newly described species.

*Ragatrichia garuhape* (ANGRISANO et SGANGA, 2009),  
**comb. n.**

*Rhyacopsyche garuhape* ANGRISANO et SGANGA, 2009: 63–64.

*Remarks* – ANGRISANO & SGANGA (2009) described this species from Argentina as closely related to *Rhyacopsyche yatay* ANGRISANO, 1989 from Argentina.

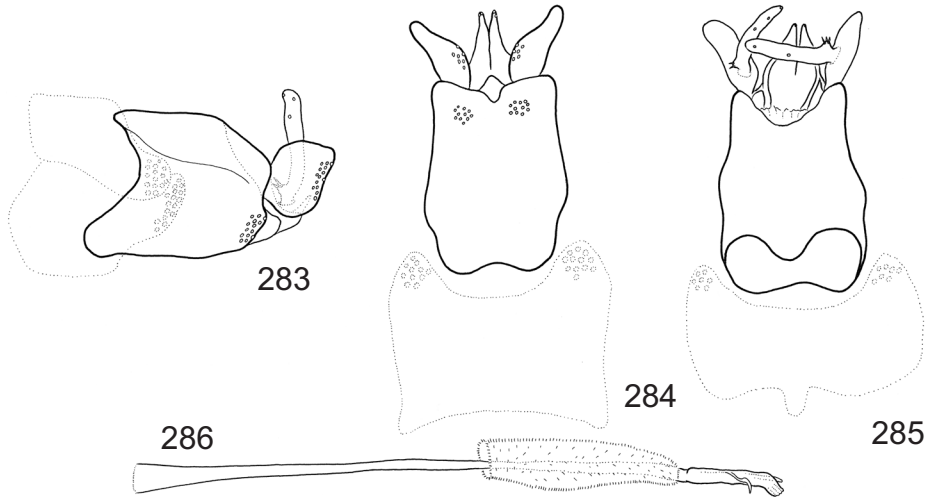
***Ragatrichia ragada* sp. n.**  
(Figs 283–286)

*Diagnosis* – This remarkable new species with dense tufts of long and black setae on apical regions of pregenital and genital segments has retained the harpago, the second segment of the gonopods. It is closest to *Ragatrichia dietzi* (FLINT, 1974) from Guyana, but the new species differs by having a basodorsal lobe on segment IX; paraprocts triangular, not rod-shaped; coxopodits of the gonopods subquadrangular without any basoventral lobe in lateral view; harpagones digitiform without any apicoventral lobe; phallic organ with a regular sheath densely covered with microtrichia.

*Description* – Male (in alcohol). Light brown species with forewing length 2 mm. 3 ocelli present. Postoccipital setal warts elongate ovoid. Tentorium with anterior and posterior arms present, tentorial bridge absent. Antennae 22 segments; scapus normal, unmodified curving cylindrical with bulbous apical half, little longer than pedicel; flagellomeres quadratic, each with whorled fimbriate setal base and fully packed with large sensilla placodea sprinkled by few of smaller sensilla; terminal segment stylate. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum subtriangular. Tibial spurs 1,3,4. Abdominal terga with few modifications; pair of membranous rounded circular sack present between terga VII and VIII. Sternum VII with short apicomeresal kell.

Male genitalia. Tergum VIII with ventroapical, sternum VIII with dorsoapical lobes densely packed with tuft of long black setae; these lobes delineate wide apical excision with medium length both on tergite and sternite. Segment IX formed as closed tube with anterior-dorsal mesal lobe and long and wide apicodorsal excision. Segment X (dorsal plate) visible in this dorsoapical excision as short membranous area. Paraprocts forms pair of less sclerotized long triangular ventral plates in subphallic position; pointed and tipped with 2 setae

and connected by straps to gonopods and to apicodorsum of segment IX. No cerci discernible. Gonopods consist of subquadrangular coxopodit and long digitiform harpago articulated ventromesad to coxopodit; tuft of long black setae located on apical area of coxopodit. Basal plate of gonopods may be present ventrally of paraprocts in form of triangular mesal structure, however its articulation to gonopods indiscernible. Phallic organ forming long thin tube with short apical articulated section; there is an unusual middle regular tubelike sheath of unknown function densely padded by pointed microtrichia; apical articulated section composed of ejaculatory duct, subapical thread with S-shaped end and striated apex.



Figs 283–286. *Ragatrichia ragada* sp. n., holotype, male genitalia: 283 = lateral view, 284 = dorsal view, 285 = ventral view, 286 = phallus, lateral view

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.-7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Ragada*, from “ragadás”, grabbing in Hungarian, refers to the retained harpago on the gonopods (harpago = grabbing in Greek).

*Ragatrichia yatay* (ANGRISANO, 1989), **comb. n.**

*Rhyacopsyche yatay* ANGRISANO, 1989: 157–159.

*Remarks* – ANGRISANO (1989) described this species from Argentina emphasizing the presence of the bisegmented gonopods.

Genus *Rhyacopsyche* MÜLLER, 1879*Rhyacopsyche colubrinosa* WASMUND et HOLZENTHAL, 2007

*New records* – Peru: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (3 males, NHRS, 2 males, OPC).

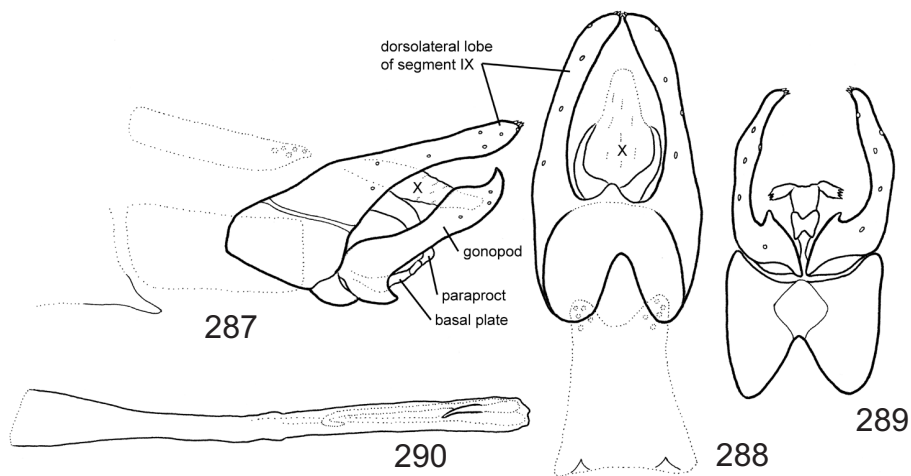
***Rhyacopsyche bunkotala* sp. n.**  
(Figs 287–290)

*Diagnosis* – Its forewing and genital structure is close to *R. hajtoka* sp. n., but differs by having dorsolateral processes of segment IX tapering, not broadening club-shaped, ventral arm of gonopods very short, almost vestigial; membranous segment X long narrow, not ovoid; paraproctal complex different.

*Description* – Male (in alcohol). Dark brown species with forewing length 3.2 mm. 3 ocelli present. Groove and setal wart patterns on head similar to *R. hajtoka* sp. n. Coronal, occipital, lateral vertexal, ocular, antennal grooves and frontal lateral compact, fused vertexal lateroantennal plus medioantennal compact, vertexal ocellar compact, occipital compact and postgenal compact setose warts are present; postoccipital setal warts large and ovoid. Tentorium with thin anterior and posterior arms; tentorial bridge vestigial. Antennae 40 segments; scapus normal, unmodified bending cylindrical and double long than pedicel; flagellomeres as long as wide and slightly elongating cylindrical apicad. Maxillary palp formula I-II-IV-V-III, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum pentagonal. Forewing with overfold, similarly constructed like at *R. hajtoka* sp. n. Tibial spurs 1,3,4. Sternum VII with short apicomesal pointed process.

Male genitalia. Tergite VIII with V-shaped excision apicad, produced dorsolateral lobes with very long articulating setae; sternite VIII unmodified, shorter and lower than segment VII. Segment IX long triangular in lateral view with elongate dorsolateral lobes; in dorsal view mesad turning apex of dorsolateral lobes tapering; dorsum of segment IX reduced to short less sclerotized transversal strap fused to segment X; however this entire membranous dorsum may represent segment X. Membranous segment X (dorsal plate) elongate in dorsal view, its lateral lower margin more sclerotized, this sclerotized lateral bands articulate to sclerotized marginal bands of paraprocts. Paraprocts (subgenital plate) forming rounded less sclerotized plate with its more sclerotized margin articulating dorsally to segment X and ventrally to basal plate of gonopods. Gonopods composed of elongate dorsal arm and shorter ventral arm. Basal plate of gonopods present as mesal rod with dilated apex articulating to paraprocts by narrow mesal strap. Phallus base highly inflated; tubule of ejaculatory duct longer than lateral process and broadened apically; pigmented dark elongate filament visible inside, its anterior end turning backward, its anterad turning posterior end stout spinelike.





**Figs 287–290.** *Rhyacopsyche bunkotala* sp. n., holotype, male genitalia: 287 = lateral view, 288 = dorsal view, 289 = ventral view, 290 = phallus, lateral view

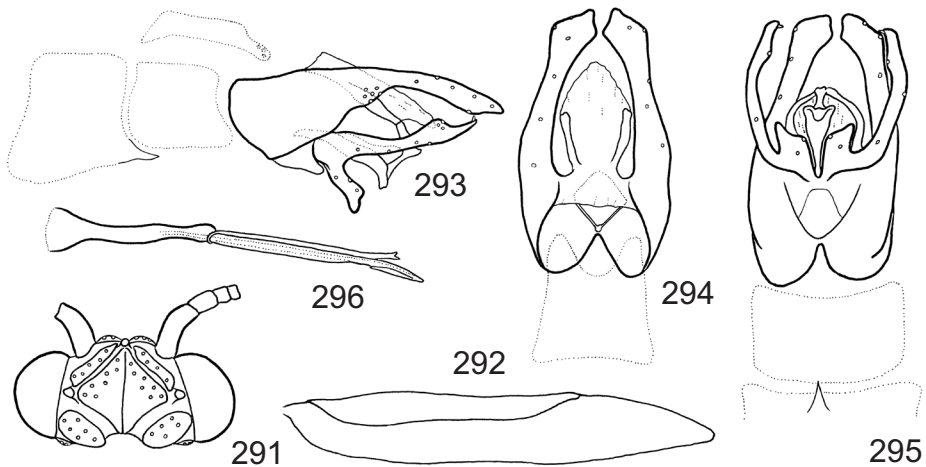
*Type material* – Holotype, male: **Ecuador:** Wild Sumaco, near Pacto Sumaco, 7–8.X.2010, light trap, leg. J. OLÁH jr. (OPC).

*Etymology* – *Bunkotala*, from “bunkótalan”, without club in Hungarian, refers to the tapering apex on dorsolateral processes of segment IX, not quadratic club-shaped.

### ***Rhyacopsyche hajtoka* sp. n.** (Figs 291–296)

*Diagnosis* – Its genital structure is very close to *Rhyacopsyche tanylobosa* WASMUND et HOLZENTHAL, 2007 described from Venezuela, Ecuador and Peru. However, we found an unusual costal overfold on the forewing of this new species. This forewing modification was not mentioned in the original description of *R. tanylobosa*. With reference to the genital similarity, we conducted R. HOLZENTHAL to check the forewing of the types for the presence of costal overfold. He re-examined the type specimens and found that a similar costal overfold is also present on the forewing of their species *R. tanylobosa*. During description the forewing was examined only on dry specimens. On pinned specimens this fold is easy to miss as it is very appressed and obscured by hairs (HOLZENTHAL, personal communication). He also examined other *Rhyacopsyche* species and found their forewings without any overfold (*R. andina* FLINT, 1996, *R. benwa* WASMUND et HOLZENTHAL, 2007, *R. bulbosa* WASMUND et HOLZENTHAL, 2007, *R. colei* WASMUND et HOLZENTHAL, 2007, *R. colombiana* WASMUND et HOLZENTHAL, 2007, *R. dikrosa* WASMUND et HOLZENTHAL,

2007, *R. flinti* WASMUND et HOLZENTHAL, 2007, *R. hagenii* MÜLLER, 1879, *R. intraspina* WASMUND et HOLZENTHAL, 2007, *R. matthiasi* FLINT, 1991, *R. mexicana* (FLINT, 1967), *R. patulosa* WASMUND et HOLZENTHAL, 2007, *R. peruviana* FLINT, 1975, *R. rhamphisa* WASMUND et HOLZENTHAL, 2007, *R. torulosa* FLINT, 1971, *R. turrialbae* FLINT, 1971). This remarkably developed costal overfold appears to be a character of *S. bunkotala* sp. n., *R. hajtoka* sp. n. and *Rhyacopsyche tanylobosa*. This finding also demonstrates how unreliable are the unusual modifications on head, antennae and wing as generic characters. *R. hajtoka* sp. n. differs from *R. tanylobata* by having the membranous segment X long and ovoid in dorsal view, not short and acute; moreover both the dorsal and ventral arm of gonopods differently formed; sophisticated articulating and hinging of paraprocts and basal plate of gonopods different.



**Figs 291–296.** *Rhyacopsyche hajtoka* sp. n., holotype, male: 291 = head, dorsal view, 292 = right forewing, 293 = genitalia: lateral view, 294 = genitalia: dorsal view, 295 = genitalia: ventral view, 296 = phallus, lateral view

*Description* – Male (in alcohol). Dark brown species with forewing length 3.5 mm. 3 ocelli present. Groove and setal wart patterns on head are more complete than drawn at *Rhyacopsyche hagenii* (WASMUND et HOLZENTHAL 2007). Coronal, occipital, lateral vertexal, ocular, antennal grooves and frontal lateral compact, fused vertexal lateroantennal plus medioantennal compact, vertexal ocellar compact, occipital compact and postgenal compact setose warts are present; postoccipital setal warts large and ovoid. Tentorium complete with thin anterior arm. Antennae with 38 segments; scapus normal, unmodified bending cylindrical and double long than pedicel; flagellomeres as long as wide and slightly elongating cylindrical apicad. Maxillary palp formula I-II-IV-III-V, first two segments extremely short, shorter than wide. Mesoscutellum with transverse suture; metascutellum pentagonal. Tibial spurs 1,3,4. Sternum VII with short apicomeres pointed process.

Like slats on wing of an aircraft, forewing producing an overfold on its anterior margin, along leading-edge filled with specialized small scales. Flexion line for overfold developed along two length of subcosta; its total length is 2.3 mm. Similar overfold was described at leucotrichiini genus *Abtrichia*. function of overfold is unknown. It may have role in pheromonal communication. Flexion lines may be involved in changes of shape of wing in flight enabling pronatory and supinatory movements of leading-edge spar relative to rest of wing. Microsculptural feature of scale-like setae may have aerodynamic effects modifying greatly boundary layer condition for turbulancy optimising flow over surface relief for flight manipulation.

Male genitalia. Tergite VIII produced dorsolateral lobes with very long articulating setae; sternite VIII unmodified, shorter and lower than segment VII. Segment IX long triangular in lateral view with elongate dorsolateral lobes; in dorsal view mesad turning apex of dorsolateral lobes quadrangular; dorsum of segment IX reduced to short less sclerotized transversal strap fused to segment X; however this entire membranous dorsum may represent segment X. Membranous segment X (dorsal plate) ovoid in dorsal view, its lateral lower margin more sclerotized, this sclerotized lateral bands articulate to sclerotized marginal bands of paraprocts. Paraprocts (subgenital plate) forming rounded less sclerotized plate with its more sclerotized margin articulating dorsally to segment X and ventrally to basal plate of gonopods. Gonopods composed of elongate dorsal arm and shorter ventral arm. Basal plate of gonopods present as mesal rod with dilated apex articulating to paraprocts by narrow mesal strap. Phallus base highly inflated; tubule of ejaculatory duct longer than lateral process of paramer; dark pigmented apical filament attached tightly to head of ejaculatory duct; no membranous sheath discernible, however wall of ejaculatory duct seems thickened.

*Type material* – Holotype, male: **Ecuador**: Alambi, 24.IX.2010, light trap, leg. J. OLÁH jr. (OPC). Paratypes: **Ecuador**: same as the holotype (1 male, 1 associated possible female, OPC). Tinalandia, near Alluriqui 15.X.2010, light trap, leg. J. OLÁH jr. (1 male, OPC). **Peru**: Pasco Reg., Yanachaga-Chemillen N.P., side river to Rio Huancabamba, N end of park, along Oxabamba-Pozuzo rd., 10°11.133'S, 75°34.106'W, light, loc.01, 31.XII. 2008, leg. T. MALM & K. A. JOHANSON (11 males, 51 associated possible females, NHRS, 5 males, 8 females, OPC). Huanuco, Tomayquichua Distr. River Tomayquichua, 2041 m, humid subtropical forest, 10°04'27"S, 76°12'36"W, 29.X.–6.XI.2005, light trap, leg. FAVIOLA MONTES CARLOS (7 males, NHRS).

*Etymology* – *Hajtoka*, from “hajtóka”, folding over in Hungarian, refers to the overfold on the forewing.

### *Rhyacopsyche hasta* WASMUND et HOLZENTHAL, 2007

*New records* – **Peru**: San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, OPC).

*Rhyacopsyche rhamphisa* WASMUND et HOLZENTHAL, 2007

*New records* – **Peru:** Amazonas Prov., river crossing Olmos-Tarapoto rd., 371 km (rd.) E Olmos Desv. Jaén, 5°41.178'S, 77°46.421'W, light, loc. 02, 5.I.2009, leg. T. MALM & K. A. JOHANSON (1 male, 1 female, NHRS).

## Tribe Stactobiini

Genus *Bredinia* FLINT, 1968*Bredinia espinosa* HARRIS, HOLZENTHAL et FLINT, 2002

*New records* – **French Guiana:** Maripasoula: Lawa River: Gzaan Dayé, 4°01.130'N, 54°19.015'W, 74 m, 8.II.2007, FRG 14, leg. N. JÖNSSON (1 male, NHRS).

*Bredinia pilcopata* HARRIS, HOLZENTHAL et FLINT, 2002

*New records* – **Peru:** San Martin Prov., creek crossing rd. Tarapoto-Yurimaguas, ca. 30 km (rd.) NE Tarapoto, 6°24.904'S, 76°18.756'W, light, loc. 08, 8.I.2009, leg. T. MALM & K. A. JOHANSON (6 males, NHRS, 3 male, OPC).

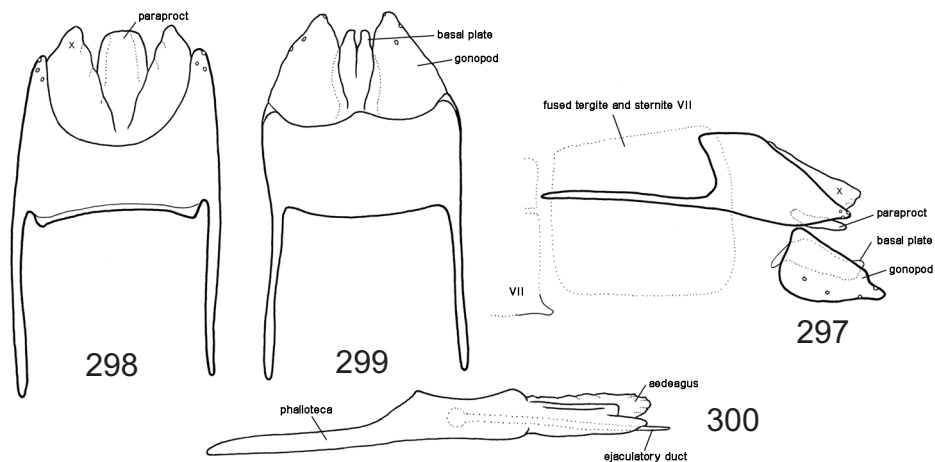
*Bredinia venezuelensis* HARRIS, HOLZENTHAL et FLINT, 2002

*New records* – **Ecuador:** Gareno, near Puerto Napo, 10–11.X.2010 light trap, leg. J. OLÁH jr. (2 males, OPC). **Peru:** San Martin Prov., Rio Huallaga tributary, small river passing Chazuta, 6°34.665'S, 76°08.209'W, light, loc. 11, 10.I.2009, leg. T. MALM & K. A. JOHANSON (7 males, NHRS, 3 males, OPC).

Genus *Flintiella* ANGRISANO, 1995*Flintiella harma* sp. n.

(Figs 297–300)

*Diagnosis* – It is similar to *Flintiella manauara* SANTOS et NESSIMIAN, 2009 from Brazil (Amazonas: Manaus), but differs by having elongate apodemes on anterolateral margin of segment IX double long; segment X divided mesad; no sclerotized “dorsal process” present; paraprocts fused quadrangular; gonopods triangular, not quadrangular; basal plate of gonopods forming a pair of heavily sclerotized small hooked processes.



**Figs 297–300.** *Flintiella harma* sp. n., holotype, male genitalia: 297 = lateral view, 298 = dorsal view, 299 = ventral view, 300 = phallus, lateral view

*Description* – Male (in alcohol). Small species with forewing length 1.3 mm. Ocelli absent. Postoccipital setal warts pronounced, triangular. Tentorium with anterior and posterior arms present, shifted laterally; tentorial bridge vestigial. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-IV-V-III, first two segments longer than wide. Mesoscutellum with just discernible transverse suture; metascutellum short and scutum- wide. Tibial spurs 0,2,3. Sternum VII with small apicomeres process.

Male genitalia. Segment VII with discernible tergite and sternite; segment VIII possibly fused. Segment IX with long threadlike anterior apodeme; ventrum open; dorsum deeply round excised posteriorly and anterior margin straight in dorsal view; posteriorly narrowing in lateral view. Segment X (dorsal plate) separated mesad, at least discernible as less pigmented lateral lobes located on lateral margin in deep excision of segment IX. Paraprocts (subgenital plate) visible in lateral view as sclerotized horizontal rod located under phallic organ and as an elongate quadratic plate in ventral or dorsal view. Gonopods hinge on ventroapical corner of segment IX; triangular with small subapical excision on dorsum in lateral view. Basal plate of gonopods forming pair of heavily sclerotized hooked processes touching mesad and visible partly uncovered between gonopods. Phallic organ tripartite, basal part is actually an elongate foramen, middle tube and apical complex with lobes, membranous dorsum and pigmented ejaculatory duct with free apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4° 32.833'N, 52° 11.452'W, 77 mao, 24.I.2007, FRG 5, light trap, leg N. JÖNSSON (NHRS).

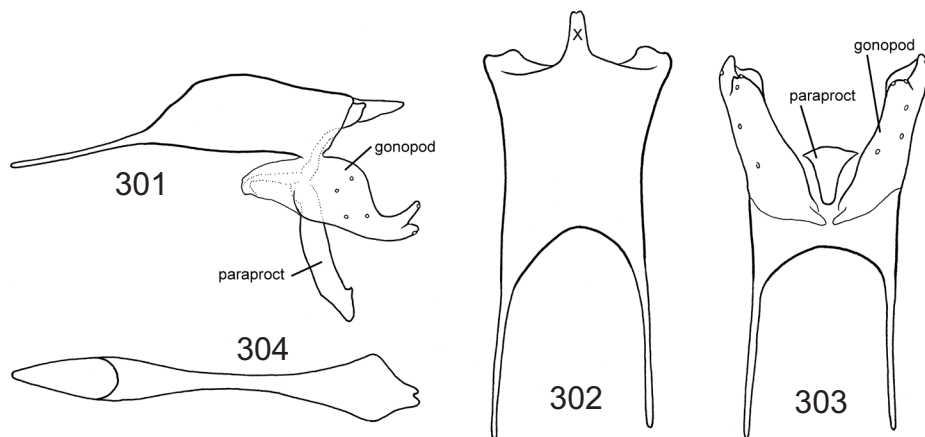
*Etymology* – *Harma*, from “hármas”, triple in Hungarian, refers to the tripartite nature of phallic organ and to the triangular gonopods.

**Flintiella leloga** sp. n.

(Figs 301–304)

*Diagnosis* – This new species differs from all the known species of the genus *Flintiella* ANGRISANO, 1995 by having trifold gonopod apices and narrowing segment X.

*Description* – Male (in alcohol). Small species with forewing length 1.5 mm. Ocelli absent. Postoccipital setal warts pronounced, rounded triangular. Tentorium with anterior and posterior arms present, shifted laterally; tentorial bridge vestigial. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-IV-V-III, first two segments longer than wide. Mesoscutellum with just discernible transverse suture; metascutellum short and scutum-wide. Tibial spurs 0,2,3. Sternum VII with small apicomeseal process.



**Figs 301–304.** *Flintiella leloga* sp. n., holotype, male genitalia: 301 = lateral view, 302 = dorsal view, 303 = ventral view, 304 = phallus, dorsal view

Male genitalia. Segment VII with discernible tergite and sternite; segment VIII possibly fused. Segment IX with long threadlike anterior apodeme; ventrum open, dorsum quadrangular in dorsal view; more sclerotized lobe present on apical dorsolateral corner. Segment X (dorsal plate) reduced to narrow mesal projection in dorsal view. Paraprocts (subgenital plate) very elongate and deeply hanging down between gonopods and producing pair of lateral straps upward and single mesal band anteroventrally. Gonopods hinge on ventroapical corner of segment IX; large, well-developed; broad based in lateral view with bifid upward turning apex; third mesal lobe discernible in ventral view. No basal plate of gonopods detectable. Phallic organ with elongate dorsal foramen anteriorly, apex trapezoid in dorsal view.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 104 mao, 4°33.035'N, 52°11.661'W, Malaise trap, 23.I.–7.II.2007, FRG MF3, leg. N. JÖNSSON (NHRS).

*Etymology* – *Leloga*, from “lelógo”, hanging down in Hungarian, refers to the elongate paraprocts deeply hanging down between gonopods.

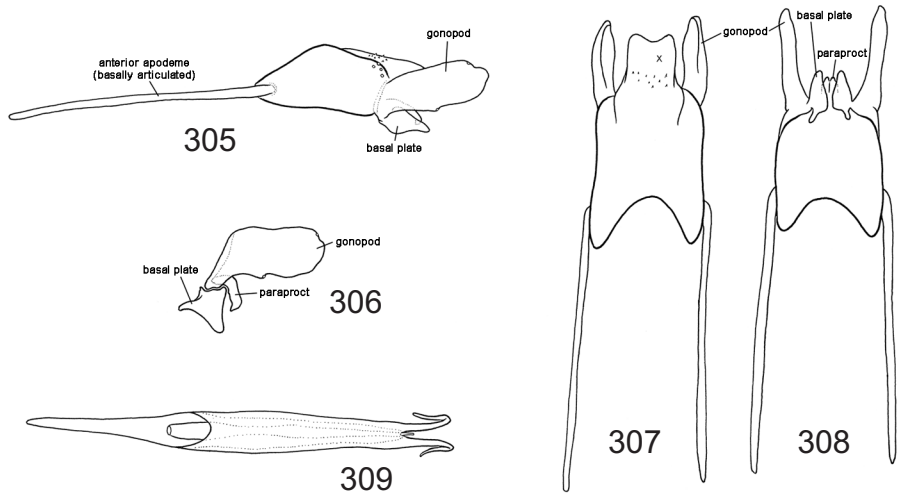
## Genus *Orinocotrichia* HARRIS, FLINT et HOLZENTHAL, 2002

### *Orinocotrichia tagola* sp. n.

(Figs 305–309)

*Diagnosis* – This small hydroptilid having short scutum-wide metascutellum is a member of the tribe Stactobiini. Characters of elongate anterior apodemes on segment IX, loss of ocelli and the peculiar triangular occipital setal wart bring this new species close to genus *Flintiella* ANGRISANO, 1995. *Flintiella* has large elongate and well-separated gonopods but this new species has reduced gonopods relating it to the genus *Orinocotrichia* HARRIS, FLINT et HOLZENTHAL, 2002. However, the validity of genus *Orinocotrichia* needs further studies. The size-reduced gonopods as a generic character is questioned by the fused gonopods of the *Flintiella alajucla* HARRIS, FLINT et HOLZENTHAL, 2002. Fused gonopods is a more diverse state compared to size-reduced (smaller) state of gonopods. A more possible alternative if we treat the posterolateral lobe articulated to segment IX as the laterally shifted gonopods like the bracteoles at *Neotrichia* MORTON, 1905, and the small reduced gonopods as the basal plate of gonopods. A discernible articulation present between posterolateral lobe and reduced gonopods suggest this alternative. Similar situation could be examined and explained at the type species of the genus. The presence of large lateral gonopods further questions the state of genus *Orinocotrichia*. *Orinocotrichia tagola* sp. n. differs from the single known species of the genus *Orinocotrichia calcariga* HARRIS, FLINT et HOLZENTHAL, 2002 from Venezuela by having unique articulated anterior apodemes on segment IX, this means that the apodemes are jointed subapicad on the lateral surface of the segment with articulation, not a direct continuation of the segment without any articulation; posterior margin of segment IX producing large vertically extended rounded lateral lobes, the possible gonopod alternatives with articulations, this alternative gonopods seems present on *O. calcariga*, however with a dorsal pointed process; membranous segment X excised apicad, not rounded; paraprocts and basal plate of gonopods differently shaped.

*Description* – Male (in alcohol). Small species with forewing length 1.4 mm. Ocelli absent. Postoccipital setal warts pronounced, triangular. Tentorium with anterior and posterior arms present, shifted laterally; tentorial bridge vestigial. Antennae with 18 segments; scapus normal, unmodified cylindrical and double long than pedicel; flagellomeres long cylindrical. Maxillary palp formula I-II-IV-V-III, first two segments longer than wide. Mesoscutellum with just discernible transverse suture; metascutellum short and scutum-wide. Tibial spurs 0,2,3. Sternum VII with small apicomeral process.



**Figs 305–309.** *Orinocotrichia tagola* sp. n., holotype, male genitalia: 305 = lateral view with gonopod in relaxed position, 306 = gonopod, released position, 307 = dorsal view, 308 = ventral view, 309 = phallus, dorsal view

Male genitalia. Segment VII with discernible tergite and sternite; segment VIII possibly fused. Segment IX with long threadlike anterior apodeme; this apodeme discernible as an independent structure articulating subapically and laterally on anteroventral corner of segment IX, sternite IX vestigial, ventrum IX open; dorsum excised posteriorly. Segment X (dorsal plate) membranous with cover of microtrichia. Paraprocts (subgenital plate) visible as pair of heavily sclerotized hooked process. Gonopods present as broad rounded plate moved laterally like bracteoles of *Neotrichia*. Basal plate of gonopods forming pair of heavily sclerotized triangular short processes separated mesad and articulated to gonopods. Phallic organ tripartite, basal part is actually an elongate foramen, middle tube and apical complex with anterad turning bifid apex; ejaculatory duct rather broad and with free apex located between bifid apex.

*Type material* – Holotype, male: **French Guiana**: Approuaguekaw, Kaw Mt, 4° 32.833'N, 52° 11.452'W, 77 m, 24.I.2007, FRG 5, light trap, leg N. JÖNSSON (NHRS). Paratypes: same as holotype (1 male, NHRS, 1 male, OPC).

*Etymology* – *Tagola*, from “tagolás”, articulation in Hungarian, refers to unusual articulations between anterior apodemes and segment IX as well as between posterior lateral lobes (gonopods) and segment IX.

\*



*Acknowledgements* – We are very thankful to Dr TOBIAS MALM (University of Eastern Finland, Joensuu, Finland), Dr MARIANNE ESPELAND (Museum of Comparative Zoology, Harvard University, Cambridge, USA) and Mr NIKLAS JÖNSSON (NHRS) for the help in collecting much of the material on which this publication was based on. Dr OLIVER S. FLINT, Jr. (NMNH) kindly sent us additional material of *Leucotrichia forrota* sp. n.

## REFERENCES

- ANGRISANO, E. B. 1989: Rhyacopsyche yatay, una nueva especie de Hydroptilidae de la Argentina (Trichoptera). – *Revista de la Sociedad Entomologica Argentina* **46**(1–4): 157–159.
- ANGRISANO, E. B. 1995: Contribución al conocimiento de los Trichoptera del Uruguay. II. Familia Hydroptilidae. – *Revista Brasileira de Entomologia* **39**(3): 501–516.
- ANGRISANO, E. B. 2002: Contribution to the knowledge on Trichoptera of El Palmar National Park (Argentina). Description of immature stages of Bredinia sp. and Rhyacopsyche yatay (Hydroptilidae). – In: MEY, W. (ed.): Proceedings of the 10<sup>th</sup> International Symposium on Trichoptera. *Nova Supplementa Entomologica, Keltern* **15**: 395–406.
- ANGRISANO, E. B. & SGANGA, J. V. 2009: New species of Hydroptilidae (Trichoptera) from Salto Encantado Provincial Park (Misiones province, Argentina). – *Zootaxa* **2162**: 57–68.
- AREFINA, T. I. 2004: A new species of the genus Stactobiella Martynov with reassignment of Stactobiella tshistjakovi (Arefina & Morse, 2002) and new records of micro-caddisflies (Trichoptera: Hydroptilidae) from the Russian Far East. – *Eurasian Entomological Journal* **2004**: 2009–2011.
- AREFINA, T. I., VSHIVKOVA, T. S. & MORSE, J. C. 2002: New and interesting Hydroptilidae (Insecta: Trichoptera) from the Russian Far East. – In: MEY, W. (ed.): Proceedings of the 10<sup>th</sup> International Symposium on Trichoptera. *Nova Supplementa Entomologica, Keltern* **15**: 96–106.
- BANKS, N. 1907: New Trichoptera and Psocidae. – *Journal of the New York Entomological Society* **15**: 162–166.
- BUENO-SORIA, J. & HOLZENTHAL, R. W. 2004: New species of the genus Ochrottrichia Mosely (Trichoptera: Hydroptilidae) from Mexico and Panama. – *Transactions of the American Entomological Society* **130**: 245–269.
- BUENO-SORIA, J. & SANTIAGO-FRAGOSO, S. 2002: Description of five new species of the genus Metrichia Ross (Trichoptera: Hydroptilidae) from Panama. – *Transactions of the American Entomological Society* **128**: 245–254.
- FLINT, O. S. Jr. 1968: Bredin-Archbold-Smithsonian Biological Survey of Dominica, 9. The Trichoptera (Caddisflies) of the Lesser Antilles. – *Proceedings of the United States National Museum* **125**: 1–86.
- FLINT, O. S. Jr. 1972: Studies of Neotropical caddisflies, XIII: The genus Ochrottrichia from Mexico and Central America (Trichoptera: Hydroptilidae). – *Smithsonian Contributions to Zoology* **118**: 1–28.

- FLINT, O. S. Jr. 1974: The Trichoptera of Surinam. Studies of Neotropical caddisflies, XV. – *Studies on the Fauna of Suriname and other Guyanas* 14: 1–151.
- FLINT, O. S. Jr. 1983: Studies of Neotropical caddisflies, XXXIII: new species from austral South America (Trichoptera). – *Smithsonian Contributions to Zoology* 377: 1–100.
- FLINT, O. S. Jr. 1991: Studies of Neotropical caddisflies, XLV: The taxonomy, phenology, and faunistics of the Trichoptera of Antioquia, Colombia. – *Smithsonian Contributions to Zoology* 520: 1–113.
- FLINT, O. S. Jr. & BUENO-SORIA, J. 1998: Studies of Neotropical caddisflies, LVI: Descriptions of five new species of the genus *Metrichia* Ross (Trichoptera: Hydroptilidae) from Pakitza, Peru with a checklist and bibliography of the described species of the genus. – *Proceedings of the Entomological Society of Washington* 100(3): 489–736.
- FLINT, O. S. Jr. & BUENO-SORIA, J. 1999: Studies of Neotropical caddisflies, XVIII: New species of the genus *Ochrotrichia* Mosely (Trichoptera: Hydroptilidae) from Peru. – *Proceedings of the Entomological Society of Washington* 101(4): 729–496.
- FLINT, O. S. Jr., HARRIS, S. C. & BOTOSANEANU, L. 1994: Studies of Neotropical caddisflies, L: the description of *Cerasmatrichia*, new genus, a relative of *Alisotrichia*, with the descriptions of new and old species and the larva (Trichoptera: Hydroptilidae). – *Proceedings of the Biological Society of Washington* 107: 360–382.
- FLINT, O. S., Jr., HOLZENTHAL, R. W. & HARRIS, S. C. 1999: *Catalog of the Neotropical Caddisflies (Trichoptera)*. – Ohio Biological Survey, Columbus, Ohio, 239 pp.
- HARRIS, S. C., FLINT, O. S., Jr. & HOLZENTHAL, R. W. 2002: Two new genera of Hydroptilidae from the neotropics (Trichoptera: Hydroptilidae: Stactobiini). – *Journal of the New York Entomological Society* 110: 49–64.
- HARRIS, S. C. & HOLZENTHAL, R. W. 1993: Phylogeny of the species groups of *Alisotrichia* sensu lato, with the description of a new species from Costa Rica (Trichoptera: Hydroptilidae). – In: OTTO, C. (ed.): *Proceedings of the 7th International Symposium on Trichoptera*. Backhuys Publishers, Leiden, pp. 155–160.
- HICKIN, N. E. 1967: *Caddis larvae. Larvae of the British Trichoptera*. – Hutchison & Co. Publishers Ltd., London, 476 pp.
- KELSEY, L. P. 1969: A revision of the Scenopinidae (Diptera) of the world. – *Bulletin of the United States National Museum. Smithsonian Institution Press* 277: 1–336.
- KETH, A. C. 2002: *Taxonomy of the genus Neotrichia and related taxa (Trichoptera: Hydroptilidae: Neotrichiini)*. Ph. D. Thesis. – Pennsylvania State University, University Park, 327 pp.
- KETH, A. C. 2004: Five new species of *Neotrichia* (Trichoptera: Hydroptilidar: Neotrichiini) from Southern Mexico and Northern Belize. – *Entomological News* 114(3): 164–178.
- MARSHAL, J. E. 1979: A review of genera of the Hydroptilidae (Trichoptera). – *Bulletin of the British Museum (Natural History), Entomology series* 39(3): 135–239.
- MORSE, J. C. (ed.) 2010: *Trichoptera World Checklist*. <http://entweb.clemson.edu/database/trichopt/index.htm>. [Accessed 27 July 2010.]
- MOSELY, M. E. 1937: Mexican Hydroptilidae (Trichoptera). – *Transactions of the Royal Entomological Society of London* 86: 151–189.

- OLÁH, J. & JOHANSON, K. A. 2007: Trinominal terminology for cephalic setose warts in Trichoptera (Insecta). – *Braueria* **35**: 21–28.
- OLÁH, J. & JOHANSON, K. A. 2008: Reasoning an appendicular and functional caddisfly genital terminology. – *Braueria* **35**: 29–40.
- OLÁH, J. & JOHANSON, K. A. 2010: Description of 46 new Old World Hydroptilidae (Trichoptera). – *Folia Entomologica Hungarica* **70**: 65–155.
- ÖZDIKMEN, H. 2008: A nomenclatural act for caddis flies (Trichoptera). – *Munis Entomology & Zoology* **3**(2): 614–616.
- ROSS, H. H. 1938: Lectotypes of North American caddis flies in the Museum of Comparative Zoology. – *Psyche* **45**(1): 1–61.
- ROSS, H. H. 1944: The caddis flies or Trichoptera, of Illinois. – *Bulletin of the Illinois Natural History Survey* **23**(1): 1–326.
- ROSS, H. H. 1948: Notes and descriptions of Nearctic Hydroptilidae (Trichoptera). – *Journal of the Washington Academy of Sciences* **38**: 201–206.
- WASMUND, A. M. & HOLZENTHAL, R. W. 2007: A revision of the Neotropical caddisfly genus *Rhyacopsyche*, with the description of 13 new species (Trichoptera: Hydroptilidae). – *Zootaxa* **1634**: 1–59.
- WELLS, A. & WICHARD, S. 1989: Caddisflies of Dominican Amber VI. Hydroptilidae (Trichoptera). – *Studies on Neotropical Fauna and Environment* **24**(1): 41–51.
- WIGGINS, G. B. 1996: *Larvae of the North American Caddisfly genera (Trichoptera)*. Second Edition. – University of Toronto Press, Toronto and Buffalo, 457 pp.