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New species and records of Afrotropical, Oriental and Palaearctic *Venturia* Schrottky, 1902 (Hymenoptera: Ichneumonidae: Campopleginae)

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Abstract. Five new species of *Venturia* Schrottky, 1902 are described from the Afrotropical and Oriental regions, *Venturia aurantia* sp. nov. from South Africa, *Venturia erythrina* sp. nov. from Tanzania, *Venturia ignea* sp. nov. from Ghana, *Venturia veruta* sp. nov. from Uganda, and *Venturia biroi* sp. nov. from India. The hitherto unknown male sex of *Venturia peringueyi* (Cameron, 1906), a South African species, is also described. Additionally, the first records of *Venturia aquila* Vas, 2019 and *Venturia crassicaput* (Morley, 1926) from South Africa, and *Venturia canescens* (Gravenhorst, 1829) from Cyprus, Crete and Tanzania are given.

Keywords. ichneumon wasp, species description, distribution, Old World.

INTRODUCTION

Venturia Schrottky, 1902 is a species-rich genus of family Ichneumonidae, subfamily Campopleginae. Prior to this study 138 valid species were known worldwide; 44 of them occur in the Neotropical, 40 in the Nearctic, 35 in the Oriental, 11 in the Afrotropical, 8 in the Western Palaearctic, 8 in the Eastern Palaearctic, 4 in the Australasian, and 4 in the Oceanic regions (Yu *et al.* 2012, Vas 2019*a*, *b*).

In this paper, based on the material of the Hungarian Natural History Museum (HNHM, Budapest) and the Biological Museum of Lund University (MZLU, Lund), five new species of the genus are described (four species from the Afrotropical region and one species from the Oriental region), the hitherto unknown male sex of *Venturia peringueyi* (Cameron, 1906), a South African species, is also described, and new distributional records of some *Venturia* species are given.

MATERIAL AND METHODS

Taxonomy and nomenclature follow Yu & Horstmann (1997) and Yu *et al*. (2012); hence, complete nomenclatural history and list of synonym taxa are not repeated here. The morphological terminology is primarily based on Gauld (1991) and Gauld *et al*. (1997); however, in some cases, especially regarding wing veins, the corresponding terminology of Townes (1969) is also indicated. In the case of Oriental species, for better comparability with Gupta & Maheshwary (1977), both the length of ovipositor sheath and the total length of exposed ovipositor are given. The identifications were based on Gravenhorst (1829), Förster (1869), Magretti (1884), Schrottky (1902), Cameron (1906, 1912), Enderlein (1914), Morley (1926), Seyrig (1935), Townes *et al*. (1961), Momoi (1965), Townes (1970), Horstmann (1973), Townes & Townes (1973), Gupta & Maheshwary (1977), Horstmann (1979), Wahl (1987), Kusigemati (1988), Polaszek *et al*. (1994), Zwart (1998), Jonathan (1999), Sudheer & Nar-

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endran (2006), Horstmann (2008), van Noort (2019), Vas (2019*a*, *b*), and on checking the relevant type material (*i.e.* type specimens of all species listed in the taxonomy section were examined at least by digital images except that of *Venturia canescens* (Gravenhorst, 1829) which type material was unnecessary to check), and specimens determined by V.K. Gupta in HNHM. The specimens were identified and examined by the author using a Nikon SMZ645 stereoscopic microscope. Results are grouped into biogeographical regions, within biogeographical regions species are listed alphabetically. Label data is given as is, with clarifying, abbreviated or missing information given in brackets. Photos were taken with a 14 MP MicroQ-U3L digital camera. Post image work was done with ToupTek ToupView v4.7 and Photoshop CS3.

TAXONOMY AND RESULTS

Subfamily: Campopleginae Förster, 1869

Genus: *Venturia* Schrottky, 1902

Type species: *Venturia argentina* Schrottky; designation by Viereck (1914).

AFROTROPICAL REGION

Before this study, 11 valid species were known from the region (Yu *et al.* 2012, Vas 2019*a*). Most Afrotropical species were described several decades ago (Yu *et al.* 2012), except quite recently a new species, *Venturia aquila* Vas, 2019 was described from Ghana, along with the unknown female sex of *Venturia crassicaput* (Morley, 1926) (Vas 2019*a*). With the new species described below, the number of Afrotropical *Venturia* species increased to 15.

Venturia aquila Vas, 2019

Material examined. Two females, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 26.XII.[19]50, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 95, Insect trap, Id. No. MZLU-HYM 26390, 26397. – Two females, same locality, collectors, 22.I.[19]51, No. 157, Id. No. MZLU-HYM 26385, 26388. – One female, same locality, collectors, 2.II.[19]51, No. 166, Id. No. MZLU-HYM 26384. – One female, same locality, collectors, 14.II.[19]51, No. 183, Id. No. MZLU-HYM 26399. – The specimens are deposited in MZLU (Lund) except MZLU-HYM 26385, 26397 are deposited in HNHM (Budapest) (HNHM-HYM 154982, 154983).

Remarks. First records for South Africa. This species was recently described from Ghana (Vas 2019*a*). As compared to the holotype specimen of this species, the following slight intraspecific variations were observed: tegula yellow to yellowish brown, middle legs entirely blackish to dark brown.

Venturia aurantia sp. nov.

(Figures 1–3)

Material examined. Holotype: female, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 22.I.[19]51, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 157, Insect trap; specimen pinned, Id. No. MZLU-HYM 26382. – Paratypes: three females, same locality, date, collector; specimens pinned, Id. No. MZLU-HYM 26383, 26396, 26398; one female and one male, same locality, collector, 2.II.[19]51, No. 166; specimens pinned, Id. No. MZLU-HYM 26389 (male, antennae missing), 26393. – The holotype and three paratype specimens (MZLU-HYM 26383, 26389, 26393) are deposited in MZLU (Lund), two paratype specimens (MZLU-HYM 26396, 26398) are deposited in HNHM (Budapest) (HNHM-HYM 154986, 154987).

Diagnosis. Among the Afrotropical species of the genus, *Venturia aurantia* sp. nov. could be reliably identified by the combined presence of the following characters: gena in dorsal view 0.4–0.5× as long as eye width, moderately strongly narrowed behind eye, mesopleuron punctate on granulate background, ventral part of epicnemial carina little elevated, posterior transverse carina of mesosternum elevated, medially distinctly

excised and curved inwards, submedially convex, area superomedia relatively short and wide, *ca* 1.6× as long as wide, area superomedia and area petiolaris with distinct transverse wrinkles, propodeal carinae complete, lateromedian longitudinal carinae distinctly angulate at costulae and convergent behind costulae, areolet long-stalked, ovipositor sheath 1.2–1.4× as long as hind tibia, ovipositor evenly, weakly upcurved, scapus and pedicellus ventrally more or less extensively orange brown, mandible yellow except teeth, tegula orange brown, basal three tergites of metasoma predominantly dark, following tergites extensively reddish, fore coxa orange, middle coxa dark brown, apically narrowly orange brown, hind coxa blackish, apically very narrowly orange brown, rest of legs entirely to almost entirely reddish orange.

Description. Female (Figs 1–3). Body length *ca* 7–8 mm, fore wing length *ca* 5 mm.

Head. Antenna with 35–37 flagellomeres; first flagellomere long and slender, 3.5–3.9× as long as wide apically; preapical flagellomeres quadrate to slightly longer than wide. Head transverse, matt, with dense, short, greyish hairs. Ocular-ocellar distance 0.8–0.9× as long as ocellus diameter, posterior ocellar distance 1.5–1.7× as long as ocellus diameter, posterior ocellar distance 1.6–1.8× as long as ocular-ocellar distance. Inner eye orbits slightly indented, about parallel. Gena granulate with dense, superficial punctures, moderately short, in dorsal view 0.4–0.5× as long as eye width, moderately strongly narrowed behind eye. Occipital carina complete, medially evenly arched, reaching hypostomal carina little before base of mandible, hypostomal carina slightly elevated. Frons flat, without median longitudinal carina, rugose-punctate. Face very weakly convex in profile, rugose-punctate. Clypeus rugose-punctate, very weakly separated from face, flat in profile, relatively wide, its apical margin very weakly convex, sharp. Malar space 0.5× as long as basal width of mandible. Mandible relatively long, lower margin of mandible with a wide flange from base toward teeth, flange gradually narrowed toward teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma with dense, short, greyish hairs. Pronotum rugose-punctate, ventral half to two-third with strong transverse wrinkles on predominantly smooth background; epomia strong. Mesoscutum rugose-punctate, convex in profile, *ca* 1.1× as long as wide, notaulus not developed. Scuto-scutellar groove wide, deep. Scutellum rugose-punctate, convex, lateral carina indistinct. Upper half of mesopleuron densely punctate with weak rugosity, lower half densely punctate on granulate background, distances between punctures smaller than puncture diameters, with rather strong transverse wrinkles above and anterior to speculum; speculum smooth, shiny; mesopleural suture impressed with short, relatively strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, little elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, elevated, medially distinctly excised and curved inwards, submedially convex. Metanotum rugose-punctate, 0.4–0.5× as long as scutellum. Metapleuron rugose-punctate; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle oval, separated from pleural carina by *ca* 0.5–0.7× its length, connected to pleural carina by a weak ridge. Propodeum long, its apex reaching middle length of hind coxa, coarsely rugose-punctate, area superomedia and area petiolaris with distinct transverse wrinkles and rugosity, medially not impressed. Area basalis trapezoidal, rather short, *ca* 0.5× as long as its basal width; area superomedia hexagonal, relatively short and moderately wide, *ca* 1.6× as long as wide, reaching up to basal 0.40–0.45× length of propodeum, apically opened, confluent with area petiolaris; area petiolaris moderately wide. Propodeal carinae complete; lateromedian longitudinal carinae distinctly angulate at costulae and convergent behind costulae. Fore wing with long-stalked areolet, its stalk 0.7–0.9 × as long as maximum height of areolet, 3*rs-m* present,

pigmented, second recurrent vein (2*m-cu*) close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) interstitial to slightly postfurcal, weakly inclivous; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted slightly above its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) broken, intercepted by discoidella (distal abscissa of *Cu*1) at about posterior 0.2–0.3× its length, strongly inclivous above discoidella, weakly reclivous below discoidella; discoidella spectral, proximally connected to nervellus. Coxae granulate with weak punctures. Hind femur relatively stout, *ca* 5× as long as high. Inner spur of hind tibia *ca* 0.5× as long as first tarsomere of hind tarsus. Tarsal claws slightly longer than arolium, basal two-third with strong pecten.

Metasoma. Metasoma with short, greyish to light brownish hairs, compressed, petiolus smooth, from postpetiolus finely granulate to shagreened. First tergite *ca* 4.6–4.8× as long as width of its apical margin, 1.1–1.2× as long as second tergite, *ca* 0.95× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated little above mid-height at basal third of first metasomal segment. Second tergite long and slender, *ca* 1.8–2.1× as long as its apical width; thyridium small, oval, its distance from basal margin of tergite *ca* 3× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of apical tergites medially distinctly excised. Ovipositor sheath 1.2–1.4× as long as hind tibia; ovipositor compressed, evenly, weakly upcurved.

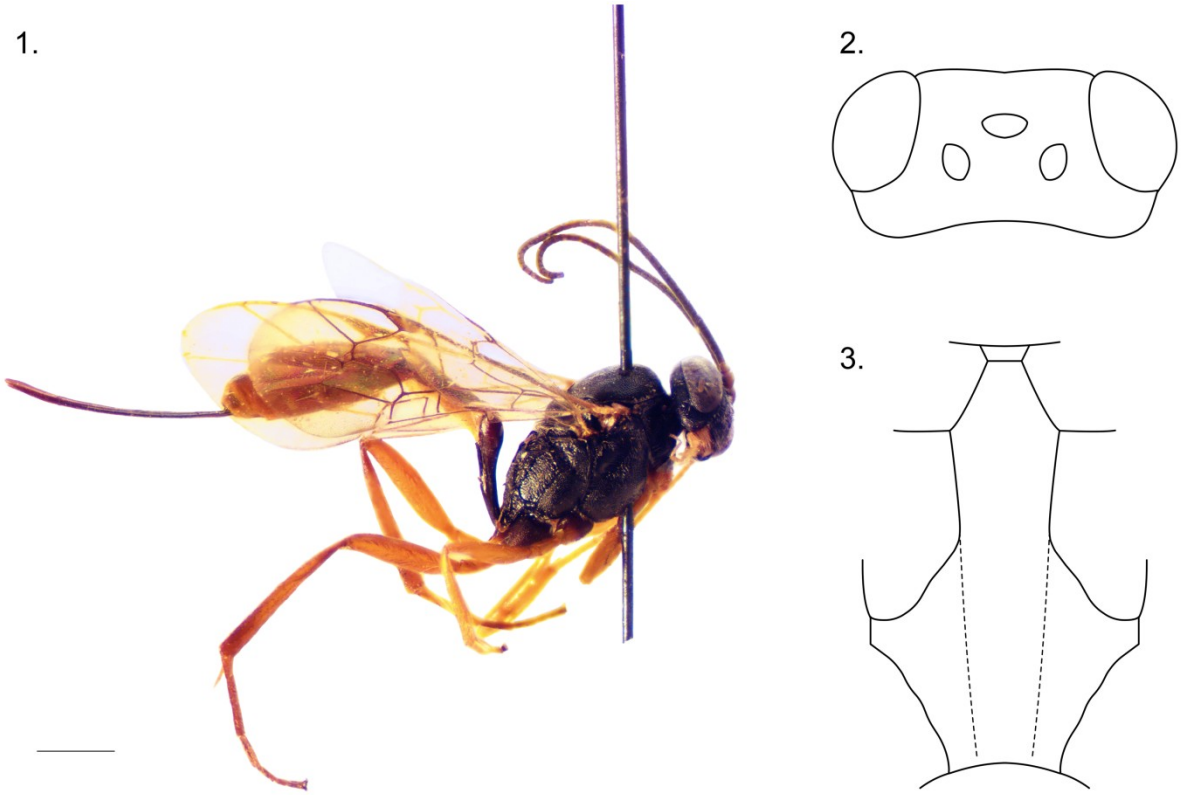
Colour. Antenna dark brown, scapus and pedicellus ventrally more or less extensively orange brown. Head black except palpi and mandible yellow, mandibular teeth dark reddish brown. Mesosoma black except tegula orange brown. Metasoma: first tergite black, postpetiolus laterally and apically very dark reddish brown; second tergite blackish, apical margin and apicolateral corners narrowly reddish brown; third tergite blackish to dark brown, subapically widely reddish, apically narrowly dark brown, sometimes less extensively reddish; following tergites reddish with dark brown dorsal patches; ovipositor sheath blackish. Wings hyaline, wing veins and pterostigma brown. Fore leg: entirely reddish orange, apical tarsomere darkened. Middle leg: coxa dark brown, apically narrowly orange brown; rest of leg reddish orange, apical tarsomere darkened. Hind leg: coxa blackish, apically very narrowly orange brown; rest of leg reddish orange, except tibia dorsally and tarsus more or less darkened, brownish, rarely trochanter partly brownish.

Male. Similar to female in all characters described above, except: propodeal spiracle elongate oval, separated from pleural carina by *ca* about its length, connected to pleural carina by a strong ridge; propodeal carinae and sculpture stronger than in female; stalk of areolet little shorter than in female; first tergite slenderer, *ca* 5.5× as long as width of its apical margin, 1.3× as long as second tergite; third and following tergites short, posterior margins medially not excised; claspers narrowly, deeply notched dorsally; first tergite entirely, second and third tergites almost entirely black, dorsal patches of apical tergites larger and darker than in female; wings subhyaline.

Distribution. South Africa.

Etymology. The specific epithet *aurantia* is the feminine form of the Latin adjective *aurantius, -a, -um* meaning orange-coloured; it refers to the colouration of legs of the new species.

Remarks. The new species is similar to *Venturia canescens* (Gravenhorst, 1829), which could be distinguished from the new species by its following characteristics: gena shorter (in dorsal view *ca* 0.3× as long as eye width) and more strongly narrowed behind eye, background of mesopleuron somewhat smoother, more finely sculptured, posterior transverse carina of mesosternum normal, area superomedia much more elongate and narrow (*ca* 2× as long as wide), lateromedian longitudinal carinae about parallel and not distinctly angulate at costulae, areolet



Figures 1–3. *Venturia aurantia* sp. nov. 1 = holotype, lateral habitus (scale bar = 1 mm); 2 = head, dorsal view; 3 = shape of median areas of propodeum.

short-stalked or subsessile, ovipositor sheath longer, *ca* 1.6× as long as hind tibia, male claspers more widely and less deeply notched dorsally, tegula yellow, fore and middle coxae, trochanters, trochantelli, and hind trochantellus yellowish, femora and tibiae mostly yellowish brown to brownish, not orange.

Venturia canescens (Gravenhorst, 1829)

Material examined. Three females and one male, Tanzania, Usa River, 1190m, 1965, leg. J. Szunyoghy, Id. No. HNHM-HYM 154976–154979. – The specimens are deposited in HNHM (Budapest).

Remarks. First record for Tanzania. This species has a worldwide distribution (Yu *et al.* 2012, Vas 2019*a*).

Venturia crassicaput (Morley, 1926)

Material examined. One female, S. Afr. [= South Africa], Natal, Royal Natal National Park, Tugela Valley, 5.IV.[19]51, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 265, Insect trap, Id. No. MZLU-HYM 26380. – Four females and one male, S. Afr. [= South Africa], Natal, Royal Natal National Park, 7–11.IV.[19]51, same collectors, No. 271, Id. No. MZLU-HYM 26379, 26381 (male), 26386, 26387, 26401. – The specimens are deposited in MZLU (Lund) except MZLU-HYM 26387, 26401 are deposited in HNHM (Budapest) (HNHM-HYM 154984, 154985).

Remarks. First records for South Africa. This species was described from Zimbabwe and recently reported from Tanzania (Yu *et al.* 2012, Vas 2019*a*).

Venturia erythrina sp. nov.

(Figures 4–6)

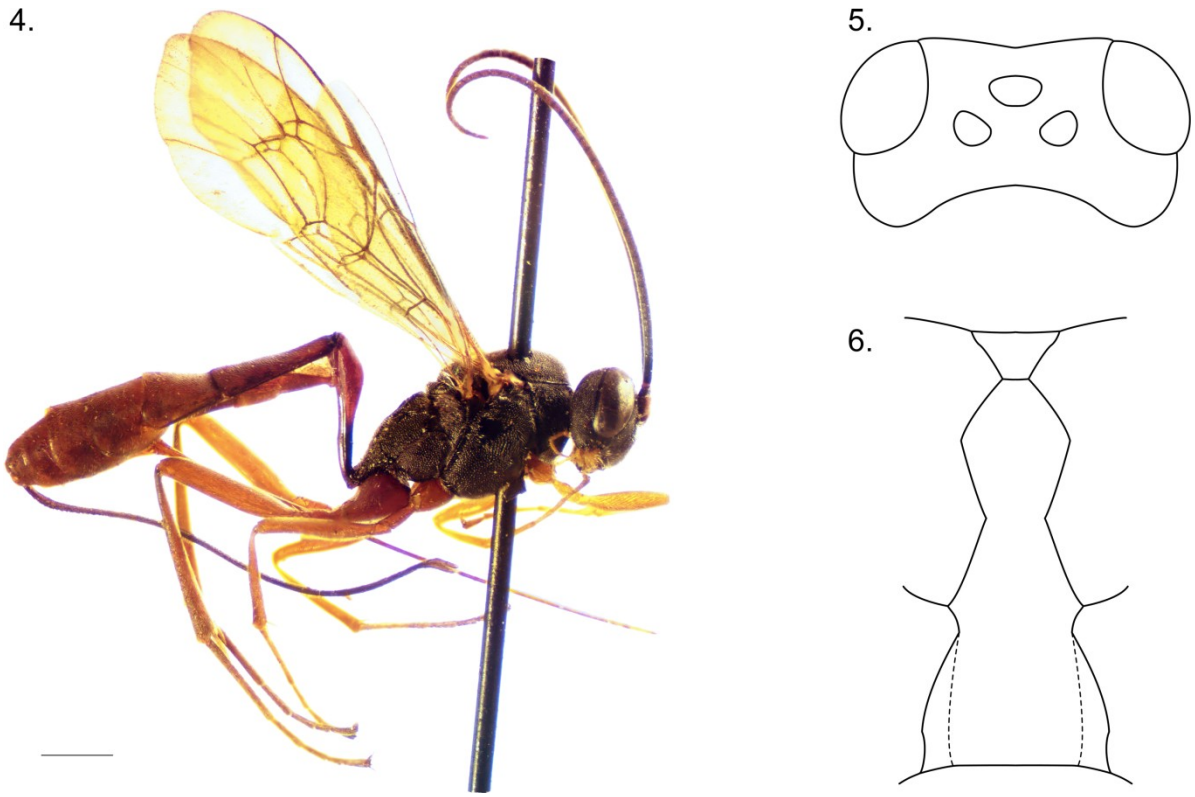
Material examined. Holotype: female, Africa or. [= orientalis], [Tanzania], Arusha, 1906, leg. [K.] Katona [= K. Kittenberger]; specimen pinned, Id. No. HNHM-HYM 154972. – The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Afrotropical species of the genus, *Venturia erythrina* sp. nov. could be reliably identified by the combined presence of the following characters: gena long, in dorsal view 0.7× as long as eye width, subparallel behind eye, area superomedia moderately narrow, 1.6× as long as wide, ovipositor sheath 2.4× as long as hind tibia, ovipositor tip strongly upcurved, scapus ventrally brownish yellow, mandible yellowish except teeth, tegula light reddish brown, metasoma rusty reddish except basal 0.4 of first tergite black and extreme base of second tergite very narrowly blackish, all legs, including coxae, reddish to rusty reddish, except middle and hind tibiae dorsally brownish, basal 0.2 of hind tibia dark brown, middle and hind tarsi brown.

Description. Female (Figs 4-6). Body length *ca* 10 mm, fore wing length *ca* 7 mm.

Head. Antenna with 42 flagellomeres; first flagellomere *ca* 3× as long as wide apically; preapical flagellomeres longer than wide. Head transverse, matt, with dense, short, silvery hairs. Ocular-ocellar distance 0.9× as long as ocellus diameter, posterior ocellar distance 1.2× as long as ocellus diameter, posterior ocellar distance 1.3× as long as ocular-ocellar distance. Inner eye orbits slightly indented, about parallel. Gena distinctly, densely punctate on granulate surface, moderately buccate, long, in dorsal view 0.7× as long as eye width, subparallel behind eye. Occipital carina complete, medially evenly arched, reaching hypostomal carina distinctly before base of mandible, hypostomal carina not elevated. Frons flat, without median longitudinal carina, rugose-punctate. Face almost flat in profile, densely rugose-punctate. Clypeus weakly rugose with dense punctures, very weakly separated from face, flat in profile, relatively wide, its apical margin almost straight, sharp. Malar space short, 0.4× as long as basal width of mandible. Mandible moderately long, lower margin of mandible with moderately wide flange from base toward teeth, flange gradually narrowed toward teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma with dense, short, silvery hairs. Pronotum strongly and densely rugose-punctate, ventral half with weak transverse wrinkles; epomia distinct. Mesoscutum coarsely rugose-punctate, convex in profile, about as long as wide, notaulus not developed. Scuto-scutellar groove wide, deep. Scutellum rugose-punctate, convex, lateral carina indistinct. Upper half of mesopleuron moderately rugose with strong, dense punctures, lower half strongly, densely punctate on coarsely granulate background, distances between punctures smaller than puncture diameters, with weak transverse wrinkles anterior to speculum; speculum relatively small, very finely granulate to smooth, shiny; mesopleural suture impressed with short, relatively weak transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated, medially not excised. Metanotum rugose-punctate, *ca* 0.5× as long as scutellum. Metapleuron rugose-punctate; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle elongate oval, separated from pleural carina by *ca* 0.5× its length, connected to pleural carina by a weak ridge. Propodeum long, its apex reaching middle length of hind coxa, coarsely and densely rugose-punctate, except area superomedia granulate with relatively weak transverse wrinkles and area petiolaris with mostly transverse rugosity, medially not impressed. Area basalis trapezoidal, small, about as long as its basal width; area superomedia elongate hexagonal, moderately narrow, 1.6× as long as wide, reaching up to basal 0.35 × length of propodeum, behind costulae



Figures 4–6. *Venturia erythrina* sp. nov. 1 = holotype, lateral habitus (scale bar = 1 mm); 2 = head, dorsal view; 3 = shape of median areas of propodeum.

distinctly constricted; area petiolaris moderately narrow. Propodeal carinae strongly developed, area superomedia apically opened, confluent with area petiolaris. Fore wing with short-stalked, relatively large areolet, its stalk about 0.25× as long as maximum height of areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) little to distal middle of areolet; distal abscissa of *Rs* almost straight, distally weakly curved toward wing margin; nervulus (*cu-a*) interstitial, strongly inclivous; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted slightly above its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) weakly broken, intercepted by discoidella (distal abscissa of *Cu*1) at about posterior 0.3× its length, vertical above discoidella, weakly reclivous below discoidella; discoidella spectral, proximally connected to nervellus. Coxae granulate with distinct, dense punctures. Hind femur relatively stout, *ca* 5× as long as high. Inner spur of hind tibia *ca* 0.5× as long as first tarsomere of hind tarsus. Tarsal claws strong, distinctly longer than arolium, basal half with strong pecten.

Metasoma. Metasoma with short, greyish hairs, moderately compressed, petiolus smooth, from postpetiolus finely granulate to shagreened. First tergite *ca* 4× as long as width of its apical margin, 1.1× as long as second tergite, 0.95× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated at about mid-height at basal third of first metasomal segment. Second tergite long and slender, *ca* 2× as long as its apical width; thyridium small, oval, weak, its distance from basal margin of tergite *ca* 3× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of third and following tergites medially distinctly, widely concave. Ovipositor sheath 2.4× as long as hind tibia; ovipositor compressed, shaft weakly, tip strongly upcurved.

Colour. Antenna dark brown, scapus ventrally brownish yellow. Head black except palpi and mandible yellowish, mandibular teeth dark brown. Mesosoma black except tegula light reddish brown. Metasoma rusty reddish except basal 0.4 of first tergite black and extreme base of second tergite very narrowly blackish; ovipositor sheath blackish. Wings weakly infuscate, wing veins and pterostigma brown. All legs, including coxae, reddish to rusty reddish, except middle and hind tibiae dorsally brownish, basal 0.2 of hind tibia dark brown, middle and hind tarsi brown.

Male. Unknown.

Distribution. Tanzania.

Etymology. The specific epithet *erythrina* is the feminine form of the Latinised Greek adjective *erythrinus, -a, -um* meaning reddish; it refers to the colouration of legs and metasoma of the new species.

Remarks. The new species is most similar to *Venturia crassicaput* (Morley, 1926), which species could be easily distinguished from the new species by its almost entirely black middle and hind coxae, dorsally less darkened hind tibia, more extensively blackish basal tergites of metasoma, more elongate area superomedia (*ca* 2× as long as wide), and distinctly longer ovipositor sheath (almost 3× as long as hind tibia).

Venturia ignea sp. nov.

(Figures 7–9)

Material examined. Holotype: female, Ghana, Ashanti region, Kumasi, 293m, 4.II.1968, leg. S. Endrődy-Younga, light trap, No. 297; specimen card-mounted, Id. No. HNHM-HYM 154980. – Paratype: female, same locality, date, collector; antennae damaged, specimen card-mounted, Id. No. HNHM-HYM 154981. – The holotype and paratype specimens are deposited in HNHM (Budapest).

Diagnosis. Among the Afrotropical species of the genus, *Venturia ignea* sp. nov. could be reliably identified by the combined presence of the following characters: gena moderately long, in dorsal view 0.55× as long as eye width, weakly narrowed behind eye, area superomedia rather elongate and narrow, *ca* 3× as long as wide, with weak, mostly transverse rugosity, area petiolaris irregularly rugose-punctate without transverse wrinkles, propodeal carinae partly weakened, ovipositor sheath 1.3–1.4× as long as hind tibia, apical half of ovipositor evenly, strongly upcurved, scapus and pedicellus ventrally yellow, mandible yellow except teeth, tegula yellowish, metasoma amber-coloured except petiolus, basal half of second tergite and basal quarter of third tergite black to dark brown, fore and middle legs predominantly yellowish, base of coxae narrowly darkened, femora and ventral side of tibiae with light orange tinge, hind coxa almost entirely dark, trochanter, trochantellus and dorsal side of tibia yellowish, femur, ventral side of tibia and tarsus light orange.

Description. Female (Figs 7–9). Body length *ca* 8 mm, fore wing length *ca* 5 mm.

Head. Antenna with 45 flagellomeres; first flagellomere *ca* 3× as long as wide apically; preapical flagellomeres longer than wide. Head transverse, matt, with dense, relatively long, silvery hairs. Ocular-ocellar distance about as long as ocellus diameter, posterior ocellar distance 1.6–1.7× as long as ocellus diameter, posterior ocellar distance 1.6–1.7× as long as ocular-ocellar distance. Inner eye orbits slightly indented, subparallel. Gena granulate with dense, superficial punctures, moderately long, in dorsal view 0.55× as long as eye width, weakly narrowed behind eye. Occipital carina complete, medially evenly arched, reaching hypostomal carina little before base of mandible, hypostomal carina not elevated. Frons flat, without median longitudinal carina, rugose-punctate. Face weakly convex in profile, rugose-punctate, punctures moderately strong. Clypeus rugose-punctate, very weakly separated from face, almost flat in profile, relatively wide, its apical margin sharp, medially straight, truncate, laterally very weakly convex. Malar space short, 0.4× as long as basal width of mandible. Mandible relatively long and strong, lower margin of mandible with a moderately wide flange from base toward teeth, flange gradually

narrowed toward teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma with dense, short, silvery hairs. Pronotum rugose-punctate, ventral third with weak, short transverse wrinkles; epomia weak. Mesoscutum rugose-punctate, convex in profile, 1.1× as long as wide, notaulus not developed. Scuto-scutellar groove wide, moderately deep. Scutellum rugose-punctate, convex, lateral carina indistinct. Upper half of mesopleuron weakly rugose with dense punctures, lower half densely punctate on granulate background, distances between punctures smaller than puncture diameters, with rather weak and short transverse wrinkles anterior to speculum; speculum very finely granulate, subpolished, ventrally smooth; mesopleural suture impressed with short, indistinct transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, not elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete. Metanotum rugose-punctate, *ca* 0.4× as long as scutellum. Metapleuron rugose-punctate; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle elongate oval, almost touching pleural carina. Propodeum long, its apex reaching middle length of hind coxa, coarsely, irregularly rugose-punctate except area superomedia with weak, mostly transverse rugosity; area petiolaris irregularly rugose-punctate without transverse wrinkles or transverse rugosity, medially not impressed. Area basalis triangular, narrow, longer than its basal width; area superomedia rather elongate and narrow, *ca* 3× as long as wide, reaching up to basal 0.5× length of propodeum, apically opened, confluent with area petiolaris; area petiolaris moderately narrow. Propodeal carinae partly weakened; lateromedian longitudinal carinae behind costulae weak; lateral longitudinal carinae obsolescent. Fore wing with short-stalked, relatively large areolet, its stalk *ca* 0.4× as long as maximum height of areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) distinctly distal to middle of areolet; distal abscissa of *Rs* almost straight, distally weakly curved toward wing margin; nervulus (*cu-a*) interstitial, weakly inclivous; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell weakly acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) broken, intercepted by discoidella (distal abscissa of *Cu*1) at about posterior 0.4× its length, vertical above discoidella, strongly reclivous below discoidella; discoidella spectral, proximally connected to nervellus. Coxae granulate with weak punctures. Hind femur stout, *ca* 4.6× as long as high. Inner spur of hind tibia *ca* 0.5× as long as first tarsomere of hind tarsus. Tarsal claws slightly longer than arolium, basal half with strong pecten.

Metasoma. Metasoma with short, whitish hairs, compressed, petiolus smooth, from postpetiolus finely granulate to shagreened. First tergite *ca* 4.5–4.7× as long as width of its apical margin, 1.0–1.1× as long as second tergite, about as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated little above mid-height at basal third of first metasomal segment. Second tergite long and slender, *ca* 2.2–2.4× as long as its apical width; thyridium small, oval, its distance from basal margin of tergite *ca* 4× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of apical tergites medially slightly and widely excised. Ovipositor sheath 1.3–1.4× as long as hind tibia; ovipositor compressed, apical half evenly, strongly upcurved.

Colour. Antenna yellowish brown, dorsally brown, scapus and pedicellus ventrally yellow. Head black except palpi and mandible yellow, mandibular teeth dark brown. Mesosoma black except tegula yellowish. Metasoma amber-coloured except petiolus, basal half of second tergite and basal quarter of third tergite black to dark brown; ovipositor sheath dark brown. Wings hyaline, wing veins and pterostigma brown. Fore and middle legs: coxae pale yellow, basal third to

half brownish; trochanters and trochantelli pale yellow; femora and ventral side of tibiae yellowish with light orange tinge, dorsal side of tibiae and tarsi yellowish. Hind leg: coxa blackish to dark brown, apically narrowly yellowish; trochanter and trochantellus pale yellow; femur, ventral side of tibia and tarsus light orange, dorsal side of tibia yellowish.

Male. Unknown.

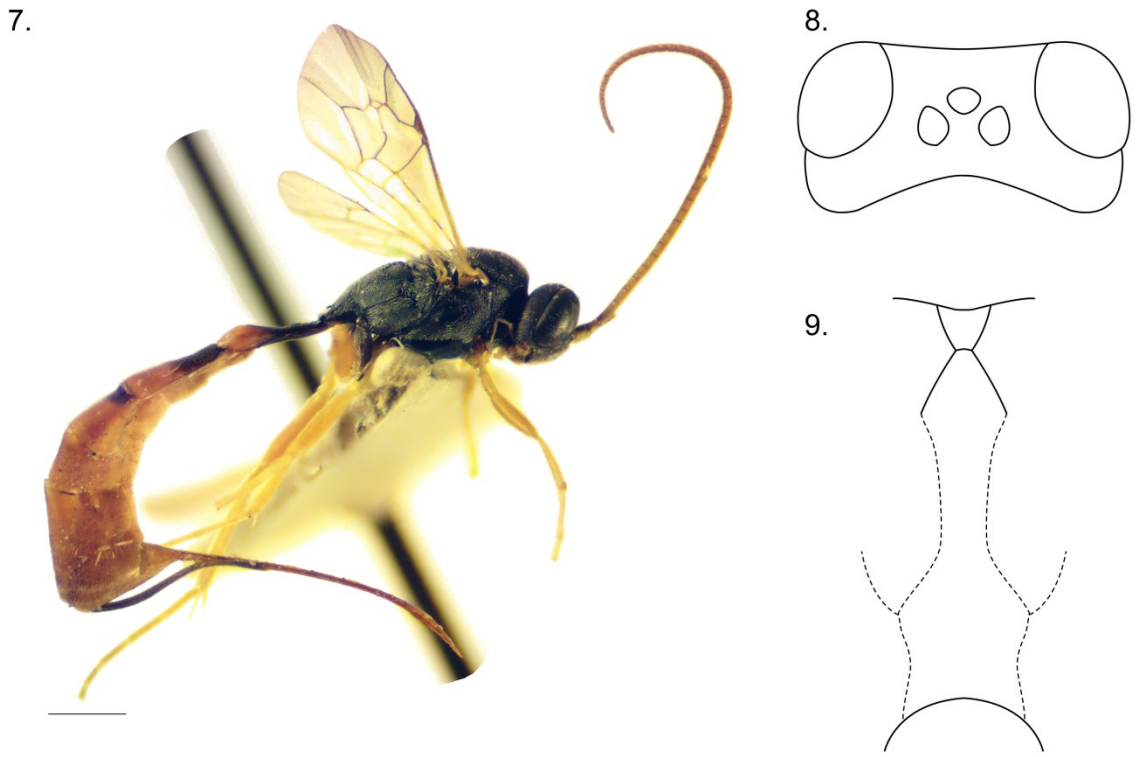
Distribution. Ghana.

Etymology. The specific epithet *ignea* is the feminine form of the Latin adjective *igneus, -a, -um* meaning fiery, inflamed, glowing; it refers to the colouration of metasoma and legs of the new species.

Remarks. The new species is somewhat similar to *Venturia jordanae* Fitton, 1994, which species could be readily distinguished from the new species by its buccate, distinctly longer gena (in dorsal view *ca* 0.9× as long as eye width), transversely striated area petiolaris and area superomedia, shorter and less upcurved ovipositor (ovipositor sheath as long as hind tibia), and distinctly darker coloured hind legs and metasoma.

Venturia peringueyi (Cameron, 1906)

Material examined. One male, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 14.II.[19]51, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 183, Insect trap, Id. No. MZLU-HYM 26392. – One male, same locality, collectors, 2.II.[19]51, No. 166, Id. No. MZLU-HYM 26400. – Specimen MZLU-HYM 26392 is deposited in MZLU (Lund), specimen MZLU-HYM 26400 is deposited in HNHM (Budapest) (HNHM-HYM 154988).



Figures 7–9. *Venturia ignea* sp. nov. 1 = holotype, lateral habitus (scale bar = 1 mm); 2 = head, dorsal view; 3 = shape of median areas of propodeum.

First description of male sex. This species, as well as its junior synonym *Venturia areolata* (Cameron, 1926), was described from South Africa, based on female sex only (Cameron 1906). The male is similar to the female except in the following characters: antenna with 35–36 flagellomeres; gena little longer than in female, in dorsal view 0.55–0.60× as long as eye width, less strongly narrowed behind eye; mesopleuron more strongly punctate; propodeal carination and sculpture stronger; area superomedia and area petiolaris little narrower; claspers widely, moderately deeply notched dorsally; metasoma distinctly darker coloured than in female, petiolus dark brown, postpetiolus reddish brown, second and third tergites entirely, fourth tergite basally brownish with weak reddish brown tinge, following tergites dark brown.

Venturia veruta sp. nov.

(Figures 10–12)

Material examined. Holotype: female, Uganda, Mujenje, VIII.1913, leg. [K.] Katona [= K. Kittenberger]; specimen card-mounted, Id. No. HNHM-HYM 154973. – The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Afrotropical species of the genus, *Venturia veruta* sp. nov. could be reliably identified by the combined presence of the following characters: gena moderately long, in dorsal view 0.55× as long as eye width, weakly narrowed behind eye, area superomedia elongate, narrow, *ca* 2× as long as wide, propodeal carinae partly developed, partly obsolescent, ovipositor sheath 2.9× as long as hind tibia, ovipositor straight, its apex very weakly sinuous, scapus and pedicellus ventrally narrowly yellowish brown, mandible yellow except teeth, tegula pale yellow, metasoma light amber-coloured except petiolus blackish, postpetiolus basally yellowish brown, basal two-third of second tergite and extreme base of third tergite dark brown, fore and middle legs, except coxae, yellowish, middle and hind coxae almost entirely dark, hind femur and tibia brownish yellow, tibia dorsally brownish.

Description. Female (Figs 10–12). Body length *ca* 8 mm, fore wing length *ca* 5 mm.

Head. Antenna with 43 flagellomeres; first flagellomere *ca* 3× as long as wide apically; preapical flagellomeres little longer than wide. Head transverse, matt, with dense, relatively long, greyish hairs. Ocular-ocellar distance about as long as ocellus diameter, posterior ocellar distance 1.4× as long as ocellus diameter, posterior ocellar distance 1.4× as long as ocular-ocellar distance. Inner eye orbits slightly indented, subparallel. Gena granulate with weak punctures, moderately long, in dorsal view 0.55× as long as eye width, weakly narrowed behind eye. Occipital carina complete, medially evenly arched, reaching hypostomal carina little before base of mandible, hypostomal carina not elevated. Frons flat, without median longitudinal carina, rugose-punctate, punctures weaker than on face and clypeus. Face flat in profile, rugose-punctate, punctures moderately strong. Clypeus rugose-punctate, very weakly separated from face, flat in profile, relatively wide, its apical margin sharp, medially straight, truncate, laterally weakly convex. Malar space short, 0.5× as long as basal width of mandible. Mandible relatively long and strong, lower margin of mandible with a rather narrow flange from base toward teeth, flange gradually narrowed toward teeth, upper mandibular tooth little longer than lower tooth.

Mesosoma. Mesosoma with dense, moderately short, silvery hairs. Pronotum rugose-punctate, ventral half with weak transverse wrinkles; epomia weak. Mesoscutum rugose-punctate, convex in profile, little longer than wide, notaulus not developed. Scuto-scutellar groove wide, relatively shallow. Scutellum rugose-punctate, convex, lateral carina indistinct. Upper half of mesopleuron moderately rugose with dense punctures, lower half densely punctate on coarsely granulate background, distances between punctures smaller than puncture diameters, with rather weak transverse wrinkles anterior to speculum; speculum relatively small, very finely granulate, subpolished; mesopleural suture impressed with short, weak transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height,

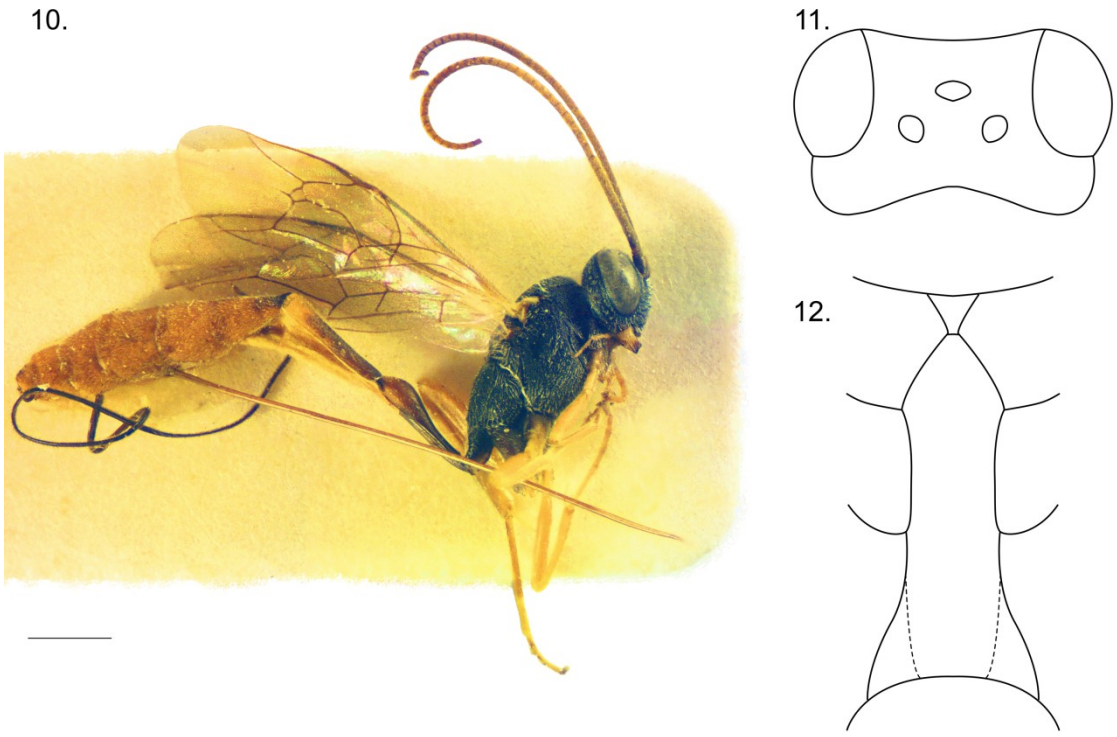
transversal part (*i.e.* part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, not elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, slightly elevated, medially not excised. Metanotum rugose-punctate, *ca* 0.5× as long as scutellum. Metapleuron granulate to rugose with dense punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum moderately strong; propodeal spiracle oval, separated from pleural carina by *ca* 0.5× its length. Propodeum long, its apex reaching little beyond middle length of hind coxa, coarsely rugose-punctate except area superomedia granulate with weak transverse wrinkles and area petiolaris granulate to rugose with relatively weak transverse wrinkles, medially not impressed. Area basalis triangular, small, about as long as its basal width; area superomedia elongate, narrow, *ca* 2× as long as wide, reaching almost up to basal 0.5× length of propodeum, apically opened, confluent with area petiolaris; area petiolaris narrow. Propodeal carinae partly developed; lateromedian longitudinal carinae developed before costulae but relatively weak, behind costulae obsolescent; costulae developed but relatively weak; lateral longitudinal carinae obsolescent; posterior transverse carina only laterally developed. Fore wing with short-stalked, relatively large areolet, its stalk *ca* 0.4× as long as maximum height of areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) little distal to middle of areolet; distal abscissa of *Rs* almost straight, distally weakly curved toward wing margin; nervulus (*cu-a*) interstitial, distinctly inclivous; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted slightly below its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) broken, intercepted by discoidella (distal abscissa of *Cu*1) at about posterior 0.25× its length, vertical above discoidella, reclivous below discoidella; discoidella spectral, proximally connected to nervellus. Coxae granulate with weak punctures. Hind femur relatively stout, *ca* 5× as long as high. Inner spur of hind tibia *ca* 0.5× as long as first tarsomere of hind tarsus. Tarsal claws little longer than arolium, basal half with distinct pecten.

Metasoma. Metasoma with moderately short, whitish hairs, compressed, petiolus smooth, from postpetiolus finely granulate to shagreened. First tergite *ca* 5× as long as width of its apical margin, 0.9× as long as second tergite, as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated slightly above mid-height at basal third of first metasomal segment. Second tergite rather long and slender, *ca* 2.7× as long as its apical width; thyridium small, rather weak, subcircular, its distance from basal margin of tergite *ca* 3.5× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of third and following tergites medially slightly and widely concave, apical tergites more strongly excised medially. Ovipositor sheath 2.9× as long as hind tibia; ovipositor compressed, straight, its apex very weakly sinuous, dorsal preapical notch weak, indistinct.

Colour. Antenna brown, scapus and pedicellus ventrally narrowly yellowish brown. Head black except palpi and mandible yellow, mandibular teeth dark brown. Mesosoma black except tegula pale yellow. Metasoma light amber-coloured except petiolus blackish, postpetiolus basally yellowish brown, basal two-third of second tergite and extreme base of third tergite dark brown; ovipositor sheath blackish. Wings subhyaline, wing veins and pterostigma brown. Fore leg: coxa basally brownish, apically yellowish; trochanter, trochantellus, femur, tibia and tarsus yellowish. Middle leg: coxa dark brown, apically narrowly yellowish; trochanter, trochantellus, femur, tibia and tarsus yellowish, apical tarsomere brownish. Hind leg: coxa blackish to dark brown, apically very narrowly yellowish; trochanter brownish, apically yellowish; trochantellus yellowish; femur brownish yellow; tibia brownish yellow, dorsally brownish; tarsus brownish.

Male. Unknown.

Distribution. Uganda.



Figures 10–12. *Venturia veruta* sp. nov. 1 = holotype, lateral habitus (scale bar = 1 mm); 2 = head, dorsal view; 3 = shape of median areas of propodeum.

Etymology. The specific epithet *veruta* is the feminine form of the Latin adjective *verutus, -a, -um* meaning armed with a javelin; it refers to the long and straight ovipositor of the new species.

Remarks. The new species has a rather unique character combination, which is dissimilar to any known *Venturia* species in the region (see Diagnosis section). Due to the very long ovipositor it is rather superficially similar to *Venturia crassicaput* (Morley, 1926), which species could be readily distinguished from the new species by its buccate, distinctly longer gena (in dorsal view *ca* 0.7× as long as eye width), stronger propodeal carination, strongly upcurved ovipositor tip, and predominantly reddish colouration of legs and metasoma.

ORIENTAL REGION

Before this study, 35 valid species were known from the region (Yu *et al.* 2012). Gupta & Maheshwary (1977) revised the Oriental species; since then only four species were described from the region (Kusigemati 1988, Sudheer & Narendran 2006). With the new species described below, the number of Oriental *Venturia* species increased to 36.

Venturia biroi sp. nov.

(Figures 13–15)

Material examined. Holotype: female, India or. [= orientalis], [Maharastra state], Matheran, 10.VII.1902, leg. [L.] Bíró; specimen pinned, Id. No. HNHM-HYM 154967. – The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Oriental species of the genus, *Venturia biroi* sp. nov. could be reliably identified by the combined presence of the following characters: antennal flagellomeres dark brown, scapus and pedicellus almost entirely pale yellow except a narrow brown stripe laterally,

frons without median longitudinal carina, face rugose-punctate, posterior ocellar distance 2.5× as long as ocular-ocellar distance, mandible pale yellow, its lower margin with rather wide flange, gradually narrowed toward teeth, tegula pale yellow, mesopleuron and metapleuron strongly, densely punctate on smooth background, area superomedia elongate hexagonal, moderately narrow, 1.6× as long as wide, almost entirely smooth, area petiolaris with strong transverse wrinkles, fore wing with petiolate, long-stalked, small areolet, nervellus intercepted, ovipositor sheath 1.5× as long as hind tibia, first tergite black, apically brownish, second and third tergites blackish, apically narrowly reddish brown, following tergites dorsally blackish, laterally reddish brown, hind femur reddish brown, hind tibia reddish brown, subbasally and apically darkened, basal yellowish brown spot present but indistinct.

Description. Female (Figs 13–15). Body length *ca* 7 mm, fore wing length *ca* 4 mm.

Head. Antenna with 33 flagellomeres; first flagellomere long and slender, *ca* 4× as long as wide apically; preapical flagellomeres quadrate to slightly longer than wide. Head transverse, matt, with dense, greyish hairs. Ocular-ocellar distance 0.6× as long as ocellus diameter, posterior ocellar distance 1.5× as long as ocellus diameter, posterior ocellar distance 2.5× as long as ocular-ocellar distance. Inner eye orbits slightly indented, parallel. Gena granulate with weak punctures, short, in dorsal view 0.3× as long as eye width, strongly narrowed behind eye. Occipital carina complete, medially evenly arched, reaching hypostomal carina little before base of mandible, hypostomal carina little elevated. Frons flat, without median longitudinal carina, rugose-punctate, punctures weaker than on face and clypeus. Face weakly convex in profile, strongly rugose-punctate. Clypeus strongly rugose-punctate, very weakly separated from face, almost flat in profile, relatively wide, its apical margin weakly convex, sharp. Malar space short, 0.4× as long as basal width of mandible. Mandible relatively long, lower margin of mandible with rather wide flange from base toward teeth, flange gradually narrowed toward teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma with dense, short, greyish hairs. Dorsal third of pronotum rugose-punctate, ventral two-third smooth with strong transverse wrinkles; epomia weak. Mesoscutum coarsely rugose-punctate, convex in profile, about as long as wide, notaulus not developed. Scutoscutellar groove wide, relatively shallow. Scutellum punctate, apically rugose-punctate, convex, lateral carina indistinct. Mesopleuron strongly, densely punctate on smooth, shiny background, distances between punctures smaller than puncture diameters, with relatively long and strong transverse wrinkles anterior to speculum; speculum large, smooth, shiny; mesopleural suture impressed with short, weak transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated, medially not excised. Metanotum rugose-punctate, *ca* 0.4× as long as scutellum. Metapleuron strongly, densely punctate on smooth background; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle elongate oval, separated from pleural carina by about its length, connected to pleural carina by a distinct ridge. Propodeum long, its apex reaching middle length of hind coxa, coarsely rugose-punctate except area superomedia almost entirely smooth and area petiolaris with strong transverse wrinkles, medially not impressed. Area basalis trapezoidal, shorter than its basal width; area superomedia elongate hexagonal, moderately narrow, 1.6× as long as wide, reaching up to basal 0.3× length of propodeum; area petiolaris moderately wide. Propodeal carinae strongly developed, area superomedia apically opened, confluent with area petiolaris. Fore wing with petiolate, long-stalked, small areolet, its stalk about as long as maximum height of areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) very

close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) interstitial; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted little above its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) broken, intercepted by discoidella (distal abscissa of *Cu*1) at about posterior 0.35× its length, vertical above discoidella, weakly reclivous below discoidella; discoidella spectral, proximally connected to nervellus. Coxae granulate with distinct punctures. Hind femur relatively stout, *ca* 5× as long as high. Inner spur of hind tibia *ca* 0.5× as long as first tarsomere of hind tarsus. Tarsal claws thin, little longer than arolium, basal half with small but distinct pecten.

Metasoma. Metasoma with short, greyish hairs, compressed, petiolus smooth, from postpetiolus finely granulate to shagreened. First tergite *ca* 4.2× as long as width of its apical margin, 1.15× as long as second tergite, 0.95× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated little above mid-height at basal third of first metasomal segment. Second tergite long and slender, *ca* 2.3× as long as its apical width; thyridium small, oval, its distance from basal margin of tergite *ca* 3× as long as its length, connected to basal margin of tergite by a weak, almost indiscernibly shallow groove. Posterior margins of third and following tergites medially slightly and widely concave. Ovipositor sheath 1.5× as long as hind tibia and 1.9× as long as hind femur (total length of exposed ovipositor 1.8× as long as hind tibia and 2.2× as long as hind femur); ovipositor compressed, weakly upcurved.

Colour. Antennal flagellomeres dark brown, scapus and pedicellus almost entirely pale yellow except a narrow brown stripe laterally. Head black except palpi and mandible pale yellow, mandibular teeth reddish brown. Mesosoma black except tegula pale yellow. Metasoma: petiolus black, postpetiolus black, apically brownish; second and third tergites blackish, apically narrowly reddish brown; following tergites dorsally blackish, laterally reddish brown; ovipositor sheath blackish. Wings hyaline, wing veins and pterostigma brown. Fore leg: coxa dark brown, apical third yellowish; trochanter and trochantellus pale yellow; femur, tibia and tarsus yellowish brown, apical tarsomere brownish. Middle leg: coxa blackish to dark brown, apically narrowly yellowish; trochanter and trochantellus pale yellow; femur, tibia and tarsus yellowish brown, apical tarsomere brownish. Hind leg: coxa black, apically narrowly yellowish; trochanter and trochantellus pale yellow; femur reddish brown; tibia reddish brown, subbasally and apically darkened, basal yellowish brown spot present but rather indistinct; tarsus brown except extreme base of first tarsomere very narrowly yellowish brown.

Male. Unknown.

Distribution. India.

Etymology. This species is dedicated to the memory of its collector, Lajos Bíró (1856–1931), in honour of his exceedingly remarkable collecting activity and work for the Hungarian natural history collection, and especially for the Hymenoptera Collection.

Remarks. By using the identification key in Gupta & Maheshwary (1977), the new species key out with *Venturia palmaris* (Wilkinson, 1928) at couplet 14, but without complete match to the characters given in the couplet. *Venturia palmaris* (Wilkinson, 1928) could be distinguished from the new species by its following characteristics: posterior ocellar distance 1.8× as long as ocular-ocellar distance, frons with median longitudinal carina, area superomedia with weak transverse striae, total length of exposed ovipositor significantly longer (3× as long as hind femur), scapus and pedicellus only ventrally yellowish. The new species is also somewhat similar to *Venturia girishi* Sudheer et Narendran, 2006, which species could be easily distinguished from the new species by its not intercepted nervellus and distinctly shorter ovipositor sheath (1.6× as long as hind femur), and colouration differences of scapus, pedicellus, legs and metasoma. *Venturia canescens* (Gravenhorst, 1829) could also be readily distinguished from the new species by its large,

Figures 13–15. *Venturia biroi* sp. nov. 1 = holotype, lateral habitus (scale bar = 1 mm); 2 = head, dorsal view; 3 = shape of median areas of propodeum.

sessile or subsessile areolet, significantly longer, narrower and more strongly sculptured area superomedia, and colouration differences of scapus, pedicellus, legs and metasoma.

PALAEARCTIC REGION

Eight valid species are known from the region (Yu *et al.* 2012). An identification key to the Western Palaearctic species was given by Vas (2019*a*).

Venturia canescens (Gravenhorst, 1829)

Material examined. Two females, Cyprus, Larnaka, VI.1900, leg. Glaszner, Id. No. HNHM-HYM 154962, 154963. – One female, [Greece], Creta [= Crete], Herakelion [= Heraklion], V.1906, leg. [L.] Bíró, Id. No. MZLU-HYM 154961. – The specimens are deposited in HNHM (Budapest).

Remarks. First records for Cyprus and Crete. This species has a worldwide distribution (Yu *et al.* 2012, Vas 2019*a*).

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REFERENCES

CAMERON, P. (1906): Descriptions of new species of parasitic Hymenoptera chiefly in the collection of the South African Museum, Cape Town. *Annals of the South African Museum*, 5: 17–186.

CAMERON, P. (1912): On the Hymenoptera from Belgian Congo in the Congo Museum, Tervueren.

Annales de la Société Entomologique de Belgique, 56: 357–401.

ENDERLEIN, G. (1914): *Hymenoptera IV: Ichneumonidae*. In. MICHAELSEN W. (Ed.) Beiträge zur Kenntnis der Land-und Süsswasserfauna Deutsch-Südwestafrikas. Band 1. Hamburg, p. 211–233.

FÖRSTER, A. (1869): Synopsis der Familien und Gattungen der Ichneumonen. *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens*, 25(1868): 135–221.

GAULD, I.D. (1991): The Ichneumonidae of Costa Rica, 1. Introduction, keys to subfamilies, and keys to the species of the lower Pimpliform subfamilies Rhyssinae, Poemeniinae, Acaenitinae and Cylloceriinae. *Memoirs of the American Entomological Institute*, 47: 1–589.

GAULD, I.D., WAHL, D., BRADSHAW, K., HANSON, P. & WARD, S. (1997): The Ichneumonidae of Costa Rica, 2. Introduction and keys to species of the smaller subfamilies, Anomaloninae, Ctenopelmatinae, Diplazontinae, Lycorininae, Phrudinae, Tryphoninae (excluding *Netelia*) and Xoridinae, with an appendix on the Rhyssinae. *Memoirs of the American Entomological Institute*, 57: 1–485.

GRAVENHORST, J.L.C. (1829): *Ichneumonologia Europaea. Pars III*. Vratislaviae, 1097 pp.
doi: 10.5962/bhl.title.65750

GUPTA, V.K. & MAHESHWARY, S. (1977): Ichneumonologia Orientalis, Part IV. The tribe Porozontini (=Campoplegini) (Hymenoptera: Ichneumonidae). *Oriental Insects Monograph*, 5: 1–267.

HORSTMANN, K. (1973): Übersicht über die europäischen Arten der Gattung Venturia Schrottky (Hymenoptera, Ichneumonidae). *Mitteilungen der Deutschen Entomologischen Gesellschaft*, 32: 7–12.

HORSTMANN, K. (1979): Revision der von Kokujev beschriebenen Campopleginae-Arten (mit Teiltabellen der Gattungen Venturia Schrottky, Campoletis Förster und Diadegma Förster). *Beiträge zur Entomologie*, 29: 195–199.

HORSTMANN, K. (2008): Neue westpalaarktische arten der Campopleginae (Hymenoptera: Ichneumonidae). *Zeitschrift der Arbeitsgemeinschaft Oesterreichischer Entomologen*, 60: 3–27.

JONATHAN, J.K. (1999): *Hymenoptera: Ichneumonidae. Fauna of West Bengal. Part. 8. Insecta (Trichoptera, Thysanoptera, Neuroptera, Hymenoptera and Anoplura)*. Zoological Survey of India, Calcutta, 442 pp.

KUSIGEMATI, K. (1988): Descriptions of four new Ichneumon flies parasitic on pine insect pests in Thailand (Hymenoptera: Ichneumonidae). *Memoirs of the Faculty of Agriculture, Kagoshima University*, 24: 147–155.

MAGRETTI, P. (1884): Roccolte imenotterologiche nell'Africa orientale. *Bollettino della Societa Entomologica Italiana*, 15: 241–253.

MOMOI, S. (1965): Description of a new Ichneumonfly of the genus Devorgilla from Japan (Hymenoptera: Ichneumonidae). *Science Reports of the Hyogo University of Agriculture*, 7(1): 38.

MORLEY, C. (1926): On some South African Ichneumonidae in the collection of the South African Museum. *Annals of the South African Museum*, 23: 435–481.

POLASZEK, A., FITTON, M.G., BIANCHI, G. & HUDDLESTON, T. (1994): The parasitoids of the African white rice borer, Maliarpha separatella Ragonot (Lepidoptera: Pyralidae). *Bulletin of Entomological Research*, 84: 65–89.
doi: 10.1017/S0007485300032247

SCHROTTKY, C. (1902): Neue argentinische Hymenoptera. *Anales del Museo Nacional de Buenos Aires*, 8: 91–117.

SEYRIG, A. (1935): Mission scientifique de l'Omo. Tome III. Fascicule 18. Hymenoptera, II. Ichneumonidae: Cryptinae, Pimplinae, Tryphoninae et Ophioninae. *Mémoires du Muséum National d'Histoire Naturelle*, 4: 1–100.

SUDHEER, K. & NARENDRAN, T.C. (2006): Three new species of Venturia Schrottky (Hymenoptera: Ichneumonidae) from India. *Oriental Insects*, 40: 317–325. doi: 10.1080/00305316.2006.10417485

TOWNES, H. & TOWNES, M. (1973): A catalogue and reclassification of the Ethiopian Ichneumonidae. *Memoirs of the American Entomological Institute*, 19: 1–416.

TOWNES, H. (1969): The genera of Ichneumonidae. Part 1. *Memoirs of the American Entomological Institute*, 11: 1–300.

TOWNES, H. (1970): The genera of Ichneumonidae. Part 3. *Memoirs of the American Entomological Institute*, 13: 1–307.

TOWNES, H., TOWNES, M. & GUPTA, V.K. (1961): A catalogue and reclassification of the Indo-Australian Ichneumonidae. *Memoirs of the American Entomological Institute*, 1: 1–522.

VAN NOORT, S. (2019): WaspWeb: Hymenoptera of the Afrotropical region. Available from: http://www.waspweb.org (accessed 15 March 2020)

VAS, Z. (2019*a*): Contributions to the taxonomy, identification, and biogeography of *Casinaria* Holmgren and *Venturia* Schrottky (Hymenoptera: Ichneumonidae: Campopleginae). *Zootaxa*, 4664(3): 351–364. doi: 10.11646/zootaxa.4664.3.3

VAS, Z. (2019*b*): New species and new records of Campopleginae from the Palaearctic region (Hymenoptera: Ichneumonidae). *Folia entomologica hungarica,* 80: 247–271.

VIERECK, H.L. (1914): Type species of the genera of Ichneumon flies. *United States National Museum Bulletin*, 83: 1–186. doi: 10.5479/si.03629236.83.1

WAHL, D.B. (1987): A revision of *Venturia* north of Central America (Hymenoptera: Ichneumonidae). *University of Kansas, Science Bulletin*, 53: 275–356.

YU, D.S. & HORSTMANN, K. (1997): A catalogue of world Ichneumonidae (Hymenoptera). *Memoirs of the American Entomological Institute*, 58: 1–1558.

YU, D.S., VAN ACHTERBERG, C. & HORSTMANN, K. (2012): *Taxapad 2012 – World Ichneumonoidea 2011. Taxonomy, Biology, Morphology and Distribution.* Ottawa, Ontario, www.taxapad.com.

ZWART, K.W.R. (1998): *Ichneumonidae*. In. POLASZEK, A. (Ed.) African cereal stem borers: economic importance, taxonomy, natural enemies and control. CAB International, Oxon & New York, p. 205–258.

Opusc. Zool. Budapest, 2020, 51(2): 115–121

New data on the pseudoscorpion family Chthoniidae (Arachnida: Pseudoscorpiones) from Hungary

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Abstract. *Chthonius submontanus* Beier, 1963, *Ephippiochthonius romanicus* (Beier, 1935) and *Occidenchthonius parmensis* (Beier, 1963) are firstly recorded from Hungary. The genus *Occidenchthonius* Zaragoza, 2017 is new for the country. A brief description and the relative figures are reported for each species. Fifty-seven species are currently recorded from Hungary.

Keywords. Central Europe, *Chthonius*, *Ephippiochthonius*, *Occidenchthonius*, faunistics, new records.

INTRODUCTION

Pseudoscorpions are small-sized terrestrial arthropods that range from 1 mm to 1 cm in body size (Harvey 2002). They superficially resemble scorpions but lack a sting and a tail and are smaller. With more than 3500 (Harvey 2013) described species and 25 extant families (Benavides *et al*. 2019) they represent one of the four meso-diverse orders of Arachnida (Harvey 2002) and inhabit almost all terrestrial habitats.

The family Chthoniidae comprises twenty-nine genera and more than 600 species (Harvey 2013; Zaragoza 2017) and belongs to the superfamily Chthonioideae, alongside with Pseudotyrannochthoniidae (Benavides *et al*. 2019). Tridenchthoniidae and Lechtyiidae, two former families of hte superfamiliy, were reduced recently to subfamilies of Chthoniidae as Tridenchthoniinae and Lechtyiinae (Benavides *et al*. 2019).

Although investigated from the second half of the 19th century, the pseudoscorpion fauna of Hungary is still poorly known. Occurrence data of 54 species belonging to eight families is known to date from the country (Novák 2012, 2015, Novák & Harvey 2015, Harivey *et al*. 2018), of which 13 belong to three genera of Chthoniidae: *Chthonius* C.L. Koch, 1843 (9 species), *Ephippiochthonius* Beier, 1930 (3) and *Mundochthonius* J.C. Chamberlin, 1929 (1).

The aim of the present study is to report the first occurrences of *Occidenchthonius parmensis* (Beier, 1963), *Chthonius submontanus* Beier, 1963, and *Ephippiochthonius romanicus* (Beier, 1935) in Hungary, with brief descriptions of the specimens found.

MATERIAL AND METHODS

All specimens were collected by hand sampling, sifting or using pitfall traps. Representative specimens were cleared in lactic acid and examined with a stereo- and a Zeiss Axioskop 2 compound light microscope. Drawings were made with the aid of a Zeiss Axioskop 2 microscope. Measurements were made with the Olympus Soft Imaging analySIS work 5.0 software.

The specimens are stored in 70% ethanol and deposited at the Hungarian National History Museum (HNHM). All specimens are accompanied and registered with an inventory number (HNHM Pseud-Nr).

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RESULTS

Chthonius submontanus Beier, 1963

(Figures 1A–C)

Material examined. HNHM Pseud-1882: 1 ♂, Dobogókő, leaf litter of beech forest, sifting, 11.07.2013. leg. Klára Dózsa-Farkas & János Novák; HNHM Pseud-1891: 1♂, Szakonyfalu, 04.1958 leg. ???.

Short description of the main characteristics of the found males. Carapace, tergites, chelicerae and pedipalps pale brown. Hispid granulation on lateral surfaces of carapace and on cheliceral palm. Carapace subquadrate, epistome absent, anterior margin dentate (Fig. 1B). Anterior eyes with convex lens, posterior eyes with flat lens. Carapace with 20 macrosetae and 2+2 microsetae laterally, before the eyes; chaetotaxy: mm4mm: 6:4:2:4 (24). Four lyrifissures present, two at the ocular region and two near the posterior margin of carapace. Tergal chaetotaxy (I–X): 4-4-4-4-6-6-6-6-6-6. Sternal chaetotaxy (II–X): 10:(3)9(3):(2)8(2):6:6:6:6:6:6. Genital opening flanked by 6–7 setae on each side. Cheliceral palm with 6 setae, one seta on movable finger (Fig. 1A). Fixed cheliceral finger with 10–11, movable with 6–8 teeth and with an isolated apical tooth (*di*); *gl* ratio 0.56–0.59×. Spinneret prominent and apically rounded; rallum with 11 pinnate blades. Serrula exterior with 11–15 blades, serrula interior not seen. Pedipalpal coxa with 5 setae, including 2 on manducatory process; coxa I–IV: 2–3 + 3 marginal microsetae; 4; 5; 5–6; coxa II with 5–8, coxa III with 3–5 spines; intercoxal tubercle bisetose. Fixed chelal finger with 32, movable with 22–24 teeth (Fig. 1C). Dental line of movable finger ending between trichobothria *b* and *sb*. Trichobothria *est-it* at the level of *st-t*. Distoparaxial seta of fixed finger sinuous. Coupled trichobothria *pc* closer to *sb* than to *b*.

Measurements (in mm) and ratios (in parentheses). Body 1.20–1.60. Carapace length 0.40, width at posterior margin 0.34–0.37, width at the level of the eyes 0.42. Cheliceral palm with fixed finger 0.31–0.32/0.18 (1.72–1.78 ×); movable finger 0.17–0.18. Palpal femur 0.44–0.48/0.10 (4.40–4.80 ×), patella 0.24/0.12 (2.00 ×); chela 0.73–0.74 (0.52–0.53 ×); hand 0.27–0.28/0.14, depth 0.14–0.15; fixed finger 0.46–0.49.

Remarks. *Chthonius submontanus* was described by Beier (1963a) from the Austrian Alps, where it was found in leaf litter and grass branches, and subsequently reported from Italy (Beier 1963b), Romania (Cîrdei *et al*. 1970), Switzerland (DeVore-Scribante 1999), and Germany (Drogla 2004). The species was redescribed by Gardini and the Romanian and Italian data were referred as dubious (Gardini 2009, Mahnert 2009). The characters of the new specimens from Hungary correspond well with the redescription of *C. submontanus* (Gardini 2009) therefore, I have no doubts about its identity. The species is new for the fauna of Hungary.

Ephippiochthonius romanicus Beier, 1935

(Figures 2A–C)

Material examined. HNHM Pseud-1894: 1♂, Tatabánya, 14.06.1960, leg. Imre Loksa. HNHM Pseud-1896: 1 ♂, 2 ♀♀, Tenkes Hill, 29.09.1960, leg. Imre Loksa.

Short description of the main characteristics of the found males and females. Carapace, tergites, chelicerae and pedipalps yellowish-brown. Hispid granulation on lateral surfaces of carapace and on cheliceral palm. Carapace subquadrate, epistome absent, anterior margin dentate (Fig. 3B). Anterior eyes having convex lens, posterior eyes with flat lens. Carapace with 18 macrosetae and 1+1/2+2 microsetae laterally, before the eyes; chaetotaxy: m4m/mm4mm:6:4:2:2 (20/22). Tergal chaetotaxy (I–X): 4:4:4:4:6:6:6:6:6:6. Sternal chaetotaxy (II–X): 10–11:(2–3)8(2–3):(1–2)8–10(1–2):6:4–6:4–6:4–6:4–8. Male genital opening flanked by 6–7 setae on each side. Cheliceral palm with 6 setae and 1–2 microsetae laterally (Fig. 3A). Fixed cheliceral finger with 8–11, movable with 5–8 teeth and without an isolated apical tooth (*di*); *gl* ratio 0.53–0.57 ×. Spinneret prominent and

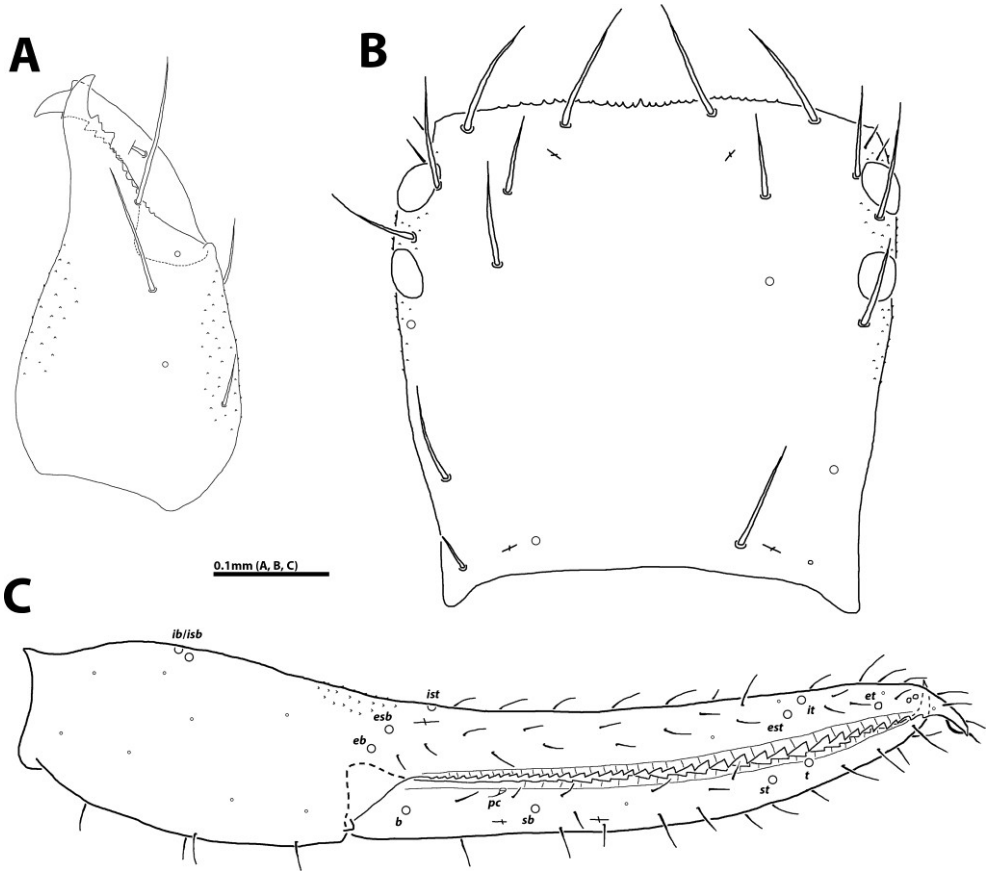

Figure 1. *Chthonius submontanus* (HNHM Pseud-1882). A: right chelicera, male, dorsal view; B: carapace, male, dorsal view; C: right chela, male, lateral view.

apically conical. Rallum with 8–11 blades. Serrula exterior with 12–14 blades, serrula interior not seen. Pedipalpal coxa with 5 setae, including 2 on manducatory process; coxa I–IV: 3 + 2 marginal microsetae; 4–5; 4–5; 6–7; coxa II with 5–8, coxa III with 2–4 spines; intercoxal tubercle bisetose. Hand of chela dorsally depressed at the level of *ib–isb*, with a hump distal to *ib–isb*. Fixed chelal finger with 16–18, movable with 9–13 teeth (Figs. 3C–D). Dental line of movable finger ending between trichobothria *st* and *sb*. Coupled trichobothria *pc* closer to *sb* than to *b*.

Measurements (in mm) and ratios (in parentheses). *Male*. Body 1.2. Carapace length 0.38, width at posterior margin 0.35, width at the level of the eyes 0.39. Cheliceral palm with fixed finger 0.26/0.15 (1.73 ×); movable finger 0.15. Palpal femur 0.44–0.49/0.07–0.08 (6.13–6.29 ×), patella 0.20/0.10 (2.00 ×); chela 0.66–0.68/0.12 (5.00–5.67 ×); fixed finger 0.38–0.40.

Females. Body 1.2–1.6. Carapace length 0.39, width at posterior margin 0.36, width at the level of the eyes 0.40. Cheliceral palm with fixed finger 0.26–0.28/0.15 (1.73–1.86 ×); movable finger 0.15–0.16. Palpal femur 0.48/0.10 (4.80 ×), patella 0.20/0.11 (1.82 ×); chela 0.68–0.74/0.14 (4.86–5.29 ×); fixed finger 0.39–0.40.

Remarks. *Ephippiochthonius romanicus* was described from Comana (in the former county of Vlaşca), Southern Romania (Beier 1935). Later, the species was reported from the other side of the Carpathians (Transylvania, Romania) (Beier 1939), Turkey (Beier 1963c), Rhodos (Greece) (Beier 1966), and Iran (Beier 1971). The Hungarian specimens were collected in the southern part of the country. The characteristics of the new

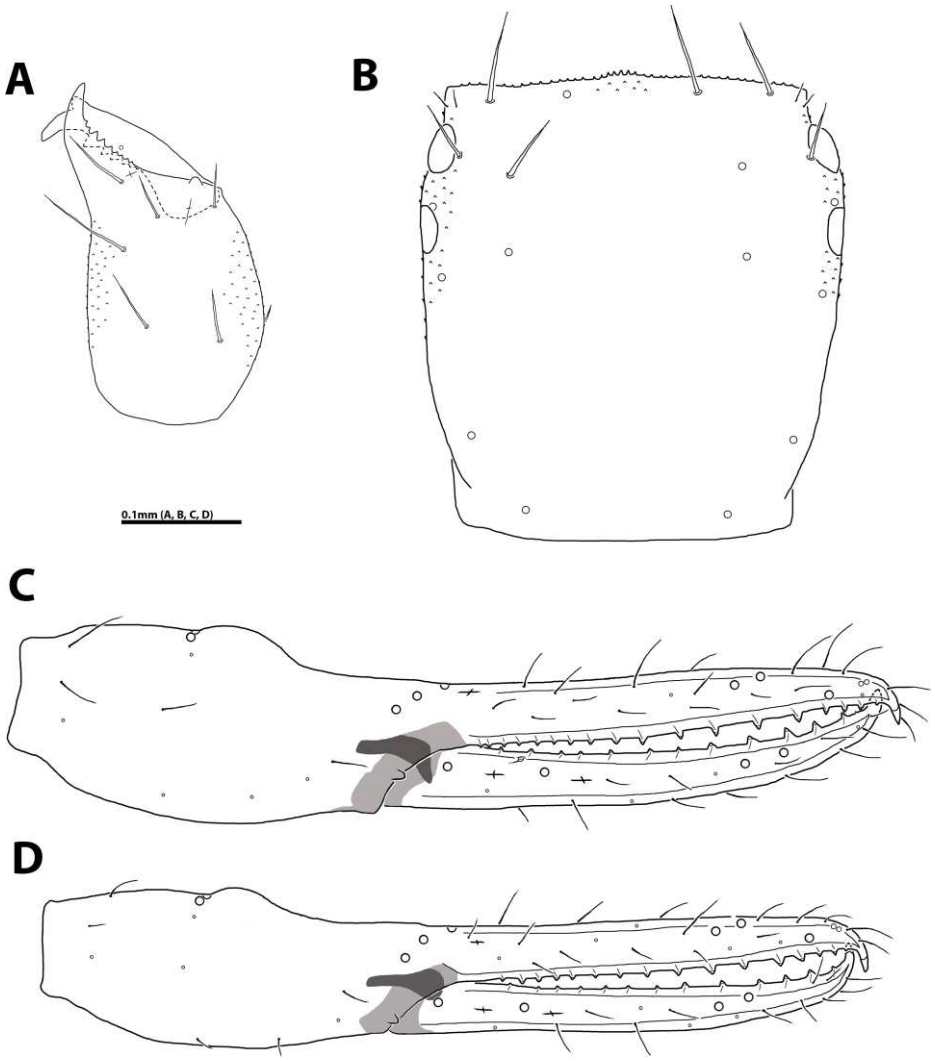

Figure 2. *Ephippiochthonius romanicus* (HNHM Pseud-1896). A: right chelicera, female dorsal view; B: carapace, female, dorsal view; C: right chela, female, lateral view; D: right chela, male, lateral view.

specimens correspond well with the original description (Beier 1935). However, as the whereabouts of the type material is unknown, some modern characteristics of the species, *e.g.* setation of male genital opening and the situation of coupled sensilla *pc* could not be compared to them.

***Occidenchthonius parmensis* (Beier, 1963)**

(Figures 3A–C)

Material examined. HNHM Pseud-1895: 1♂, Nagykovácsi: oak forest, leaf litter, sieving 06. 11.2014, leg. János Novák; HNHM Pseud-1897: 3 ♀♀, Tenkes Hill: 29.09.1960, leg. Imre Loksa.

Short description of the main characteristics of the found male and females. Carapace, tergites, chelicerae and pedipalps yellowish-brown. Hispid granulation on lateral surfaces of carapace and on cheliceral palm. Carapace subquadrate, epistome absent, anterior margin dentate (Fig. 3B). Anterior eyes with convex lens, posterior eyes with flat lens. Carapace with 20 macrosetae and 2+2 microsetae laterally, before the eyes; chaetotaxy: mm4mm:6:4:2:4 (24). Two lyrifissures near

porsterior margin of carapace. Tergal chaetotaxy (I–X): 4:4:4:4:6:6:6:6:6:4. Sternal chaetotaxy (II–X): 6-8: (3)8(3): (2)8–10(2):8:6:6:6:6:8. Male genital opening flanked by 7 setae on each side. Cheliceral palm with 5–6 setae and 1–2 microsetae laterally, movable finger with one seta (Fig. 3A). Fixed cheliceral finger with 5–6, movable with 6–8 teeth and an isolated apical tooth (*di*); *gl* ratio 0.52–0.56 ×. Spinneret prominent and apically rounded. Rallum with 11 blades; serrula exterior with approximately 12 blades, serrula interior not seen. Pedipalpal coxa with 5 setae, 2 of them on manducatory process; coxa I–IV: 3 + 3 marginal microsetae; 4; 5; 6; coxa II with 5, coxa III with 2 spines; intercoxal tubercle bisetose. Fixed chelal finger with 13–15 teeth, 2–5 of which being partially fused and forming an elevation at the proximal one third of the finger. Movable finger with 10–11 teeth, 2–5 of which being partially fused and forming an elevation at the proximal one third of the finger (Figs. 3C–D). On movable finger dental line ending between trichobothria *b* and *sb*. Trichobothria *est-it* at the level of *st-t*. Disto-paraxial seta of fixed finger sinuous. Coupled trichobothria *pc* situated distad to *sb*, at the level of fused teeth.

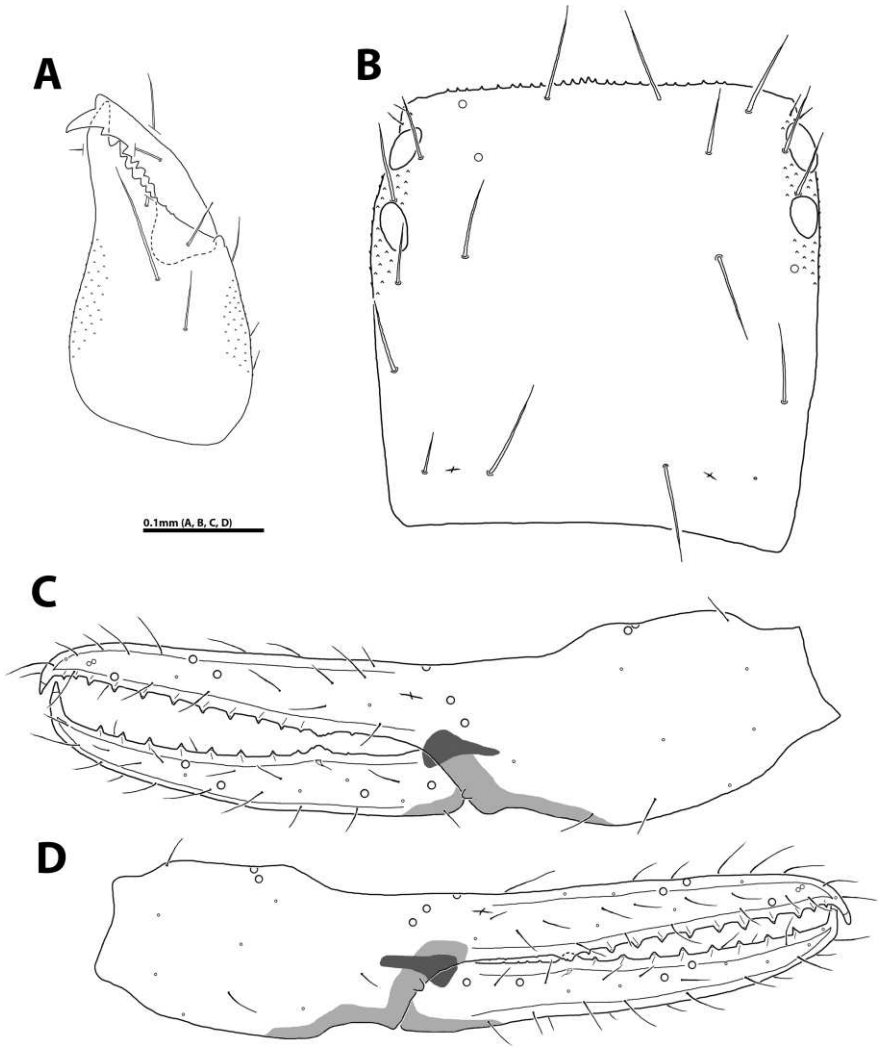

Figure 3. *Occidenchthonius parmensis* (HNHM Pseud-1895, HNHM Pseud-1897). A: right chelicera, female, dorsal view; B: carapace, female, dorsal view; C: left chela, female, lateral view; D: right chela, male, lateral view.

Measurements (in mm) and ratios (in parentheses). *Male*. Body 1.00. Carapace length 0.30, width at posterior margin 0.23, width at the level of the eyes 0.27. Cheliceral palm with fixed finger 0.23/0.12 (1.95 ×); movable finger 0.11. Palpal femur 0.31/0.07 (4.43 ×), patella 0.15/0.08 (1.89 ×); chela 0.54/0.13 (4.1 5×); movable finger 0.31.

Females. Body length 1.10. Carapace 0.35–37, width at posterior margin 0.30–0.32, width at the level of the eyes 0.32–0.34. Cheliceral palm with fixed finger 0.25/0.13 (1.92 ×); movable finger 0.13–0.14. Palpal femur 0.29–0.31/0.07 (4.14–4.43 ×), patella 0.15/0.08 (1.89 ×); chela 0.55–0.56/0.12–0.13 (4.31–4.58 ×); movable finger 0.30–0.31.

Remarks. The species was described from Sasso di Neviano, Emilia, northern Italy (Beier 1963b). It have also been reported from Croatia, Slovenia, Austria, Germany and Switzerland (Gardini 2013). *Occidenchthonius parmensis* was found in Hungary in leaf litter of an oak forest, in the Buda Mts (Nagykovácsi) and in the Villányi Mts (Tenkes Hill, SW part of Hungary).

The species was recently transferred to the genus *Occidenchthonius* Zaragoza, 2017 by having movable chelal finger with proximal teeth rounded and partially fused (Zaragoza 2017).

DISCUSSION

With the three species new for Hungary (*Chthonius submontanus*, *Ephippiochthonius romanicus* and *Occidenchthonius parmensis*) the number of the pseudoscorpion species recorded for Hungary has raised to 57. Furthermore, the genus *Occidenchthonius* is new for the country. According to our present knowledge, the following four genera of Chthoniidae are reported from Hungary: *Chthonius*, *Ephippiochthonius*, *Occidenchthonius* and *Mundochthonius*.

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REFERENCES

BEIER, M. (1935): Drei neue Pseudoscorpione aus Rumänien. *Bulletin de la Section Scientifiqe de l'Académie Roumaine*, 17: 31–34.

BEIER, M. (1939): Pseudoscorpionidea de Roumanie. *Bulletin du Musée Royal d'Histoire Naturelle de Belgique*, 15(39): 1–21.

BEIER, M. (1963a): *Ordnung Pseudoscorpionidea (Afterskorpione)*. Bestimmungsbücher zur Bodenfauna Europas, 1. Akademie-Verlag, Berlin, 313 pp.

BEIER, M. (1963b): Pseudoscorpione aus dem Museum 'Enrico Caffi' in Bergamo. *Rendiconti dell' Instituto Lombardo di Scienze e Lettere*, 97B: 147–156.

BEIER, M. (1963c): Pseudosckorpione aus Anatolien. *Annalen des Naturhistorischen Museums in Wien*, 66: 267–277.

BEIER, M. (1966): Über die Pseudoskorpione der Insel Rhodos. *Annalen des Naturhistorischen Museums in Wien*, 69: 161–167.

BEIER, M. (1971): Pseudoskorpione aus dem Iran. *Annalen des Naturhistorischen Museums in Wien*, 75: 357–366.

BENAVIDES, L.R., COSGROVE, J.G., HARVEY, H.S., GIRIBET, G. (2019): Phylogenetic interrogation resolves the backbone of the Pseudoscorpiones tree of life. *Molecular Phylogenetics and Evolution*, 139: 106509. doi: 10.1016/j.ympev.2019.05.023

CÎRDEI, F., BULIMAR, F. & MALCOCI, E. (1970): Contribuții la studiul pseudoscorpionidelor (ord. Pseudoscorpionidea) din Carpații orientali (Rarău). *Comunicări de Zoologie,* Bucaresti, 9: 7–16.

DEVORE-SCRIBANTE, A. (1999): *Les pseudoscorpions (Arachnida) de la Suisse: étude systématique, faunistique et biogéographique*. Thèse de doctorat en biologie. Université de Genève, Genève, 314 pp.

DROGLA, R. (2004): *Kommentierte Checkliste der Pseudoskorpione Thüringens* (*Arachnida*, *Pseudoscorpiones*). In. HARTMANN, M. & BELLSTEDT, R. (Eds.) Check-listen Thüringer Insekten und Spinnentiere. Thüringer Entomologenvernad e. V., Jena, p. 5–8.

GARDINI, G. (2009): *Chthonius* (*C.*) *delmastroi* n. sp. delle Alpi occidentali e del Piemonte e ridescrizione di *Chthonius* (*C.*) *tenuis* L. Koch, 1873 e di *C.* (*C.*) *submontanus* Beier, 1963 (Pseudoscorpiones Chthoniidae). *Rivista Piemontese di Storia Naturale*, 30: 25–51.

GARDINI, G. (2013): A revision of the species of the pseudoscorpions subgenus *Chthonius* (*Ephippiochthonius*) (Arachnida, Pseudoscorpiones, Chthoniidae) from Italy and neighbouring areas. *Zootaxa*, 3655: 1–151. doi: 10.11646/zootaxa.3655.1.1

HARVEY, M.S. (2002): The neglected cousins: what do we know about the smaller arachnid orders? *Journal of Arachnology,* 30: 357–372. doi: 10.1636/0161-8202(2002)030[0357:TNCWDW]2.0.CO;2

HARVEY, M.S. (2013): *Pseudoscorpions of the World*, version 3.0. Western Australian Museum, Perth. http://museum.wa.gov.au/catalogues-beta/pseudoscorpions.

HARVEY, M.S., GARDINI, G. & NOVÁK, J. (2018): Case 3736 – *Garypus latus* Hansen, 1884 (currently *Larca lata*; Arachnida, Pseudoscorpiones): proposed precedence over *Garypus hungaricus* Tömösváry, 1882. *Bulletin of Zoological Nomenclature*, 75(1): 16–20.

MAHNERT, V. (2009): *Pseudoskorpiones* (*Pseudoskopione*). In. RABITSCH, W. & F. ESSL (Eds.) Endemiten: Kostbarkeiten in Österreichs Pflanzen- und Tierwelt, p. 501–508.

NOVÁK, J. (2012). New records of pseudoscorpions for the fauna of the Bükk Mts., Northeast Hungary (Arachnida: Pseudoscorpiones). *Opuscula Zoologica*, *Budapest*, 43(1): 57–65.

NOVÁK, J. (2015): *New data on the pseudoscorpion fauna of Hungary* (Arachnida: Pseudoscorpiones). In. TAJOVSKÝ, K. (Ed.) 13th Central European Workshop on Soil Zoology, 13.–16.04.2015, Abstract book. České Budějovice, Czech Republic, p. 34.

NOVÁK, J. & HARVEY, M.S. (2015): The identity of pseudoscorpions of the genus *Diplotemnus* (Pseudoscorpiones: Atemnidae) from Europe and Asia. *North-Western Journal of Zoology*, 11(2): 316–323.

ZARAGOZA, J.A. (2017): Revision of the *Ephippiochthonius* complex in the Iberian Peninsula, Balearic Islands and Macaronesia, with proposed changes to the status of the *Chthonius* subgenera (Pseudoscorpiones, Chthoniidae). *Zootaxa*, 4246 (1): 1–221. doi: 10.11646/zootaxa.4246.1.1

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Dendrobaena attemsi (Michaelsen, 1902) (Clitellata, Megadrili) on the Balkan Peninsula and Anatolia: distribution and biogeographical significance

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Abstract. In this paper we summarize the knowledge on the presence of *Dendrobaena attemsi* (Michaelsen, 1902) on the Balkan Peninsula and Anatolia. The aim of this paper is to present new data on *D. attemsi* and, by analyzing the new and literature records, to establish the first complete list of its records on the Balkan Peninsula and Anatolia. The list provided a general overview of its current distribution and zoogeographical position. *D. attemsi* is distributed from the Pyrenees through the Central Europe, Balkan Peninsula and Anatolia to the Caucasus. It is common in the Balkan Peninsula, but in Turkey it was rarely found, only in the northern part of the Country. The most important distribution centre of the species in Europe is situated in the Balkanic-Alpine area where it was registered in the largest number of its records. Summarizing all the data reported so far, it can be concluded that *D. attemsi* in its native range (southern Eurasia) shows a Trans-Aegean distribution.

Keywords. Oligochaeta, Lumbricidae, Trans-Aegean Distribution, Earthworms, Fauna of Turkey.

INTRODUCTION

Dendrobaena attemsi is distributed from the Pyrenees through the Balkans and Anatolia to the Caucasus. It was described from Austria (Michaelsen 1902), and later reported from Central, Southern, East and Northern Europe, and as well, from the northern part of Turkey and the Caucasus (Michaelsen 1902, Černosvitov 1934, 1938, Pop 1938, Omodeo 1952, Plisko 1963, Zicsi 1981, 1994, Alvarez 1977, Bouché 1972, Šapkarev 1978, Zicsi & Michalis 1981, Kvavadze 1985, Pizl 1986, Omodeo & Rota 1989, 1991, Mršić 1991, Pavlíček *et al.* 2010, Szederjesi 2017, Stojanović *et al.* 2018). Until present, the northernmost record of the species is in Sweden (Rota & Erseus 1997), England (Sims & Gerard 1983), Ireland (Schmidt *et al.* 2015), Germany (Lechmit *et al.* 2014) Canada and USA (Fender 1985).

D. attemsi is an epigeic species present in acid and sandy soils rich in organic matter (Bouché 1972), mainly in forests and meadows, under moss, logs and in the litter (Sims & Gerard 1999).

It shows high morphological variation. According to the morphometric study based on adult worms from three countries Rota & Erseus (1997) reported variation of body morphology (coloration and the position of the first dorsal pore) in four populations of *D. attemsi*. Subsequently, other scientists have worked on this problem as well (Sims & Gerard 1999, Szederjesi 2017). What is particularly interesting is that the position of tubercles also varies; from 30–31, 1/n32, ½32, 32 (Szederjesi 2017).

The aim of this paper is to present new data on the distribution of *D. attemsi* and, by analyzing the new reports together with literature records, to

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establish the first complete list of its occurrence on the Balkan Peninsula and Anatolia. This list provides a general overview of the current distribution and zoogeographical position of this species.

MATERIAL AND METHODS

Data on the species were obtained from the literature and from fieldwork. The data from several authors were used to complete the distribution maps of *D. attemsi* in the World and Anatolia (Fig. 1 and Fig. 2). Over the last study period, from all over the investigated region we have collected earthworms from various habitats which included natural and urban biotopes as well.

Unfortunately, only one specimen of *D. attemsi* was registered in Turkey, while on the Balkans from the last six years of investigations we did not registered it. Therefore, in the data analyzed we have included the unpublished data from the Balkans from 1997 to 2019 as well.

The earthworms were collected by digging and hand-sorting complemented with the diluted formaldehyde method (Raw 1959). The specimens were killed in 70% ethanol in the field. After 15 minutes, they were transferred to 96% ethanol. Specimens were described and dissected under stereomicroscope. Species identification of was done in accordance with Csuzdi & Zicsi 2003, Blakemore 2008, Mršić 1991, Zicsi 1982 and Šapkarev 1978. The collected species were identified in the laboratory of Faculty of Science in Kragujevac, Serbia and in Faculty of Science in Eskisehir, Turkey

TAXONOMY

Dendrobaena attemsi (Michaelsen, 1902)

Helodrilus (Dendrobaena) attemsi Michaelsen, 1902: 47.
Dendrobaena alpina: Pop 1972: 40 (part.); Pop 1997: 225 (part.).
Dendrobaena octaedra: Pop 1947: 108 (part.).
Dendrobaena attemsi: Omodeo 1952: 12.
Dendrobaena attemsi: Šapkarev 1989: 39; Šapkarev 2002: 295; Mršić 1991: 604; Stojanović & Karaman 2005: 129; Milutinović *et al.* 2010: 630; Csuzdi 2012: 97; Csuzdi & Pop 2006: 39; Csuzdi & Pop 2008: 147; Szederjesi 2013: 66; Stojanović *et al.* 2013: 637; Perel 1979: 236; Pop *et al.* 2012: 62.
Dendrobaena attemsi: Omodeo & Rota 1989: 191.
Dendrobaena attemsi: Omodeo & Rota 1991: 180.
Dendrobaena jastrebensis: Mršić 1991: 584; Stojanović & Karaman 2003: 56; Milutinović *et al.* 2010: 630; Stojanović & Milutinović 2013: 152; Stojanović *et al.* 2013: 637; Trakić *et al.* 2016: 261.
Dendrobaena macedonica Mršić, 1991: 587. Šapkarev 1997: 105. Trakić et al. 2016: 262; Szederjesi 2017: 12.
Dendrobaena vranicensis Mršić, 1991: 588. Šapkarev 1997: 105. Trakić *et al.* 2016: 263; Szederjesi 2017: 12.
Dendrobaena grmecensis: Mršić, 1991: 593. Šapkarev 1997: 105; Szederjesi 2017:12.
Dendrobaena attemsi: Szederjesi *et al.* 2014: 94; Szederjesi *et al.* 2017: 62
Dendrobaena attemsi: Tavuç *et al.* 2018: 150.
Dendrobaena attemsi: Mısırlıoğlu 2018: 143.
Dendrobaena attemsi: Stojanović *et al.* 2018: 135.
Dendrobaena attemsi: Szederjesi 2019: 27.

Distribution on the Balkan Peninsula. **Serbia.** Suva planina Mt., Jastrebac, Užice (Šapkarev 1989, Mršić 1991; Stojanović & Karaman 2005, Milutinović *et al.* 2010); Cave Rajkova pećina, Vidojevica Mt., Pasjače Mt., Kukavica Mt., Homolj Mts., Bešnjaja (Karaman & Stojanović 2002); Jastrebac Mt., Stolovi Mt. (Stojanović & Karaman 2005, Milutinović *et al.* 2010); Jabučko Ravnište, Golema reka, Babin Zub, Lom (Stojanović *et al.* 2013); Đerdap Mts., between Majdanpek and Donji Milanovac (Szederjesi 2013); Kragujevac, Gledić Mts., Goč (Mršić & Šapkarev 1987, Stojanović *et al.* 2008); Čemernik, Vlasina, Stara planina Mt. (Karaman and Stojanović 2002); Đerdap (Szederjesi 2013).

New records in Serbia. Usovica 03.04.2003, 12 ex.; Kraljevo 03.10.2002, 1 ex. Đulica 15.04. 2000, 2 exemplars. Voljevica Mt. 21.04.2007. 1 ex. Ražanj Mt. 01.05.1997. 1 ex.

Romania. Maramureş Mts.-Baile Borşa-Vf Cearcanul, Maramureş basin-Rona de Sus Hera, Gutai Mts. Budeşti, Lapuş Mts.-Leorda, Gutai Mts.-Valea Roşie-Nedeia Taranului, Rodnei Mts.-Cornaia-Valea Vinului (Csuzdi & Pop 2006);

Munţii Maramureşului (Máramarosi-havasok)-Petrova, Munţii Rodnei (Radnai-havasok), Borşa - Staţiunea Borşa (Borsa – Borsafüred), Munţii Rodnei (Radnai-havasok), Borşa – Staţiunea Borşa (Borsa – Borsafüred), Munţii Maramureşului (Máramarosi-havasok)-Poienile de sub Munte (Havasmező)-Budescu valley, Munţii Maramureşului (Máramarosi-havasok) – Poienile de sub Munte (Havasmező) – Socolău valley, Munţii Maramureşului (Máramarosihavasok) – Poienile de sub Munte (Havasmező) – Lutoasa valley, Depresiunea Maramureşului (Máramarosi-medence) – Rona de Sus (Felsőróna) – Héra, Munţii Oaş (Avas), Piatra (Kövesláz) – Munţii Maramureşului (Máramarosi-havasok) – Borşa – Băile Borşa (Borsa – Borsabánya) – Vinişor valley, Munţii Rodnei (Radnai-havasok) – Săcel (Izaszacsal) – Iza Spring in spruce forest, Munţii Rodnei (Radnai-havasok)-Săcel (Izaszacsal), Munţii Maramureşului (Máramarosi-havasok) – Vişeu de Sus (Felsővisó) – Şuligu de Sus (Csuzdi & Pop 2008); Retezat – Lapusnic Valley – Stanulet Fagaras¸ Mts. Balea – Rodnei Mts. –Sacel above the Iza Spring, Maramureş¸ Mts.-Suligu de Sus, Maramureş Mts. – Mihoaia Valley, Maramures¸ Mts. – Vasser Valley – above Faina (Csuzdi *et al.* 2011); Apuseni Mts. – Vladeasa Mt. (Pop *et al.* 2012); Bucovina – Iedu, Bucovina – after Stratioara, Banat – Cerna Sat, Maramureş Mts. Borşa – Băile Borşa – Vinişor valley, Maramureş Mts, Borşa – Băile Borşa, Maramureş Mts. – Poienile de sub Munte – Budescu valley, Maramureş Mts. –Poienile de sub Munte – Socolău valley, Maramureş Mts. – Poienile de sub Munte-Lutoasa valley, Maramureş Mts. – Borşa – Băile Borşa – Vulcănescu Brook, Băile Herculane (Szederjesi *et al.* 2014).

Bulgaria. Rhodiopi Mt. (Černosvitov 1937), Rila Mt. (Zicsi & Csuzdi 1986); Balkan Mt. (Plisko 1963); Kărdžhali province, Zălti Djal Mts., Sedlarci, Smoljan province, Perelik Mts., Smoljan (Szederjesi 2012a).

Greece. Mainland: Vermion (Černosvitov 1938). Florina (Michalis 1975). Ano Kleinae, Foteina (Zicsi & Michalis 1981). Ano Kalesmeno, Timfristos, Angistrou, Vrondous Mts, Orvilos Mts, Kalikarpos, Florina, Metsovo (Szederjesi and Csuzdi 2012b). Chaliki (Szederjesi 2015). Athos (Michalis 1977). Lesvos: Mytilini (Zicsi and Michalis 1981). Naxos: Koronidha (Szederjesi 2015).

Albania. Krej-Lurë, Gropë Mts, Pezë Mts, Qafëmollë, Mirditë district (Szederjesi & Csuzdi 2012a); Tiranë, Gropë Mts (Szederjesi & Csuzdi 2015); Kukës district, Turaj (Szederjesi 2019).

Croatia. Bijele stijene, Jasenak (Mršić 1986, Hackenberger and Hackenberger 2013).

Bosnia & Herzegovina. Zelengora Mt. (Szederjesi 2013).

Montenegro. Biogradska Gora (Stojanović and Karaman 2003).

Macedonia. Trpeica, Nidže Mt. (Šapkarev 1978); Ohrid, Galičica Mts, Gostivar, Ogrožden Mts, Peštani (Szederjesi 2013).

*New Records in Macedonia***.** Mavrovo, 16.10. 2012, 1 exemplar**;** Galičica Mt. 14.10.2012, 1 ex.

Distribution in Anatolia. **Turkey.** Polonezköy (Omodeo 1952); Bursa Uludağ, Giresun Görele, Trabzon Maçka, Artvin Cankurtaran pass, Bolu Boludağı Geçidi (Omodeo & Rota 1989); Bilecik 75 km. E of Bursa, Bursa N face of Uludağ (Omodeo & Rota 1991); Akçaören-Düzce, Hopa-Artvin (Szederjesi *et al.* 2018); Türkmen Dağı (Tavuç *et al.* 2018); road entry to Hüseyinalan and Tuzaklı Village, Hüseyinalan Village-Uludağ (Mısırlıoğlu 2018).

New record for Turkey. Eskişehir Province, Vişnelik Quarter, Kanlıkavak Promenade area, the edge of the Porsuk River, 25.02.2018, 1 ex.

Zoogeographical distribution. *D. attemsi* is a Trans-Aegean species, it is distributed in: Caucasia, Russia, Southern Europe, Carpato-Balkan Peninsula, Austria, Northern Italy, Central and Southern France, Britain, Norway, Ireland and Germany (Perel 1997, Rota & Erseus 1997, Sims & Gerard 1999, Csuzdi & Zicsi 2003, Csuzdi *et al.* 2011, Lechmit *et al.* 2014, Schmidt *et al.* 2015, Mısırlıoğlu 2017, Szederjesi 2017, Szederjesi *et al.* 2017, 2018, Stojanović *et al.* 2018).

Remarks. *D. attemsi* is widely distributed in Romania, however in the older literature it was reported under the name *D. alpina* (Rosa, 1884) or *D. octaedra* (Savigny, 1826) (Csuzdi *et al.*

2005, Pop *et al.* 2007) therefore, only the recent records were included in the present study.

DISCUSSION

Dendrobaena is the most speciose genus on the Balkan Peninsula and Anatolia; and half of its species are endemics (Trakić *et al.* 2016, Mısırlıoğlu *et al.* 2019). So far, 92 species have been described in the genus *Dendrobaena* (Csuzdi 2012), of which 23 are exclusive endemics on the Balkan Peninsula (Trakic *et al.* 2016), while 12 species are endemic to Anatolia (Szederjesi *et al.* 2014). Due to the marked diversity of the genus *Dendrobaena* in the Balkans, Omodeo & Rota (2008) considered it to be of European origin. Today, the Balkan Peninsula and Anatolia are separated by sea, but the paleogeographic scenario from the Oligocene, when these land systems were connected into a single land mass (Aegean land mass), contributed to the extension of this genus from Europe to the territory of Anatolia. Based on the number of endemic *Dendrobaena* species on the Balkans and Anatolia, it is clear that these areas are the most important centres of diversity of this genus.

On the Balkans, *D. attemsi* is the most widespread in the Serbia (central, southern and eastern parts), Macedonia, Greece and Bulgaria. It is less frequent in Albania, Croatia, Montenegro Bosnia & Herzegovina and Romania but this may also be due to less work done on earthworms in some of the mentioned countries. In previous studies from Anatolia, *D. attemsi* was recorded from North-Anatolia, the Aegean and Marmara regions of Turkey. In this study it was recorded from the Inner Anatolia as well.

The northernmost records (Sweden, Ireland, England) of *D. attemsi* raise the serious question, *i.e.* is it native or introduced to the fauna. According to Omodeo (1952), it spreads from the Caucasian area towards Romania and from there migrated to the Balkan Peninsula and, across the Dinaric range, to Austria. Following this view and, as well, based on their investigation, Rota & Erseus (1997) considered that *D. attemsi* has two core areas of distribution. The centre of its western distribution is France, and from there it spreads towards Italy, Spain and, as well, to the north into Great Britain and Ireland. Therefore, Rota & Erséus (1997) assume that all records from sandy woodland soils from England and Sweden most likely indicate post-glacial expansion of *D. attemsi*. This is also supported by Bouché (1972) who pointed out that *D. attemsi* lives naturally in organic rich woodland soils. However, in northern countries it has a very restricted distribution in natural biotopes and is generally considered rare in those areas (Schmidt *et al.* 2015).

Figure 1. Distribution of *D. attemsi* in the world.

Moreover, England was connected to Europe after the Ice Age just for some 5.000 years (Sims & Gerard 1985). Considering that earthworms' natural range expansion capability is 60–100 km per 10.000 years (James 1998), it is a very short time for earthworms to reach the British Islands and highly questionable that during this time it could have reached England by natural way. Furthermore, approximately 12000 years ago Ireland was cut off totally from England so before the establishment of the England Europe connection (Devoy 2015). So, it seems to be impossible for *D. attemsi* to reach Great Britain and Ireland during this short period and most probably Ireland's and Great Britain's populations are not autochtonous but introduced by man.

The eastern area of this species is larger and seems to be ancient covering the Balkans, Anatolian and the Caucasus regions. Several records of *D. attemsi* can be connected with human activities and, therefore, some researchers consider that it may belong to semiperegrine species (Szederjesi & Csuzdi 2012). Namely, the presence of the species in anthropogenic biotopes (greenhouses, gardens) indicates the possibility of human introduction of this species with imported plant material, as is the case in North America (Fender 1985), New Zealand's North Island (Blakemore 2012) and in Russian Kamchatka (Shekhovtsov *et al.* 2014).

On the other hand, Eggleton et *al.*'s (2009) research suggests that it should not be neglected that *D. attemsi* has a Balkan origin and has greater ability than the northern European species *D. octaedra* to tolerate dry and warm summers. Therefore, this ability of *D. attemsi* could also allow its certain invasiveness towards the northern regions under the influence of current climate change.

Until about fifteen years ago, *D.attemsi* was classified to Trans-Aegean distribution type (Csuzdi *et al.* 2006) which has wider distribution in Central Europe and, as well, occupies smaller areas around the eastern and southern coasts of the Black Sea (Mısırlıoğlu 2008). However, the most important distribution centre of *D. attemsi* in Europe is situated in the Balkanic-Alpine area where the largest number of its records are registered. This was the reason for researchers to classify the species into the Balkanic-Alpine distribution type (Csuzdi *et al.* 2011, Valchovski

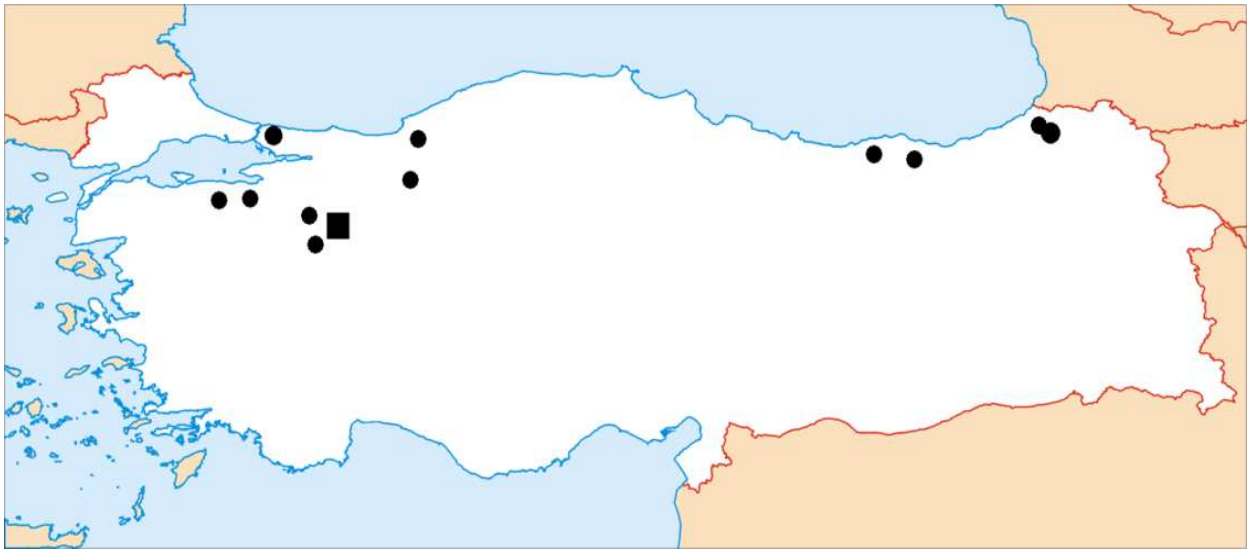

Figure 2. Distribution of *D. attemsi* in Turkey (Black square shows the new record of the species).

2012, Hackenberger & Hackenberger 2013, Szederjesi 2012b, Szederjesi, *et al.* 2017, Stojanović *et al.* 2018). However, its presence in Anatolia and the Caucasus rather shows a Trans-Aegean distribution. Based on all findings so far, it could be concluded that *D. attemsi* in its native range (southern Eurasia) belongs to the Trans-Aegean distribution type.

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REFERENCES

ALVAREZ, J. (1977): La distribucion de las especies de oligoquetos terricolas en la Jacetania. *Publication del Centro Pir de Biologia Experimental*, 9: 121–124.

BOUCHÉ, M.B. (1972): *Lombriciens de France. Ecologie et Systématique.* INRA, Paris. 672 pp.

BLAKEMORE, R.J. (2008): *Cosmopolitan earthworms – an Eco-Taxonomic Guide to the Species* (3rd Edition). VermEcology, Yokohama, Japan, 757 pp.

BLAKEMORE, R.J. (2012): On Schmarda's lost earthworm and some newly found New Zealand species (Oligochaeta: Megadrilacea: Lumbricidae, Acanthodrilidae, Octochaetidae, & Megascolecidae *s. stricto*). *Journal of Species Research,* 1: 105–132.

ČERNOSVITOV, L. (1937). Die Oligochaetenfauna Bulgariens. *Mitteilungen des Naturwissenschaftlichen Institute Sofia,* 10: 69–92.

ČERNOSVITOV, L. (1938): Zur Kenntnis der Oligochätenfauna des Balkans. VI. Oligochäten aus Griechenland. *Zoologischer Anzeiger,* 123: 192–200.

CSUZDI, CS., POP, A.A., POP, V.V., ZICSI, A. & WINK, M. (2005): *Revision of the Dendrobaena alpina (Rosa) Species Group (Oligochaeta, Lumbricidae).* In. POP, V.V. & POP, A.A. (Eds.) Advances in earthworm taxonomy II. University Press, Cluj, p. 119–128.

CSUZDI, CS. & POP, V.V. (2006): Earthworms of the Maramureş (Romania) (Oligochaeta, Lumbricidae). *Studia Universitatis Vasile Goldiş, Arad*, 17: 37–42.

CSUZDI, CS., ZICSI A. & MISIRLIOĞLU M. (2006): An annotated checklist of the earthworm fauna of Turkey (Oligochaeta: Lumbricidae). *Zootaxa*, 1175: 1–29. doi: 10.11646/zootaxa.1175.1.1

CSUZDI, CS. & POP, V.V. (2008): New Data on The Earthworm Fauna of The Maramureş Mts. (Eastern Carpathians, Romania) (Oligochaeta, Lumbricidae). *Studia Universitatis Vasile Goldiş, Arad*, 18: 145–152.

CSUZDI, CS. (2012): Earthworm species, a searchable database. *Opuscula Zoologica, Budapest*, 43: 97–99.

CSUZDI, CS. & ZICSI, A. (2003): *Earthworms of Hungary (Annelida: Oligochaeta: Lumbricidae).* In. CSUZDI, CS. & MAHUNKA, S. (Eds.) Pedozoologica Hungarica 1. Hungarian Natural History Museum, Budapest, 271 pp.

CSUZDI, CS., POP V.V.& POP, A.A. (2011): The earthworm fauna of the Carpathian Basin with new records and description of three new species (Oligochaeta: Lumbricidae). *Zoologischer Anzeiger*, 250: 2–18. doi: 10.1016/j.jcz.2010.10.001

DEVOY, R.J.N. (2015): *Deglaciation, Earth crustal behaviour and sea-level changes in the determination of insularity: a perspective from Ireland.* In. Preece, R.C. (Ed.) Island Britain a Quaternary perspective. Geological Society Special Publication No. 96, p. 181–208

EGGLETON, P., INWARD, K., SMITH, J., JONES, D.T. & SHERLOCK, E. (2009): A six-year study of earthworm (Lumbricidae) populations in pasture woodland in southern England shows their responses to soil temperature and soil moisture. *Soil Biology and Biochemistry,* 41: 1857–1861. doi: 10.1016/j.soilbio.2009.06.007

FENDER, W.M. (1985): Earthworms of the western United States. Part I. Lumbricidae. *Megadrilogica,* 4: 93–132.

HACKENBERGER KUTUZOVIĆ, D. & HACKENBERGER KUTUZOVIĆ, B. (2013): Checklist of the earthworm fauna of Croatia (Oligochaeta: Lumbricidae). *Zootaxa*, 3710(1): 1–30. doi: 10.11646/zootaxa.3710.1.1

JAMES, S.W. (1998): *Earthworms and earth history.* In. EDWARDS, C.A. (Ed.) Earthworm Ecology. Proc. 5th International Symposium on Earthworm Ecology. St. Lucie Press, Boca Raton. p. 3–14.

KARAMAN, S. & STOJANOVIĆ, M. (2002): *Treći prilog poznavanja kišnih glista (Oligochaeta, Lumbricidae) južne i jugoistočne Srbije.* Proceedings of 7. Simpozijum o flori jugoisočne Srbije i susednih

područja, 2002, Dimitrovgrad, Bulgaria, 6–9 Juna 2002, p. 223–225.

KVAVADZE, E. (1985): *The earthworms (Lumbricidae) of the Caucasus*. Metsniereba, Tbilisi, 238 pp. (In Russian with English summary).

LEHMITZ, L., RÖMBKE, J., JANSCH, S., KRÜCK, S., BEYLICH, A. & GRAEFE, U. (2014). Checklist of earthworms (Oligochaeta: Lumbricidae) from Germany. *Zootaxa,* 3866(2): 221–24. doi: 10.11646/zootaxa.3866.2.3

MICHAELSEN, W. (1902): Neue Oligochäten und neue Fundorte altbekannter. *Mitteilungen Naturhistorie Museum*, *Hamburg*, 19: 1–54.

MICHALIS, K. (1975): Neue Angaben zur Fauna der Oligochaeten von Mazedonien. *Scientific Annals Faculty of Physics and Mathematics*, *University of Thessaloniki*, 15: 201–211.

MICHALIS, K. (1977): Die Oligochaetenfauna der Halbinsel von Athos (Chalkidiki). *Scientific Annals Faculty of Physics and Mathematics*, *University of Thessaloniki*, 17: 285–298.

MILUTINOVIĆ, T., AVRAMOVIĆ, A., PEŠIĆ, S., BLESIĆ, B., STOJANOVIĆ, M. & BOGDANOVIĆ, A.M. (2010): Contribution to the knowledge of pedofauna in Šumadija (Central part of Serbia). *Biotechnology and Biotechnological Equipment*, 24 (2): 628–635. doi: 10.1080/13102818.2010.10817911

MISIRLIOĞLU, M. (2008): Some earthworm records from Anatolia (Oligochaeta, Lumbricidae). *Turkish Journal of Zoology*, 32: 469–471.

MISIRLIOĞLU, M. (2017): *Topraksolucanları, Biyolojileri, Ekolojileri, Zirai Yönleri, Türkiye Türleri ve Türlerin Taksonomik Özellikleri*. Nobel yayıncılık, Ankara, 168 pp. (In Turkish)

MISIRLIOĞLU, İ.M. (2018): Earthworms from Bursa Uludağ Mountain, with first record of *Octolasion cyaneum* (Savigny, 1826) from Turkey. *Zootaxa*, 4394 (1): 141–143. doi: 10.11646/zootaxa.4394.1.10

MISIRLIOĞLU, M., VALCHOVSKI, H. & REYNOLDS, J.W. (2019): Updated list of earthworm species from Turkey (Clitellata, Megadrili). *Megadrilogica,* 24 (8): 99–106.

MRŠIĆ, N. (1991): *Monograph on earthworms (Lumbricidae) of the Balkans. Vol. I–II*. Slovenska Akademija Znanosti in Umetnosti, Ljubljana, Slovenia, 757 pp.

MRSIC, N. & ŠAPKAREV, J. (1987): Survey of earthworms (Lumbricidae) of Serbia in a restricted sense and description of a new taxa. *Biološki Vestnik*, 35(2): 67–86.

OMODEO, P. (1952): Oligocheti della Turchia. *Annuario Dell'istituto Museo Di Zoologia Della Universita Dı Napoli*, 4: 1–20.

OMODEO, P. & ROTA, E. (1989): Earthworms of Turkey. *Bolletino Zoologica*. 56: 167–199. doi: 10.1080/11250008909355639

OMODEO, P. & ROTA, E. (1991): Earthworms of Turkey II. *Bolletino Zoologica*. 58: 171–181. doi: 10.1080/11250009109355749

OMODEO, P. & ROTA, E. (2008): Earthworm diversity and land evolution in three Mediterranean districts. *Proceedings of the California Aacademy of Sciences*, 59, Supplement I (5): 65–83.

PAVLIČEK, T., CSUZDI, CS., MISIRLIOĞLU, M. & VILENKIN, B. (2010): Faunistic similarity and endemism of earthworms in East Mediterranean, *Biodiversity and Conservation,* 19 (7): 1989–2001. doi: 10.1007/s10531-010-9821-1

PEREL, T.S. (1979): *Range and regularities in the distribution of earthworms of the USSR fauna*. Nauka, Moscow, 272 pp. (in Russian with an abstract in English).

PEREL, T.S. (1997): *The Earthworms of the Fauna of Russia, Cadaster and Key*. In. CHERNOVA N.M (Ed.) Academia Nauka, Moscow, 101 pp. (in Russian with an abstract in English).

PIZL, V. (1986): Zízaly (Oligochaeta, Lumbricidae) rezervace Ruzák na Decínsku [Regenwürmer (Oligochaeta, Lum- bricidae) des Naturschutzgebietes Ruzák in Nord- böhmen]. *Zborník slovenského národného Múzea v Martine (Prír Vedy),* 15: 69–76.

PLISKO, J.D. (1963): Materialien zur Kenntnis der Regenwürmer (Oligochaeta, Lumbricidae) Bulgariens. *Fragmente Faunistica Polskiej Akademii Nauk,* 10: 425–440.

POP, V. (1938): Neue Lumbriciden aus Rumänien. *Bulletinul Societătii de Stiinte din Cluj,* 9: 134–152.

POP, V. (1947): Die Lumbriciden der Ostalpen. *Analele Academiei Române Memoriile Secțiunii Științifice, Seria 3*, 22 (3): 85–133.

POP, V.V. (1972): Contributions to the study of lumbricids (Oligochaeta) from the Retezat National Park. *Ocrotirea Naturii Bucharest,* 16: 33–41.

POP, V.V. (1997): Earthworm–vegetation–soil relationships in the Romanian Carpathians. *Soil Biology and Biochemistry*, 29: 223–229. doi: 10.1016/S0038-0717(96)00168-X

POP, V.V., POP, A.A. & CSUZDI, CS. (2007): New data and an updated viewpoint on the earthworm communities with the *Dendrobaena alpina* species group (Oligochaeta, Lumbricidae) from the South-Eastern Carpathians.). *European Journal of Soil Biology*, 43S: 53–56.
doi: 10.1016/j.ejsobi.2007.08.009

POP, V.V., POP, A. A. & CSUZDI, CS. (2012): An annotated checklist of the Romanian earthworm fauna (Oligochaeta, Lumbricidae). *Zoology in the Middle East*, 58(S4): 59–70.
doi: 10.1080/09397140.2012.10648985

RAW, F. (1959): Estimating earthworm population by using formalin. *Nature,* 184: 1661–1662.
doi: 10.1038/1841661a0

ROTA, E. & ERSEUS, C. (1997): First record of *Dendrobaena attemsi* (Michaelsen) (Oligochaeta, Lumbricidae) in Scandinavia, with a critical review of its morphological variation, taxonomic relationships and geographical range. *Annales Zoologici Fennici,* 34: 89–104.

ŠAPKAREV, J. (1978): *Fauna de Macedonie IV. (Oligochaeta-Annelida).* Natural History Museum, Skopje, 116 pp.

ŠAPKAREV, J. (1989): Description of new species of earthworms (Oligochaeta: Lumbricidae) from Yugoslavia. *Macedonian Academy of Sciences and Arts*, 7(1–2): 33–36.

ŠAPKAREV, J. (1997): High degree of endemicity of the lumbricid fauna in the Balkans. *The University Thought – Publication in Natural Sciences (Pristina, Serbia),* 4(2): 103–108.

ŠAPKAREV, J. (2002): Rasprostranjenje kišnih glista središnje Srbije. *Zbornik radova SANU*, 307–318.

SCHMIDT, O., SHUTENKO, G. & KEITH, A. (2015): Multiple records confirm presence of *Dendrobaena attemsi* (Oligochaeta: Lumbricidae) in Ireland. *Irish Naturalists Journal*, 34(2): 110–112.

SHEKHOVTSOV, S.V., GOLOVANOVA, E.V. & PELTEK, S.E. (2014): Invasive lumbricid earthworms of Kamchatka (Oligochaeta). *Zoological Studies*, 53: 52. doi: 10.1186/s40555-014-0052-0

SIMS, R.W. & GERARD, B.M. (1985): *Earthworms. Keys and Notes to the Identification and Study of the Species.*Synopses of the British Fauna New Series, Brill, Leiden. No. 31, UK, 171 pp.

SIMS, R.W. & GERARD, B.M. (1999): *Earthworms.* Synopses of the British Fauna N.S. no. 31. Field Studies Council, Shrewsbury, UK, 169 pp.

STOJANOVIĆ, M. & KARAMAN, S. (2003): Second contribution of knowledge of earthworms (Lumbricidae) in Montenegro. *Archives of Biological Science*, 55(1–2): 55–58.

STOJANOVIĆ, M. & KARAMAN, S. (2005): Further contribution to the knowledge of the earthworms of Šumadija. *Archives of Biological Sciences*, 57: 127–133.

STOJANOVIĆ, M., MILUTINOVIĆ, T. & KARAMAN, S. (2008): Earthworm (Lumbricidae) diversity in the Central Balkans: An evaluation of their conservation status. *European Journal of Soil Biology*, 44: 54–67. doi: 10.1016/j.ejsobi.2007.09.005

STOJANOVIĆ, M. & MILUTINOVIĆ, T. (2013): Checklist of earthworms (Oligochaeta: Lumbricidae) from Montenegro: Diversity and biogeographical review. *Zootaxa*, 3710(2): 147–164
doi: 10.11646/zootaxa.3710.2.2

STOJANOVIĆ, M., SEKULIĆ, J. & TRAKIĆ, T. (2018): Checklist of earthworms (Oligochaeta: Lumbricidae) from Serbia: a review. *Zootaxa,* 4496(1): 124–155. doi: 10.11646/zootaxa.4496.1.9

SZEDERJESI, T. (2013): New earthworm records from the former Yugoslav countries (Oligochaeta: Lumbricidae). *Opuscula Zoologica Budapest*, 44(1): 61–76.

SZEDERJESI, T. (2015): New earthworm records from various parts of Greece (Oligochaeta: Lumbricidae, Acanthodrilidae, Megacolecidae, Ocnerodrilidae). *Opuscula Zoologica, Budapest*, 46 (2): 143–152. doi: 10.18348/opzool.2015.2.143

SZEDERJESI, T. (2017): The first combined checklist of earthworms of the Northeastern Mediterranean region (Clitellata: Megadrili) *Opuscula Zoologica, Budapest*, 48(2): 77–116.
doi: 10.18348/opzool.2017.2.77

SZEDERJESİ T (2019). Data to the earthworm fauna of the Balkan Peninsula, Istria, the Papuk Mountain

and the Kamnik-Savinja Alps (Megadrili: Lumbricidae). *Folia historico-naturalia Musei Matraensis*, 43: 25–31.

SZEDERJESI, T. & CSUZDI, CS. (2012a): New earthworm species and records from Albania (Oligochaeta, Lumbricidae). *Acta Zoologica Academiae Scientiarum Hungaricae*, 58 (3): 259–274.

SZEDERJESI, T. & CSUZDI, CS. (2012b): New and little known earthworm species from Greece (Oligochaeta: Lumbricidae, Acanthodrilidae). *Zootaxa*, 3304: 25–42. doi: 10.11646/zootaxa.3304.1.2

SZEDERJESI, T. & CSUZDI, CS. (2015): A new earthworm species and new records from Albania with remarks on the molecular phylogenetic relationships of the *Eisenia* species of the Balkan Peninsula (Oligochaeta: Lumbricidae). *North-Western Journal of Zoology*, 11(1): 110–116.

SZEDERJESI, T., PAVLICEK, T., COŞKUN, Y. & CSUZDI, CS. (2014): New earthworm records from Turkey, with description of three new species (Oligochaeta: Lumbricidae), *Zootaxa,* 3764(5): 555–570. doi: 10.11646/zootaxa.3764.5.4

SZEDERJESI, T., POP, V.V. & CSUZDI, CS. (2014): New and Little Known Earthworm Species from Peripheral Areas of the Romanian Carpathians (Oligochaeta, Lumbricidae). *Acta Zoologica Academiae Scientiarum Hungaricae*, 60(2): 85–107.

SZEDERJESI, T., VAVOULIDOU, E., CHALKIA, C., DÁNYI, L. & CSUZDI, CS. (2017): An annotated checklist of earthworms of Greece (Clitellata: Megadrili). *Zootaxa,* 4272(1): 57–82 doi: 10.11646/zootaxa.4272.1.3

SZEDERJESI, T., DÁNYI, L., KAYDAN, M.B. & CSUZDI, CS. (2018): Contribution to the Knowledge of the Earthworm Fauna of Turkey with Description of Three New Species (Clitellata, Megadrili). *Zootaxa,* 4496(1): 160–172. doi: 10.11646/zootaxa.4496.1.11

TAVUÇ, İ., MISIRLIOĞLU, İ. M., KAPTANOĞLU, A S. & ÇELİK, N. (2018): Türkmen Dağı'nda Farklı Meşcerelerde Yayılış Gösteren Topraksolucanları (Clitellata, Megadrili) Hakkında Bir Ön Araştırma. *Bilge International Journal of Science and Technology Research*, 2 (Special Issue): 145–154. doi: 10.30516/bilgesci.487263

TRAKIĆ, T., VALCHOVSKI, H. & STOJANOVIĆ, M. (2016): Endemic earthworms (Oligochaeta: Lumbricidae) of the Balkan Peninsula: a review. *Zootaxa*, 4189: 251–274. doi: 10.11646/zootaxa.4189.2.3

VALCHOVSKI, H. (2012): Checklist of earthworms (Oligochaeta: Lumbricidae) from Bulgaria - a review. *Zootaxa*, 3458: 86–102.

ZICSI, A. (1981): Weitere Angaben zur Lumbricidenfauna Italiens (Oligochaeta: Lumbricidae). *Opuscula Zoologica, Budapest,* 16–17: 157–180.

ZICSI, A. (1982): Verzeichnis der bis 1971 beschriebenen und revidierten Taxa der Familie Lumbricidae (Oligochaeta). *Acta Zoologica Hungarica*, 28: 421–454.

ZICSI, A. (1994): Die Regenwürmer Österreichs (Oligochaeta: Lumbricidae) mit Bestimmungstabellen der Arten. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Österreich*, 131: 37–74.

ZICSI, A. & MICHALIS, K. (1981): Übersicht der Regenwurm- Fauna Griechenlands (Oligochaeta: Lumbricidae). *Acta Zoologica Academia Scientiarum Hungarica*, 27: 239–264.

ZICSI, A. & CSUZDI, CS. (1986): Regenwürmer aus Bulgarien (Oligochaeta: Lumbricidae). *Opuscula Zoologica, Budapest,* 22: 113–121.

https://www.gbif.org (Accessed: 02.01.2020).

https://tr.wikipedia.org (Accessed: 04.09.2020).

Opusc. Zool. Budapest, 2020, 51(2): 133–152

New species and records of Afrotropical, Australasian, Oriental and Palaearctic *Casinaria* Holmgren, 1859 (Hymenoptera: Ichneumonidae: Campopleginae)

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Abstract. Eight new species of *Casinaria* Holmgren, 1859 are described: *Casinaria castanea* sp. nov. and *Casinaria rubens* sp. nov. from South Africa, *Casinaria sellata* sp. nov. from South Africa and Kenya, *Casinaria kittenbergeri* sp. nov. from Uganda, *Casinaria papuensis* sp. nov. from Papua New Guinea, *Casinaria coloratilis* sp. nov., *Casinaria russea* sp. nov. and *Casinaria vesca* sp. nov. from Taiwan. The Afrotropical species of the genus are overviewed, and an identification key provided. Additionally, the first reports of *Casinaria granulicoxis* (Seyrig, 1935) from South Africa, *Casinaria albipalpis* (Gravenhorst, 1829) from Sweden and *Casinaria kriechbaumeri* (Costa, 1884) from Cyprus are given.

Keywords. species description, identification key, Old World, Kittenberger.

INTRODUCTION

Casinaria Holmgren, 1859 is a species-rich genus of family Ichneumonidae, subfamily Campopleginae. Prior to this study 106 valid species were known worldwide, 33 of them occurring in the Oriental, 28 in the Western Palaearctic, 18 in the Eastern Palaearctic, 11 in the Australasian, two in the Oceanic, two in the Afrotropical, 20 in the Nearctic, and nine in the Neotropical regions (Yu *et al.* 2012, Riedel 2018, Vas 2019*a*, *b*). Most species are koinobiont endoparasitoids of various lepidopterous hosts (Jerman & Gauld 1988).

In this paper, based on the material of the Hungarian Natural History Museum (HNHM, Budapest) and the Biological Museum of Lund University (MZLU, Lund), eight new species of the genus are described (four species from Afrotropical region, one species from Australasian region, and three species from Oriental region), the Afrotropical *Casinaria* species are revised and an identification key provided, and new distributional records of some *Casinaria* species are given.

MATERIAL AND METHODS

Taxonomy and nomenclature follow Yu & Horstmann (1997) and Yu *et al*. (2012); hence, complete nomenclatural history and list of synonym taxa are not repeated here. The morphological terminology is based on Gauld (1991) and Gauld *et al*. (1997); however, regarding wing veins, the corresponding terminology of Townes (1969) is also indicated for better comparability with previous works. The identifications were based on Szépligeti (1905), Cameron (1906), Morley (1926), Seyrig (1935), Walley (1947), Townes *et al*. (1961), Townes (1970), Townes & Townes (1973), Gupta & Maheshwary (1977), Kusigemati (1985), Jerman & Gauld (1988), Jonathan (1999), Choi & Lee (2010), Riedel (2018), van Noort (2019), Vas (2018, 2019*a*, *b*), and on checking the relevant type material (type specimens of all species mentioned in the species descriptions were examined at least by images). The specimens were identified and examined by the author using a Nikon SMZ645 stereoscopic microscope. Results are grouped into biogeog

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raphical regions; within biogeographical regions species are listed alphabetically. Photos were taken with 14 MP MicroQ-U3L digital camera. Post image work was done with ToupTek ToupView v4.7 and Photoshop CS3.

TAXONOMY

Subfamily: Campopleginae Förster, 1869

Genus: *Casinaria* Holmgren, 1859

Type species. *Campoplex tenuiventris* Gravenhorst, 1829; designation by Viereck (1914).

AFROTROPICAL REGION

Prior to this study, only two *Casinaria* species were known from the Afrotropical region, *Casinaria crassiventris* (Cameron, 1906) and *Casinaria granulicoxis* (Seyrig, 1935) (Yu *et al*. 2012). Their specific status is confirmed here as valid, their diagnoses are given, and four new Afrotropical species are described. An identification key to the currently known six Afrotropical *Casinaria* species is provided below.

Casinaria castanea sp. nov.

(Figure 1)

Material examined. Holotype: female, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 26.XII.[19]50, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 95, Insect trap; specimen pinned, Id. No. MZLU-HYM 26376. – Paratype: male, same locality and collectors, 22.I. 1951, Swedish South African Expedition 1950–1951, No. 157, Insect trap; specimen pinned, Id. No. MZLU-HYM 26371. – The holotype and paratype specimens are deposited in MZLU (Lund).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria castanea* sp. nov. can be easily identified by the combined presence of the following characters: scapus and pedicellus ventrally yellowish, mandible and tegula pale yellow, metasoma from third tergite on predominantly chestnut-brown, hind femur dark reddish brown, hind tibia chestnut-brown with distinct basal yellowish spot.

Description. Female (Fig. 1). Body length *ca*. 8 mm, fore wing length ca. 5 mm.

Head. Antenna with 33 flagellomeres; first flagellomere *ca*. 3.5× as long as wide apically; preapical flagellomeres quadrate to slightly longer than wide. Head transverse, matt, face coarsely granulate with superficial punctures, gena finely granulate with weak punctures, and with dense, greyish hairs. Ocular-ocellar distance 0.6× as long as ocellus diameter, posterior ocellar distance 1.7× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally moderately convergent. Gena very short, very strongly narrowed behind eye. Occipital carina complete, strongly bent out ventrally, reaching hypostomal carina at base of mandible, hypostomal carina slightly elevated. Malar space short, 0.4× as long as basal width of mandible. Face flat in profile, narrowed ventrally, minimal width of face *ca*. 0.5× as long as eye length. Clypeus very weakly separated from face, almost flat in profile, small, its apical margin weakly convex and moderately sharp. Mandible short, wide, lower margin of mandible with rather wide flange from base toward teeth, flange abruptly narrowed at teeth, upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma. Mesosoma with dense, relatively short, greyish hairs. Dorsal half of pronotum granulate, ventral half finely granulate with strong transverse wrinkles; epomia strong. Mesoscutum coarsely granulate to rugulose and punctate, convex in profile, 0.85× as long as wide, notaulus not developed. Scuto-scutellar groove relatively narrow. Scutellum coarsely granulate with superficial punctures, wide, almost flat, medially not impressed, lateral carina indistinct. Mesopleuron coarsely granulate with dense, superficial punctures, and with transverse wrinkles anterior to speculum; speculum granulate; mesopleural suture impressed with short, strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it above its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the

epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete. Metanotum coarsely granulate, *ca*. 0.4× as long as scutellum. Metapleuron coarsely granulate with superficial punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle oval, separated from pleural carina by distinctly less than 0.5× its length. Propodeum long, its apex reaching about middle length of hind coxa, rather coarsely granulate to rugose, apical two-third medially narrowly impressed with strong transverse wrinkles; propodeal carinae indistinct. Fore wing with petiolate areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) about interstitial; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) about vertical, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with superficial punctures. Hind femur relatively stout, *ca*. 5.0× as long as high. Inner spur of hind tibia *ca*. 0.75× as long as first tarsomere of hind tarsus. Tarsal claws small and short, about as long as arolium, basal half with small but distinct pecten.

Metasoma. Metasoma compressed, finely granulate to shagreened with short, greyish hairs. First tergite long and slender, *ca*. 5.0× as long as width of its apical margin, 1.25× as long as second tergite, 1.1× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus moderately bulging. Suture separating first tergite from first sternite situated strongly above mid-height at basal third of first metasomal segment. Second tergite long and slender, 2.5× as long as its apical width; thyridium strongly elongate, long and deep, its distance from basal margin of tergite *ca*. 1.5× as long as its length, connected to basal margin of tergite by a weak, superficial groove. Posterior margins of third and following tergites medially slightly concave. Ovipositor sheath shorter than apical depth of metasoma; ovipositor strong, straight, compressed, dorsal preapical notch distinct, lower valve abruptly narrowed before apex.

Colour. Antenna dark brown, scapus and pedicellus ventrally yellowish. Head black except palpi and mandible pale yellow, mandibular teeth reddish brown. Mesosoma black except tegula pale yellow. Metasoma: petiolus black, postpetiolus brownish; second tergite blackish, subapically brownish; basal half of third tergite dark brown, apical half chestnut-brown; following tergites chestnut-brown with indistinct, narrow, somewhat darker dorsal patches; ovipositor sheath blackish. Wings hyaline, wing veins and pterostigma brown. Fore leg: coxa extensively pale yellow, basally dark brown to blackish; trochanter and trochantellus pale yellow; femur pale yellow, ventrally reddish yellow; tibia dorsally pale yellow, ventrally reddish yellow; tarsus yellowish, apical tarsomere brownish. Middle leg: coxa black, apically narrowly yellowish; trochanter and trochantellus pale yellow; femur brownish yellow, basally and ventrally somewhat darkened; tibia dorsally pale yellow, ventrally reddish yellow; tarsus light brownish except basal half of first tarsomere yellowish. Hind leg: coxa black; trochanter dark brown with pale yellow apical margin; trochantellus pale yellow; femur dark reddish brown, apically somewhat darkened, extreme base narrowly yellowish; tibia chestnut-brown with distinct basal yellowish spot; tarsus dark brown except extreme base of first tarsomere narrowly yellowish.

Male. Similar to female in all characters described above, except: antenna with 34 flagellomeres; first flagellomere *ca*. 2.5× as long as wide; malar space 0.5× as long as basal width of mandible; minimal width of face *ca*. 0.6× as long as eye length; sculpture of mesosoma and coxae somewhat coarser, punctures stronger, propodeum more rugose than in female; hind femur *ca*. 5.5× as long as high; second tergite *ca*. 3.0× as long as its apical width; clasper narrow, elongate rod-like, apically little widened and rounded; fore and middle femora more reddish brown, hind femur and metasoma somewhat darker brownish than in female.

Distribution. South Africa.

Etymology. The specific epithet *castanea* is the feminine form of the Latin adjective *castaneus, -a, -um* meaning chestnut-coloured; it refers to the colouration of metasoma and hind legs of the new species.

Remarks. The new species is somewhat similar to the Afrotropical species *Casinaria granulicoxis* (Seyrig, 1935), but this species can be readily distinguished from the new species by its entirely dark brown scapus and pedicellus, dark brown hind femur, and dark brown hind tibia without yellowish basal spot.

Casinaria crassiventris (Cameron, 1906)

Campoplex crassiventris Cameron, 1906: 95, female.

Material examined. Holotype female, deposited in Iziko South African Museum (SAMC, Cape Town).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria crassiventris* (Cameron, 1906) can be easily identified by the combined presence of the following characters: scapus, pedicellus, palpi and tegula blackish, mandible predominantly blackish, fore and middle legs except coxae predominantly reddish, hind femur blackish, hind tibia dark reddish brown without distinct basal yellowish spot, metasoma black, middle tergites extensively reddish, wings infuscate. Male unknown.

Distribution. South Africa.

Casinaria granulicoxis (Seyrig, 1935)

Deltops granulicoxis Seyrig, 1935: 85, female.

Material examined. Holotype female, deposited in Muséum National d'Historie naturelle (MNHN, Paris). – Two females, S. Afr. [= South Africa], Natal, Royal Natal National Park, 7–11.IV.[19]51, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 271, Insect trap; specimens pinned, Id. No. MZLU-HYM 26372 deposited in MZLU (Lund), Id. No. MZLU-HYM 26373 deposited in HNHM (Budapest, Id. No. HNHM-HYM 155184).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria granulicoxis* (Seyrig, 1935) can be identified by the combined presence of the following characters: scapus and pedicellus entirely dark brown, mandible and tegula yellow, hind femur dark brown, hind tibia dark brown without yellowish basal spot, metasoma blackish to dark brown, laterally dark reddish brown. Male unknown.

Distribution. Kenya, South Africa.

Remarks. First record for South Africa.

Casinaria kittenbergeri sp. nov.

(Figure 2)

Material examined. Holotype: female, Uganda, Mujenje, VII.1913, leg. [K.] Katona [= K. Kittenberger]; specimen pinned, Id. No. HNHM-HYM 155185. – Paratypes: one female and one male, same locality and collector, VIII.1913; specimens pinned, Id. No. HNHM-HYM 155186–155187, respectively. The holotype and paratype specimens are deposited in HNHM (Budapest).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria kittenbergeri* sp. nov. can be readily identified by the combined presence of the following characters: body black except mandible subapically and apical two-third of third tergite reddish brown, middle and hind legs black to dark brown, dorsally all tibiae extensively ivory.

Description. Female (Fig. 2). Body length *ca.* 11 mm, fore wing length *ca.* 6 mm.

Head. Antenna with 48–50 flagellomeres; first flagellomere *ca.* 2.5× as long as wide apically; preapical flagellomeres longer than wide. Head transverse, matt, face rugose-punctate, gena granulate-punctate, and with dense, relatively long, silvery hairs. Ocular-ocellar distance 0.9× as long as ocellus diameter, posterior ocellar distance 1.9× as long as ocellus diameter. Inner eye orbits indented, about parallel. Gena moderately short,

roundly narrowed behind eye, in dorsal view *ca*. 0.4× as long as eye width. Occipital carina ventrally weakened, weakly bent out, reaching hypostomal carina at or little before base of mandible, hypostomal carina slightly elevated. Malar space very short, *ca*. 0.3× as long as basal width of mandible. Face weakly convex in profile, minimal width of face *ca*. 0.75× as long as eye length. Clypeus very weakly separated from face, almost flat in profile, relatively wide, its apical margin weakly convex, sharp, punctures stronger on clypeus than on other parts of head. Mandible relatively long, strong and wide, lower margin of mandible with relatively narrow flange from base toward teeth, flange gradually tapered toward teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma relatively short, with dense, relatively long, silvery hairs. Dorsal half of pronotum granulate with superficial punctures, ventral half finely granulate with moderately strong transverse wrinkles; epomia distinct. Mesoscutum rugose-punctate, weakly convex in profile, little shorter than wide, notaulus not developed. Scuto-scutellar groove narrow. Scutellum rugose-punctate, wide, weakly convex, medially not impressed, lateral carina indistinct. Mesopleuron coarsely granulate to rugose with dense, distinct punctures on lower half and along anterior margin, with relatively weak transverse wrinkles above speculum; speculum granulate; mesopleural suture impressed with short, moderately strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e*. the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated, medially slightly and widely excised. Metanotum rugose-punctate, *ca*. 0.3× as long as scutellum. Metapleuron rugose-rugulose with superficial punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle strongly elongate, separated from pleural carina by about 0.2–0.3× its length. Propodeum in profile roundly curved toward apex, rather long, its apex reaching beyond middle length of hind coxa, rather evenly and finely sculptured rugose-rugulose, medially distinctly and widely impressed; propodeal carinae indistinct except very short basal sections of lateromedian longitudinal carinae. Fore wing with petiolate, small areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) at distal corner of areolet; distal part of distal abscissa of *Rs* rather strongly curved toward wing margin; nervulus (*cu-a*) interstitial to postfurcal by about its width; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) broken, weakly intercepted by discoidella (distal abscissa of *Cu*1) at about its lower 0.3–0.5, its anterior section vertical, posterior section reclivous; discoidella spectral, proximally weakly connected to nervellus. Coxae granulate with superficial punctures. Hind femur relatively slender, *ca*. 5.5× as long as high. Inner spur of hind tibia *ca*. 0.70–0.75× as long as first tarsomere of hind tarsus. Tarsal claws relatively long, longer than arolium, basal half with distinct pecten.

Metasoma. Metasoma long, weakly compressed, very finely granulate to shagreened with moderately short, greyish hairs. First tergite long and slender, *ca*. 5.0× as long as width of its apical margin, 1.3× as long as second tergite, 1.2× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated strongly above mid-height at basal third of first metasomal segment. Second tergite long and slender, 2.5–2.7× as long as its apical width; thyridium small, short and oval, its distance from basal margin of tergite *ca*. 4.0× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of apical tergites medially slightly concave. Ovipositor sheath shorter than apical depth of metasoma; ovipositor moderately strong, straight, compressed, dorsal preapical notch distinct, lower valve gradually tapered to apex.

Colour. Antenna basally, including scapus and pedicellus, blackish, apical two-third dorsally

brown, ventrally light brownish. Head black, palpi brown to yellowish brown, mandible black, before teeth narrowly reddish brown, teeth dark reddish brown. Mesosoma, including tegula, black. Metasoma black, except apical two-third of third tergite reddish brown, sometimes basal 0.1–0.2 of fourth tergite also reddish brown; ovipositor sheath dark brown. Wings little infuscate, wing veins and pterostigma brown. Fore leg: coxa black; trochanter dark brown, apically narrowly yellowish brown; trochantellus dorsally brown, apically and ventrally yellowish brown; femur predominantly brown, basally darkened, apical half dorsally yellowish brown; tibia dorsally ivory, ventrally brownish; tarsus yellowish brown, apical tarsomeres brown. Middle leg: coxa and trochanter black; trochantellus and femur blackish; tibia dorsally ivory, ventrally and a narrow apical band dark brown; tibial spurs ivory; tarsus brown. Hind leg: coxa, trochanter, trochantellus and femur black; tibia blackish, dorsally ivory from base to half or two-third of its length; tibial spurs ivory; tarsus dark brown except extreme base of first tarsomere very narrowly reddish brown.

Male. Similar to female in all characters described above, except: ocular-ocellar distance 1.1× as long as ocellus diameter, posterior ocellar distance 2.2× as long as ocellus diameter; lower external angle of second discal cell almost right-angled; nervellus less distinctly broken, weakly intercepted at about its lower 0.2; inner spur of hind tibia 0.65× as long as first tarsomere of hind tarsus; posterior margins of apical tergites straight; clasper narrow, rather thin, elongate rod-like, apically slightly widened and rounded.

Distribution. Uganda.

Etymology. This species is dedicated to the memory of its collector, Kálmán Kittenberger (1881–1958), in honour of his remarkable collecting activity for the Hungarian natural history collection.

Remarks. The general habitus of this species shows some superficial similarity to the closely related Oriental and Eastern Palaearctic genus *Scenocharops* Uchida, 1932, but the medially impressed mesopleural suture and the lack of lateral flange on petiolus clearly distinguish it from *Scenocharops* species.

***Casinaria rubens* sp. nov.**

(Figure 3)

Material examined. Holotype: female, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 26.XII.[19]50, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 95, Insect trap; specimen pinned, Id. No. MZLU-HYM 26377. – The holotype specimen is deposited in MZLU (Lund).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria rubens* sp. nov. can be easily identified by the combined presence of the following characters: scapus and pedicellus ventrally yellowish brown, mandible and tegula pale yellow, metasoma basally extensively, from third tergite entirely reddish, all femora reddish, middle and hind tibiae reddish with distinct basal yellowish spots.

Description. Female (Fig. 3). Body length *ca*. 8 mm, fore wing length *ca*. 5 mm.

Head. Antenna with 34 flagellomeres; first flagellomere *ca*. 4.0× as long as wide apically; preapical flagellomeres quadrate to slightly longer than wide. Head transverse, matt, face rugulose-punctate, gena granulate with superficial punctures, and with dense, greyish hairs. Ocular-ocellar distance 0.5× as long as ocellus diameter, posterior ocellar distance 1.7× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally moderately convergent. Gena very short, very strongly narrowed behind eye, in lateral view ventrally widened. Occipital carina complete, slightly bent out ventrally, reaching hypostomal carina distinctly before base of mandible, hypostomal carina slightly elevated. Malar space 0.5× as long as basal width of mandible. Face flat in profile, narrowed ventrally, minimal width of face *ca*. 0.6× as long as eye length. Clypeus very weakly separated from face, almost flat in profile, small,

its apical margin weakly convex, sharp. Mandible short, wide, lower margin of mandible with rather wide flange from base toward teeth, flange abruptly narrowed at teeth, upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma. Mesosoma with dense, relatively short, greyish hairs. Pronotum granulate to finely rugose, ventral half with weak transverse wrinkles; epomia distinct. Mesoscutum rugose-punctate, convex in profile, 0.9× as long as wide, notaulus not developed. Scuto-scutellar groove relatively wide. Scutellum rugose, partly rugose-punctate, convex, medially not impressed, lateral carina indistinct. Mesopleuron rugose-rugulose with dense, superficial punctures on lower half and along anterior margin, with few, weak transverse wrinkles above speculum; speculum granulate to finely granulate, ventrally subpolished; mesopleural suture impressed with short, moderately strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it at about its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, not elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, medially not excised. Metanotum granulate-rugose, *ca*. 0.4× as long as scutellum. Metapleuron rugose with superficial punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum strong; propodeal spiracle oval, separated from pleural carina by *ca*. 0.75× its length. Propodeum relatively short, its apex not reaching middle length of hind coxa, coarsely rugose, apical half medially only slightly impressed with moderately strong transverse wrinkles. Propodeal carinae partly developed: basal sections of lateromedian longitudinal carinae weak but discernible, apical sections obsolete; lateral longitudinal carinae strong; median section of anterior transverse carina strong, costula and lateral section indistinct; posterior transverse carina strong except median section indistinct. Fore wing with petiolate areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) postfurcal by 0.2× its length; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted little above its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) about vertical, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with weak, superficial punctures. Hind femur relatively stout, *ca*. 5.0× as long as high. Inner spur of hind tibia *ca.* 0.7× as long as first tarsomere of hind tarsus. Tarsal claws small and short, little longer than arolium, basal half with distinct pecten.

Metasoma. Metasoma compressed, relatively short, finely granulate to shagreened with short, greyish-brownish hairs. First tergite moderately long and slender, *ca*. 4.0× as long as width of its apical margin, 1.3× as long as second tergite, 0.9× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated at mid-height at basal third of first metasomal segment. Second tergite moderately long and slender, 2.0× as long as its apical width; thyridium oval, its distance from basal margin of tergite about as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of apical tergites medially slightly, almost indiscernibly concave. Ovipositor sheath shorter than apical depth of metasoma.

Colour. Antenna dark brown, scapus and pedicellus ventrally yellowish brown. Head black except palpi and mandible pale yellow, mandibular teeth reddish brown. Mesosoma black except tegula pale yellow. Metasoma: petiolus dark brown, apically reddish, postpetiolus reddish; second tergite reddish, its basal half and apical margin blackish; third and following tergites reddish; ovipositor sheath blackish. Wings subhyaline, wing veins and pterostigma brown. Fore leg: coxa dark brown, ventrally and apically yellowish brown; trochanter and trochantellus pale yellow; femur reddish; tibia reddish, dorsally yellowish; tarsus reddish, apical tarsomeres brownish. Middle leg: coxa blackish, ventrally and apically reddish brown; trochanter pale yel-

low; trochantellus reddish brown; femur reddish; tibia reddish with distinct yellowish basal spot; tarsus brownish. Hind leg: coxa black; trochanter and trochantellus brown; femur reddish; tibia reddish with distinct yellowish basal spot; tarsus brown.

Male. Unknown.

Distribution. South Africa.

Etymology. The specific epithet *rubens* is a Latin one-termination participle treated as an adjective, meaning coloured or tinged with red; it refers to the colouration of metasoma and legs of the new species.

***Casinaria sellata* sp. nov.**

(Figure 4)

Material examined. Holotype: female, S. Afr. [= South Africa], Cape Prov., Cape Peninsula, Hout Bay, Skoorsteenkop, 14.II.[19]51, leg. Brinck & Rudenbeck, Swedish South African Expedition 1950–1951, No. 183, Insect trap; specimen pinned, Id. No. MZLU-HYM 26375. – Paratypes: male, same locality and collectors, 26.XII.[19]50, Swedish South African Expedition 1950–1951, No. 95, Insect trap; specimen card-mounted, Id. No. MZLU-HYM 26378; male, Kenya, Mt. Elgon Nat. P., SW ridge of Koroborte, Echinaceae bush, 3300m, 16.I.1992, leg. O. Merkl, No. 472, swept; specimen card-mounted, Id. No. HNHM-HYM 155188. The holotype and one paratype (MZLU-HYM 26378) are deposited in MZLU (Lund), and one paratype (HNHM-HYM 155188) is deposited in HNHM (Budapest).

Diagnosis. Among the Afrotropical species of the genus, *Casinaria sellata* sp. nov. can be easily identified by the combined presence of the following characters: scapus and pedicellus blackish, at least apical half of mandible yellowish, tegula yellow, metasoma blackish except apical half of third tergite and almost entire fourth tergite orange to yellowish brown, middle and hind femora reddish, hind tibia brown with distinct basal yellowish spot (female) or basally and externo-medially yellowish, sub-basally, ventrally and apically brown (male).

Description. Female (Fig. 4). Body length *ca.* 7 mm, fore wing length *ca*. 4.5 mm.

Head. Antenna with 33 flagellomeres; first flagellomere *ca*. 3.5× as long as wide apically; preapical flagellomeres quadrate. Head transverse, matt, face rugulose with superficial punctures, gena granulate with weak punctures, and with dense, short, greyish hairs. Ocular-ocellar distance 0.7× as long as ocellus diameter, posterior ocellar distance 1.6× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally moderately convergent. Gena very short, very strongly narrowed behind eye. Occipital carina complete, not bent out ventrally, reaching hypostomal carina little before base of mandible, hypostomal carina slightly elevated. Malar space 0.6× as long as basal width of mandible. Face flat in profile, narrowed ventrally, minimal width of face *ca*. 0.5× as long as eye length. Clypeus very weakly separated from face, almost flat in profile, small, its apical margin weakly convex, sharp. Mandible short, wide, lower margin of mandible with rather wide flange from base toward teeth, flange abruptly narrowed at teeth, upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma. Mesosoma relatively short, with dense, short, greyish hairs. Dorsal third of pronotum granulate to rugulose, ventral two-third finely granulate with moderately strong transverse wrinkles; epomia strong. Mesoscutum rugose-punctate, convex in profile, 0.9× as long as wide, notaulus not developed. Scuto-scutellar groove moderately wide. Scutellum rugose-punctate, convex, medially not impressed, lateral carina indistinct. Mesopleuron rugose with dense, superficial punctures on lower half and along anterior margin, with relatively weak transverse wrinkles above and anterior to speculum; speculum granulate; mesopleural suture impressed with short, strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it at about its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the

ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, medially not excised. Metanotum rugose-punctate, *ca*. 0.5× as long as scutellum. Metapleuron rugulose-rugose with superficial punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum complete; propodeal spiracle oval, separated from pleural carina by *ca*. 0.5× its length. Propodeum long, its apex reaching little beyond middle length of hind coxa, rugose-rugulose, apical half medially narrowly, weakly impressed with relatively weak, short transverse wrinkles; propodeal carinae indistinct. Fore wing with petiolate areolet, stalk of areolet short, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) slightly distal to middle of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) postfurcal by about its width; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) reclivous, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with superficial punctures. Hind femur slender, *ca*. 5.5× as long as high. Inner spur of hind tibia *ca*. 0.7× as long as first tarsomere of hind tarsus. Tarsal claws small and short, about as long as arolium, basal half with small pecten.

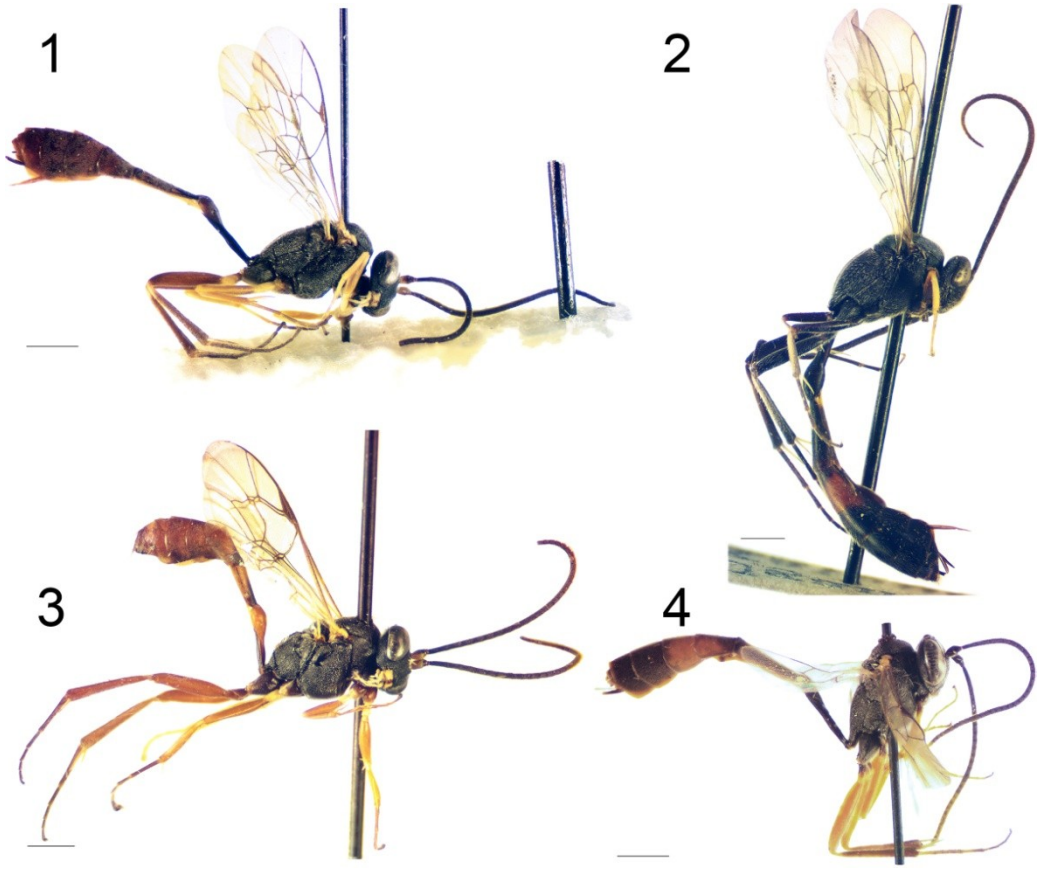
Metasoma. Metasoma compressed, conspicuously elongate, finely granulate to shagreened with short, greyish hairs. First tergite rather long and slender, *ca*. 5.5× as long as width of its apical margin, 1.1× as long as second tergite, 1.0× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus moderately bulging. Suture separating first tergite from first sternite situated strongly above mid-height at basal third of first metasomal segment. Second tergite rather long and slender, 3.3× as long as its apical width; thyridium large, elongate oval, deep, its distance from basal margin of tergite *ca*. 3.0× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of third and following tergites medially slightly, almost indiscernibly concave. Ovipositor sheath shorter than apical depth of metasoma.

Colour. Antenna, including scapus and pedicellus, blackish to dark brown. Head black except palpi yellow, apical half of mandible brownish yellow, mandibular teeth reddish brown. Mesosoma black except tegula yellow. Metasoma blackish except apical half of third tergite and almost entire fourth tergite orange; ovipositor sheath blackish. Wings hyaline, wing veins and pterostigma brown. Fore leg: coxa black; trochanter brown; trochantellus brownish yellow; femur dark reddish yellow; tibia light reddish yellow, dorsally pale yellow; tarsus light reddish yellow, apical tarsomeres brownish. Middle leg: coxa black; trochanter dark brown; trochantellus brownish yellow; femur reddish; tibia reddish, dorsally pale yellowish; tarsus reddish brown. Hind leg: coxa black; trochanter blackish; trochantellus brownish to yellowish; femur reddish; tibia brown with distinct basal yellowish spot; tarsus brown except extreme base of first tarsomere narrowly yellowish brown.

Male. Similar to female in all characters described above, except: antenna with 31–33 flagellomeres; first flagellomere *ca*. 2.5× as long as wide; ocular-ocellar distance 0.9× as long as ocellus diameter, posterior ocellar distance 1.8× as long as ocellus diameter; malar space 0.7–0.8× as long as basal width of mandible; minimal width of face *ca*. 0.6× as long as eye length; hind femur *ca*. 5.0× as long as high; first tergite about as long as second tergite, 1.0–1.1× as long as hind femur; second tergite 3.0–4.0× as long as its apical width; clasper broad, apically rounded; mandible predominantly yellowish; apical half of third tergite and fourth tergite orange to yellowish brown; all trochantelli predominantly yellowish; fore and middle tarsi yellowish, apical tarsomeres brownish; hind femur apically darkened; hind tibia basally and externo-medially pale yellow, sub-basally, ventrally and apically brown.

Distribution. South Africa, Kenya.

Etymology. The specific epithet *sellata* is the feminine form of the Latin adjective *sellatus, -a, -um* meaning saddled; it refers to the colouration of metasoma of the new species.



Figures 1–4. Holotypes of new Afrotropical *Casinaria* species. 1 = *Casinaria castanea* sp. nov., 2 = *Casinaria kittenbergeri* sp. nov., 3 = *Casinaria rubens* sp. nov., 4 = *Casinaria sellata* sp. nov. (scale bars = 1 mm)

Identification key to the Afrotropical *Casinaria* species

An identification key to the currently known Afrotropical *Casinaria* species is provided below. It should be considered preliminary and used with caution, as it is principally based on type materials, hence the intraspecific variability is little understood, and most probably several yet undescribed species occur in the region.

1. Tegula black **2**
– Tegula yellow **3**

2. Middle legs except coxae predominantly reddish, hind femur blackish, hind tibia dark reddish brown without distinct basal yellowish spot .....
..... ***Casinaria crassiventris*** (Cameron, 1906)
– Middle and hind legs blackish, tibiae dorsally extensively ivory ..... ***Casinaria kittenbergeri*** sp. nov.

3. Metasoma from third tergite entirely reddish, basal tergites extensively reddish ..... ***Casinaria rubens*** sp. nov.
– Metasoma predominantly black to brown **4**

4. Hind femur reddish, metasoma blackish except apical half of third tergite and almost entire fourth tergite orange to yellowish brown .....
..... ***Casinaria sellata*** sp. nov.
– Hind femur dark reddish brown to dark brown, metasoma either blackish to dark brown, laterally dark reddish brown or from third tergite predominantly chestnut-brown **5**

5. Scapus and pedicellus entirely dark brown, metasoma blackish to dark brown, laterally dark reddish brown, hind femur dark brown, hind tibia dark brown without yellowish basal spot .....
..... ***Casinaria granulicoxis*** (Seyrig, 1935)
– Scapus and pedicellus ventrally yellowish, metasoma from third tergite predominantly chestnut-brown, hind femur dark reddish brown, hind tibia chestnut-brown with distinct basal yellowish spot .....
..... ***Casinaria castanea*** sp. nov.

AUSTRALASIAN REGION

Prior to this study, 11 *Casinaria* species were known from the Australasian region (Yu *et al*. 2012). A new species from Papua New Guinea is described here.

***Casinaria papuensis* sp. nov.**

(Figure 5)

Material examined. Holotype: female, [Papua] New Guinea, Wau, 20.IX.1972, leg. L. Móczár, M.cs. [= Malaise-trap]; specimen pinned, Id. No. HNHM-HYM 155189. – The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Australasian species of the genus, *Casinaria papuensis* sp. nov. can be easily identified by the combined presence of the following characters: propodeum elongate, its apex reaching beyond middle length of hind coxa, propodeal carinae indistinct, scutellum convex, medially not impressed, without lateral carina, speculum large, smooth, first metasomal segment long, not modified, ovipositor straight, scapus predominantly brownish yellow, mandible black, apical half reddish brown, mesosoma black except tegula brownish yellow, first tergite black, apically reddish brown, second tergite black with a subapical reddish band, third, fourth and fifth tergite dorsally blackish, laterally orange to reddish, apical tergites blackish, fore and middle femora orange, hind femur reddish, hind tibia brown, externo-medially dark reddish brown, basal yellowish spot present but indistinct.

Description. Female (Fig. 5). Body length *ca*. 12.5 mm, fore wing length ca. 8 mm.

Head. Antenna with 39 flagellomeres; first flagellomere *ca*. 3.0× as long as wide apically; preapical flagellomeres slightly longer than wide. Head transverse, matt, face rugose-punctate, vertex coarsely granulate, gena granulate with weak punctures, and with dense, relatively long, greyish hairs. Ocular-ocellar distance 0.6× as long as ocellus diameter, posterior ocellar distance 1.5× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally moderately convergent. Gena very short, very strongly narrowed behind eye. Occipital carina complete, not bent out ventrally, reaching hypostomal carina little before base of mandible, hypostomal carina slightly elevated. Malar space very short, 0.3× as long as basal width of mandible. Face almost flat in profile, narrowed ventrally, minimal width of face *ca*. 0.55× as long as eye length. Clypeus very weakly separated from face, slightly convex in profile, relatively wide, its apical margin weakly convex and moderately sharp. Mandible short, wide, lower margin of mandible with rather wide flange from base toward teeth, flange moderately abruptly, obliquely narrowed at teeth, upper mandibular tooth slightly longer and wider than lower tooth.

Mesosoma. Mesosoma with dense, moderately long, greyish hairs. Pronotum with strong transverse wrinkles almost on its entire length, along dorsal edge and hind corner rugulose; epomia strong. Mesoscutum coarsely rugose-punctate, convex in profile, 0.9× as long as wide, notaulus not developed. Scuto-scutellar groove wide and deep. Scutellum rugose-punctate, convex, medially not impressed, lateral carina indistinct. Mesopleuron coarsely rugose with dense punctures on lower half and along anterior margin, with strong transverse wrinkles above and anterior to speculum; speculum large, smooth and shiny; mesopleural suture impressed with short, moderately strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, distinctly elevated, medially widely, shallowly excised. Metanotum rugulose-punctate, *ca.* 0.35× as long as scutellum. Metapleuron rugose-punctate; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum complete; propodeal spiracle oval, separated from pleural carina by *ca*. 0.6–0.7× its length, connected to pleural carina by a distinct ridge. Propodeum long, its apex reaching little beyond middle

length of hind coxa, rugose-rugulose, medially distinctly, moderately widely impressed with short transverse wrinkles; propodeal carinae indistinct. Fore wing with petiolate areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) postfurcal by about its width; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) reclivous, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with superficial punctures. Hind femur slender, *ca*. 5.5× as long as high. Inner spur of hind tibia ca. 0.6× as long as first tarsomere of hind tarsus. Tarsal claws little longer than arolium, entire lengths with distinct, strong pecten.

Metasoma. Metasoma compressed, finely granulate to shagreened with short, greyish-brownish hairs. First tergite rather long and slender, *ca*. 5.0× as long as width of its apical margin, 1.1× as long as second tergite, 1.1× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated little above mid-height at basal third of first metasomal segment. Second tergite rather long and slender, 3.5× as long as its apical width; thyridium large, oval, its distance from basal margin of tergite ca. 3.0× as long as its length, not connected to basal margin of tergite by a groove. Posterior margins of third and following tergites medially distinctly, widely concave, seventh tergite medially strongly excised. Ovipositor sheath shorter than apical depth of metasoma; ovipositor strong, straight, compressed, dorsal preapical notch distinct, lower valve obliquely tapered to apex.

Colour. Antenna dark brown, scapus predominantly brownish yellow. Head black except palpi yellow, apical half of mandible reddish brown, mandibular teeth blackish. Mesosoma black except tegula brownish yellow. Metasoma: first tergite black, postpetiolus apically reddish brown; second tergite black with a subapical reddish band; third, fourth and fifth tergite dorsally blackish, laterally orange to reddish; following tergites predominantly blackish; ovipositor sheath blackish. Wings little infuscate, wing veins and pterostigma brown. Fore and middle legs: coxae black; trochanters reddish brown; trochantelli brownish yellow; femora orange; tibiae orange, dorsally yellowish; tarsi light reddish yellow, apical tarsomeres brownish. Hind leg: coxa black; trochanter blackish; trochantellus reddish; femur reddish, apically brown; tibia brown, externo-medially dark reddish brown, basal yellowish spot present but indistinct, small; tarsus brown except extreme base of first tarsomere narrowly yellowish brown.

Male. Unknown.

Distribution. Papua New Guinea.

Etymology. The specific epithet *papuensis* is the feminine form of the Latin adjective *papuensis, -is, -e* meaning Papuan.

Remarks. By using the identification key in Jerman & Gauld (1988), the new species keys out with the Australian species, *Casinaria hesperiophaga* Jerman et Gauld, 1988, but without matching its characteristics given in the key; this species can be readily distinguished from the new species by its small speculum, distinctly upcurved ovipositor, and different colouration of legs and metasoma.

ORIENTAL REGION

Prior to this study, 33 *Casinaria* species were known from the Oriental region (Yu *et al*. 2012). Three new species from Taiwan are described here.

***Casinaria coloratilis* sp. nov.**

(Figure 6)

Material examined. Holotype: female, Formosa [= Taiwan], Mt. Hoozan, I.1910, leg. [H.] Sauter; specimen pinned, apices of antennae broken, Id. No. HNHM-HYM 155190. The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Oriental species of the genus, *Casinaria coloratilis* sp. nov. could be

easily identified by the combined presence of the following characters: malar space 0.5× as long as basal width of mandible, nervulus strongly postfurcal, propodeum medially distinctly impressed, propodeal carinae partly developed, first tergite little shorter than hind femur, apex of propodeum not reaching beyond middle length of hind coxa, thyridium connected to basal margin of second tergite by a weak, superficial groove, scapus and pedicellus ventrally brownish yellow, mandible yellow, tegula yellow to brownish yellow, wings infuscate, metasoma black with third and fourth tergites extensively dark reddish brown, fore and middle femora and tibiae reddish yellow to light reddish, hind femur chestnut-brown, hind tibia brown, externo-medially somewhat lighter, basal yellowish spot present, small.

Description. Female (Fig. 6). Body length *ca*. 7.5 mm, fore wing length *ca*. 5.5 mm.

Head. First flagellomere *ca*. 3.5× as long as wide apically. Head transverse, matt, face rugulose with superficial punctures, gena granulate with weak punctures, and with dense, relatively short, greyish hairs. Ocular-ocellar distance 0.5× as long as ocellus diameter, posterior ocellar distance 1.2× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally moderately convergent. Gena very short, very strongly narrowed behind eye. Occipital carina complete, bent out ventrally, reaching hypostomal carina at base of mandible, hypostomal carina slightly elevated. Malar space 0.5× as long as basal width of mandible. Face flat in profile, narrowed ventrally, minimal width of face *ca*. 0.6× as long as eye length. Clypeus very weakly separated from face, slightly convex in profile, its apical margin weakly convex and moderately sharp. Mandible short, wide, lower margin of mandible with rather wide flange from base toward teeth, flange abruptly narrowed at teeth, mandibular teeth of equal length.

Mesosoma. Mesosoma with dense, short, greyish hairs. Dorsal third of pronotum granulate, ventral two-third finely granulate to smooth with moderately strong transverse wrinkles; epomia strong. Mesoscutum rugulose-punctate, convex in profile, about as long as wide, notaulus not developed. Scuto-scutellar groove wide and deep. Scutellum rugose-punctate, convex, medially not impressed, lateral carina indistinct. Mesopleuron rugose-rugulose with dense, weak punctures on lower half and along anterior margin, with distinct transverse wrinkles above and anterior to speculum; speculum very finely granulate, subpolished, in the middle smooth, shiny; mesopleural suture impressed with short, moderately strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, not elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated, medially not excised. Metanotum rugulose-punctate, *ca*. 0.4× as long as scutellum. Metapleuron rugulose with superficial punctures; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum complete; propodeal spiracle oval, separated from pleural carina by *ca*. 0.7× its length. Propodeum long, its apex reaching about middle length of hind coxa, rugose-rugulose, medially distinctly, moderately widely impressed with short transverse wrinkles. Propodeal carinae mostly indistinct except short basal sections of lateromedian longitudinal carinae, median section of anterior transverse carina running conspicuously close to base of propodeum, and lateral sections of posterior transverse carina. Fore wing with petiolate areolet, stalk of areolet short, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) close to distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) postfurcal by *ca*. 0.2× its length; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell weakly acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) weakly reclivous, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with superficial punctures. Hind femur relatively stout, *ca*. 5.0× as long as high. Inner spur of hind tibia

ca. 0.6× as long as first tarsomere of hind tarsus. Tarsal claws little longer than arolium, basal two-third with distinct pecten.

Metasoma. Metasoma weakly compressed, finely granulate to shagreened with short, greyish-brownish hairs. First tergite relatively stout, *ca*. 4.7× as long as width of its apical margin, 1.2× as long as second tergite, 0.9× as long as hind femur, without glymma; dorsomedian carina of first tergite missing; postpetiolus strongly bulging. Suture separating first tergite from first sternite situated distinctly above mid-height at basal third of first metasomal segment. Second tergite moderately long and slender, 2.0× as long as its apical width; thyridium large, oval, its distance from basal margin of tergite *ca*. 1.5× as long as its length, connected to basal margin of tergite by a weak, superficial groove. Posterior margins of third and following tergites straight. Ovipositor sheath subequal to apical depth of metasoma; ovipositor strong, straight, compressed, dorsal preapical notch deep, lower valve obliquely tapered to apex.

Colour. Antenna dark brown, scapus and pedicellus ventrally brownish yellow. Head black except palpi and mandible yellow, mandibular teeth reddish brown. Mesosoma black except tegula yellow to brownish yellow. Metasoma black except subapical band of second tergite, apical half of third tergite laterally, and fourth tergite laterally dark reddish brown; ovipositor sheath dark brown. Wings infuscate, brownish, wing veins and pterostigma brown. Fore and middle legs: coxae black, apically yellowish; trochanters and trochantelli yellowish; femora and tibiae reddish yellow to light reddish; tarsi brownish yellow to brownish, apical tarsomeres brown. Hind leg: coxa black, apically narrowly yellowish; trochanter blackish; trochantellus yellowish; femur chestnut-brown; tibia brown, externo-medially somewhat lighter, basal yellowish spot present, small; tarsus dark brown except extreme base of first tarsomere narrowly yellowish brown.

Male. Unknown.

Distribution. Taiwan.

Etymology. The specific epithet *coloratilis* is the feminine form of the Latin adjective *coloratilis, -is, -e* meaning brown, tanned; it refers to the colouration of metasoma and hind legs of the new species.

Remarks. By using the identification key in Gupta & Maheshwary (1977), the new species runs to the species of *C. infesta* species group sensu Gupta & Maheshwary (1977), but without complete match to the character combinations given in the couplets. The new species is somewhat similar to *Casinaria simillima* Maheshwary et Gupta, 1977, and *Casinaria tikari* Maheshwary et Gupta, 1977; the former species could be distinguished from the new species by its following characteristics: posterior ocellar distance longer (1.7× as long as ocellus diameter), posterior transverse carina of mesosternum medially distinctly excised, nervulus slightly postfurcal, propodeum dorsally flat, thyridium not connected to basal margin of second tergite by a groove, scapus and pedicellus blackish, hind femur reddish; while the latter species could be readily distinguished by its semicircular rugosity on face, blackish tegula and hind femur.

Casinaria russea sp. nov.

(Figure 7)

Material examined. Holotype: female, Formosa [= Taiwan], Mt. Hoozan, I.1910, leg. [H.] Sauter; specimen pinned, Id. No. HNHM-HYM 155191. The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Oriental species of the genus, *Casinaria russea* sp. nov. could be easily identified by the combined presence of the following characters: malar space 0.45× as long as basal width of mandible, nervulus strongly postfurcal, propodeum medially widely, shallowly impressed, propodeal carinae partly developed, first tergite slightly shorter than hind femur, apex of propodeum not reaching middle length of hind coxa, thyridium connected to basal margin of second tergite by a weak groove, scapus and pedicellus dark brown, mandible black, apical half brownish yellow, tegula brownish yellow, wings weakly infuscate, metasoma reddish except first

tergite black, fore femur yellowish brown, apically narrowly yellowish, middle femur dark brown, basally and apically narrowly yellowish, hind femur dark brown, hind tibia sub-basally, ventrally and apically brown, basally and externo-medially brownish yellow.

Description. Female (Fig. 7). Body length ca. 8 mm, fore wing length ca. 5.5 mm.

Head. Antenna with 35 flagellomeres; first flagellomere *ca*. 3.0× as long as wide apically; preapical flagellomeres quadrate. Head transverse, matt, face rugose, gena granulate with weak punctures, and with dense, moderately long, greyish hairs. Ocular-ocellar distance 0.8× as long as ocellus diameter, posterior ocellar distance 1.4× as long as ocellus diameter. Inner eye orbits strongly indented, ventrally weakly convergent. Gena very short, in dorsal view very strongly narrowed behind eye. Occipital carina complete, weakened and not bent out ventrally, reaching hypostomal carina little before base of mandible, hypostomal carina slightly elevated. Malar space 0.45× as long as basal width of mandible. Face flat in profile, weakly narrowed ventrally, minimal width of face *ca*. 0.6× as long as eye length. Clypeus very weakly separated from face, almost flat in profile, its apical margin weakly convex, sharp. Mandible moderately short, lower margin of mandible with rather wide flange from base toward teeth, flange moderately abruptly, obliquely narrowed at teeth, mandibular teeth of about equal length.

Mesosoma. Mesosoma with dense, moderately short, greyish hairs. Dorsal third of pronotum granulate to rugose, ventral two-third finely granulate with moderately strong transverse wrinkles; epomia strong. Mesoscutum rugose-punctate, convex in profile, *ca*. 0.9× long as wide, notaulus not developed. Scuto-scutellar groove wide and deep. Scutellum rugose-punctate, convex, medially not impressed, lateral carina indistinct. Mesopleuron coarsely rugose with weak, indistinct punctures on lower half and along anterior margin, with weak, dense transverse wrinkles above and anterior to speculum; anterior half of speculum matt with rather dense, fine transverse wrinkles, posterior half abruptly smooth and shiny; mesopleural suture impressed with short, moderately strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, not elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, little elevated, medially not excised. Metanotum rugose-punctate, *ca.* 0.4× as long as scutellum. Metapleuron coarsely rugose; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum complete; propodeal spiracle small, elongate oval, separated from pleural carina by *ca*. 0.6× its length, connected to pleural carina by a distinct ridge. Propodeum moderately long, its apex not reaching middle length of hind coxa, rugose-reticulate, medially widely, shallowly impressed. Propodeal carinae mostly indistinct except median section of anterior transverse carina running conspicuously close to base of propodeum, and lateral sections of posterior transverse carina weakly discernible. Fore wing with petiolate, small areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) at distal corner of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) postfurcal by ca. 0.2× its length; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) vertical, not intercepted by discoidella (distal abscissa of *Cu*1); discoidella spectral, proximally not connected to nervellus. Coxae granulate with superficial, weak punctures. Hind femur relatively stout, *ca*. 4.5× as long as high. Inner spur of hind tibia ca. 0.75× as long as first tarsomere of hind tarsus. Tarsal claws little longer than arolium, basal two-third with distinct pecten.

Metasoma. Metasoma moderately compressed, finely granulate to shagreened with short, greyish-brownish hairs. First tergite relatively stout, *ca*. 4.0× as long as width of its apical margin, 1.25× as long as second tergite, *ca.* 0.95× as long as hind femur, without glymma; dorsomedian carina

of first tergite missing; postpetiolus bulging. Suture separating first tergite from first sternite situated little above mid-height at basal third of first metasomal segment. Second tergite moderately long and slender, 2.0× as long as its apical width; thyridium pear-shaped, weak and shallow, its distance from basal margin of tergite *ca*. 1.5× as long as its length, connected to basal margin of tergite by a weak groove. Posterior margins of third and following tergites medially slightly concave. Ovipositor sheath shorter than apical depth of metasoma; ovipositor strong, straight, compressed, dorsal preapical notch deep, lower valve gradually tapered to apex.

Colour. Antenna dark brown, apical margin of scapus very narrowly yellowish brown. Head black except palpi yellowish and apical half of mandible brownish yellow, mandibular teeth dark reddish brown. Mesosoma black except tegula brownish yellow. Metasoma reddish except first tergite black, postpetiolus apically narrowly brownish; ovipositor sheath dark brown. Wings weakly infuscate, wing veins and pterostigma brown. Fore leg: coxa black; trochanter dark brown; trochantellus brown; femur yellowish brown, apically narrowly yellowish; tibia reddish yellow, dorsally yellowish; tarsus reddish yellow, apical tarsomere brownish. Middle leg: coxa black; trochanter dark brown; trochantellus brown; femur dark brown, basally and apically narrowly yellowish; tibia reddish yellow, dorsally extensively yellowish; tarsus reddish yellow, apical tarsomere brownish. Hind leg: coxa black; trochanter blackish; trochantellus brown; femur dark brown; tibia sub-basally, ventrally and apically brown, basally and externo-medially brownish yellow; tarsus brown.

Male. Unknown.

Distribution. Taiwan.

Etymology. The specific epithet *russea* is the feminine form of the Latin adjective *russeus, -a, -um* meaning reddish; it refers to the colouration of metasoma of the new species.

Remarks. By using the identification key in Gupta & Maheshwary (1977), the new species runs to the species of *C. infesta* species group sensu Gupta & Maheshwary (1977), but without complete match to the character combinations given in the couplets. The new species is most similar to *Casinaria buddha* Maheshwary et Gupta, 1977; this species could be readily distinguished from the new species by its following characteristics: malar space 0.35× as long as basal width of mandible, mandible without a distinct ventral flange, propodeal spiracle large, circular, areolet large, short-stalked, 2*m-cu* slightly distal to middle of areolet, scapus ventrally yellowish, tegula black, middle femur basally dark brown, apically yellowish brown, hind femur black, hind tibia basally and apically blackish, externo-medially reddish.

***Casinaria vesca* sp. nov.**

(Figure 8)

Material examined. Holotype: female, Formosa [= Taiwan], Mt. Hoozan, I.1910, leg. [H.] Sauter; specimen pinned, Id. No. HNHM-HYM 155192. The holotype specimen is deposited in HNHM (Budapest).

Diagnosis. Among the Oriental species of the genus, *Casinaria vesca* sp. nov. could be easily identified by the combined presence of the following characters: antenna conspicuously long and slender, posterior ocellar distance little longer than ocular-ocellar distance, gena short, weakly narrowed behind eye, malar space 0.4× as long as basal width of mandible, nervulus slightly postfurcal, proximal abscissa of *Cu*1a 1.6× as long as distal abscissa of *Cu*1a, nervellus intercepted, propodeum mostly rugulose-rugose, propodeal carinae more or less distinctly developed, anterior transverse carina not running conspicuously close to base of propodeum, area basalis trapezoidal, little longer than its basal width, metasomal segments not constricted at joints, first tergite as long as second tergite, shorter than hind femur, scapus and pedicellus ventrally, mandible and tegula yellow, metasoma black, middle tergites extensively orange, fore and middle legs including coxae yellowish, hind coxa brown, hind femur light reddish yellow, hind tibia sub-basally and apically brown, medially yellowish brown, basally with small yellowish spot.

Description. Female (Fig. 8). Body length *ca*. 6 mm, fore wing length *ca*. 4 mm.

Head. Antenna conspicuously long and slender, with 35 flagellomeres; first flagellomere rather slender, *ca*. 4.0× as long as wide apically; preapical flagellomeres quadrate to slightly longer than wide. Head transverse, matt, face granulate-rugulose, gena granulate with weak punctures, and with dense, moderately long, greyish hairs. Ocular-ocellar distance 0.8–0.9× as long as ocellus diameter, posterior ocellar distance 1.1× as long as ocellus diameter. Inner eye orbits distinctly indented, ventrally weakly convergent. Gena very short, in dorsal view relatively weakly narrowed behind eye. Occipital carina complete, strongly bent out ventrally, reaching hypostomal carina at base of mandible, hypostomal carina elevated. Malar space 0.4× as long as basal width of mandible. Face flat in profile, weakly narrowed ventrally, minimal width of face *ca*. 0.6× as long as eye length. Clypeus very weakly separated from face, flat in profile, its apical margin medially straight, laterally convex, sharp. Mandible relatively long, lower margin of mandible with conspicuously wide flange from base toward teeth, flange moderately abruptly, obliquely narrowed before teeth, mandibular teeth of about equal length.

Mesosoma. Mesosoma with dense, short, greyish hairs. Dorsal third of pronotum granulate, ventral two-third finely granulate with moderately strong transverse wrinkles; epomia distinct. Mesoscutum rugulose-punctate, convex in profile, about as long as wide, notaulus not developed. Scuto-scutellar groove wide and moderately deep. Scutellum granulate-rugulose, convex, medially not impressed, lateral carina indistinct. Mesopleuron granulate, punctures indistinct, with weak, irregular wrinkles above and anterior to speculum; speculum finely granulate, matt; mesopleural suture impressed with short, strong transverse costae. Epicnemial carina complete, strong, pleural part bent to anterior margin of mesopleuron reaching it below its middle height, transversal part (*i.e.* the part at the level of sternaulus running through the epicnemium to the ventral edge of pronotum) not developed, ventral part (behind fore coxae) complete, slightly elevated. Sternaulus indistinct. Posterior transverse carina of mesosternum complete, distinctly elevated, medially not excised. Metanotum granulate-rugulose, *ca*. 0.4× as long as scutellum. Metapleuron granulate-rugulose; juxtacoxal carina indistinct; submetapleural carina complete, strong. Pleural carina of propodeum complete; propodeal spiracle small, elongate oval, separated from pleural carina by *ca*. 0.5× its length, connected to pleural carina by a weak ridge. Propodeum long, its apex reaching about middle length of hind coxa, granulate to rugulose-rugose, medially moderately widely, shallowly impressed, area superomedia and area petiolaris with strong transverse wrinkles, area basalis trapezoidal, little longer than its basal width. Propodeal carinae more or less distinctly developed: lateromedian longitudinal carinae distinct, apically weakened, lateral longitudinal carinae obsolescent except short basal sections, anterior transverse carina strongly developed, not running conspicuously close to base of propodeum, and lateral sections of posterior transverse carina discernible. Fore wing with relatively large, short-stalked areolet, 3*rs-m* present, pigmented, second recurrent vein (2*m-cu*) little distal to middle of areolet; distal abscissa of *Rs* straight; nervulus (*cu-a*) slightly postfurcal; postnervulus (abscissa of *Cu*1 between 1*m-cu* and *Cu*1a + *Cu*1b) intercepted at about its middle by *Cu*1a; lower external angle of second discal cell acute, proximal abscissa of *Cu*1a 1.6× as long as distal abscissa of *Cu*1a. Hind wing with nervellus (*cu-a* + abscissa of *Cu*1 between *M* and *cu-a*) about vertical, intercepted by discoidella (distal abscissa of *Cu*1) little below its middle; discoidella spectral, proximally connected to nervellus. Coxae finely granulate. Hind femur relatively stout, *ca*. 5.0× as long as high. Inner spur of hind tibia *ca*. 0.6× as long as first tarsomere of hind tarsus. Tarsal claws thin and short, about as long as arolium, basally with small, indistinct pecten.

Metasoma. Metasoma weakly compressed, finely granulate to shagreened with short, greyish-brownish hairs, segments not constricted at joints. First tergite relatively stout, *ca*. 4.0× as long as width of its apical margin, as long as second tergite, *ca*. 0.85× as long as hind femur, without glymma; dorsomedian carina of first tergite miss-

ing; postpetiolus bulging. Suture separating first tergite from first sternite situated distinctly above mid-height at basal third of first metasomal segment. Second tergite moderately long and slender, 2.5× as long as its apical width; thyridium elongate oval, its distance from basal margin of tergite *ca*. 2.0× as long as its length, connected to basal margin of tergite by a rather weak, superficial groove. Posterior margins of third and following tergites straight, seventh tergite medially weakly concave. Ovipositor sheath shorter than apical depth of metasoma; ovipositor strong, straight, compressed, dorsal preapical notch deep, lower valve gradually tapered to apex.

Colour. Antenna brown, scapus and pedicellus ventrally yellow. Head black except palpi pale yellow and mandible yellow, mandibular teeth brownish. Mesosoma black except tegula pale yellow. Metasoma: first tergite black; second tergite black with orange subapical band; basal half of third tergite blackish, apical half orange; fourth and fifth tergites dorsally with blackish, triangle-shaped, large patches, laterally and apically orange; sixth tergite dorsally blackish, laterally reddish brown; seventh tergite blackish; ovipositor sheath dark brown. Wings hyaline, wing veins and pterostigma brownish. Fore and middle legs, including coxae, yellowish, apical tarsomeres brownish. Hind leg: coxa brown, apically narrowly pale yellow; trochanter and trochantellus pale yellow; femur light reddish yellow, apically narrowly darkened; tibia sub-basally and apically brown, medially yellowish brown, basally with small yellowish spot; tarsus brownish except extreme base of first tarsomere narrowly yellowish.

Male. Unknown.

Distribution. Taiwan.

Etymology. The specific epithet *vesca* is the feminine form of the Latin adjective *vescus, -a, -um* meaning small, thin, slender; it refers to the body size of the new species.

Remarks. By using the identification key in Gupta & Maheshwary (1977), the new species runs to the species of *C. leo* species group sensu Gupta & Maheshwary (1977), and keys out with *Casinaria varuni* Maheshwary et Gupta, 1977, at couplet 27, but without complete match to the character combination of couplet 23 (posterior ocellar distance not equal to ocular-ocellar distance in the new species). *Casinaria varuni* Maheshwary et Gupta, 1977 can be readily distinguished from the new species by its following characteristics: posterior ocellar distance equal to ocular-ocellar distance, nervulus strongly postfurcal, proximal abscissa of *Cu*1a 1.4× as long as distal abscissa of *Cu*1a, area superomedia granulate without transverse wrinkles, first tergite as long as hind femur, metasomal segments constricted at joints, scapus and pedicellus ventrally brownish, fore and middle femora partly brownish, hind femur reddish brown to brownish.

PALAEARCTIC REGION

Casinaria albipalpis (Gravenhorst, 1829)

Material examined. One female, Sweden, Vgtl. [= Västergötland], leg. J. Wermelin, Id. No. MZLU-HYM 26367. One female, Sweden, Salem, V.1922, leg. Frith. Nordström, Id. No. MZLU-HYM 26368. One female, Sweden, Gstr. [=Gästrikland], Hille, Forsby, 31.VII.[19]57, leg. Kj. Fahlander, Id. No. MZLU-HYM 26364. All mentioned specimens are deposited in MZLU (Lund).

Remarks. First records for Sweden. This species is widely distributed in the Palaearctic region (Yu *et al.* 2012, Riedel 2018, Vas 2018).

Casinaria kriechbaumeri (Costa, 1884)

Material examined. One female, Cyprus, Larnaka, VI.1900, leg. Glaszner, Id. No. HNHM-HYM 155193. – The specimen is deposited in HNHM (Budapest).

Remarks. First record for Cyprus. This species is widely distributed in the Palaearctic region (Yu *et al.* 2012; Riedel 2018; Vas 2018, 2019*a*, *b*).

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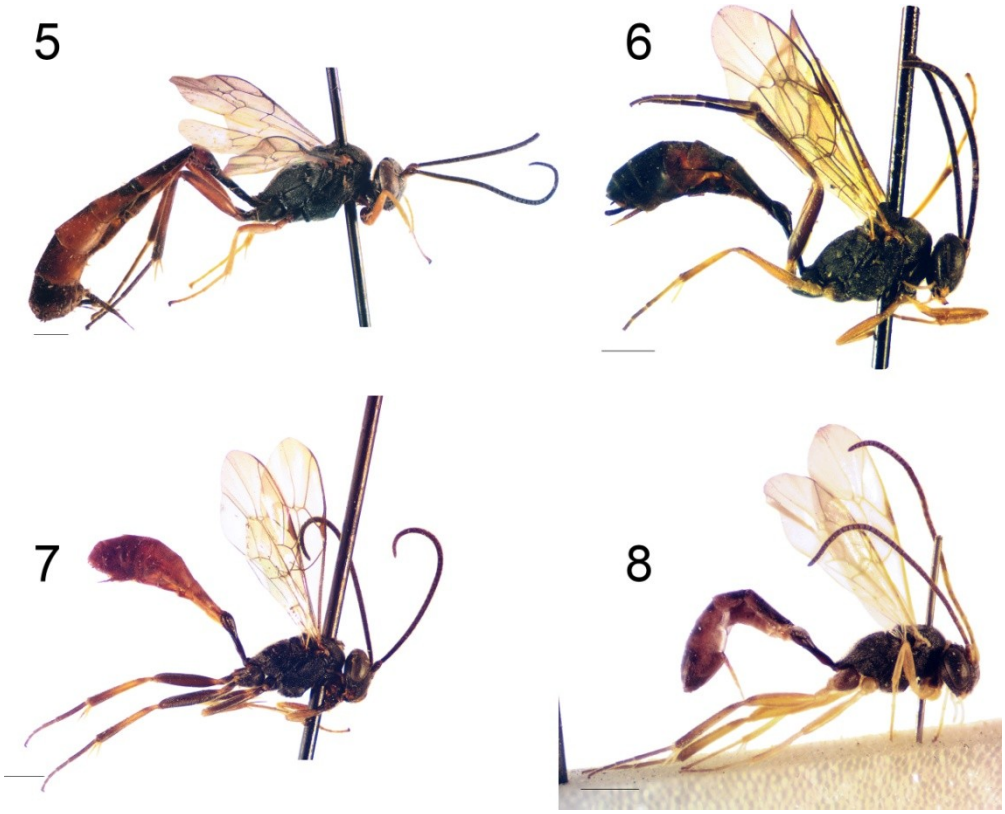

Figures 5–8. Holotypes of new Australasian and Oriental *Casinaria* species. 5 = *Casinaria papuensis* sp. nov., 6 = *Casinaria coloratilis* sp. nov., 7 = *Casinaria russea* sp. nov., 8 = *Casinaria vesca* sp. nov. (scale bars = 1 mm)

REFERENCES

CAMERON, P. (1906): Descriptions of new species of parasitic Hymenoptera chiefly in the collection of the South African Museum, Cape Town. *Annals of the South African Museum*, 5: 17–186.

CHOI, J.-K. & LEE, J.-W. (2010): Taxonomic study of the genus Casinaria Holmgren (Hymenoptera: Ichneumonidae: Campopleginae) from Korea. *Entomological Research*, 40: 148–156. doi: 10.1111/j.1748-5967.2010.00270.x

GAULD, I.D. (1991): The Ichneumonidae of Costa Rica, 1. Introduction, keys to subfamilies, and keys to the species of the lower Pimpliform subfamilies Rhyssinae, Poemeniinae, Acaenitinae and Cylloceriinae. *Memoirs of the American Entomological Institute*, 47: 1–589.

GAULD, I.D., WAHL, D., BRADSHAW, K., HANSON, P. & WARD, S. (1997): The Ichneumonidae of Costa Rica, 2. Introduction and keys to species of the smaller subfamilies, Anomaloninae, Ctenopelmatinae, Diplazontinae, Lycorininae, Phrudinae, Tryphoninae (excluding *Netelia*) and Xoridinae, with an appendix on the Rhyssinae. *Memoirs of the American Entomological Institute*, 57: 1–485.

GUPTA, V.K. & MAHESHWARY, S. (1977): Ichneumonologia Orientalis, Part IV. The tribe Porozontini (=Campoplegini) (Hymenoptera: Ichneumonidae). *Oriental Insects Monograph*, 5: 1–267.

JERMAN, E.J. & GAULD, I. (1988): Casinaria, a paraphyletic Ichneumonid genus (Hymenoptera), and a revision of the Australian species. *Journal of Natural History*, 22(3): 589–609. doi: 10.1080/00222938800770401

JONATHAN, J.K. (1999): *Hymenoptera: Ichneumonidae. Fauna of West Bengal. Part. 8. Insecta (Trichoptera, Thysanoptera, Neuroptera, Hymenoptera and Anoplura)*. Zoological Survey of India, Calcutta, pp. 442.

KUSIGEMATI, K. (1985): Records of eight species of Ichneumonidae (Hymenoptera) from Fiji and Solomon Islands, with descriptions of two new species.

Kagoshima University Research Center for the South Pacific. Occasional Papers, 5: 65–73.

MORLEY, C. (1926): On some South African Ichneumonidae in the collection of the South African Museum. *Annals of the South African Museum*, 23: 435–481.

RIEDEL, M. (2018): Revision of the Western Palaearctic species of the genus Casinaria Holmgren (Hymenoptera, Ichneumonidae, Campopleginae). *Linzer biologische Beiträge*, 50(1): 687–716.

SEYRIG, A. (1935): Mission scientifique de l'Omo. Tome III. Fascicule 18. Hymenoptera, II. Ichneumonidae: Cryptinae, Pimplinae, Tryphoninae et Ophioninae. *Mémoires du Muséum National d'Histoire Naturelle*, 4: 1–100.

SZÉPLIGETI, GY. (1905): Hymenoptera. Ichneumonidae (Gruppe Ophionoidea), subfam. Pharsaliinae-Porizontinae. *Genera Insectorum*, 34: 1–68.

TOWNES, H., TOWNES, M. & GUPTA, V.K. (1961): A catalogue and reclassification of the Indo-Australian Ichneumonidae. *Memoirs of the American Entomological Institute*, 1: 1–522.

TOWNES, H. (1969): The genera of Ichneumonidae. Part 1. *Memoirs of the American Entomological Institute*, 11: 1–300.

TOWNES, H. (1970): The genera of Ichneumonidae. Part 3. *Memoirs of the American Entomological Institute*, 13: 1–307.

TOWNES, H. & TOWNES, M. (1973): A catalogue and reclassification of the Ethiopian Ichneumonidae. *Memoirs of the American Entomological Institute*, 19: 1–416.

VAN NOORT, S. (2019): WaspWeb: Hymenoptera of the Afrotropical region. Available from: http://www.waspweb.org (accessed 15 March 2020).

VAS, Z. (2018): New species and new records of ichneumon wasps from Hungary and adjacent countries (Hymenoptera: Ichneumonidae). *Folia Entomologica Hungarica*, 79: 81–100. doi: 10.17112/FoliaEntHung.2018.79.81

VAS, Z. (2019*a*): New species and new records of ichneumon wasps from the Eastern Mediterranean and the Black Sea regions (Hymenoptera: Ichneumonidae). *Acta Zoologica Academiae Scientiarum Hungaricae*, 65(1): 19–30. doi: 10.17109/AZH.65.1.19.2019

VAS, Z. (2019*b*): Contributions to the taxonomy, identification, and biogeography of *Casinaria* Holmgren and *Venturia* Schrottky (Hymenoptera: Ichneumonidae: Campopleginae). *Zootaxa*, 4664(3): 351–364. doi: 10.11646/zootaxa.4664.3.3

VIERECK, H.L. (1914): Type species of the genera of Ichneumon flies. *United States National Museum Bulletin*, 83: 1–186. doi: 10.5479/si.03629236.83.1

WALLEY, G.S. (1947): The genus Casinaria Holmgren in America north of Mexico (Hymen., Ichneumonidae). *Scientific Agriculture*, 27: 364–395.

YU, D.S. & HORSTMANN, K. (1997): *A catalogue of world Ichneumonidae (Hymenoptera)*. The American Entomological Institute, Gainesville, 1558 pp.

YU, D.S., VAN ACHTERBERG, C. & HORSTMANN, K. (2012): *Taxapad 2012 – World Ichneumonoidea 2011. Taxonomy, Biology, Morphology and Distribution.* Ottawa, Ontario, www.taxapad.com.

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On the Trichoptera of China with relatives of adjacent territories I.

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Abstract. In our first paper on Chinese Trichoptera we have reinstated the species status of *Polymorphanisus hainanensis* Martynov, 1930 stat. restit. and furthermore described 44 species new to science: *Chimarra fureses* sp. nov., *Stenopsyche levelaga* sp. nov., *S. tulipanos* sp. nov., *Dipseudopsis kulonc* sp. nov., *Nyctiophylax* (*Paranyctiophylax*) *bubos* sp. nov., *Diplectrona dedomba* sp. nov., *D. kinulta* sp. nov., *Polymorphanisus liorum* Oláh, sp. nov., *P. totaorum* sp. nov., *Hydromanicus heges* sp. nov., *H. mintas* sp. nov., *H. ritkas* sp. nov., *Hydropsyche cernaka* sp. nov., *H. keses* sp. nov., *H. nagpupos* sp. nov., *H. vaza* sp. nov., *H. keska* sp. nov., *H. tagra* sp. nov., *H. laposhat* sp. nov., *H. picibunk* sp. nov., *H. lelapa* sp. nov., *H. nulanka* sp. nov., *H. kispupos* sp. nov., *H. lehajla* sp. nov., *Cheumatopsyche bujkala* sp. nov., *C. domborula* sp. nov., *C. forrta* sp. nov., *C. kiugra* sp. nov., *C. lepa* sp. nov., *C. magaska* sp. nov., *C. perem* sp. nov., *C. rovides* sp. nov., *C. sikoska* sp. nov., *C. bunkos* sp. nov., *C. kurtula* sp. nov., *C. sara* sp. nov., *C. harma* sp. nov., *C. lekera* sp. nov., *Rhyacophila simpla* sp. nov., *R. taraja* sp. nov., *Oecetis girba* sp. nov., *Asynarchus delies* sp. nov. and *Pseudostenophylax haromsog* sp. nov.

Keywords. Trichoptera, biodiversity, caddisfly, China, new species.

INTRODUCTION

Chinese research on Chinese Trichoptera has a solid basement rooted in the very first study of the Chinese caddisfly founder Hwang Chi-ling (1957) and produced significant progress reaching 1267 described species (Yang *et al.* 2016), out of the estimated potential of 5000 species (Yang *et al.* 2005). This is a rather conservative estimation of the real caddisfly biodiversity detectable by fine phenomics or genetics. During our present study we were highly impressed by the exceptional diversity of Chinese Trichoptera. Here we report on 93 species including 44 species new to science.

MATERIAL AND METHODS

With this paper we intend to lunch some research on Chinese Trichoptera collected mostly by local Chinese scientists as well as by the junior author, J. Oláh jr. In our srtudies on caddisflies we apply the the principles, methods and procedures of fine phenomics in order to delineate incipient sibling species forming well-defined species complexes. In traditional routine taxonomy of gross phenomics these species are treated by lumpers as single species frequently qualified as "widely distributed and highly varying". Most of the types are deposited in Chinese institutions.

Depositories

British Museum (Natural History), London (BMNH)

Department of Plant Protection, Henan Institute of Science and Technology (DPP-HIST)

Entomological Museum of China Agricultural University, Beijing (CAU)

National Museum of Natural History, Smithsonian Institution, Washington, D.C. (NMNH)

Oláh Private Collection, Debrecen, Hungary, under national protection by the Hungarian Natural History Museum, Budapest (OPC).

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TAXONOMY

Annulipalpia

Philopotamoidea

Philopotamidae

Chimarrinae

Chimarra cachina Mosely, 1942

Material examined. China, Guangxi, Jinxiu County, Yinshan Wild Station, 17.VIII.2016, light trap (1 male, OPC).

Chimarra fureses sp. nov.

(Figures 1–4)

Material examined. Holotype: China, Shaanxi Province, Foping, Yueba, 1099.8 m, 25.VIII. 2014, leg. Lu Xiumei (1 male, CAU). *Paratypes*: same as Holotype (1 male, OPC). China, Shaanxi Province, Foping, Daguping, 1269.7 m, 23.VIII. 2014, leg. Lu Xiumei (1 male, OPC). China, Hubei, Yingshan, Taohuachong, 600m, 15.VI. 2018, leg. Jiang Yunlan (1 male, DPP-HIST)

Diagnosis. Having digitiform paraproct, digitiform gonopod and short segment IX this new species is most close to *Chimarra quadridigitata* Yang, Sun & Yang, 2001 described from China (Zhejiang) and to *C. talos* Malicky, 2007 described from Bhutan. *Chimarra fureses* sp. nov. has an almost completely fused dorsal arm of paraproct and the cerci forming together a serrated structure. The new species has a pair of very long and parallel-sided endothecal spines accompanied by two rows of small spine clusters.

Description. Male (in alcohol). *Male genitalia*. Segment IX very short forming an almost regular parallel-sided band-like ring with unsclerotized dorsum. Segment X long, membranous, hardly indiscernible. The paraproct composed of a pair of digitate ventral arm; its basal part turning mesad encircling ventrally the phallic organ; the dorsal arm of paraproct is fused to the cerci forming together a heavily sclerotized bilobed structure serrated on the ventral margin; apical lobes represent the dorsal arm of the paraproct with sensory pits; the basal more rounded lobes represent the fused cerci with sensory setae. Phallic organ with two long and strong spines seems somehow fixed parallel-sided; there is a pair of small spine row located apicad, at the terminal ending of the two long spines.

Etymology. *fureses* from "fűrészes" serrated in Hungarian, refers to the fused dorsal arm of paraproct and cerci with serrated ventral margin in lateral view.

Stenopsychidae

Stenopsyche angustata Martynov, 1930

Material examined. China, Henan Province, Xinxian County, Mt. Liankangshan, 22.IX.2014, (1 male, DPP-HIST; 1 male, OPC). China, Shaanxi, Hanzhong, Yang County, Huayang Town, Banqiao Village, N33.6155° E107.5079°, 1154m, 4.V.2017, (2 males, DPP-HIST, 2 males, OPC). China, Shaanxi, Yang County, Huayang Town, Zhoujiayu Village, N33°60'10", E107° 47′42.82", 1362m, 12.V.2017, (1 male, DPP-HIST; 1 male, OPC). China, Shaanxi, Hanzhong, Yang County, Huayang Town, Banqiao Village, N33.6155° E107.5079°, 1154m, 4.V.2017, light traps (4 males, DPP-HIST).

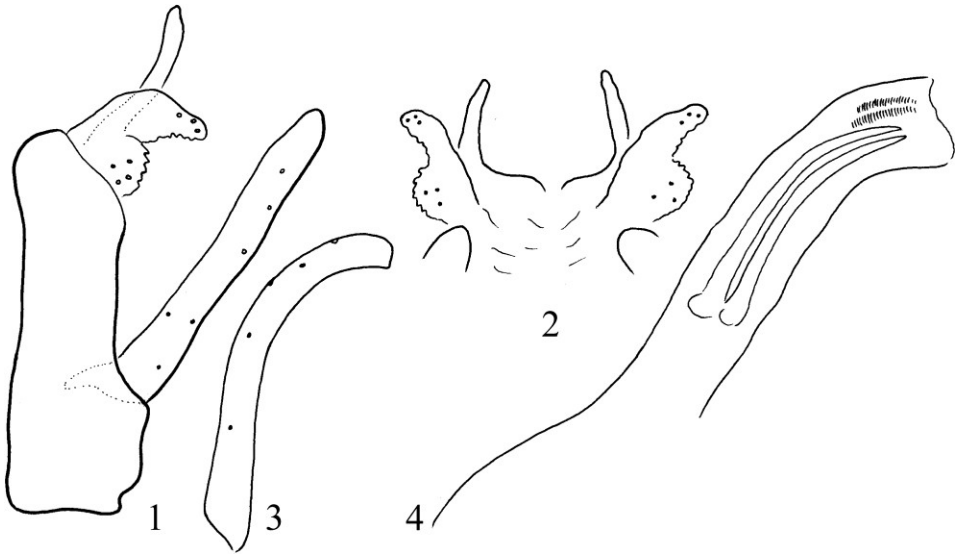
Stenopsyche tienmushanensis Hwang, 1957

Material examined. China, Shaanxi Province, Zhashui, Guanghuojie, N33.4548 E108.4615, 1172m, 26.VII.2014, leg. Tang Chufei (1 male, DPP-HIST; 1 male, 1 female; OPC).

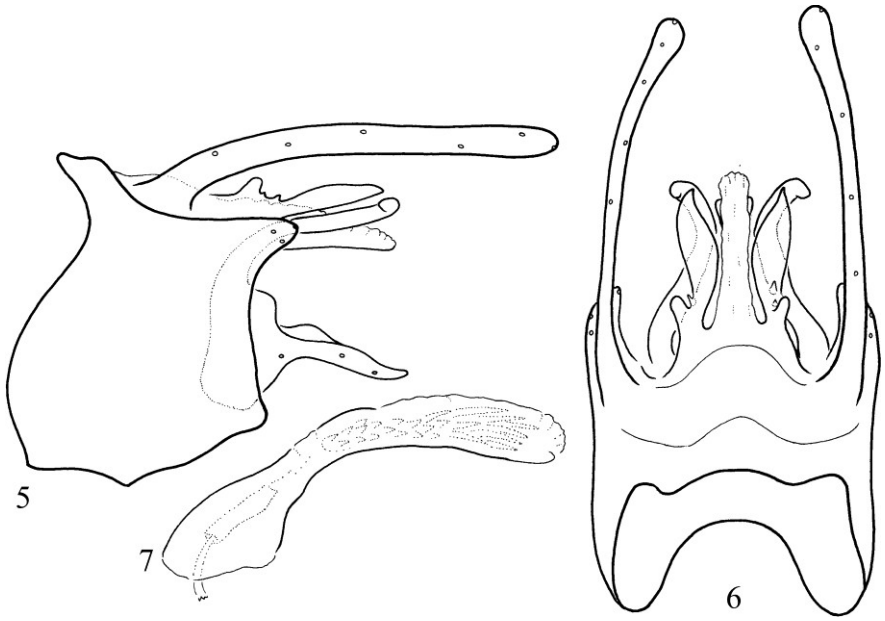
Stenopsyche levelaga sp. nov.

(Figures 5–7)

Material examined. Holotype: China, Shaanxi Province, Zhouzhi, Houzhenzi, 1278m, 16.VIII. 2014, leg. Lu Xiumei (1 male, CAU).



Figures 1–4. *Chimarra fureses* sp. nov. Holotype. 1 = male genitalia in left lateral view, 2 = male genitalia in dorsal view, 3 = left gonopod in ventral view, 4 = phallic organ in left lateral view.



Figures 5–7. *Stenopsyche levelaga* sp. nov. Holotype. 5 = male genitalia in left lateral view, 6 = male genitalia in dorsal view, 7 = phallic organ in left lateral view.

Diagnosis. Having segment X large, partially sclerotized and paraproct long heavily sclerotized this new species belongs to the *S. simplex* species group and to subgroup with straight directed paraproct. Although the endothecal armature comprised of many spines, but the spies are not fine, there are short, but stout and even these short strong spines are elongating apicad. Most close to *Stenopsyche ningshanensis* Xu, Wang & Sun, 2014, but differs by having larger size, differently shaped paraproct and dorsal arms of gonopods. The endothecal spine armature different.

Description. Male (in alcohol). Medium-sized, reticulate-patterned brown animal with broad lighter pattern along the margin on the forewing anal region. Forewing length 26 mm.

Male genitalia. Segment IX subquadrangular and with blunt triangular pointed apical lobe on its posterolateral margin. Segment X long, its dorsum membranous, ventrum sclerotized. Paraproct foliform with small dorsobasal twig. The heavily sclerotized dorsal arms of gonopods slightly S-shaped with laterad turning apices. Endotheca with short stout spines gradually elongating apicad at least in inverted state.

Etymology. *levelaga* from "levélága" "leaf and twig" in Hungarian, refers to the broadened foliform parameres armed with basad located small branch.

***Stenopsyche tapaishana* Schmid, 1959**

Material examined. China, Shaanxi Province, Zhouzhi, Houzhenzi, 1278m, 16.VIII.2014, leg. Lu Xiumei (1 male, OPC). China, Shaanxi Province, Zhashui, Guanghuojie, N33.4548 E108.4615, 1172m, 26.VII.2014, leg. Tang Chufei (1 male, 1 female, DPP-HIST; 1 male, 1 female, OPC).

Remarks. New species record for China!

***Stenopsyche tulipanos* sp. nov.**

(Figures 8–10)

Material examined. Holotype: China, Heibei Province, Xionglong, Dagoucun, 589m, 11.VI. 2014, leg. Tang Chufei, (1 male, OPC).

Diagnosis. This new species belongs to the *S. marmorata* species group, having segment X elongate, partially sclerotized, semimembranous, paraproct small lobiform, laterad directed endothecal armature composed of short numerous spines dispersed along its entire length. Most close to *Stenopsyche uniformis* Schmid, 1965, but differs by having segment X quatrilobed apex, not bilobed, paraproct without lateral twig and reaching almost to the tip of segment X, not only to the middle, curvature of the dorsal arm of gonopods different both in dorsal and lateral view.

Description. Male (in alcohol). Medium-sized, reticulate, marbled light fleck patterned faded brown forewing. Forewing length 24 mm.

Male genitalia. Segment IX short dorsad and long almost subcircular ventrad in lateral view; apical lobe on its posterolateral margin long slender and pointed. Segment X with quadrilobed apex, mesal lobes membranous, lateral lobes sclerotized. Paraproct lobiform, long arching mesad. The heavily sclerotized dorsal arms of gonopods strongly S-shaped with laterad turning club shaped apices with needle pointed tip. Endotheca with short thin spines gradually elongating and apicad in inverted state.

Etymology. *tulipanos* from "tulipános" tulip shaped in Hungarian, refers to the tulip outline shape of the dorsal arm of gonopods in dorsal view.

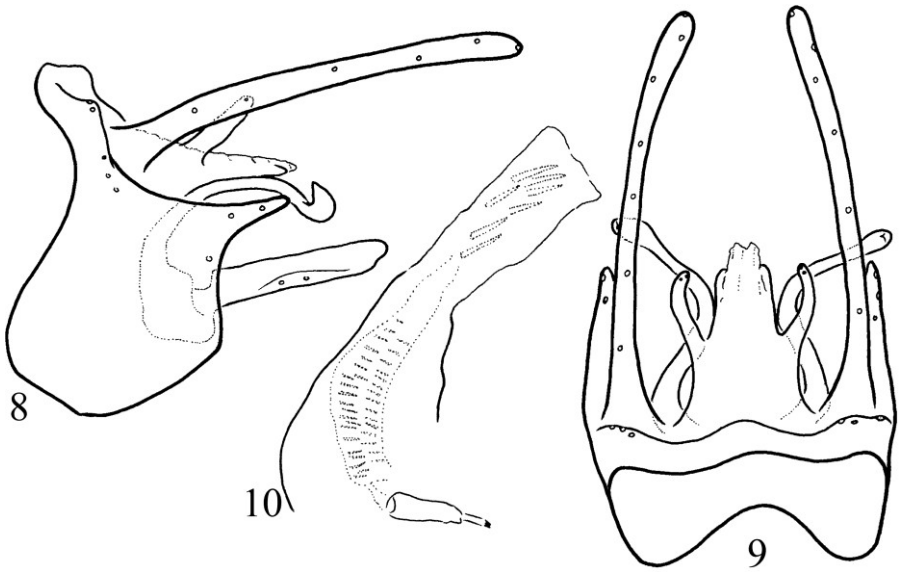
Dipseudopsidae

***Dipseudopsis kulonc* sp. nov.**

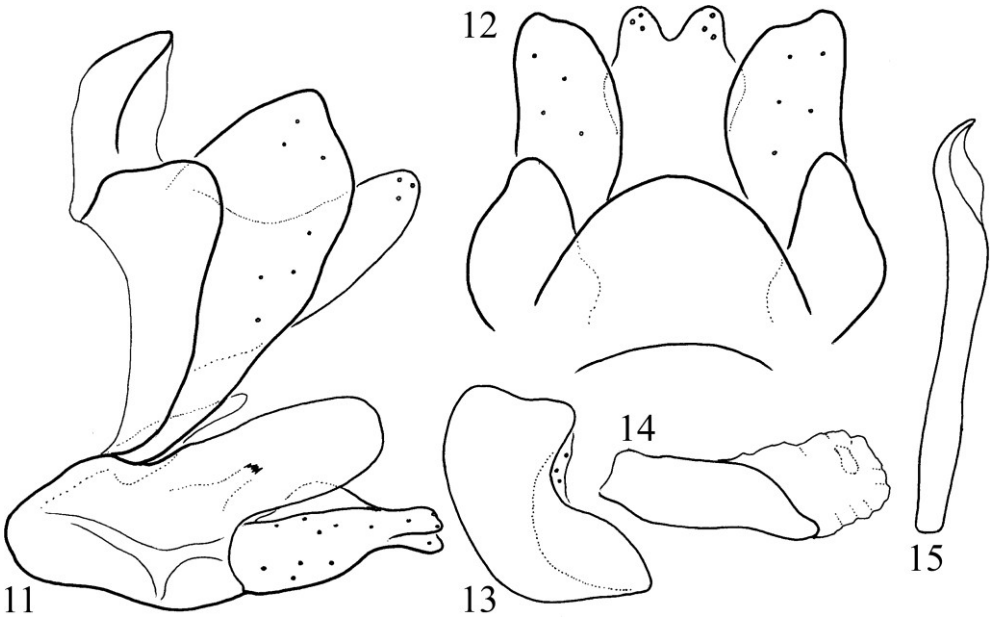
(Figures 11–15)

Material examined. Holotype: Malaysia, Sabah, Mt.Trus Madi, The Borneo jungle girl camp, 2016.II.19, leg. Liu Xingyue (1 male, CAU).

Diagnosis. *Dipseudopsis kulonc* sp. nov. is an unusual species with several unique character states. All the known member of the *Dipseudopsis* genus is characterized by the almost vestigial pleural sclerite XI, it is reduced to a very indistinct structure; poorly discernible as a very short, band or strip like vertical structure partially or entirely hidden or obscured by cerci. The pleural sclerite IX is present and very much produced, strong, heavily sclerotized, almost as long as the cerci. The other unusual character state is the sternal sclerite producing a dorsoapical extension as much enlarged as the entire sternite itself. These two unique character states distinguish this new species from all the known species of the genus.



Figures 8–10. *Stenopsyche tulipanos* sp. nov. Holotype. 8 = male genitalia in left lateral view, 9 = male genitalia in dorsal view, 10 = phallic organ in left lateral view.



Figures 11–15. *Dipseudopsis kulonc* sp. nov. Holotype. 11 = male genitalia in left lateral view, 12 = male genitalia in dorsal view, 13 = left gonopod in ventral view, 14 = phallic organ in left lateral view, 15 = modified left hind leg mesoapical spur in ventral view.

Description. Male (in alcohol). Medium-sized brown species with banded forewing pattern, light banded longitudinal cell delineated by dark brown are along veins. Hind leg modified spur slightly twisted spatulate. Forewing length is 12 mm.

Male genitalia. Segment IX with small tergite, well-produced pleural sclerite and larger sternite; tergite IX rounded in dorsal view; pleurite IX is almost as long and high as the cerci; sternite IX articulating to pleurite IX and cerci uniquely

developed; its dorsoapical region extremely produced into a long rounded lobe, longer and bigger than the sternite itself. Segment X as long as sternite IX, slightly overlapping with tergite IX, forming heavily pigmented hood with several sensory pits on bilobed apex; thumb-shaped, slightly concave dorsally in lateral view; with excised apex in dorsal view. Intersegmental depression between segment IX and segment X forming high vertical concavity in lateral view by slightly overhanging tergite IX. Cerci large, auriform, narrowing dorsoapicad. Gonopods each without harpago, as long as the dorsoapical extension of sternite IX; very broad in ventral view. Phallic apparatus small, consisting of phallotheca, endotheca and aedeagus; phallotheca forming heavily sclerotized, broad, basal tube and slightly narrowing ventroapical lobe; no minute alveoli or small setae visible basal part. Delineation of membranous dorsal part, apical endotheca, and aedeagus obscured; weakly chitinized sclerite complex discernible.

Etymology. *kulonc* from "*különc*" deviating, unique in Hungarian, refers to the plesiomorphic presence of the pleural sclerite IX and the extremely elongated apomorphic apicodorsal rounded lobe-like extension of sternite IX.

Psychomyioidea

Polycentropodidae

***Nyctiophylax* (*Paranyctiophylax*) *bubos* sp. nov.**

(Figures 16–17)

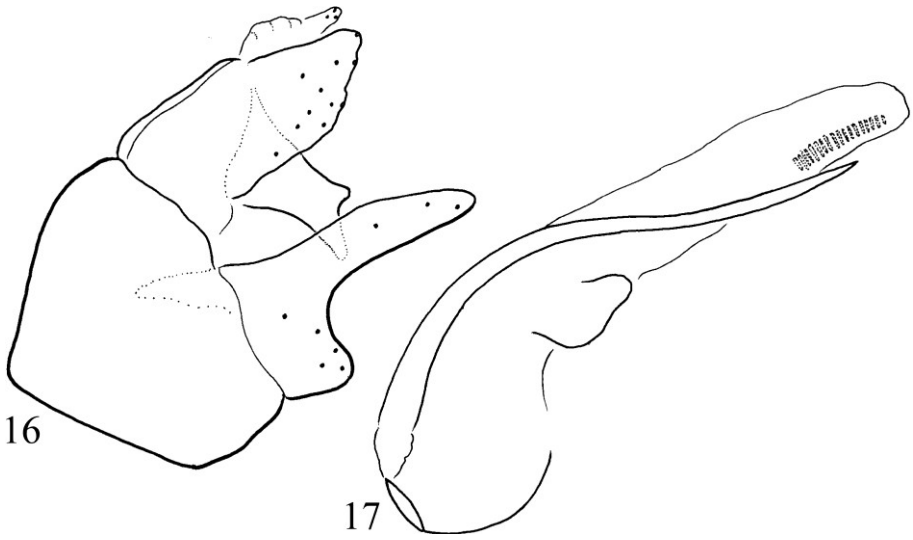
Material examined. Holotype: China, Guangxi, Jinxiu County, Dayaoshan, Yinshan Wild Station, 2016.VIII.17, light traps (1 male, CAU). Paratype same as Holotype (1 male, DPP-HIST; 1 male, OPC).

Diagnosis. This new *Nyctiophylax* species is close to species of *N.* (*Paranyctiophylax*) *archemoros* Malicky, 1999 described from Thailand, *N.* (*Paranyctiophylax*) *antenor* Malicky, 1997 described from Nepal, *N.* (*Nyctiophylax*) *catunujah* Oláh & Johanson, 2010 described from Myanmar and *N.* (*Nyctiophylax*) *gracilis* Morse, Zhong & Yang,. 2012 described from China (Jiangxi). It differs from all by having large rectangular cerci and straight not curving ventral paraproctal processes with slightly hooked or knotted apex. All species are members of the *Paranyctiophylax* subgenus with looped anal veins in the forewing. *N.* (*Nyctiophylax*) *catunuyah* having the same type of genital structure, but has normal pattern of anal veins without any loop.

Description. Male (in alcohol). The entire body is uniformly brown coloured. Spur formula 344. Maxillary palp formula is (I,II)-IV-III-V, third segment inserted mesosubapicad. Forewing length is 6 mm. Discoidal cells both on forewing and hindwing are closed; median cells on forewing open. Forewing with apical forks 2, 3, 4, 5, hindwing with apical forks 2, 5 present. In forewing A1, A2 and A3 anal veins with loop.

Male genitalia. The IXth abdominal segment is composed of the robust sclerotized sternite, rounded quadrangular in lateral view; there is sclerotized tergite discernible as fused to cerci and paraproct. Segment X semisclerotized, deeply excised in dorsal view producing a bilobed process in dorsal view scarcely setose. Cerci large, qudrangular and setose in lateral view; arising from the fused complex of IXth tergite and paraproct. Paraproctal complex consists of the basal body and a pairs of ventral paraproctal processes; as usual it is unsetosed, heavily sclerotized and straight slightly downward curving supplied withdorsosubapical hump. Gonopods are robust, basal elbow well-developed representing a ventral lobe-like branch; dorsal branch of the gonopod straight both in lateral and ventral view. The phallic apparatus located dorsad, fixed and guided by the spine-like ventral paraproctal straight processes; the phallic apparatus characterised by a tube-like faintly sclerotized phallotheca armed with a pair of lateral knob-like sclerotized structure, continuing into a membranous endotheca or aedeagus with a pair of long arching spines arising from the phallobase.

Etymology. *bubos* from "búbos" cristate in Hungarian, refers to the dorsosubapical hump-like process on the ventral arm of the paraproct.



Figures 16–17. *Nyctiophylax* (*Paranyctiophylax*) *bubos* sp. nov. Holotype. 16 = male genitalia in left lateral view, 17 = phallic organ in left lateral view.

Psychomyiidae

***Psychomyia extensa* Li, 1999**

Material examined. China, Hubei, Yingshan, Taohuachong, 600m, 15.VI.2018, leg. Jiang Yunlan (1 male, DPP-HIST).

Hydropsychidae

Diplectroninae

***Diplectrona dedomba* sp. nov.**

(Figures 18–22)

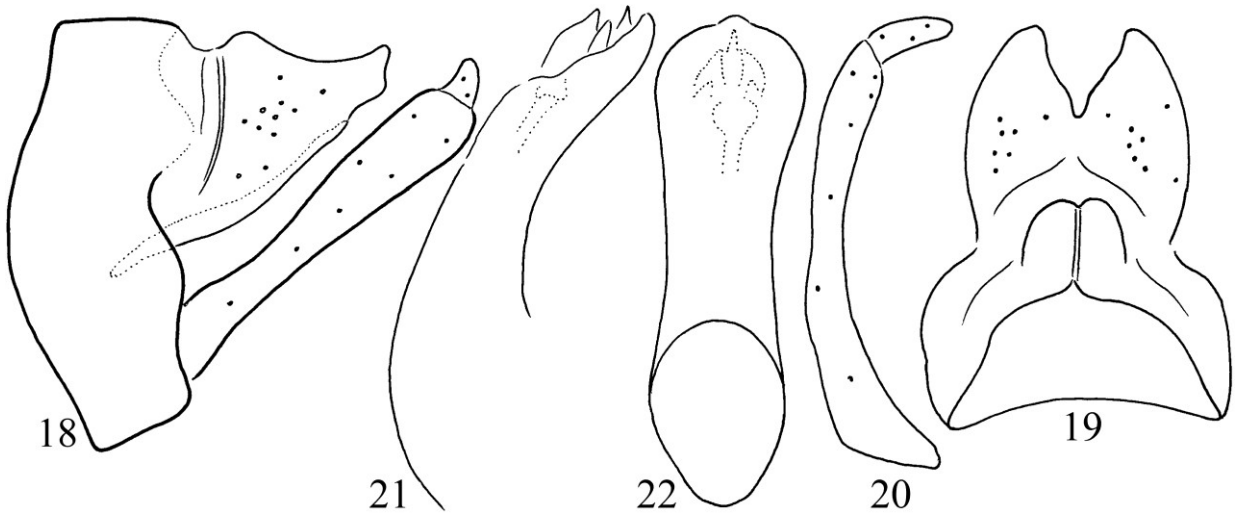
Material examined. *Holotype*: China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, small forest brook and the surrounding mountain forest, N21°50.574', E107°51.802', 365m, 28.III.2015 (/20), leg. J. Kontschán, W. H. Li, D. Murányi & G. Q. Wang (1 male, CAU). *Paratypes*: same as Holotype (2 males, DPP-HIST; 2 males, OPC).

Diagnosis. This new species with fused dorsoapical setose lobes and the setaless paraproct is similar to *D. wangyipingi* Sun, 2017 described from China (Zhejiang Province), but differs by the differently shaped fused segment X; by the fine structure of the endothecal processes as well as by the lateral and ventral profiles of the phallotheca.

Description. Male (in alcohol). Dark brown animal. Forewings without pattern. Forewing length 7 mm, apical fork I present on hindwing. Eyes setaless, not enlarged. Maxillary palp formula I-IV-III-II-V. Anterodorsal filament on sternite V 2X as long as the sternite, there are no anx internal large sacs present in segment VIII.

Male genitalia. Segment IX convex anterad, dorsum long and flat with a middle depression line. Segment X fused to the tergum IX. The dorsoapical setose lobes (inner lobes) and the unsetose paraproct (outer lobes or lateral plates of segment X) fused together into a pair of subtriangular plate. Cerci form setose area in lateral view, visible both in lateral and dorsal view. Gonopods are robust, almost straight with dilated apical half; the broad harpago mesad turning. Phallic apparatus with slightly downward curving and broadening basal and tube-forming apical sections; its ventrum elongated; two pairs plus a single of endothecal processes visible, both with pointed apices; phallotremal sclerite less distinct.

Etymology. *dedomba* euphonic coined from "domb, dedombos" hill in Hungarian, refers to the basal part of segment X with a pronounced hump in lateral view.



Figures 18–22. *Diplectrona dedomba* sp. nov. Holotype. 18 = male genitalia in left lateral view, 19 = male genitalia in dorsal view, 20 = left gonopod in ventral view, 21 = phallic organ in left lateral view, 22 = phallic organ in ventral view.

Diplectrona keto **Malicky, 2002**

Material examined. China, Taiwan, Province Taitung, 4 km N of Tupan, 390 m, 12.XI.1996, leg. T. Csőváry & Cs. Szabóky (1 male, HNHM).

Diplectrona kinulta **sp. nov.**

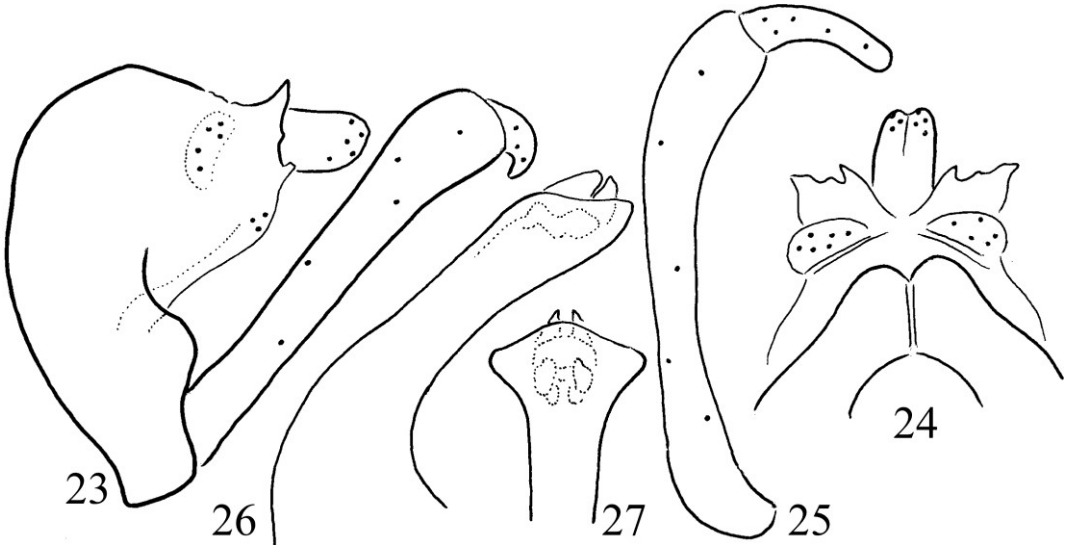
(Figures 23–27)

Material examined. Holotype: China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (1 male, CAU). *Paratypes*: same as Holotype (8 males, DPP-HIST; 5 males, OPC).

Diagnosis. This species belongs to the species, like *D. burha* characterized by subquadrangular, plate-like paraproct with variously diverged apical pattern. It differs from each by the character combination of small setaless eyes; a pair of large internal sacs in segment VIII; long anterodorsal filament on sternite V, presence of fork I on hindwing; elongated lobes of segment X; delta-shaped head of the phallic organ.

Description. Male (in alcohol). Light brown animal. Forewings light spotted brown. Forewing length 8 mm, apical fork I present on hindwing. Eyes setaless, not enlarged. Maxillary palp formula I-IV-III-II-V. Cephalic setose warts on head dorsum represented by two pairs (1) large egg-shaped compact occipital setose warts, (2) vertexal ocellar compact setose warts, as well as a single vertexal medioantennal compact setose wart; epicranial suture abbreviated; curves of lateral vertexal grooves rounded subtriangular; ending posterad far from epicranial groove. Anterodorsal filament on sternite V 2.24X as long as the sternite, there are two internal large sacs present in segment VIII.

Male genitalia. Segment IX convex anterad, dorsum long and flat with a middle depression line. Segment X fused to the tergum IX. The dorsoapical setose lobes (inner lobes) of segment X well-developed, extremely elongated rounded broad, protruded; seems bilobed, but tightly adhered; the ventroapical setose area distinct. Cerci setose, high and short in lateral view, semicircular in dorsal view. Unsetose paraproct (outer lobes or lateral plates of segment X) subquadrangular flat plate in lateral view with upward directed pointed dorsal process and a laterad directed smaller ventral process. Gonopods robust straight and its harpago mesad turning. Phallic apparatus with down curving and broadening basal section and with a longer tube-forming horizontal two thirds with rounded obliquely cut apex in lateral view; two pairs of endothecal processes visible, both with blunt apices in lateral and pointed triangular in ventral view; dorsal



Figures 23–27. *Diplectrona kinulta* sp. nov. Holotype. 23 = male genitalia in left lateral view, 24 = male genitalia in dorsal view, 25 = left gonopod in ventral view, 26 = phallic organ in left lateral view, 27 = phallic organ in ventral view.

endothecal process larger and more pigmented; phallotremal sclerite less distinct. The phallic organ with much produced wing-like triangular delta-shaped head in ventral view.

Etymology. *kinulta* coined from "kinyúlt" stretched in Hungarian, refers to elongated lobes of segment X compared to the paraproct.

Diplectrona sanguana Kimmins, 1964

Material examined. China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (2 males, DPP-HIST; 1 male, OPC).

Remarks. New species record for China! Malicky (2002) has redrawn a specimen from Dakhi Khola, Nepal, fitting well to the original drawings of the Holotype. However, emphasising the extremely varying nature of the lateral plate of segment X, that is the paraproct, he has drawn specimens from several regions under the name of *D. sanguana* with completely different paraproct profiles. The drawn specimens under the name of *D. sanguana* represent probably three different siblings of incipient species. Paraproct has been found as an extremely stable and not varying organ (Oláh *et al.* 2017). In the same paper Malicky (2002) has listed similarly probable siblings of incipient species under the name of *D. dilutensis*, *D. fama*, *D. aurovittata* and *D. burha* differing by the subtle, but stable divergences in paraproct shape. Paraproct as a titillating or stimulating organ of the genitalia is usually formed by adaptive mechanism and are the most stable genetic component compared to the neutral organs under the influence of stochastic events. It seems that the *Diplectrona* genus is very diverse in the Oriental region and there are diverse species complexes existing under a single a name. This hidden diversity is explorable only by fine phenomics that is by examining population samples and applying higher resolution and more care with research focus on the adaptive speciation traits.

Diplectrona tamdaophila Mey, 1998

Material examined. China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, Pearl River above tourist route bridge, N21°53.913' E107°54.283', 375m, 27.III.2015 (/15), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, DPP-HIST).

Remarks. New species record for China!

Macronematinae subfamily

Macronematini tribe

***Amphispyche gratiosa* Navas, 1922**

Material examined. Laos, Xainabouli, near Hatdai, 250m, 26.III.2016, leg. Liu Xingyue (5 males, OPC).

***Macrostemum fastosum* (Walker, 1852)**

Material examined. China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, light trap above the confluence of Pinglong River and Minan River, N21°51.929', E107°50.675', 315m, 28.III.2015 (/21), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G.Q. Wang (1 female, DPP-HIST). China, Guangxi Zhuang Autonomous Region Wuming County, Liangjiand town, Neichao Ming Hotel, terrace above Neichao River, N23°29.547' E108°°21.507', 195m, 23–24.III.2015(/07), leg. J. Kontschán, J.N. Li, W.H. Li, D. Murányi & G.Q. Wang (1 male, OPC).

***Macrostemum punctatum* (Betten, 1909)**

Material examined. China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, light trap above the confluence of Pinglong River and Minan River, N21°51.929' E107°50.675', 315m, 28.III.2015 (/21), leg. J. Kontschán, J.N. Li, S. Li, W.H. Li, D. Murányi & G. Q. Wang (1 male, OPC).

Remarks. New species record for China!

Polymorphanisini tribe

Polymorphanisi is a distinct tribe in the Macronematinae subfamily having the mouthparts lost; wings are without the taxonomic character of the pronounced Macronematini type of wing pattern.

***Polymorphanisus* genus**

The male genitalia were considered not yielding useful characters for the determination of species in the *Polymorphanisu*s genus (Barnard 1980). Species delineation was and is still based mainly on wing venation, coloration, thoracic marking and on locality character state of distribution. Applying the speciation trait principle of fine phenomics we have discovered subtle, but stable adaptive trait divergences in the phallic head proved to be sensitive enough to separate species within the *Aethaloptera* genus of the Polymorphanisini tribe (Oláh 2018a, b). Examining a few available males of the Oriental *Polymorphanisus* species we have found the phallic profiles as a similar potential to delineate siblings of incipient species. The phallic head of the *Polymorphanisus* genus represents an advanced apomorphic character state in the Hydropsycindae family along the transformation series of simplification from the plesiomorphic state of the phallic head with abbreviated, but free structures present in the ancestral Arctopsychinae, Diplectroninae and Smicrideinae subfamilies, in most genera of Hydropsychinae subfamily and in the ancestral genera of Macronematinae, to the much specialised apomorphic state of abbreviated plus retracted terminal structures in a few species groups in the *Hydropsche* genus of the Hydropsychinae subfamily and in most genera of the Macronematinae subfamily (Oláh & deVries 2019).

Further studies are required to confirm the stability of this trait in order to apply the lateral and ventral phallic profiles reliably to separate the poorly known species of this difficult genus. The difficulty to collect population samples of *Polymorphanisus* males makes the stability test not easy. We have large series of *Polymorphanisus* species from the Afrotropical region, mostly females. The collection of *Polymorphanisus nigricornis* species in India, Orissa State, Bhubaneshwar, Dhauli marshy area, during four trips between 1985 and 1987 has resulted only female specimens. Similarly, during our five Vietnamese trips we have collected only females. It is understandable that several described species are based only on female Holotypes. We have 2 males from Vietnam and 1 male from China with the character combination of the *Polymorphanisus*

astictus species, but found very significant adaptive divergences in the morphology of the phallic organ accompanied by divergences in the non-adaptive neutral periphallic organs of the segment X and paraproct.

Polymorphanisus astictus new species complex

This new species complex belongs to the *Polymorphanisus nigricornis* species group: (1) males no enlarged eyes, well separated ventrally; (2) gonopod segmented; (3) wings long and narrow; (4) there are no dark spots on forewing; (5) in forewing M_1 is closely associated at base with R_5; (6) M_2 is a direct continuation of M_{1+2}; (7) discoidal cell much shorter than median cell; in hind wing R_1 terminates on wing margin. In this species group the *Polymorphanisus astictus* new species complex has diverged and easily distinguished by having no dark thoracic marking present in all the other member of the species group.

There are two species known in this species complex, the nominate species of *P. astictus* and the doubtful species of *P. umbripes*. The later species was described from a large series of female specimens identified by Banks (1939) erroneously as *P. nigricornis*. The dark antennae, tibiae and femora without thoracic marking inspired the new species status with the possibility of simple colour variation (Barnard 1980). The character state of colour at *P. astictus* does not seem to be stable (Malicky 1998).

Actually the species status of the *P. astictus* females and males is based on character combination of the *P. nigricornis* species group without any dark marking present on the thorax. However, the fine phenomics of our two males from Vietnam and one male from China having this character combination revealed significant divergences in the fine structure of the phallic organ as well as in the shape of segment X and the paraproct. Here we compare these structures with the lectotype of *P. astictus* and describe two new species and reinstate the species status of *Polymorphanisus hainanensis* Martynov. We keep the species status of *P. umbripes* with dark antennae, tibiae and femora until its male becomes known. All the females with light antennae, tibiae and femora can be classified as *P. astictus* until males from the same populations confirm their real species status. The lateral and ventral profiles of the phallic organ, and especially of the phallic head like in the *Aethaloptera* genus (Oláh 2018a, b), can be applied to distinguish easily any species divergences. Here we present a brief survey on this new species complex having five members: the nominate species *Polymorphanisus astictus*, *P. hainanensis*, *P. liorum* sp. nov., *P. totaorum* sp. nov., *P. umbripes*. However, much more taxa are hidden behind the females collected from various remote Oriental regions with the character combination of *Polymorphanisus nigricornis* species group accompanied with thorax without any dark marking pattern. We need males to discover them by the speciation trait of the phallic profiles.

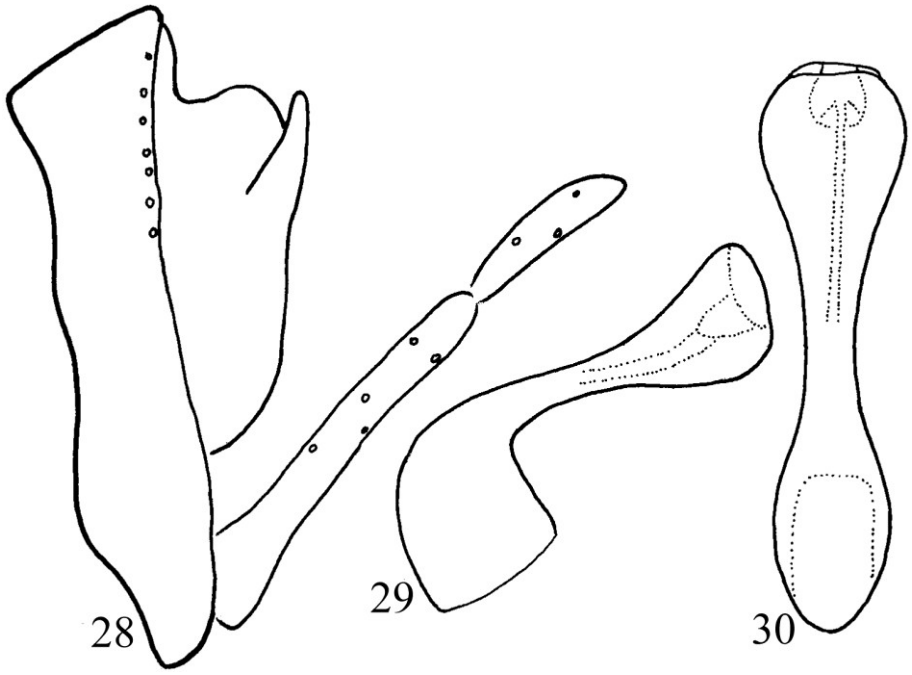
Polymorphanisus astictus Navás, 1923

(Figures 28–31)

Material examined. Vietnam, Bac Kan Province, 13 km SW from Bac Kan City, 90 m, 19.V.2012, leg. W.H. Li (1 female, DPP-HIST). Malysia, Perak, Temegor lake, 11.IX.1993, light leg. G.S. Robinson (1 female, OPC).

Remarks. The male lectotype of Navas's species was collected in Kweichow (Guizhou Province) and was examined, drawn and designated by Barnard (1980). According to his detailed drawings tergite IX is clearly capitate in dorsal view. Segment X is less discernible mesal lobes. Phallic organ with rounded apical margin in lateral view and the phallic head with elongated ovoid ventral profile.

All the females with character combination of the *P. nigricornis* species group without thoracic marking and with light antennae, tibiae and femora will be classified as *P. astictus* until males will be associated and determined to species. If population samples of sufficient number of specimens will be available there could be a possibility to distinguish species by the ventral profile of the sclerotized and sensory setosed apical margin of sternite VIII.



Figures 28–30. *Polymorphanisus astictus* Navás 1923. Lectotype: 28 = male genitalia in left lateral view, 29 = phallic organ in left lateral view, 30 = phallic organ in ventral view.

Polymorphanisus hainanensis Martynov, 1930 stat. restit.

(Figure 32)

Polymorphanisus hainanensis Martynov, 1930: 82. Holotype male, China: Hinan Tao I., Mt. Wuchih Shan, 20.V.1903 deposited in BMNH.
Polymorphanisus hainanensis Martynov, 1930. Barnard 1980:79. Synonymised with *Polymorphanisus astictus* Navás, 1923.

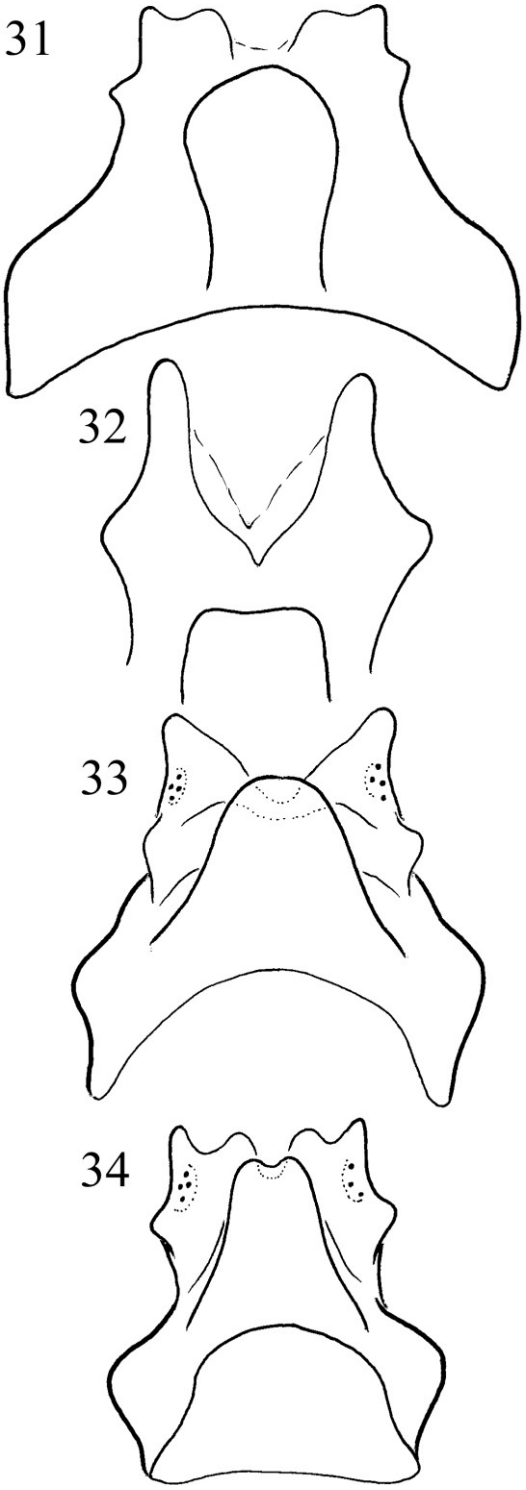
Remarks. Based on the excellent original drawings of the species description, the lateral lobes of segment X housing the vestigial cerci of the setose slightly elevated flat area and the laterad produced apical termination of the vestigial paraproct are more produced posterad and parallel-sided forming a deep mesal excision compared to the completely differently structured shape of the same complex at *P. astictus*. *P. hainanensis* has resemblance to *P. liorum* sp. nov., but the complex of lateral lobes longer and posterad directed, not short and laterad directed.

Polymorphanisus liorum J. Oláh, sp. nov.

(Figures 33, 35–38)

Material examined. Holotype: Vietnam, Quang Tri Province, Da Krong Nature Reserve, 2 km SE of HQ, light trap at small forest stream, 16.V. 2007, leg. G. Csorba (male, HNHM). *Paratype*: same as Holotype (1 male, DPP-HIST).

Diagnosis. According to the dorsal view of the segment X complex this large species with extremely long brown-ringed antennae is most close to *P. hainanensis*. Both species have bifid dorsal profile of segment X, but the new species has the lateral lobes shorter and directed laterad, not long digitate and not directed posterad. Ninth tergite rounded in dorsal view at the new species but rectangular at *P. hainanensis*. Unfortunately Martynov has not cleared his specimens, his drawings were drawn from intact genitalia. The phallic organ was almost invisible in the intact genitalia of his species. Its unique spur number of 2.3.3 differs from all the species in the complex.



Figures 31–34. Dorsal view of the male genitalia. 31 = *Polymorphanisus astictus* Navás, 1923, lectotype, 32 = *Polymorphanisus hainanensis* Martynov, 1930 stat. restit. 33 = *Polymorphanisus liorum* Oláh sp. nov. 34 = *Polymorphanisus totaorum* sp. nov.

Description. This large new species is characterised with light brown body, darker brown banded abdominal tergite and light brownish wings. It has small eyes, well separated ventrally; extremely long dark ringed antennae with 70 mm length; no dark spots on forewing; forewing 28 mm long and narrow; in forewing M_1 is closely associated at base with R_5; M_2 is a direct continuation of M_{1+2}; discoidal cell twice smaller than median cell; in hind wing R_1 terminates on wing margin and has no dark thoracic marking. Spur number: 2.3.3.

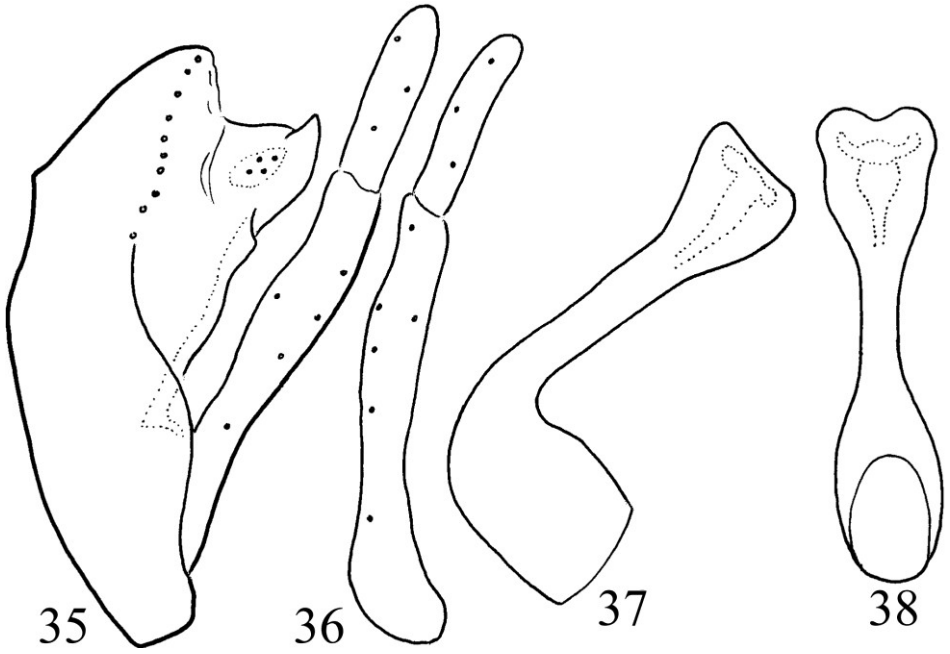
Male genitalia. Segment IX short, its tergite longer; tergite IX broad slightly narrowing apicad with rounded apical ending. The complex of segment X broad-based subtriangular in lateral view; bilobed and divorcing laterad in dorsal view with clearly visible setose area of the vestigial cerci; the other vestigial component of segment X is the paraproct discernible as a long sclerotized straps ventrolaterad, terminating posterad in a lateral hump visible both in lateral and especially in dorsal view; this vestigial paraproct functions as the phallic guides forming dorsolateral sheath of the phallocrypt or fused membranously to the basis or dorsum of the phallotheca serving in the intromitting movements of the phallic apparatus. Gonopods segmented. Phallic organ in lateral view with right angled high and long basal third of the phallotheca, low horizontal middle region funnel-like terminal and straight-cut truncate; in ventral view the phallic head is rather tunnel-like, but with a middle constriction.

Etymology. *liorum,* this wonderful large green animal with 7 cm long antennae is dedicated to the family of the second author, Weihai Li, who has realised an intensive collection of caddisfly adults in China and in adjacent territories, including Vietnam.

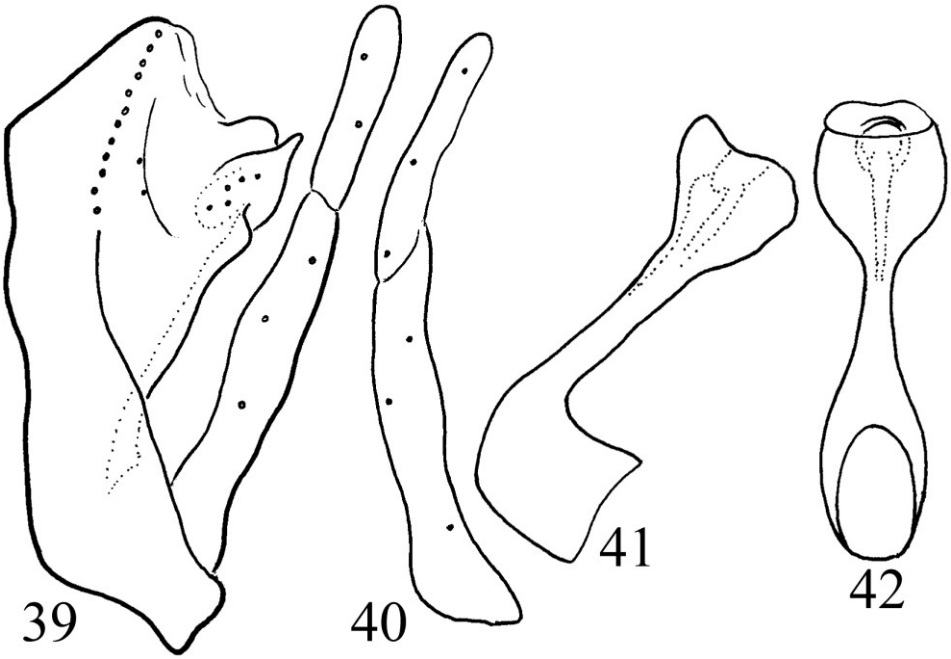
***Polymorphanisus totaorum* sp. nov.**

(Figures 34, 39–42)

Material examined. Holotype: Laos, Xainabouli, near Hatdai, 250m, 26.III.2016, leg. Liu Xingyue (1 male, CAU). *Paratype*: same as Holotype (1 male, DPP-HIST).



Figures 35–38. *Polymorphanisus liorum* J. Oláh, sp. nov. Holotype. 35 = male genitalia in left lateral view, 36 = left gonopod in ventral view, 37 = phallic organ in left lateral view, 38 = phallic organ in ventral view.



Figures 39–42. *Polymorphanisus totaorum* sp. nov. Holotype. 39 = male genitalia in left lateral view, 40 = left gonopod in ventral view, 41 = phallic organ in left lateral view, 42 = phallic organ in ventral view.

Diagnosis. According to the dorsal view of the segment X complex this large species with long brown-ringed antennae is most close to the nominal species of *P. astictus*. Both species have quadrifid dorsal profile of segment X, but the new species has deeper excision and the mesal lobes are more produced. In dorsal view the ninth tergite narrow and narrowing and ending in bifid apex, not capitate. The phallic head is circular in ventral view, not elongated ovoid. Moreover the spur number is 1.3.2, not 13.3.

Description. This new species is characterised with light brown body, darker brown banded abdominal tergite and light greenish-yellowish wings. It has small eyes, well separated ventrally; long dark ringed antennae; no dark spots on forewing; forewing 23 mm long and narrow; in forewing M_1 is closely associated at base with R_5; M_2 is a direct continuation of M_{1+2}; discoidal cell twice smaller than median cell; in hind wing R_1 terminates on wing margin and has no dark thoracic marking. Spur number 1.3.2.

Male genitalia. Segment IX short, its tergite longer; tergite IX narrow and narrowing apicad with slightly excised apical ending. The complex of segment X broad-based subtriangular in lateral view; quadrilobed and parallel-sided in dorsal view with clearly visible setose area of the vestigial cerci; the other vestigial component of segment X is the paraproct discernible as a long sclerotized straps ventrolaterad, terminating posterad in a pronounced lateral hump visible both in lateral and especially in dorsal view; this vestigial paraproct functions as the phallic guides forming dorsolateral sheath of the phallocrypt or fused membranously to the basis or dorsum of the phallotheca serving in the intromitting movements of the phallic apparatus. Gonopods segmented. Phallic organ in lateral view with right angled low and long basal part of the phallotheca, low horizontal middle region, funnel-like terminal region with patterned-cut truncate head; in ventral view the phallic head is rather circled, without any middle constriction.

Etymology. *totaorum* epithet comes from coining "Toth" and "Tao", to remind the magnificent Holon of human nature, the integrated cooperation of the "whole" as it is expressed in every myths of the prehistoric human populations in each corner of Eurasia, until negated by Western modernism manifested in the new myths of imbalanced competion and natural selection. This Holon is epithetised by combining Toth and Tao. Toth, symbolising the Occident, is the creator of universal analogy in the *tabula smaragdina* (superior is like to inferior, all have been and arose from one), the Egyptian god of knowledge, later the Greek named Hermes Trismegistos (thrice great). Tao, symbolising the Orient, is the central concept of Chinese Laoce, the principle of *Wu Wei* (action of non-action, going with the unified flow of nature) and adopted also by Buddhism (non-clinging to individual ego).

***Polymorphanisus umbripes* Barnard, 1980**

Polymorphanisus umbripes Barnard, 1980:95–96. Holotype ♀, India: Mysore, Shimoga, R. Tunga, 1865' (560 m), at light, 18.VI.(?year) (Nathan) (type no. 32396, MCZ, Harvard). Paratypes. India: 29 ♀, data as Holotype, various dates (26 in MCZ, Harvard; 2 in USNM, Washington; 1 in BMNH; 4♀, Mysore, Bhadravati (Nathan) (MCZ, Harvard).

Remarks. Distinguished from *P. astictus* by the dark antennae, tibiae and femora. In spite of colour variability detected in various remote populations of *P. astictus* the species status of *P. umbripes* is retained until male will be available to compare its segment X and phallic profiles with the other males of the species complex.

Hydropsychinae

***Hydromanicus deceptus* (Banks, 1939)**

Material examined. China, Guangxi Zhuang Autonomous Region, Tianlin County, Cenwangloashan Mt., Dalongping station, 24.V.2013 (1 male, DPP-HIST).

***Hydromanicus eleasar* Malicky, 1993**

Material examined. China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (3 males, DPP-HIST; 2 males, OPC).

Remarks. New species record for China! It was described from Nepal and recorded later from Myanmar (Oláh & Johanson 2008).

***Hydromanicus heges* sp. nov.**

(Figures 43–47)

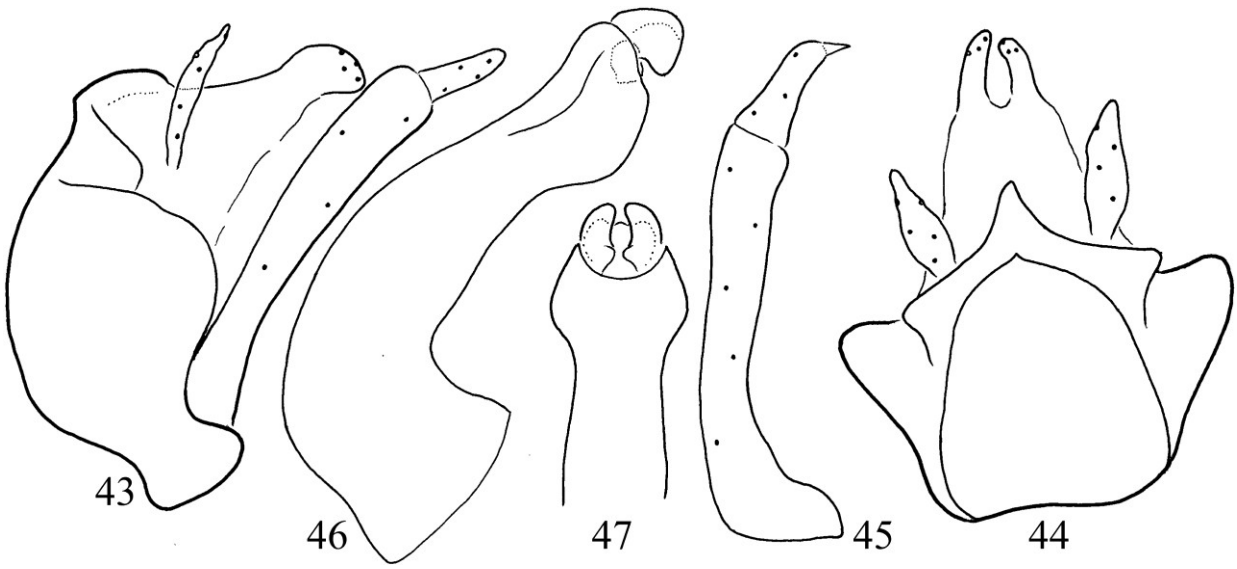
Material examined. Holotype: China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (1 male, CAU). *Paratype*: same as Holotype (1 male, DPP-HIST).

Diagnosis. This new species belongs to the *Hydromanicus luctuosus* species group, established as *H. truncatus* species group by Oláh & Johanson (2008). Very specialised by the head of the phallic organ, the ventral keel is modified and combined with apicolateral dorsal wings (widened head in dorsal or ventral view). Has resemblance to *H. falax*, but differs by the mesad turning pointed tip of the harpago and by the modified phallic head.

Description. A brown coloured animal with light spotted forewing, forewing length is 12 mm.

Male genitalia. Abdominal segment IX divided by suture into a smaller dorsal and a larger ventral part; its median keel short and narrow; anterior margin arciform, resulted in a very short ventrum and short dorsum; apical lobe on posterolateral margin robust semicircular, comprising the bulk of the segment; intersegmental depression between the ninth and tenth segments low in lateral view. Body of segment X broad-based less sclerotized; setose cerci elongated foliform; dorsoapical setose lobes form the bilobed apex of segment X. The basal segment of the gonopods almost parallel-sided slightly sinuous; terminal segment, the harpago parallel-sided with sharp mesad turning pointed tip. Phallic apparatus robust, subapical ventral keel small and shallow, endothecal sclerites downward curving, phallic apex dilated forming a dorsolateral wing visible in dorsal and lateral view.

Etymology. *heges*, coined from "hegyes" pointed, acute in Hungarian, refers to very tip of the harpago with mesad directed very sharp, pointed structure.



Figures 43–47. *Hydromanicus heges* sp. nov. Holotype. 43 = male genitalia in left lateral view, 44 = male genitalia in dorsal view, 45 = left gonopod in ventral view, 46 = phallic organ in left lateral view, 47 = phallic organ in ventral view.

Hydromanicus luctuosus Ulmer, 1905

Material examined. China, Tibet, Beibengxiang, 700 m, 30.VII.2012, leg. W. Li (1 male, DPP-HIST). China, Tibet, Muotuo, 1100 m, 26. VII.1912, leg. Li Wenliang (1 male, DPP-HIST). China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (1 male, OPC).

Hydromanicus melli species complex

These medium-sized species with variously brown patterned forewing have rather complicated phallic head: the phallotheca produced ventroapicad into specific ventral profile and the phallotremal sclerites are surrounded by complex system of endothecal processes: (1) dorsally a heavily sclerotized pair of downward curving elongated plates with inner concavity is accompanied by a pair of upward or downward curving strong spines; ventrally two pairs of variously developed and curved spines. The complex of segment X with a dorsal anterad directed pointed hook before the fused dorsoapical setose lobes. The periphallic organs of cerci and gonopods are less diverged. The specification is realised mostly by the shape divergences of the endothecal processes in sexual adaptation of the integrative organisation. The following species belong to this complex: *H. huapingensis*, *H. melli*, *H. mintas* sp. nov., *H. respersarius*, *H. ritkas* sp. nov.

Hydromanicus melli (Ulmer, 1925)

Material examined. China, Zhejiang, Jingning, Wangdongyang N.N.R, 2017.7 Zhang Tingting (1 male, DPP-HIST; 1 male, OPC). China, Fujian Province, Huankeng, Aotou village, 2.V.2004, leg. Liu Xing-Yue (1 male, OPC). China, Fujian Province, Wuyishan, Sangang, 740 m, 9.V.2004, leg. Liu Xingyue (1 male, DPP-HIST).

Hydromanicus mintas sp. nov.

(Figures 48–49)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region,, Shangsi County, Shiwandashan Natural Forest Park, light trap above the confluence of Pinglong River and Minan River, N21°51.929' E107°50.675', 315 m, 28.III.2015(/21), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC).

Diagnosis. This new species belongs to the *Hydromanicus melli* species complex, and differs from the siblings of the complex by the rather flat and more anterad directed dorsal hook and by the specialised pattern of endothecal processes and spines.

Description. A brown coloured animal with strongly contrasted darker brown forewing pattern with forewing length 12 mm.

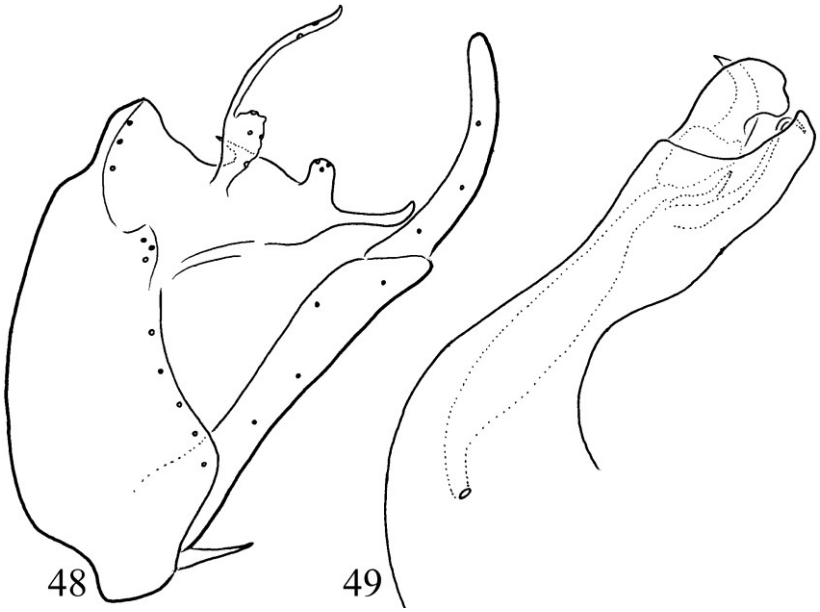
Male genitalia. Abdominal segment IX short; anterior margin arciform, resulted in a very short dorsum and longer ventrum; posterior margin almost straight vertical, delineated by vertical row of strong spines; intersegmental depression between the ninth and tenth segments low and obtuse angled in lateral view. Body of segment X complex with a dorsal anterad directed pointed hook before the fused dorsoapical setose lobes; setose cerci elongated filiform with more setose basal lobe; dorsoapical setose lobes fused and upward directed in lateral view. The basal segment of the gonopods almost parallel-sided; terminal segment, the harpago parallel-sided long and upward arching. Phallic apparatus robust, phallobase low oblique; phallic head with the pair of down curving dorsal plates, upward curving pair of strong dorsal spines; ventral spines composed of short dorsal and long ventral pairs of spines; the produced ventral lip of the phallotheca broad apicad.

Etymology. *mintas,* coined from "mintás" patterned in Hungarian, refers to strongly patterned forewing.

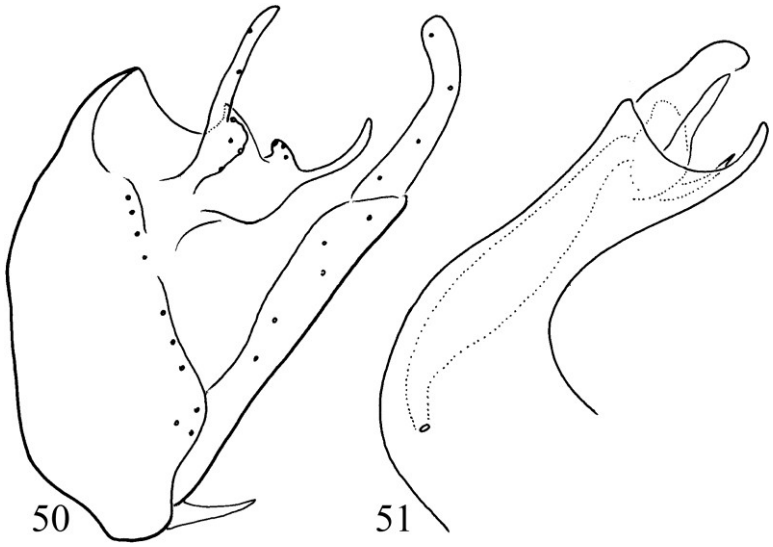
Hydromanicus ritkas sp. nov.

(Figures 50–51)

Material examined. Holotype: *China*, Guangxi Zhuang Autonomous Region,, Shangsi County, Shiwandashan Natural Forest Park, light trap a-



Figures 48–49. *Hydromanicus mintas* sp. nov. Holotype. 48 = male genitalia in left lateral view, 49 = phallic organ in left lateral view.



Figures 50–51. *Hydromanicus ritkas* sp. nov. Holotype. 50 = male genitalia in left lateral view, 51 = phallic organ in left lateral view.

bove the confluence of Pinglong River and Minan River, N21°51.929' E107°50.675', 315 m, 28.III.2015(/21), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC). Paratype: China, Shangsi County, Shiwandashan Natural Forest Park, light trap on Yunwu Hotel balcony above Pearl River, N21°54.316' E107°54.203', 295 m, 26-29.III.2015(/14), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, CAU).

Diagnosis. This new species belongs to the *Hydromanicus melli* species complex, and differs from the siblings of the complex by the upward produced and more upward directed dorsal hook and by the specialised pattern of endothecal processes and spines.

Description. A brown coloured animal with faintly developed, almost indiscernible darker brown forewing pattern, forewing length is 11 mm.

Male genitalia. Abdominal segment IX short; anterior margin arciform, resulted in a very short dorsum and longer ventrum; posterior margin almost straight vertical, delineated by vertical row of strong spines; intersegmental depression between the ninth and tenth segments deep and obtuse angled in lateral view. Body of segment X complex with a dorsal upward directed pointed hook before the fused dorsoapical setose lobes; setose cerci elongated filiform with more setose basal lobe; dorsoapical setose lobes fused and upward and anterad directed, slightly tapering in lateral view. The basal segment of the gonopods almost parallel-sided; terminal segment, the harpago parallel-sided long and upward arching. Phallic apparatus robust, phallobase high right-angled; phallic head with the pair of down curving dorsal plates, a pair of strong and straight dorsal spines; ventral spines vestigial, reduced to a pair of small spines; the produced ventral lip of the phallotheca narrowing apicad.

Etymology. *ritkas*, coined from "ritkás" sparse in Hungarian, refers to faintly, sparsely patterned forewing.

Hydropsyche **genus**

In the present survey on the *Hydropsyche* taxa we follow our "diagnostic" classification system of species groups and clusters (or clades?) elaborated around ten years ago (Oláh & Johanson 2008). At that time the "modern" distinction between diagnostic (cluster) and phylogenetic (clade) systems of classification was still dominating as a valid epistemic scenario. Today such a hubristic epistemic distinction is losing theoretical ground.

Theoretical limits of classification. The growing conundrum between gross and molecular morphology, superimposed by fine phenomics and supported by ontic and epistemic structural realities, by space-time ontology and by Heidegger's philosophy of Dasein's being in the world, makes it more and more evident that the reality is reticulated, not cladded and resulted in contextual individuality of taxa as a more realistic search fundament for taxonomy. Individuals have only a heuristic role. Structures of entanglement with nodes of structures dominate rather than the objects with an intrinsic identity. Modality of causal structures with causal properties dominates over categorical properties of objects. Therefore every classification must be diagnostic that is necessarily artificial. It's getting more and more evident that similarly to the quantum universe the classical world is also entangled into networks both in the compositional scalar and in the vectorial specification hierarchies. In the vectorial battle field between divergence (dark inflation energy) and integration (negentropy) reticulation organises and maintains the network of living universe as intact as possible against the stochastic effects of divergence.

The terms of cluster and clade are sometimes used interchangeably, but in the naive belief of molecular taxonomy they were considered not synonymous, at least according to the wishful dreams of phylogenetics to distinguish between artificial and natural systems of classification. Following their reductionist distinction a cluster is a group of organisms placed together in a classification system on the basis of their resemblance and practiced in phenetics by cluster analysis (identical by state) without special care to their evolutionary relationship. At the same time the clade is a group of organisms defined by their common biological ancestor, without particular care to their resemblance (identical by descent). In molecular genealogy, such clades are defined usually by single nucleotide polymorphism or by short tandem repeat of microsatellites, determined by polarity of ancestral or descendant character states and arranged in hierarchical branching of cladograms by cladistics.

This reductionist procedure was faced and questioned by the reality of incongruent convergences and parallelisms in the chimeric world of integrative organisation (Oláh *et al.* 2019).

Contrary to the Darwinian "descent with modification" on the tree of life, taxa are descendants of the multitude of ancestors forced by causal essence of power and realised by external and internal random effects in stochastic mechanisms. Branching of phylogeny is only the apparent surface of the reality recognised, understood and interpreted by low resolution power of human senses. Instead of this superficial simplification the reality of organisation of living or any entities is reticulated netlike in the deep. In reality, stochastic networking of scalar-dependent *hologeny* on universal scale and *retigeny* on partial scales are acting behind any speciation processes: Holon (the Whole) and Rete (the Network) dictate the universal reality. Taxonomist's trials to classify this network of reality into distinct hierarchy of taxa are fundamentally and theoretically artificial. We try to classify natural network into artificial classwork of objects for human practice according to our growing, but still limited human epistemic capacity.

Based on this theoretical consideration here we prefer to use the term cluster instead of clades due to the taxonomic incongruences and discordances getting theoretical support and practical importance and proving to be rather a rule, than an exception; branching is the surface and reticulation is the deep (Oláh & deVries 2019). Besides the species groups and clusters here we delineate species complexes, if relevant, as detected by the presence of incipient phylogenetic species of siblings.

Hydropsyche vasoumittra species group

Hydropsyche cernaka sp. nov.

(Figures 52–55)

Material examined. Holotype: China, Yunnan Province, Gongshan, Dulongjiangi, 1542 m, 1. VII.2013, leg. Zhang Wei (1 male, CAU). *Paratypes*: same as Holotype (20 males, DPP-HIST; 15 males, OPC).

Diagnosis. This new species belongs to the *Hydropsyche vasoumittra* species group having several pairs of spine sclerites as endothecal processes as well as some types of sclerous structure at the terminal opening of the endophallus, as the reduced phallotremal sclerites. Differs by all the described species by the very slender and elongated ventroapical setose lobes and to the very thin, almost vestigial thread-like harpago.

Description. A medium sized species with forewing length of 11 mm. Body and wing colour brown, forewing with light spotted pattern.

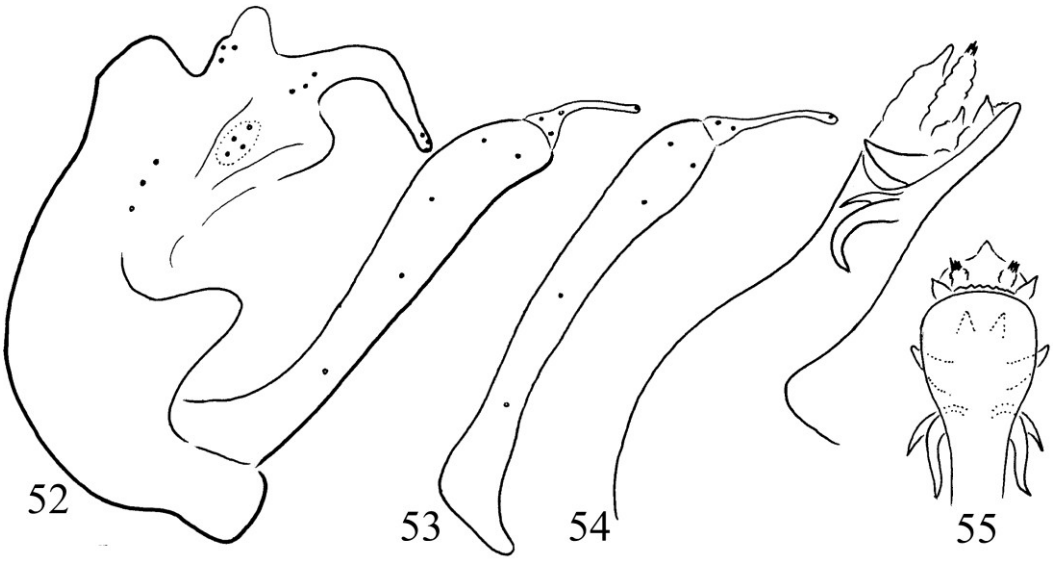
Male genitalia. Abdominal segment IX fused annular, short; its median keel short with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and dorsum; apical lobe on posterolateral margin robust triangular. Intersegmental depression between the ninth and tenth segments deep right-angled in lateral view. Body of segment X short; lateral setose area (cerci) in middle position; apicoventral setose lobe slender elongated and downward curving from middle; dorsoapical setose lobe shifted back to basal region forming a fused pair of elongated setose area; a setaless winglet attached to the fused dorsoapical setose lobes very produced; the unsetose cavity on the anterolateral area of the segment just discernible. The basal segment of the gonopod sinuous with dilated apical half; the terminal segment, the harpago is broad based and very slim. Phallic apparatus having large and low phallobase; horizontal shaft of the phallotheca broad and bellied tube, the phallic head is composed of specific pattern of six pairs of variously sized spines based by membranous endothecal lobes.

Etymology. *cernaka* euphemic coining from "cérna, cérnácska" diminutive form of thread in Hungarian, refers to the slender and elongated ventroapical setose lobes and to the very thin, almost disappeared thread-like harpago.

Hydropsyche dhusaravarna Schmid, 1975

Material examined. China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (10 males, DPP-HIST, 12 males, OPC).

Remarks. It belongs to the *Hydropsyche vasoumittra* species group (Oláh & Johanson 2008).



Figures 52–55. *Hydropsyche cernaka* sp. nov. Holotype. 52 = male genitalia in left lateral view, 53 = left gonopod in ventral view, 54 = phallic organ in left lateral view, 55 = phallic organ in ventral view.

Hydropsyche nevae species group

Hydropsyche nevae species cluster

Hydropsyche cerva Li & Tian, 1990

Material examined. China, Yunnan Province, Ruili, Nanjingli, 18.IV.2014, leg. Lu Xiumei (2 males, DPP-HIST, 2 males, OPC).

Hydropsyche keses sp. nov.

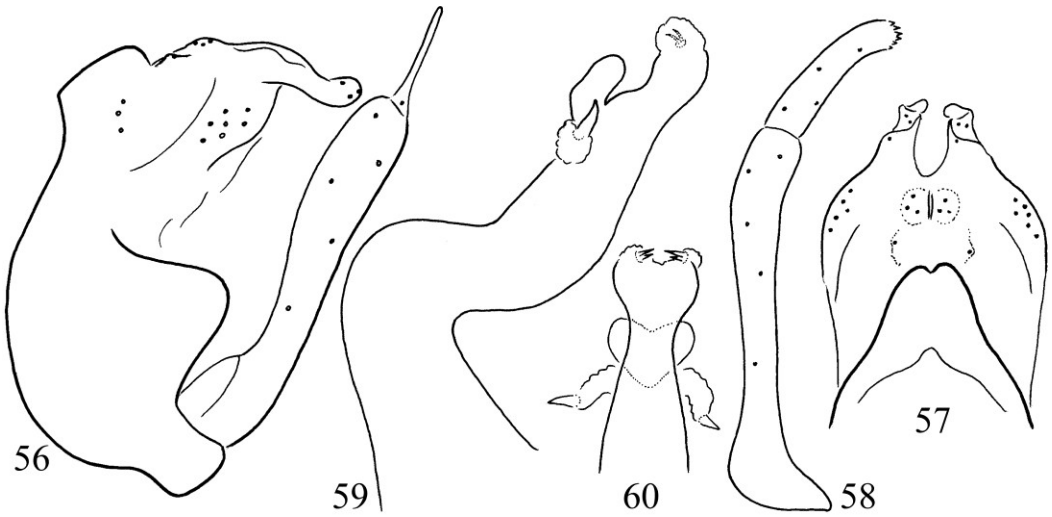
(Figures 56–60)

Material examined. Holotype: China, Shaanxi Province, Zhouzhi, Houzhenzi, 1278 m, 16.VIII. 2014, leg. Lu Xiumei (1 male, CAU). *Paratypes*: China, Sichuan Province, Jiuzhaigou County, Jiuzhaigou, 2300 m, 1.VIII.2011, (1 male, DPP-HIST; 1 male, OPC)

Diagnosis. This new species belongs to the *Hydropsyche newae* cluster of the *H. newae* species group and similar to various species having only a pair of extrusible endothecal dorsal membrane with a single spine anterad of the phallotremal sclerites and a fused endothecal apical membranes, when fully expanded their apex tipped by a pair of few spicules, in reverted position the small clump of spicules hardly discernible. The unique very high phallobase with produced dorsal hump has resemblance to *H. nagpupos* sp. nov. but differs by having blade-like harpago, more robust and patterned ventroapical setose lobes on segment X complex, broad and bellied apical half of the phallotheca and the phallic head not bilobed in ventral view.

Description. A medium sized species with forewing length of 11 mm. Body and wing colour brown, forewing without any pattern.

Male genitalia. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and dorsum; apical lobe on posterolateral margin robust semicircular. Intersegmental depression between the ninth and tenth segments small right-angled in lateral view. Body of segment X broad rounded and short; lateral setose area (cerci) in deep ventroapical position; apicoventral setose lobe digitiform; dorsoapical setose lobe shifted back to basal region forming a fused pair of elongated setose area; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod slightly sinuous, with dilated apical half; the terminal segment



Figures 56–60. *Hydropsyche keses* sp. nov. Holotype. 56 = male genitalia in left lateral view, 57 = male genitalia in dorsal view, 58 = left gonopod in ventral view, 59 = phallic organ in left lateral view, 60 = phallic organ in ventral view.

blade-like, narrow in lateral and broad in ventral view. Phallic apparatus having large and high phallobase with produced dorsum; horizontal shaft of the phallotheca broad and bellied tube, the pair of the endothecal dorsal membrane anterad of the phallotremal sclerites armed with a single spine; the endothecal apical membranes fused; the phallotremal sclerite regular heart-shaped in ventral view.

Etymology. *keses* from "késes" bearing knife blade in Hungarian, refers to the lateral profile of the harpago, narrow in lateral, but broad in ventral view due to the blade shape of the terminal gonopod segment.

***Hydropsyche nagpupos* sp. nov.**

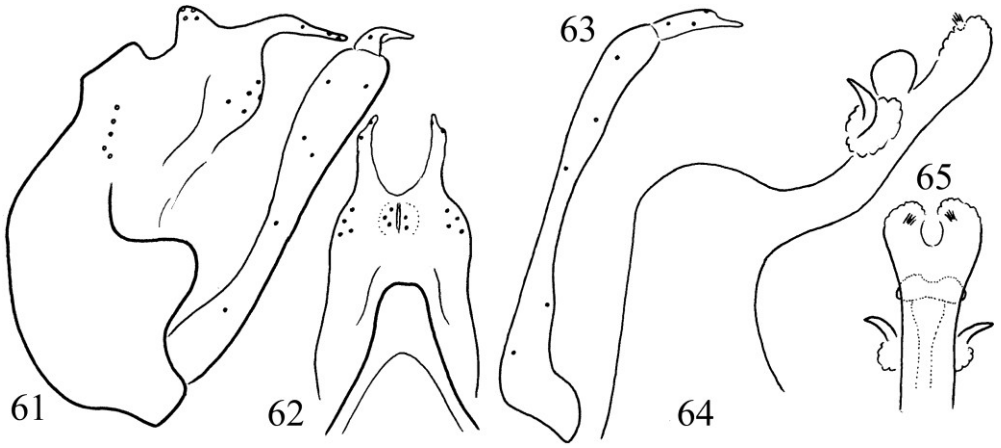
(Figures 61–65)

Material examined. Holotype: China, Taiwan, Hualien, Pi-lu, Sacred tree, 6.VI.2013, leg. Li Wenliang (1 male, CAU). *Paratypes*: same as Holotype (7 males, DPP-HIST; 6 males, OPC).

Diagnosis. This new species belongs to the *Hydropsyche newae* cluster of the *H. newae* species group and similar to various species having only a pair of extrusible endothecal dorsal membrane with a single spine anterad of the phallotremal sclerites and a pair of endothecal apical membranes, when fully expanded their apex tipped by a few spicules, in reverted position the small clump of spicules hardly discernible. The new species differs from all the known species by having unique phallobase with much produced dorsal hump.

Description. A medium sized species with forewing length of 11 mm. Body and wing colour brown, forewing faintly dotted with light spots.

Male genitalia. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and dorsum; apical lobe on posterolateral margin robust semicircular. intersegmental depression between the ninth and tenth segments small right-angled in lateral view. Body of segment X broad rounded and short; lateral setose area (cerci) in deep ventroapical position; apicoventral setose lobe digitiform; dorsoapical setose lobe shifted back to basal region forming a fused pair of elongated setose area; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod slightly sinuous, with dilated apical half; the terminal segment with abruptly narrowing apex. Phallic apparatus having large phallobase with uniquely produced dorsum;



Figures 61–65. *Hydropsyche nagpupos* sp. nov. Holotype. 61 = male genitalia in left lateral view, 62 = male genitalia in dorsal view, 63 = left gonopod in ventral view, 64 = phallic organ in left lateral view, 65 = phallic organ in ventral view.

horizontal shaft of the phallotheca narrow tube, the pair of the endothecal dorsal membrane anterad of the phallotremal sclerites armed with a single spine; the a pair of endothecal apical membranes with a group of 3-4 small spicules.

Etymology. *nagpupos* from "nagy púpos" large hump in Hungarian, refers to the lateral profile of the phallotheca having uniquely produced large hump on the dorsum of the phallobase.

Hydropsyche nevoides Malicky & Chantaramongkol, 2000

Material examined. China, Henan Province, Song County, Mt. Funiu, Muzhaling, 19.VIII. 2012 (1 male, OPC). China, Henan Province, Xinxiang, Hui County, Guangshan, 800 m, 16.VII. 2008 (1 male, DPP-HIST).

Hydropsyche newae Kolenati, 1858

Material examined. China, Xinjiang Province, Buerjin, Hema Town, 10.VII.2016 leg. Tiang Yunlan (1 male, DPP-HIST).

Hydropsyche vaza sp. nov.

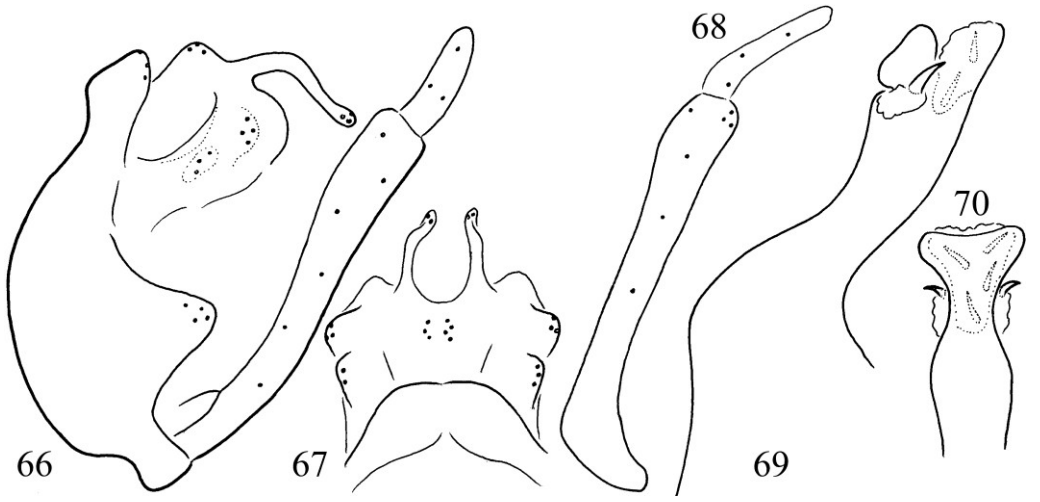
(Figures 66–70)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, light trap on Yunwu Hotel balcony above Pearl River, N21° 54.316' E107°54.203', 295m, 26–29.III.2015 (/14), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC). *Paratypes*: same as Holotype (1 male, DPP-HIST).

Diagnosis. This new species belongs to the *Hydropsyche newae* cluster of the *H. newae* species group and similar to various species having only a pair of extrusible endothecal dorsal membrane with a single spine anterad of the phallotremal sclerites and a pair of endothecal apical membranes, when fully expanded their apex tipped by a few spines or spicules, in reverted position the spines discernible inside. The new species is most close to H. nevoides having almost identical periphallic organs, but differ by almost every structural units of the diverged phallic organ and easily delineated by the vase-shaped ventral profile of the apical half of the phallotheca.

Description. A medium sized species with forewing length of 10 mm. Body and wing colour brown, forewing without any pattern of light spots.

Male genitalia. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and dorsum; apical lobe on posterolateral margin ro



Figures 66–70. *Hydropsyche vaza* sp. nov. Holotype. 66 = male genitalia in left lateral view, 67 = male genitalia in dorsal view, 68 = left gonopod in ventral view, 69 = phallic organ in left lateral view, 70 = phallic organ in ventral view.

bust triangular; intersegmental depression between the ninth and tenth segments sharp-angled in lateral view. Body of segment X broad and short, subquadrangular in dorsal view; lateral setose area (cerci) in deep ventral position; apicoventral setose lobe digitiform, downward turning; dorsoapical setose lobe shifted back to basal region forming a fused pair of triangular setose area; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod slightly sinuous, with dilated apical half; the terminal segment almost parallel-sided. Phallic apparatus having large phallobase; horizontal shaft of the phallotheca narrower, the pair of the endothecal dorsal membrane anterad of the phallotremal sclerites armed with a single small spine; apical endothecal membranous eversible bag contains four medium-sized spines.

Etymology. *vaza* from "váza" flowerpot, flower vase in Hungarian, refers to ventral profile of the apical half of the phallotheca.

Hydropsyche columnata species cluster

Hydropsyche columnata Martynov, 1931

Material examined. China, Heibei, Xionglong, Dagoukum, 589 m, 11.VI.2014, leg. Li Xuankun (1 male, OPC).

Remarks. The pair of the endothecal dorsal membrane anterad of the phallotremal sclerites is rather slim, almost vestigial and the terminal spine is lacking. Moreover the lateral profile of the phallotheca is rather robust and differently bending. It may represent a diverged sibling of the *H. columnata* species. More specimens required to establish its real taxonomic position.

Hydropsyche simulata species cluster

Hydropsyche camillus Malicky & Chantaramongkol, 2000

Material examined. China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (1 males, DPP-HIST; 1 male, OPC).

Remarks. New species record for China! It was described from Thailand and recorded from Laos and Vietnam. It belongs to the *Hydropsyche simulata* species cluster of the *Hydropsyche newae* species group (Oláh & Johanson 2008).

Hydropsyche simulata Moselyi, 1942

Material examined. China, Shaanxi Province, Yingpan, Niubeiliang, N33.7812 E108.8289, 1887 m, 29.VII.2014, leg. Tang Chufei (1 male, DPP-HIST).

Remarks. The nominate species of the *Hydropsyche simulata* species cluster of the *H. nevae* species group (Oláh & Johanson 2008).

Hydropsyche spinata Kobayashi, 1987

Material examined. China, Taiwan, Hualien, Pi-lu, Sacred tree, 6.VI.2013, leg. Li Wenliang (2 males, DPP-HIST).

Remarks. It belongs to the *Hydropsyche simulata* species cluster of the *H. nevae* species group (Oláh & Johanson 2008).

Hydropsyche penicillata new species complex

Hydropsyche penicillata species complex is characterised by the following character combination: (1) The lateral profile of the phallic apparatus is dominated by an inverse U-shaped basal section of the phallotheca; (2) apicoventral setose lobe downward turning about middle; (3) the sclerotized apex of phallotheca, posterad of the phallotremal sclerite cylindrical with erectile apical membranous endothecal process with various spine pattern. Until a revision is realised we group the following species into this species complex: *H. busiris*, *H. complicata*, *H. compressa*, *H. keska* sp. nov., *H. penicillata*, *H. tagra* sp. nov., *H. uvana*.

Hydropsyche penicillata Martynov, 1931

Hydropsyche penicillata Martynov, 1931:8. "Basal joint of the inferior appendages long, somewhat thickened in its distal portion; second joint gradually tapering to its apex." The description of this character states that is the tapering shape of the harpago is clearly supported by the narrowing shape on the original drawings in all of the observational view: lateral, dorsal and ventral. The species was described on a single male from Sichuan.

Hydropsyche penicillata Schmid, 1965:137–138. "Je considère ces insects comme appurtenant à *H. penicillata* Mart. car les génitalia du ♂ correspondent bien aux figures originales de Martynov. Il est vrai que ces dernières sont fort médiocres ce qui fait que cette opinion devra peut-être être revise plus tard." Misidentification!

Remarks. Schmid (1965) has examined a rather large series of specimens from Guangxi, Hunan, Shaanxi and Sichuan provinces. He has given complete drawings including phallic organ of the species, but unfortunately without indicating the locality of the drawn specimens. His drawings represent an unknown species: having parallel-sided not tapering harpago it is not *H. penicillata*, moreover the obtuse-angled phallotheca of the drawn species is a character state present in several member of the *H. simulata* species cluster, but the phallotheca is right-angled in the *H. penicillata* species complex.

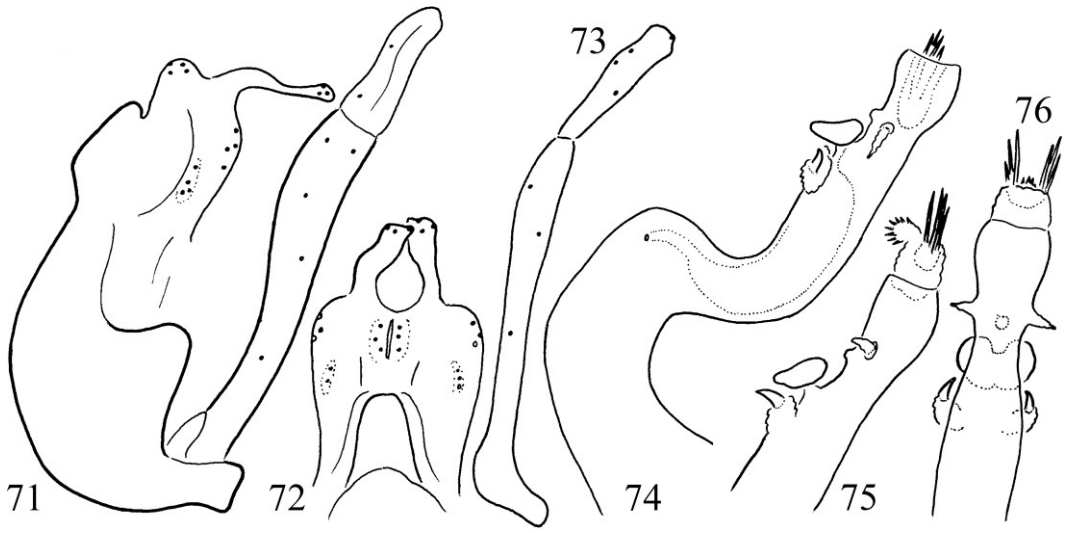
Hydropsyche keska sp. nov.

(Figures 71–76)

Material examined. Holotype: China, Henan Province, Xinxiang, Hui County, Guangshan, 800 m, 15.VII.2008 (1 male, CAU). *Paratypes*: same as Holotype (3 males, DPP-HIST, 2 males, OPC).

Diagnosis. This new species belongs to the *Hydropsyche penicillata* species complex in the *Hydropsyche simulata* cluster of the *H. newae* species group. The profile of the phallic apparatus in this cluster is modified into an inverse U-shaped basal section of the phallotheca, forming double sinuate bends. The ring-shaped bend continues into the horizontal terminal section with a right angle, at least on the dorsum. The length of the bend is almost double of the horizontal terminal segment. This new species described from China (Henan, Hui County) is most close to *H. tagra* sp. nov described from China (Henan, Song County), but differs by having (1) gap present between the dorsal keel of segment IX and the dorsoapical setose lobe is very narrow (short); (2) dorsoapical setose lobe sloping anterad, not steep upward; (3) longer sclerotized cylindrical head of the phallotheca, (4) the pair of lateral membranous endothecal processes distad of the phallotremal sclerites without black spines, not tipped with three slender black spines.

Description. Redish brown species, forewing unicoloured, without pattern, forewing length 10 mm.



Figures 71–76. *Hydropsyche keska* sp. nov. Holotype. 71 = male genitalia in left lateral view, 72 = male genitalia in dorsal view, 73 = left gonopod in ventral view, 74 = phallic organ in left lateral view, 75 = erected phallic organ in left lateral view, 76 = erected phallic organ in ventral view.

Male genitalia. Abdominal segment IX fused annular, short; its median keel broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and double longer dorsum; apical lobe on posterolateral margin robust rounded triangular, comprising the bulk of the segment; intersegmental depression between the ninth and tenth segments deep, narrow and bent anterad in lateral view. Body of segment X broad rounded slightly elongated; lateral setose area (cerci) in ventromesal position just below the setaless concavity; apicoventral setose lobe moved dorsad, longer than the body of segment X narrow-based with downward directed apical half with broadening apex; dorsoapical setose lobe shifted back to basal region forming a fused pair of an upward produced large setose hump sloping anterad in lateral view; the unsetose cavity on the anterolateral area of the segment deep. The basal segment of the gonopods short robust and slightly sinuous dorsad, terminal segment, the harpago parallel-sided both in lateral and ventral view, with some broadening subapicad in ventral view; slightly S-forming in lateral view. Phallic apparatus double sinuate with right-angle, phallobase much higher than the apical horizontal shaft; phallotremal sclerites heavily pigmented pair of exposed reniform structure; at these sclerites the tube narrowing, slightly constricted in the ventrum and followed by the cylindrical and truncate apex; the pair of dorsolateral endothecal processes just before the phallotremal sclerites short membranous tipped with a single curving small spine; the pair of lateral membranous endothecal processes distad of the phallotremal sclerites tipped with some tiny not sclerotized finger, single dorsal subapical pointed elevation present.

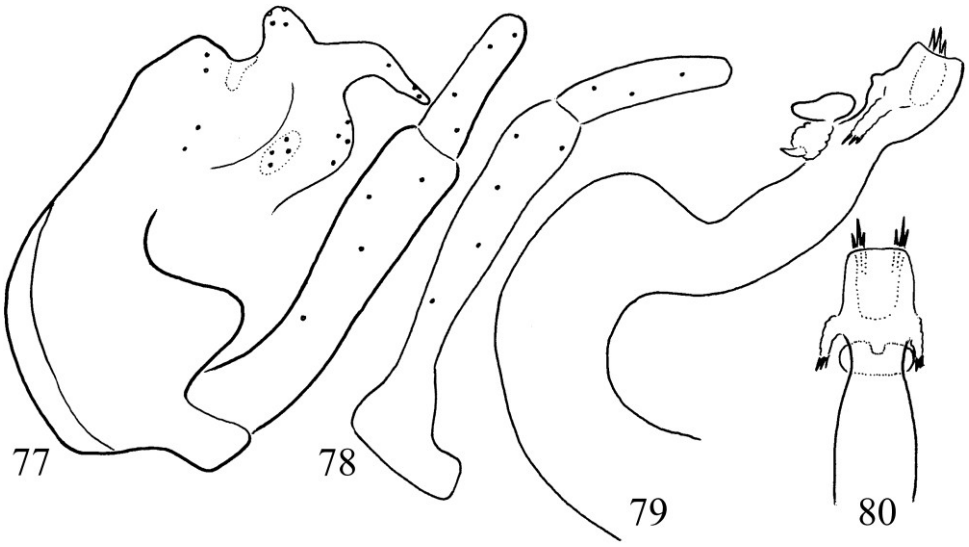
Etymology. *keska* from "keskeny" narrow in Hungarian, refers to the very narrow (short) gap present between the dorsal keel of segment IX and the dorsoapical setose lobe.

***Hydropsyche tagra* sp. nov.**

(Figures 77–80)

Material examined. Holotype: China, Henan Province, Song County, Mt. Funiu, Muzhaling, 19.VIII.2012, leg. Weihai Li (1 male, CAU).

Diagnosis. This new species belongs to the *Hydropsyche penicillata* species complex in the *Hydropsyche simulata* cluster of the *H. newae* species group. The profile of the phallic apparatus in this cluster is modified into an inverse U-



Figures 77–80. *Hydropsyche tagra* sp. nov. Holotype. 77 = male genitalia in left lateral view, 78 = left gonopod in ventral view, 79 = phallic organ in left lateral view, 80 = phallic organ in ventral view.

shaped basal section of the phallotheca, forming double sinuate bends. The ring-shaped bend continues into the horizontal terminal section with a right angle, at least on the dorsum. The length of the bend is almost double of the horizontal terminal segment. This new species is most close to *H. penicillata* Martynov, 1931 described from China (Sichuan), but differs by having parallel-sided harpago both in lateral, dorsal and ventral view, not tapering as drawn by Martynov in lateral, dorsal and ventral view. We have to emphasize that Martynov's drawings and shape explanations are proved to be extremely exact competing with many of our present day drawings and descriptions (Oláh *et al.* 2018). Remember that he was a contemporary of Navás and Banks whose drawings are incomparable because of their low resolution. Unfortunately Martynov has not cleared the genitalia therefore the lateral profile of the phallotheca is not drawn, not comparable to our new species. *H. tagra* has resemblance to *H. busiris*, but differs by the strongly upward directed dorsoapical setose lobe as well as in the fine structure of the phallic head: (1) the pair of dorsolateral endothecal processes just before the phallotremal sclerites short membranous and tipped with a single curving very short spine, not with long strong spine; (2) the pair of lateral membranous endothecal processes distad of the phallotremal sclerites tipped with three slender black spines, not without any black spines.

Schmid (1965) has identified Chinese specimens collected from Sichuan, Shaanxi, Guangxi and Hunan provinces under the name *H. penicillata* with declared uncertainty of their identity, emphasizing real need for a future revision. He has drawn the lateral shape of the complex of segment X together with the ventroapical setose lobe from specimens collected in the four provinces; these drawings indicate significant shape divergences between the populations in the four provinces. It seems that *Hydropsyche penicillata* Martynov is a rather diverse species complex comprised of an unknown number of sibling incipient species differs by the speciation trait of the phallic organ. Schmid has recorded more shape stability in the structure of the phallic organ and drawn the lateral phallic profile only from a Sichuan population; his drawing of the lateral profile of the phallotheca from a population of Sichuan Province is markedly different from that of *H. tagra* sp. nov.

At our present knowledge the species identified by Schmid as *H. penicillata* from Sichuan, Shaanxi, Guangxi and Hunan provinces is not *H. penicillata* described from Sichuan by Martynov

according at least to the parallel-sided harpago. Schmid complete drawings prepared from Sichuan population has an obtuse-angle between the basal and apical section of the phallotheca. *H. tagra* sp. nov. has clearly right-angled meeting and its harpago is not tapering like at *H. penicillata* Martynov neither in lateral, dorsal or in ventral view.

Description. Light brown species, forewing unicoloured, without pattern, forewing length 10 mm.

Male genitalia. Abdominal segment IX fused annular, short; its median keel broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and double longer dorsum; apical lobe on posterolateral margin robust rounded triangular, comprising the bulk of the segment; intersegmental depression between the ninth and tenth segments deep obtuse angled in lateral view. Body of segment X broad rounded and short; lateral setose area (cerci) in mesal position below the setaless concavity; apicoventral setose lobe moved dorsad, shorter than the body of segment X, broad-based with downward directed apical half with tapering apex; dorsoapical setose lobe shifted back to basal region forming a fused pair of rounded upward produced large setose hump in lateral view; the unsetose cavity on the anterolateral area of the segment deep. The basal segment of the gonopods short robust and slightly sinuous dorsad, terminal segment, the harpago parallel-sided both in lateral and ventral view. Phallic apparatus double sinuate, phallobase much higher than the apical horizontal shaft; phallotremal sclerites heavily pigmented pair of exposed reniform structure; at these sclerites the tube narrowing, constricted in the ventrum and followed by the truncate apex; the pair of dorsolateral endothecal processes just before the phallotremal sclerites short membranous tipped with a single curving very short spine; the pair of lateral membranous endothecal processes distad of the phallotremal sclerites tipped with three slender spines.

Etymology. *tagra* from "tágra" widened in Hungarian, refers to the very wide gap present between the dorsal keel of segment IX and the dorsoapical setose lobe.

***Hydropsyche serpentina* species cluster**

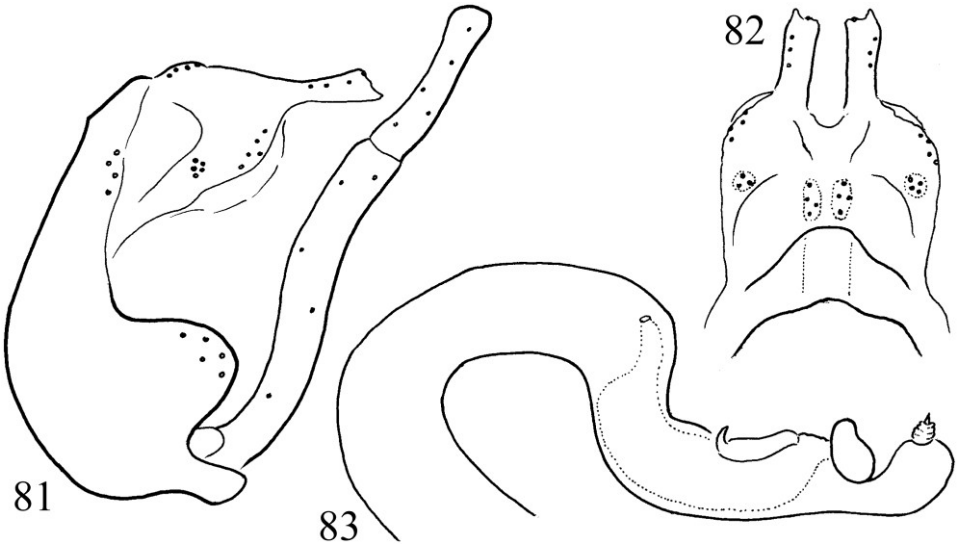
***Hydropsyche laposhat* sp. nov.**

(Figures 81–83)

Material examined. Holotype: China, Shaanxi, Yang County, Huanyang Town, Wangjiagou, N33°19'33"68E107°57'21"43, 453.2m, light trap, 11.V.2017, Liu Haoyu (1 male, CAU).

Diagnosis. This new species belongs to the *Hydropsyche serpentina* clade of the *H. newae* species group. The profile of the phallic apparatus in this clade is modified into a ring-shaped basal section of the phallotheca, forming double sinuate bends. The ring-shaped bend continues into the horizontal terminal section with a right angle, at least on the dorsum. The length of the bend is almost double of the horizontal terminal segment. This new species is a sibling of *H. homunculus* Schmid, 1965 described from China (Zhejiang), but differs by the lateral profile of the phallotheca, that is the speciation trait, having the dorsum of the basal ring flat, not produced upward like at *H. homunculus*. The pair of dorsolateral process before the phallotremal sclerites short, not long.

Description. *Male genitalia*. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and short but double longer dorsum; apical lobe on posterolateral margin robust semicircular, comprising the bulk of the segment; intersegmental depression between the ninth and tenth segments small triangular in lateral view. Body of segment X broad rounded and short; lateral setose area (cerci) in deep ventral position; apicoventral setose lobe moved dorsad, shorter than the body of segment X; dorsoapical setose lobe shifted back to basal region forming a fused pair of elongated setose area; the unsetose cavity on the anterolateral area of the segment very deep. The basal segment of the gonopods short robust and slightly sinuous, terminal long with slightly



Figures 81–83. *Hydropsyche laposhat* sp. nov. Holotype. 81 = male genitalia in left lateral view, 82 = male genitalia in dorsal view, 83 = phallic organ in left lateral view.

dilated apex. Phallic apparatus double sinuate, forming a long tube of the same diameter along its whole length, up to the heavily pigmented pair of exposed reniform phallotremal sclerites; at these sclerites the tube narrowing, strongly constricted in ventral view and followed by the sclerotized ventral phallothecal lobe with two windows for membranous protuberances tipped with fine spine; the pair of dorsolateral processes just before the phallotremal sclerites is sclerotized, not membranous tipped with a single curving spine.

Etymology. *laposhat* from "lapos hát" flat dorsum in Hungarian, refers to the dorsal profile of the basal ring of the phallotheca compared to the upward produced hump-shaped profile of his sibling.

***Hydropsyche picibunk* sp. nov.**

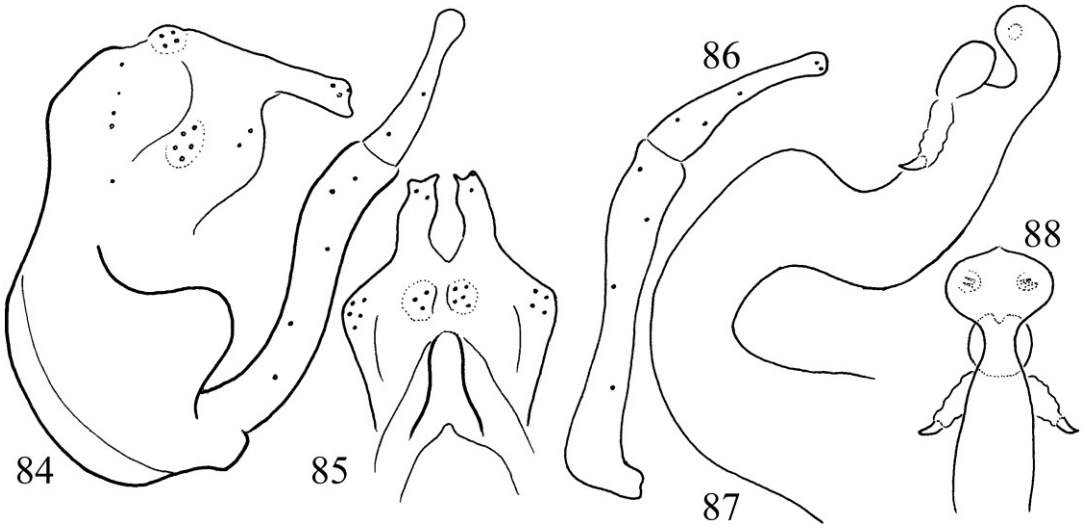
(Figures 84–88)

Material examined. Holotype: China, Shaanxi Province, Hanzhong city, Foping county, Qinling Mts. bank of Ziwu River in Foping old town, 890 m, N33°31.366', E107°59.012' 19.IV.2018(/1), leg. W. H. Li, R. R. Mo & D. Murányi (1 male, OPC).

Diagnosis. This new species belongs to the *Hydropsyche serpentina* clade of the *H. newae* species group. The profile of the phallic apparatus in this clade is modified into a ring-shaped basal section of the phallotheca, forming double sinuate bends. The ring-shaped bend continues into the horizontal terminal section with a right angle, at least on the dorsum. The length of the bend is almost double of the horizontal terminal segment. This new species is most close to *H. boreas* described from Thailand, but differs by having capitate tip of harpago and the head of the phallotheca upward directed in lateral view and transversally widened in ventral view; pair of phallotremal sclerites differently shaped both in lateral and ventral view; moreover there is no any sclerotized structures developed below the phallotremal sclerites.

Description. Yellowish light brown species, forewing unicoloured, without pattern, forewing length 11 mm.

Male genitalia. Abdominal segment IX fused annular, short; its median keel narrow elongated in dorsal view with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and double longer dorsum; apical lobe on



Figures 84–88. *Hydropsyche picibunk* sp. nov. Holotype. 84 = male genitalia in left lateral view, 85 = male genitalia in dorsal view, 86 = left gonopod in ventral view, 87 = phallic organ in left lateral view, 88 = phallic organ in ventral view.

posterolateral margin robust semicircular, comprising the bulk of the segment; intersegmental depression between the ninth and tenth segments disappeared in lateral view. Body of segment X broad rounded and short; lateral setose area (cerci) in mesal position; apicoventral setose lobe moved dorsad, shorter than the body of segment X; dorsoapical setose lobe shifted back to basal region forming a fused pair of rounded setose area; the unsetose cavity on the anterolateral area of the segment very deep. The basal segment of the gonopods short robust and slightly sinuous, terminal segment, the harpago long with capitate apex. Phallic apparatus double sinuate, forming a long tube of the same diameter along its whole length, up to the heavily pigmented pair of exposed reniform phallotremal sclerites; at these sclerites the tube narrowing, strongly constricted in ventral view and followed by the upward turning short and robust apex of the phallotheca having flattened circular shape in ventral view; the pair of dorsolateral processes just before the phallotremal sclerites membranous tipped with a single curving spine.

Etymology. *picibunk* from "pici bunkós" small capitate in Hungarian, refers to very tip of the harpago with small, but distinct capitate apex.

Hydropsyche formosana species group

Hydropsyche formosana Ulmer, 1911

Material examined. China, Taiwan, Nantuo, Lienhauchih Research Centre, 5.VI.20132, leg. Li Wenliang (1 male, DPP-HIST).

Remarks. The nominate species of the *H. formosana* species group (Oláh & Johanson 2008).

Hydropsyche orectis Mey, 1999

Material examined. China, Tibet, Muotuo, 1100m, 26.VII.2012, leg. Li Wenliang (12 males, DPP-HIST, 19 males, OPC).

Remarks. It belongs to the *H. formosana* species group (Oláh & Johanson 2008)

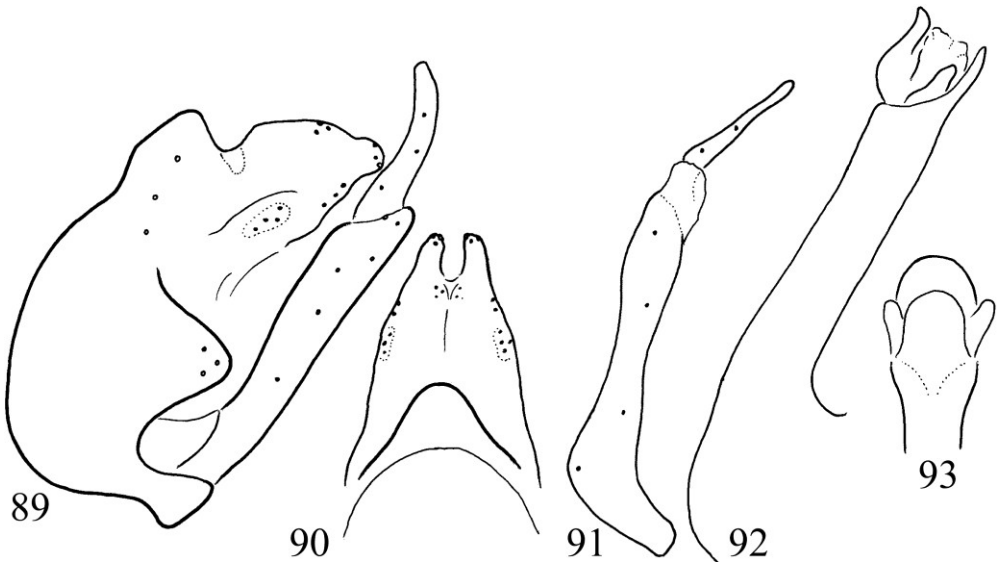
Hydropsyche pluvialis species group

Hydropsyche pluvialis species cluster

Hydropsyche lelapa sp. nov.

(Figures 89–93)

Material examined. Holotype: China, Sichuan, Tangjia He Nature Reserve, 1700 m, leg. J. Oláh jr., 10–11.VI.2001 (1 male, OPC).



Figures 89–93. *Hydropsyche lelapa* sp. nov. Holotype. 89 = male genitalia in left lateral view, 90 = male genitalia in dorsal view, 91 = left gonopod in ventral view, 92 = phallic organ in left lateral view, 93 = phallic organ in ventral view.

Diagnosis. This new species belongs to the *Hydropsyche pluvialis* species cluster of the *H. pluvialis* species group. It is most close to *H. camael* described from China (Sichuan), but differs by having flat and fused elongated dorsoapical setose lobes setosed only on very posterad, not hump-like, bipartite and not setosed anterad; ventroapical setose lobes short and blunt, not pointed in dorsal view; harpago slender narrow, not broad in ventral view; endothecal sclerites longer and markedly produced laterad; the phallotremal sclerites fused rounded, not bipartite.

Description. A medium sized species with forewing length of 12 mm. Body and wing colour brown, forewing uniform, without any pattern.

Male genitalia. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and little longer dorsum; apical lobe on posterolateral margin robust rounded subtriangular; intersegmental depression between the ninth and tenth segments deep, right-angled in lateral view. The complex body of segment X rounded and elongated; lateral setose area (cerci) in deep ventral position; apicoventral setose short with setose head; dorsoapical setose hump on segment X less produced, elongated, flat surface in lateral view; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod straight; the terminal segments narrow slender especially in ventral view. Phallic apparatus having very low phallobase, the horizontal shaft of the phallotheca regular tube; pair of endothecal sclerite discernible laterad as short, blunt sclerotized structure, produced obliquely laterad; trough-like phallotremal sclerites with fused ventrum and rimmed laterally.

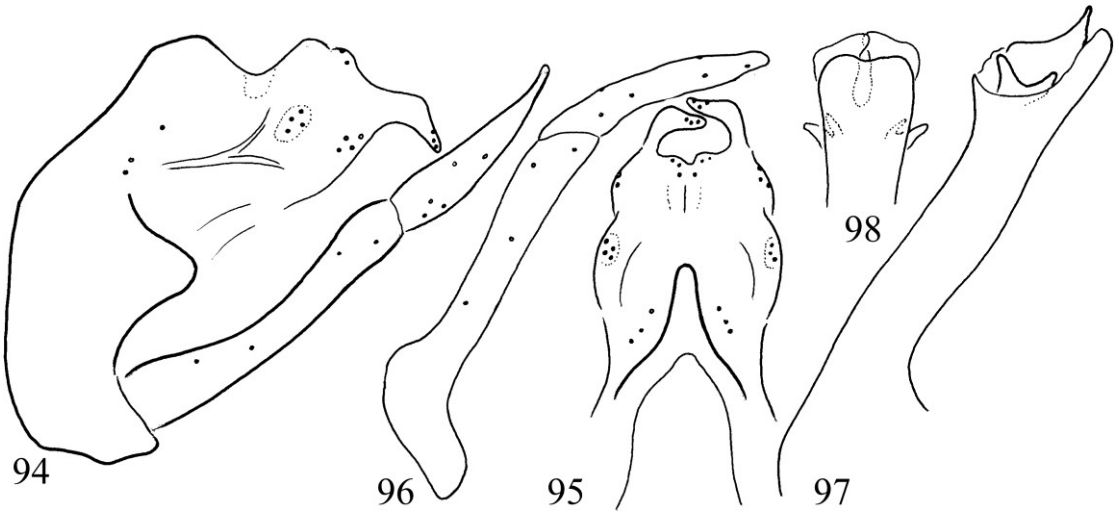
Etymology. *lelapa* euphemic coining from "lelapult, lelapított" flattened in Hungarian, refers to the rather flat and elongated dorsoapical setose lobes on segment X.

***Hydropsyche nulanka* sp. nov.**

(Figures 94–98)

Material examined. Holotype: China, Henan Province, Song County, Mt. Funiu, Muzhaling, 19.VIII.2012 (1 male, CAU). Paratype: China, Gansu, Wen County, Bikou, Yaochangping, 845 m, 30.VII.2011 (1 male, DPP-HIST).

Diagnosis. This new species, having the apicodorsal setose process located far from the



Figures 94–98. *Hydropsyche nulanka* sp. nov. Holotype. 94 = male genitalia in left lateral view, 95 = male genitalia in dorsal view, 96 = left gonopod in ventral view, 97 = phallic organ in left lateral view, 98 = phallic organ in ventral view.

median keel of segment IX, belongs to the *Hydropsyche pluvialis* species clade of the *H. pluvialis* species group. It differs from all the described species by having harpago elongated as well as the pair of ventroapical setose lobe much elongated and its apical half downward directed. This structural development organised by modular genetic complex irregularly appears in other *Hydropsyche* species groups and clades as a result of holonic chimerism.

The new species resembles *H. grahami* Banks, 1940 but the shape of both of its dorsoapical and ventroapical setose lobes differs as well as the harpago is longer. Malicky and Chantaramongkol (2000) have drawn a specimen from Zhejiang Province under the name of *H. grahami*, but this drawn species has short and tapering harpago both in lateral and ventral view. *H. grahami* was characterized in the original species description with fairly long harpago that is not tapering, but the tip is forked in ventral view. Based upon their drawing of Zhejiang specimen they have extended the taxonomic status of *H. grahami* also to specimens from Sichuan and Henan provinces. The taxonomic status of *H. grahami* was extended with synonymy by Tian *et al.* (1996) to *H. hoenei* Schmid, 1959, a species with rather unique phallic organ described from China (Yunnan province). These taxonomic acts of lumpers are not based on comparative examination of type specimens, are not based on fine phenomics of speciation traits, and are not searching and concentrating on differences. Rather, lumpers are looking for similarities and highly underestimate biodiversity and neglect the most sensitive incipient species, the most efficient and effective local agents finely specialized to function as basic autonomous components in the energy flow and mineral cycling of local ecosystems (Oláh *et al.* 2019). It is very probable that *Hydropsyche grahami* is a rather large species complex characterized by the elongated ventroapical setose lobes of the complex of segment X. *Hydropsyche nulanka* sp. nov. belongs to this complex.

Description. A medium sized species with forewing length of 10 mm. Body and wing colour yellowish light brown, forewing uniform, without any pattern.

Male genitalia. Abdominal segment IX fused annular, short; its median keel short and narrowing with granulose dorsal surface; anterior margin arciform, resulted in a very short ventrum and little longer dorsum; apical lobe on posterolateral margin rounded subtriangular; intersegmental depression between the ninth and tenth segments shallow, obtuse angled in lateral view. The complex body of segment X broad rounded and long; lateral setose area (cerci) in middle po-

sition; apicoventral setose lobe elongated break down middle with narrowing head; dorsoapical setose hump on segment X produced elongated; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod slightly sinuous dorsad, without dilated apex; the extremely elongated terminal segments tapering in lateral and broad in ventral view. Phallic apparatus having low phallobase, the horizontal shaft of the phallotheca almost parallel-sided tube; pair of bilobed endothecal sclerite discernible laterad as strongly sclerotized structure; a pair of horizontally enlarged plate-like phallotremal sclerites discernible free, not fused and not forming a trough-like structure.

Etymology. *nulanka* from "nyúlánk" slender elongated in Hungarian, refers to the elongated ventroapical setose lobes, to the uniquely elongated harpago.

Hydropsyche rhomboana species cluster

Hydropsyche kispupos sp. nov.

(Figures 99–102)

Material examined. Holotype: China, Shaanxi, Qinling, Zhou Zhi, Houzhenzi, 1278 m, 16.VIII. 2014, leg. Lu Xiumei (1 male, CAU). *Paratype*: China, Shaanxi, Zhouzhi, Qinling, Laoxiancheng, 2057 m, 19.VIII.2014, leg. Li Xuankun (1 male, DPP-HIST).

Diagnosis. This new species belongs to the *Hydropsyche rhomboana* species cluster of the *H. pluvialis* species group. It is most close to *H. rhomboana* and *H. nepalarawa*, but differs by the following character combination: (1) dark brown forewing without any pattern; (2) broad, slightly bilobed dorsal keel on tergite IX; (3) deep intersegmental depression between segments IX and X; (4) high and long dorsoapical setose hump; (5) parallel-sided harpago in ventral view; (6) shape of the trough-like phallotremal sclerites with fused ventrum and rimmed laterally.

Description. A medium sized species with forewing length of 12 mm. Body and wing colour dark brown, forewing uniform, without any pattern.

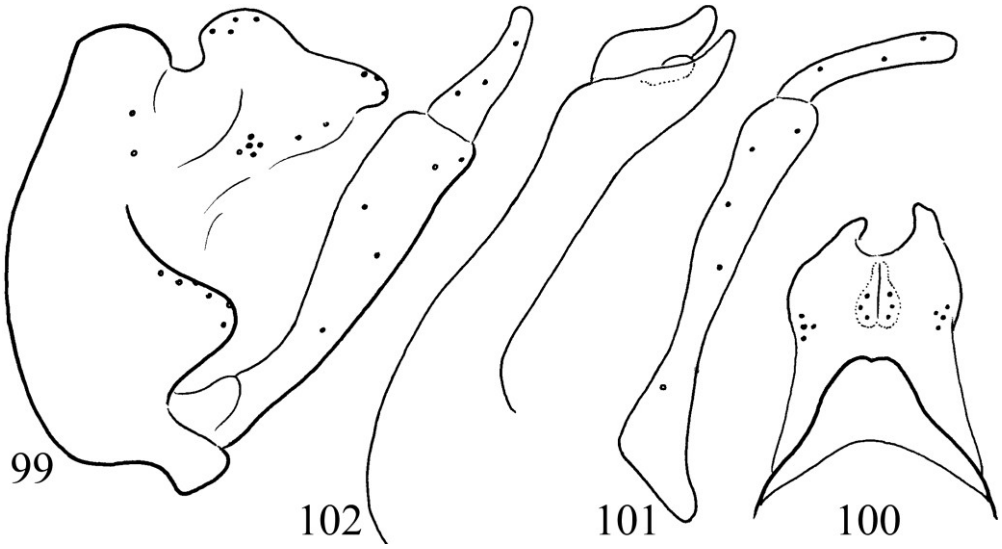
Male genitalia. Abdominal segment IX fused annular, short; its median keel short and broad with granulose dorsal surface, slightly bilobed; anterior margin arciform, resulted in a very short ventrum and little longer dorsum; apical lobe on posterolateral margin robust rounded subtriangular; intersegmental depression between the ninth and tenth segments shallow, right-angled in lateral view. The complex body of segment X broad rounded and long; lateral setose area (cerci) in deep ventroapical position; apicoventral setose lobe break down middle with patterned head; dorsoapical setose hump on segment X less produced accompanied with a less distinct pair of hump basolaterad; the unsetose cavity on the anterolateral area of the segment discernible. The basal segment of the gonopod slightly sinuous dorsad, with dilated apical half; the terminal segments narrow in lateral, broad in ventral view. Phallic apparatus having very high phallobase, the horizontal shaft of the phallotheca broad bellied tube; pair of endothecal sclerite discernible laterad as short, blunt sclerotized structure; trough-like phallotremal sclerites with fused ventrum and rimmed laterally.

Etymology. *kispupos* from "kis púpos" small hump in Hungarian, refers to the high and long rounded dorsoapical setose area, lobe or crest on segment X, distad of transversal suture absent on *Cheumatopsyche*, but present frequently on *Hydropsyche* as a setose winglet, paired or fused setose dorsal crest. This may represent the doubled epiproct of segment XI.

Hydropsyche rhomboana Martynov, 1909

Material examined. China, Tibet, Muotuo, 80K 1000m, 24.VII.2012, leg. Li Wenliang (1 male, DPP-HIST; 1 male, OPC). China, Yunnan Province, Gongshan, Dulongjiangi, 1542 m, 1.VII.2013, leg. Zhang Wei (1 male, DPP-HIST; 1 male, OPC).

Remarks. It belongs to and the nominate species of the *Hydropsyche rhomboana* species cluster of the *Hydropsyche pluvialis* species group (Oláh & Johanson 2008).



Figures 99–102. *Hydropsyche kispupos* sp. nov. Holotype. 99 = male genitalia in left lateral view, 100 = male genitalia in dorsal view, 101 = left gonopod in ventral view, 102 = phallic organ in left lateral view.

Hydropsyche asiatica species group

Hydropsyche aiakos Malicky, 1997

Material examined. China, Tibet, Beibengxiang, 700 m, 30.VII.2012, leg. Li Wenliang (1 male, DPP-HIST, 2 males, OPC).

Remarks. New species record for China! A member of *Hydropsyche asiatica* specie group described from Nepal and recorded from India (Oláh & Johanson 2008).

Hydropsyche angustipennis species group

Hydropsyche pellucidula species cluster

Hydropsyche lehajla sp. nov.

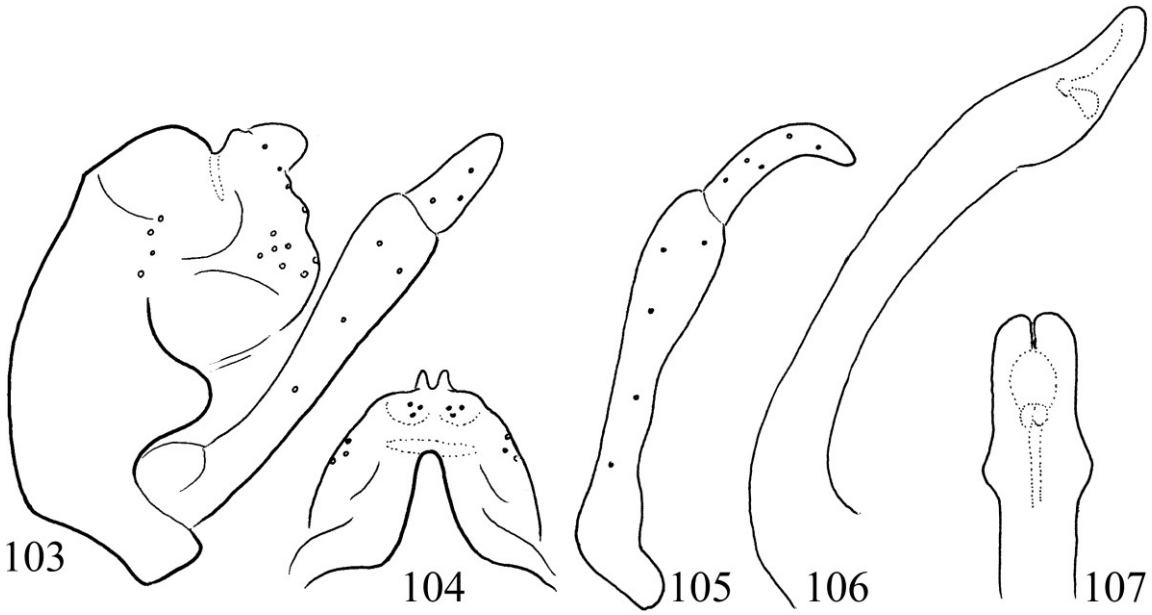
(Figures 103–107)

Material examined. Holotype: China, Inner Mongolia, Bayin, Mt Helan, Halawu, 2260 m, 12.VIII.2011 (1 male, CAU). *Paratypes*: China, Inner Mongolia, Bayin, Mt Helan, Shuimogou, 2260 m, 9.VIII.2011 (8 males, 6 probably associated females, DPP-HIST; 15 males, 3 probably associated females, OPC). China, Neimenggu, Helanshan, Halawugou, 2370 m, 4.VII.2014, leg. Shili (16 males, DPP-HIST; 2 males, OPC).

Diagnosis. Belongs to the Holarctic *Hydropsyche angustipennis* species group and to the *Hydropsyche pellucidula* species clade of Oláh & Johanson (2008). Close to *Hydropsyche pellucidula* but differs by the lateral profile of the phallic apex, more rounded, less narrowed as well as more downward directed. Moreover, there is divergence in some neutral traits that is in the development of the pair of the setaless distal winglet attached to the dorsoapical setose lobe as visible both in lateral and dorsal view; it is very much produced at the new species.

Description. Male (in alcohol). Body yellowish light brown, dorsal thoracic sclerites darker. Wings ochraceous with lighter pubescence, without pronounced pattern. Forewing length 12 mm.

Male genitalia. Segment IX fused annular and short; its median keel narrowing apicad with granulose dorsal surface, this narrow keel representing the entire dorsum of segment IX shifted posterad; apical lobe on posterolateral margin rounded triangular. Intersegmental profile be-



Figures 103–107. *Hydropsyche lehajla* sp. nov. Holotype. 103 = male genitalia in left lateral view, 104 = male genitalia in dorsal view, 105 = left gonopod in ventral view, 106 = phallic organ in left lateral view, 107 = phallic organ in ventral view.

tween the ninth and tenth segments deep, acutely angled. Segment X short, with produced setaless winglets in lateral view and semicircular in dorsal view; lateral setose area, the cerci circular and located in apical position; very short and rounded ventroapical and dorsoapical setose lobes forming the apicomarginal profile of segment X in lateral view. The coxopodit of the gonopod as long as the apex of segment X, harpago parallel-sided and mesad curving in ventral view. Phallic organ with downward bending apex and rounded tip in lateral view; the phallic head parallel-sided in ventral view apicad of the subapical lateral projection.

Etymology. *lehajla*, from "lahajló", bent downward in Hungarian, refers to the phallic head with a pronounced downward bending shape in lateral view.

Cheumatopsyche genus

Cheumatopsyche lepida species group

Cheumatopsyche acantha Sun, Yang & Morse, 2011

Material examined. China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, light trap above the confluence of Pinglong River and Minan River, N21°51.929' E107°50.675', 315 m, 28.III.2015 (/21), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (37 males, DPP-HIST; 53 male, OPC).

Cheumatopsyche chihonana Kobayashi, 1987

Material examined. China, Taiwan, Taoyuan, Fuxing, 10.VI.2013, leg. Li Wenliand (1 male, DPP-HIST; 1 male, OPC).

Cheumatopsyche infascia species complex

This species complex in the *Cheumatopsyche lepida* species group is characterized by the straight dorsal profile of the apicoventral setose lobes and by the small dorsoapical interlobular gap on the complex of segment X. The common, abundant and "widely distributed and highly varying" nominal species of *Cheumatopsyche infascia* exhibits real difficulties to delineate exactly form its incipient sibling species. In alcohol the faintly spotted forewing is not discernible. The pair of setose apicoventral lobes, this sensitive structure in the reproductive isola-

tion of copulatory processes, is particularly liable to significant shape modification either by artefact produced during preparatory treatments or by deformations created during biological functioning of reproductive mechanisms. The dorsal interlobular gap is flexible and reduced easily by the movable setose lobes and the lobes themselves change their shape by transversal and sagittal movements. Here we have described nine new species distinguished mostly by the fine structure of the bilobed apex of segment X that is by the shape divergences in the formation of the apicoventral setose lobes: *C. bujkala* sp. nov. *C. domborula* sp. nov., *C. forrta* sp. nov., *C. kiugra* sp. n., *C. lepa* sp. nov., *C. magaska* sp. nov., *C. perem* sp. nov., *C. rovides* sp. nov., *C. sikoska* sp. nov. We have redrawn the nominate species *C. infascia* Martynov, 1934 recorded from China for the first time.

Based upon this limited survey it seems that this is an extremely diverse species complex of recent divergences and probably represented by large number of unknown incipient sibling species. In the present depressed state of taxonomy there is no real potential to discover and to describe its biodiversity. Widespread population sampling and studies on the fine phenomics of the most important speciation traits on segment X combined with the latero-perpendicular and ventro-perpendicular profile of the harpago would be required to understand the contemporary divergences of this environmentally sensitive taxa.

***Cheumatopsyche bujkala* sp. nov**.

(Figures 108–111)

Material examined. Holotype: China, Fujian Province, Wuyishan, Sangang, 740 m, 9.V.2004, leg. Liu Xingyue (1 male, CAU).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). It has resemblance to *C. magaska* sp. nov. but differs by differently shaped phallotheca, larger sclerotized endothecal process and by having the ventroapical setose lobes with rounded apical margin, not truncated as well as the harpago clearly broad based both in lateral and ventral view and narrowing abruptly from the middle.

Description. A uniformly brown coloured species without any discernible spotting; forewing length 6 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but double longer ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments deep and step-wise in lateral view. Body of segment X low in lateral view, somehow elongated; lateral setose area (cerci) in subapical middle position; apicoventral setose lobes mesad turned, adhering each other and to the apicomesal setaless lobe; smooth apicomesal lobe less produced small semicircular in dorsal view. The basal segment of the gonopods straight dilated slightly apicad; harpago, the terminals segment broad based and tapering abruptly from middle both in lateral and ventral view. Phallic apparatus with broad phallobase, phallothecal shaft narrowing, endothecal processes large ovoid, almost double higher than the constricted phallothecal tube.

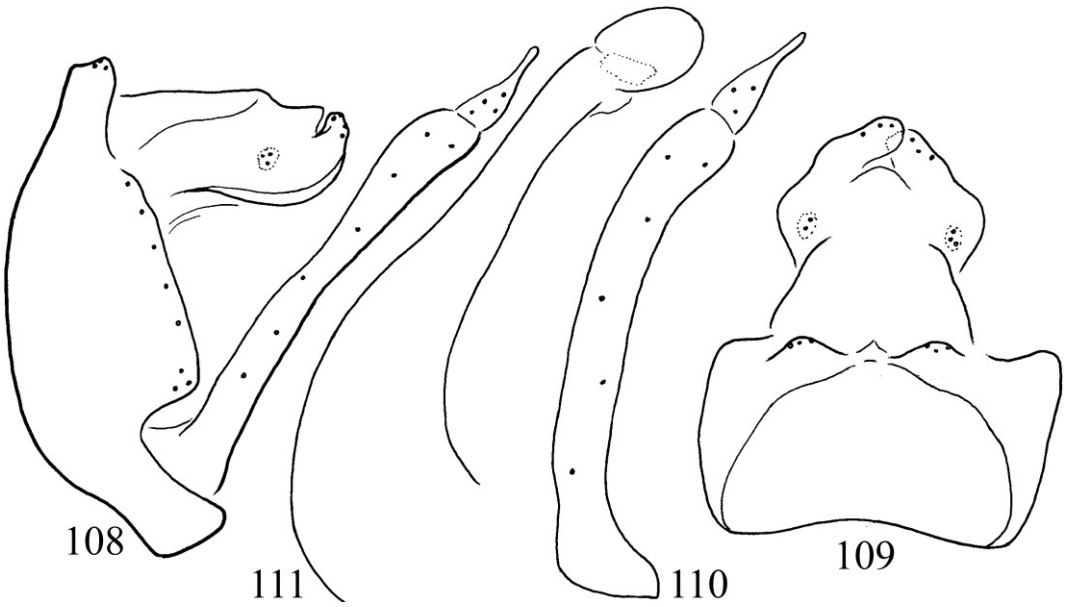
Etymology. *bujkala* from “bújkáló” in Hungarian, refers to the ventroapical setose lobes on segment X having attached tightly to each other and to the setaless smooth mesocaudal lobe.

***Cheumatopsyche domborula* sp. nov**.

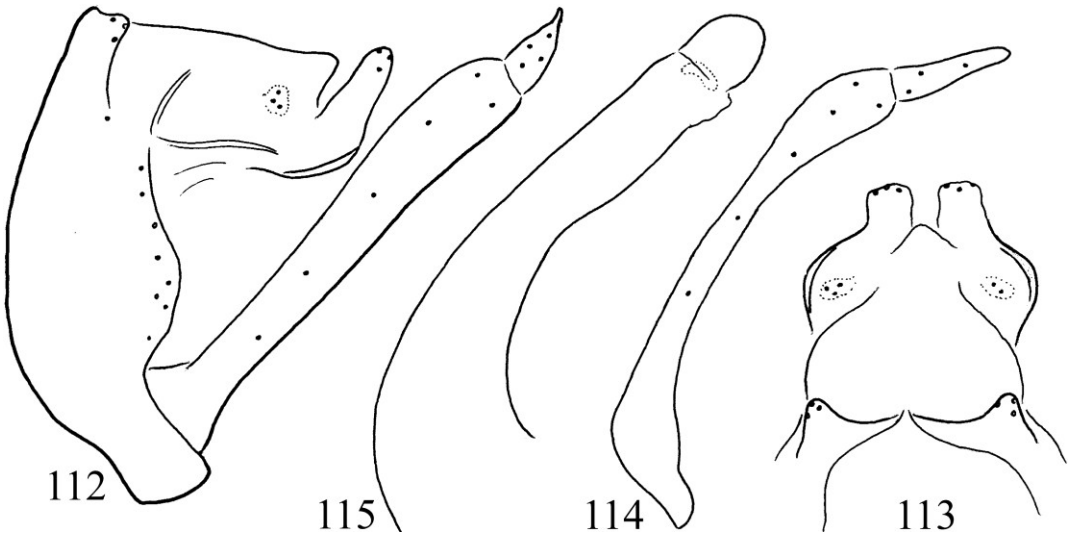
(Figures 112–115)

Material examined. Holotype: China, Yunnan Province, Zhaotong, Erxicun, 25.IV.2014, leg. Lu Xiumei (1 male, CAU).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group



Figures 108–111. *Cheumatopsyche bujkala* sp. nov. Holotype. 108 = male genitalia in left lateral view, 109 = male genitalia in dorsal view, 110 = left gonopod in ventral view, 111 = phallic organ in left lateral view.



Figures 112–115. *Cheumatopsyche domborula* sp. nov. Holotype. 112 = male genitalia in left lateral view, 113 = male genitalia in dorsal view, 114 = left gonopod in ventral view, 115 = phallic organ in left lateral view.

(Oláh *et al.* 2008). According to the enforced horizontal suture present on the lateral edges of segment X this uniform brown species is most close to *C. kiugra* sp. nov. and *C. perem* sp. nov., but differ by having the heavily sclerotized enforcement of different pattern; moreover the apical ending, the head of the ventroapical setose lobes differs, as well as the latero-perpendicular profile of cerci broad slandering digitiform at the very tip; papering apruptly from the middle at *C. perem* sp. nov. and tapering gradually from the base at *C. kiugra* sp. nov.

Description. A uniformly brown coloured small species (in alcohol) without any discernible light spots on forewing, forewing length 6 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and little longer ventrum; apical margin is almost straight vertical, marked with a row of strong spines; intersegmental depression between the ninth and tenth segments very shallow in lateral view. Body of segment X longer than high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with truncate apex; smooth apicomesal lobe small and triangular in dorsal view. The basal segment of the gonopods with regular straight ventrum and dorsum, slightly dilated apicad; harpago, the terminals segment broad up to subapicad with slender digitiform tip. Phallic apparatus arching horizontal, endothecal processes rounded.

Etymology. *domborula* from "domboruló" bulging in Hungarian, refers to the heavily sclerotized laterad protruded and rounded ending of the heavily sclerotized horizontal suture on the lateral edges of the ventrum of segment X.

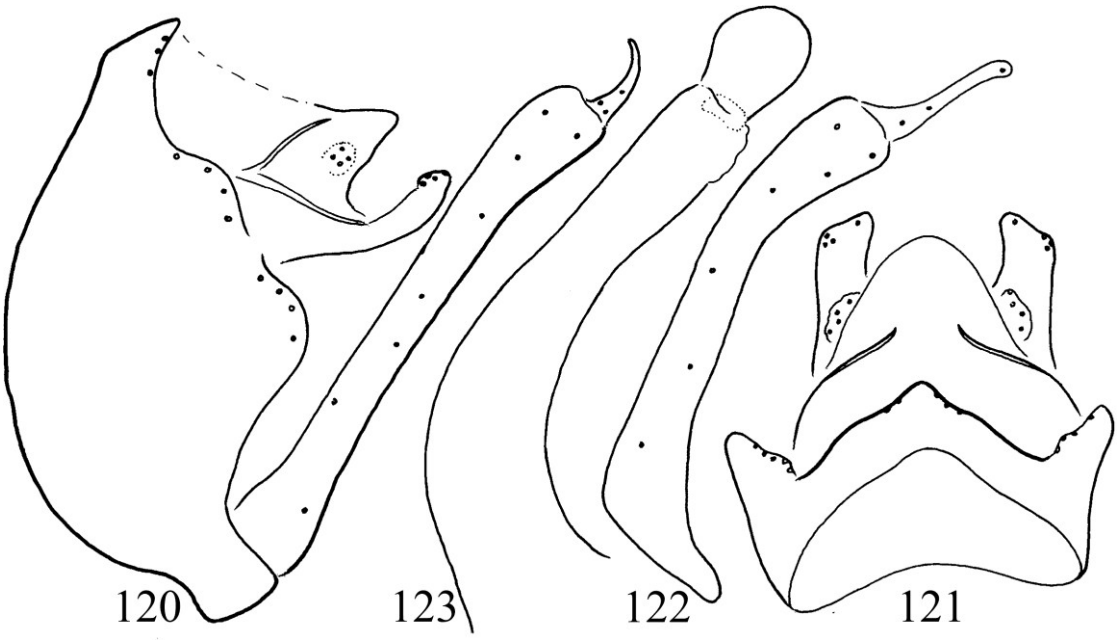
***Cheumatopsyche forrta* sp. nov**.

(Figures 116–119)

Material examined. Holotype: China, Yunnan Province, Gongshan, Dulongjiang, 1542 m, 1.VII. 2013, leg. Zhang Wei (1 male, CAU). *Paratype*: same as Holotype (1 male, OPC).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). A unique species in the complex having the pair of dorsocaudal spiny lobes fused forming together a single mesal dorsocaudal spiny pointed triangular structure. This fused structure occurs in several species of the *C. concava* species group indicating the chimeric nature of taxa.

Description. A uniformly brown coloured small species (in alcohol) without any discernible light spots on forewing, forewing length 6 mm.



Figures 116–119. *Cheumatopsyche forrta* sp. nov. Holotype. 116 = male genitalia in left lateral view, 117 = male genitalia in dorsal view, 118 = left gonopod in ventral view, 119 = phallic organ in left lateral view.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and little longer ventrum; apical margin double convex, marked with a row of strong spines; the pair of dorsocaudal spiny lobes fused and moved mesad; intersegmental depression between the ninth and tenth segments very shallow in lateral view. Body of segment X longer than high; its basal half is less pigmented; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with truncate and mesad turning apex; smooth apicomesal lobe highly produced and rounded in dorsal view. The basal segment of the gonopods with regular straight ventrum and dorsum, slightly dilated apicad; harpago, the terminals segment slender digitiform. Phallic apparatus arching horizontal, endothecal processes large and rounded.

Etymology. *forrta* from "forrt, összeforrorott, összeforrt" fused, coalescent in Hungarian, refers to the fused dorsocaudal spiny lobes located generally on the apicolateral corners of tergum IX..

Cheumatopsyche infascia Martynov, 1934

(Figures 120–123)

Material examined. China, Shaanxi Province, Hanzhong city, Foping county, Qinling Mts. bank of Ziwu River in Foping old town, 890 m, N33°31.366' E107°59.012'19.IV.2018(/1), leg. W. H. Li, R. R. Mo & D. Murányi (3 males, DPP-HIST, 2 males, OPC). China, Heibei, Xionglong, Dagoukum, 589 m, 11.VI.2014, leg. Tang Chifei (10 males, DPP-HIST, 10 males, OPC). China, Heibei, Xionglong, Dagoukum, 589m, 11.VI. 2014, leg. Ding Shuangmei (6 males, DPP-HIST, 4 males, OPC). China, Heibei, Xionglong, Dagoukum, 589 m, 11.VI.2014, leg. Li Xuankun (18 males, DPP-HIST, 10 males, OPC). China, Henan Province, Song County, Mt. Funiu, Muzhaling, 19.VIII.2012 (7 males, OPC). China, Henan Province, Xinxiang, Hui County, Guangshan, 800 m, 16.VII.2008 (1 male, DPP-HIST).

Remarks. New species record for China! *Cheumatopsyche infascia* was described from Russia (Ussuriland) with slightly spotted forewings. According to the present limited sampling it seems that this species is one of the most abundant *Cheumatopsyche* species in Shaanxi, Heibei and Henan provinces of China. The pair of apicoventral setose lobes on segment X is rounded, capitate in dorsal view, not truncate like at *C. sikoska* sp. nov. or not with a stepwise stair laterad like at *C. lepa* sp. nov. In the original description Martynov's drawings represent the dry condition of the apicoventral setose lobes, slightly deformed, especially their lateral profiles in dorsal view.

Cheumatopsyche kiugra sp. nov.

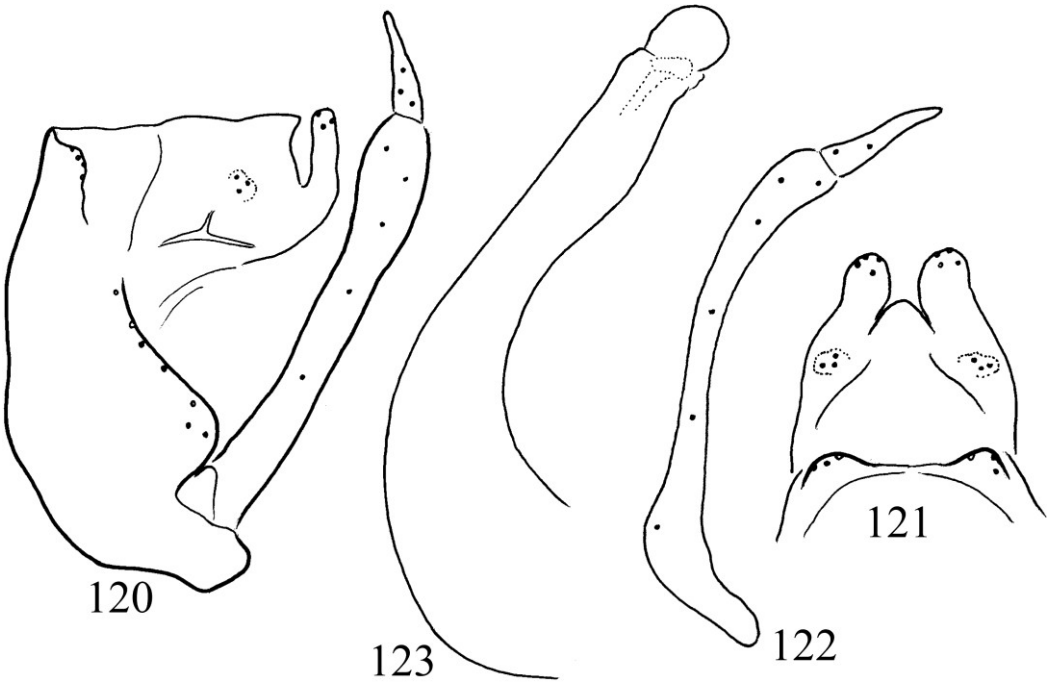
(Figures 124–127)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, light trap on Yunwu Hotel balcony above Pearl River, N21°54.316', E107°54.203', 295 m, 26–29.III. 2015(/14), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC).

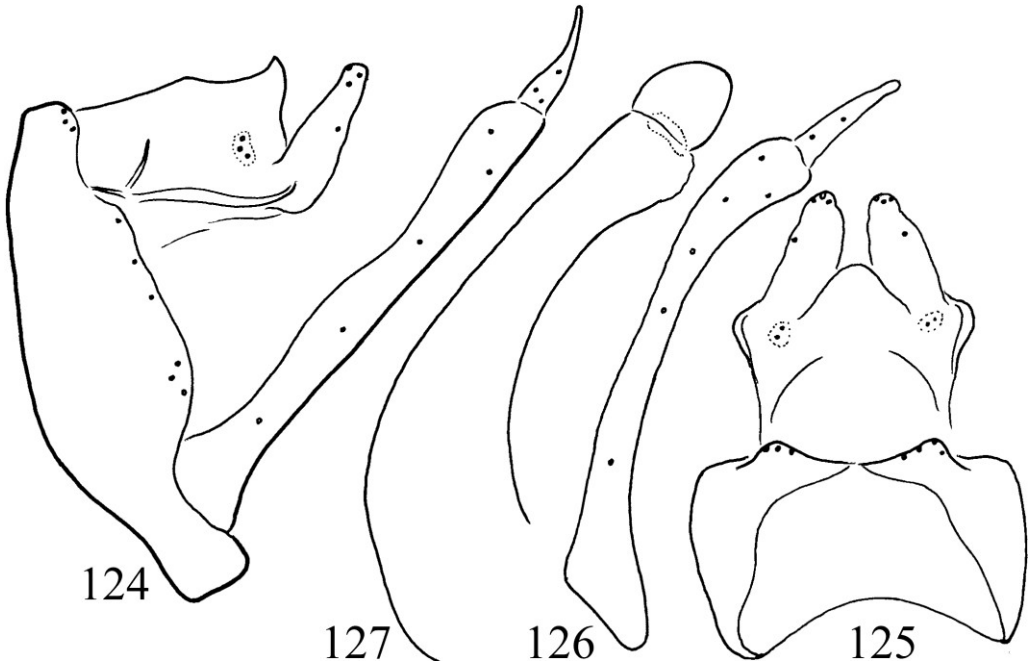
Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species is most close to *Cheumatopsyche perem*, but differ by having tapering, not blunt apex of the ventroapical setose lobes in dorsal view; by the heavily sclerotized laterad protruded ending of the sclerotized horizontal suture on the lateral edges of the ventrum of segment X; by the differently shaped harpago, more slender and gradually tapering in lateral view; by the longer endothecal sclerite.

Description. A uniformly brown coloured small species (in alcohol) without any discernible light spots on forewing, forewing length 6 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and little longer ventrum; apical margin is straight vertical, marked with a



Figures 120–123. *Cheumatopsyche infascia* Martynov, 1934. 120 = male genitalia in left lateral view, 121 = male genitalia in dorsal view, 122 = left gonopod in ventral view, 123 = phallic organ in left lateral view.



Figures 124–127. *Cheumatopsyche kiugra* sp. nov. Holotype. 124 = male genitalia in left lateral view, 125 = male genitalia in dorsal view, 126 = left gonopod in ventral view, 127 = phallic organ in left lateral view.

row of strong spines; intersegmental depression between the ninth and tenth segments shallow in lateral view. Body of segment X longer than high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with tapering apex; smooth apicomesal lobe produced triangular in dorsal view, slightly upward turning in lateral view. The basal segment of the gonopods with regular straight ventrum and with waving dorsum, dilated middle and apicad; harpago, the terminals segment broad-based with gradually narrowing in lateral and straight gradually, but less narrowing in ventral view. Phallic apparatus arching horizontal, endothecal processes rounded.

Etymology. *kiugra* from "kiugró" protrusive in Hungarian, refers to the heavily sclerotized laterad protruded ending of the heavily sclerotized horizontal suture on the lateral edges of the ventrum of segment X.

***Cheumatopsyche lepa* sp. nov**.

(Figures 128–131)

Material examined. Holotype: China, Henan, Luanchuan County, Longyuwan, 18.VIII.2012, leg. Weihai Li (1 male, CAU).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species is most close to *Cheumatopsyche sikoska* sp. nov., but differs by having the apicoventral setose pair of lobes with rounded apex, not truncate, as well as a basolateral stepwise shaped small stair-like structure present and well discernible in dorsal view.

Description. A uniformly brown coloured small species with forewing length of 7 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but double longer ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments low step-wise in lateral view. Body of segment X longer than high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with rounded apex, a basolateral stepwise structure present; smooth apicomesal lobe slightly produced, small triangular in dorsal view. The basal segment of the gonopods straight dilated slightly apicad; harpago, the terminals segment broad-based in lateral and long slender in ventral view. Phallic apparatus straight horizontal, endothecal processes rounded, not higher than the phallothecal tube.

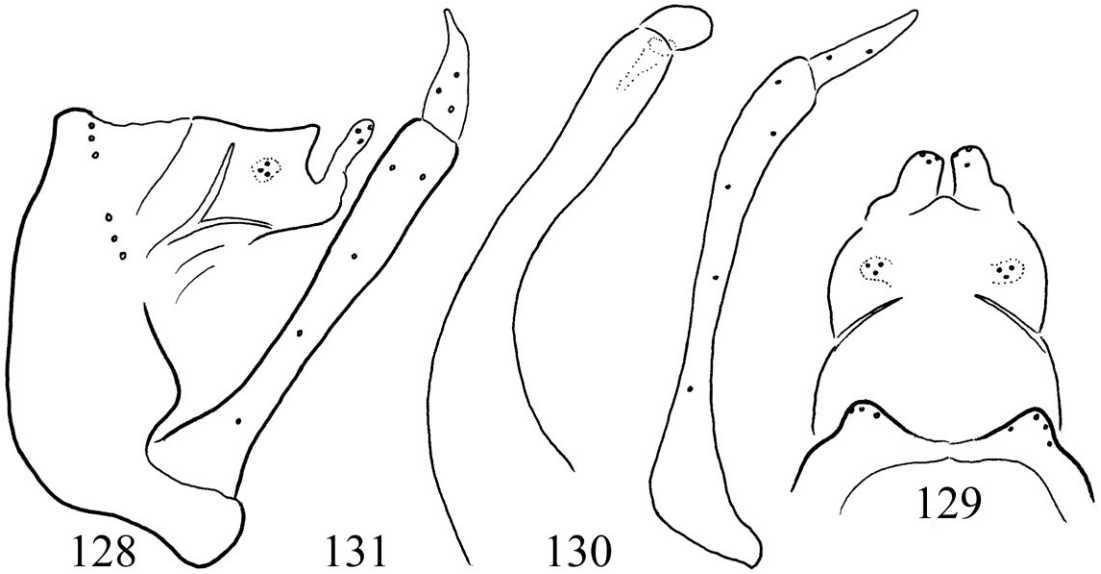
Etymology. *lepa* from "lép", "lépcső" a step, stair in Hungarian, refers to the small stepwise structure diverged basolaterad on the ventroapical setose lobes discernible in dorsal view.

***Cheumatopsyche magaska* sp. nov**.

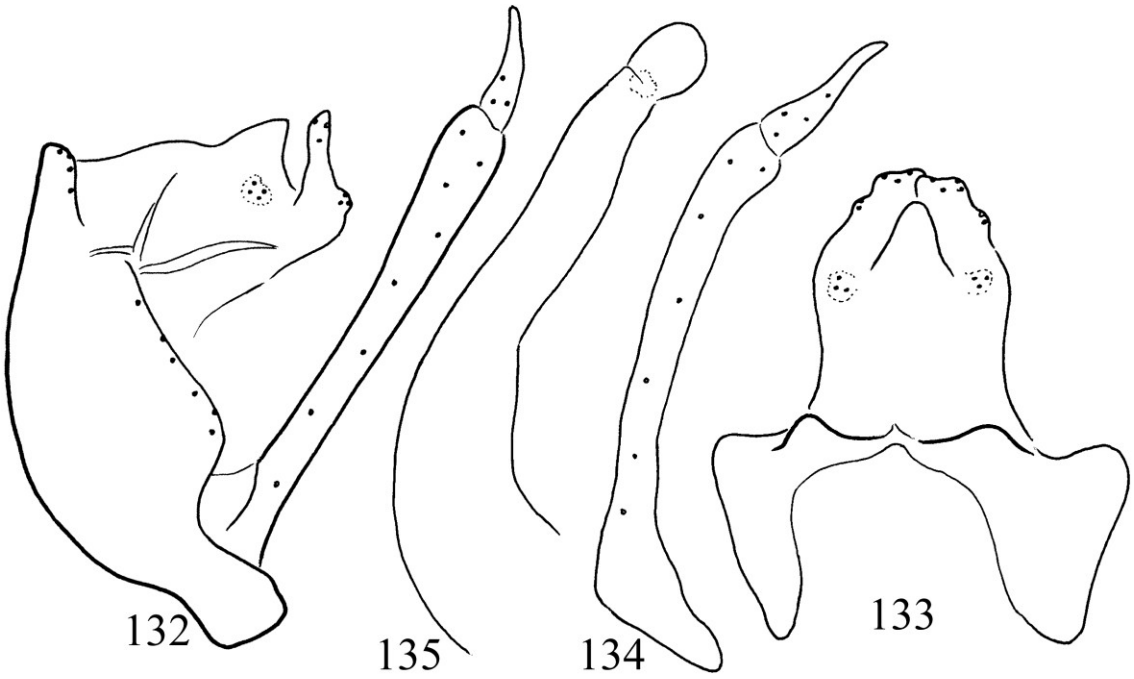
(Figures 132–135)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, Pearl River above tourist route bridge, N21°53.913' E107° 54.283', 375 m, 27.III.2015(/15), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species with fade light spotting is most close to *Cheumatopsyche lepa* sp. nov., but differs by having (1) higher segment X; (2) the apico-



Figures 128–131. *Cheumatopsyche lepa* sp. nov. Holotype. 128 = male genitalia in left lateral view, 129 = male genitalia in dorsal view, 130 = left gonopod in ventral view, 131 = phallic organ in left lateral view.



Figures 132–135. *Cheumatopsyche magaska* sp. nov. Holotype. 132 = male genitalia in left lateral view, 133 = male genitalia in dorsal view, 134 = left gonopod in ventral view, 135 = phallic organ in left lateral view.

ventral setose pair of lobes with truncate or even concave, not rounded apex, not truncate.

Description. A uniformly brown coloured species with some fade light forewing spotting; forewing length 7 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but triple longer ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments low step-wise in lateral view. Body of segment X high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with truncate or concave apex, a basolateral small lobe-like structure present; smooth apicomesal lobe produced triangular in dorsal view. The basal segment of the gonopods straight dilated slightly apicad; harpago, the terminals segment broad based gradually tapering both in lateral and ventral view; slightly S-forming in ventral view. Phallic apparatus straight horizontal with some S-shape, endothecal processes rounded, slightly higher than the tip of the phallothecal tube.

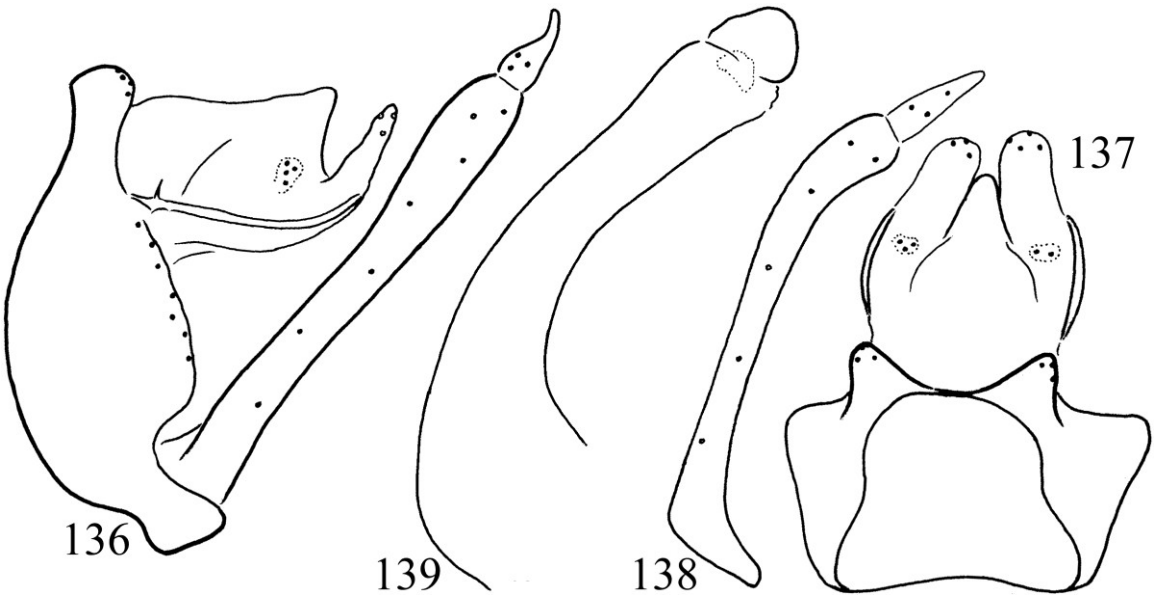
Etymology. *magaska* from "magaska" diminutive of magas in Hungarian, refers to the high segmet X compared to the segment X of his sibling *C. lepa* sp.nov.

***Cheumatopsyche perem* sp. nov**.

(Figures 136–139)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region, Shangsi County, Shiwandashan Natural Forest Park, Pearl River above tourist route bridge, N21°53.913' E107° 54.283', 375 m, 27.III.2015(/15), leg. J. Kontschán, J. N. Li, S. Li, W. H. Li, D. Murányi & G. Q. Wang (1 male, OPC).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species is most close to *Cheumatopsyche infascia*. It has no truncate ventroapical setose



Figures 136–139. *Cheumatopsyche perem* sp. nov. Holotype. 136 = male genitalia in left lateral view, 137 = male genitalia in dorsal view, 138 = left gonopod in ventral view, 139 = phallic organ in left lateral view.

lobes of *C. sikoska* sp. nov. and has no angled step of *C. lepa* sp. nov. on the lateral margin of the ventroapical lobes. It differs from *C. infascia* by having setaless mesocaudal lobe more produced in dorsal view; uniquely sclerotized and enforced horizontal suture developed on the ventrolateral margin of segment X. There are subtle divergences in the lateral and ventral shape of harpago: (1) broad-based and abruptly not gradually narrowing apicad in lateral view, and (2) straight and gradually narrowing apicad in ventral view, not slightly S-forming.

Description. A uniformly brown coloured small species (in alcohol) with some just discernible light spots on forewing, forewing length 6 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and little longer ventrum; apical margin is straight vertical, marked with a row of strong spines; intersegmental depression between the ninth and tenth segments deep stepwise in lateral view. Body of segment X longer than high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight with rounded apex; smooth apicomesal lobe produced triangular in dorsal view. The basal segment of the gonopods straight dilated slightly apicad; harpago, the terminals segment broad-based with abrupt narrowing in lateral and straight gradually narrowing in ventral view. Phallic apparatus arching horizontal, endothecal processes rounded subtriangular, slightly lower than the phallothecal tube.

Etymology. *perem* from "perem" edge in Hungarian, refers to the heavily sclerotized horizontal suture on the lateral edges of the ventrum of segment X.

***Cheumatopsyche rovides* sp. nov**.

(Figures 140–144)

Material examined. Holotype: China**,** Shaanxi, Yang County, Huayang Town, Zhoujiayu Village, N33°60′10″00 E107°47′42″82, 1362.8m, 12.V.2017 (1 male, CAU).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia* species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and harpago most close to *Cheumatopsyche trifascia* Li 1988 but differs by having abbreviated harpago with thin apical half, different lateral profile of segment X and the endothecal process on the end of the phallic organ not higher than the endothecal tube.

Description. *Male genitalia*. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but double longer ventrum; apical margin is straight vertical marked with a row of strong 5-6 spines; intersegmental depression between the ninth and tenth segments step-wise deep in lateral view. Body of segment X longer than high; lateral setose area (cerci) in middle position; apicoventral setose lobe straight in lateral and mesad turning in dorsal view; smooth mesocaudal lobe not produced, slightly bilobed. The basal segment of the gonopods straight; harpago, the terminal segment short with needle-like apical half. Phallic apparatus straight horizontal, phallotremal sclerite pronounced large, endothecal processes not higher than the phallothecal tube.

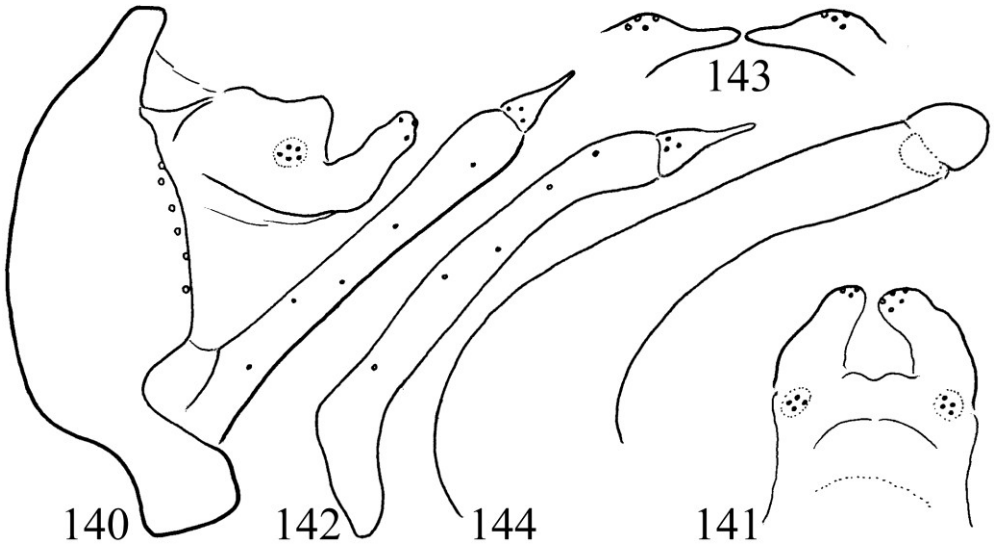
Etymology. *rovides* from "rövid", "rövides" short, shortened in Hungarian, refers to the abbreviated and pointed-from-middle harpago compared to his siblings.

***Cheumatopsyche sikoska* sp. nov**.

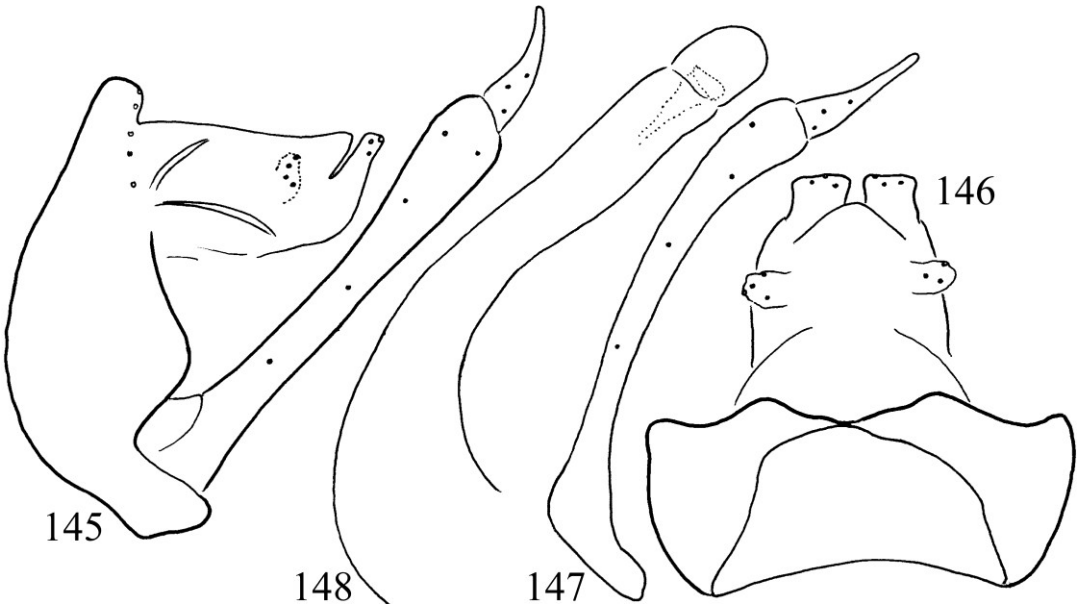
(Figures 145–148)

Material examined. Holotype: China, Heibei, Xionglong, Caojialu, 561 m, 12.VI.2014, leg. Ding Shuangmei (1 male, CAU). Paratype: same as Holotype (1 male, DPP-HIST).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche infacia*



Figures 140–144. *Cheumatopsyche rovides* sp. nov. Holotype. 140 = male genitalia in left lateral view, 141 = male genitalia in dorsal view, 142 = left gonopod in ventral view, 143 = left and right harpago in dorsal view, 144 = phallic organ in left lateral view.



Figures 145–148. *Cheumatopsyche sikoska* sp. nov. Holotype. 145 = male genitalia in left lateral view, 146 = male genitalia in dorsal view, 147 = left gonopod in ventral view, 148 = phallic organ in left lateral view.

species complex in the *C. lepida* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species is most close to *Cheumatopsyche infascia* Martynov 1934 but differs by having the apicoventral setose pair of lobes clearly truncate, straight-cut in dorsal view, not rounded and having long harpago with slender narrowing apical two thirds.

Description. A uniformly brown coloured small species with forewing length of 7 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but double longer ventrum; apical margin is straight vertical marked with a row of strong 5-6 spines; intersegmental depression between the ninth and tenth segments deep step-wise in lateral view. Body of segment X longer than high; lateral setose area (cerci) in subapical middle position; apicoventral setose lobe straight and truncate, straight-cut well discernible both in in lateral in dorsal view; smooth apicomesal lobe slightly produced, triangular in dorsal view. The basal segment of the gonopods straight dilated apicad; harpago, the terminals segment long slender with narrowing apical two-thirds. Phallic apparatus straight horizontal, phallotremal sclerite pronounced large, endothecal processes equal, not higher than the phallothecal tube.

Etymology. *sikoska* from "síkoska", a diminutive form of level, aclinic in Hungarian, refers to the levelled, straight horizontal lateral profile of the dorsum of segment X, to the straight-cut, truncate apical margin of the ventroapical setose lobes in dorsal view as well as to the rather straight tube-like shape of the horizontal shaft of the phallic organ that is without any pronounced dorsal and ventral concavity or convexity or apical dilatation.

Cheumatopsyche dubitans species group

Cheumatopsyche bunkos sp. nov.

(Figures 149–152)

Material examined. Holotype: China, Guangxi Zhuang Autonomous Region, Jinxiu County, Dayaoshan, Yinshan Wild Station, light traps (1 male, CAU). *Paratypes*: same as Holotype (1 male, OPC, 1 male, DPP-HIST; 7 males CAU). China, Fujian Province, Wuyishan, Sangang, 740 m, 9.V.2004, leg. Liu Xingyue (1 male, OPC).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and reduced setaless apicomesal lobe belongs to the *Cheumatopsyche dubitans* species group (Oláh *et al.* 2008). According to the structure of segment X, especially of the apicoventral lobes most close to *Cheumatopsyche mariannae* Oláh & Johanson 2008 described from India (Karnataka) but differs by having dorsal interlobular gap narrow and rounded, not wide and flat-based as well as the harpagones clavate in ventral view, not broad-based.

Description. A small dark brown animal with some faded small spots on forewing Sc and R, forewing length of 6 mm.

Male genitalia. Abdominal segment IX fused annular, short; anterior margin bow-shaped, resulted in a very short dorsum and short but triple longer ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments sloping deep in lateral view. Body of segment X as high as long; lateral setose area (cerci) in middle position forming a short setose process packed with alveoli; apicoventral setose lobe capitate in lateral and slightly mesad turning in dorsal view; apicomesal lobe indiscernible. The basal segment of the gonopods with dilated and down-ward turning apex; harpago, the terminals segment short with clavate apex in ventral view. Phallic apparatus straight horizontal with middle constriction, phallotremal sclerite pronounce large, endothecal processes slightly shorter than the the head of the phallothecal tube.

Etymology. *bunkos* from "bunkós" clavate in Hungarian, refers to the shape of harpago characterized by terminal broadening with slight middle constriction.

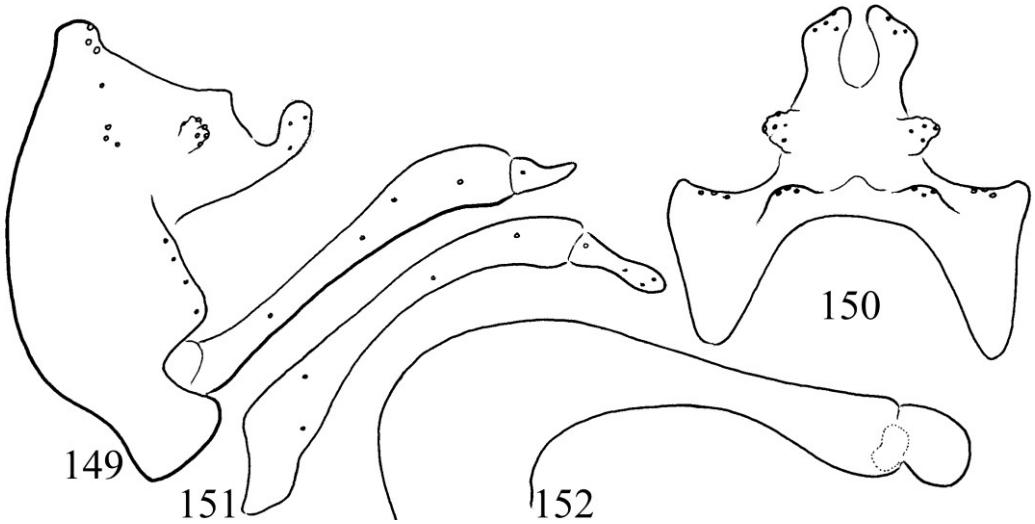
Cheumatopsyche davisi Oláh & Johanson, 2008

Material examined. China, Taiwan, Pingtung, Kenting National Park, 16.VI.2013, leg. Li Wenliang (11 males, DPP-HIST, 10 males, OPC).

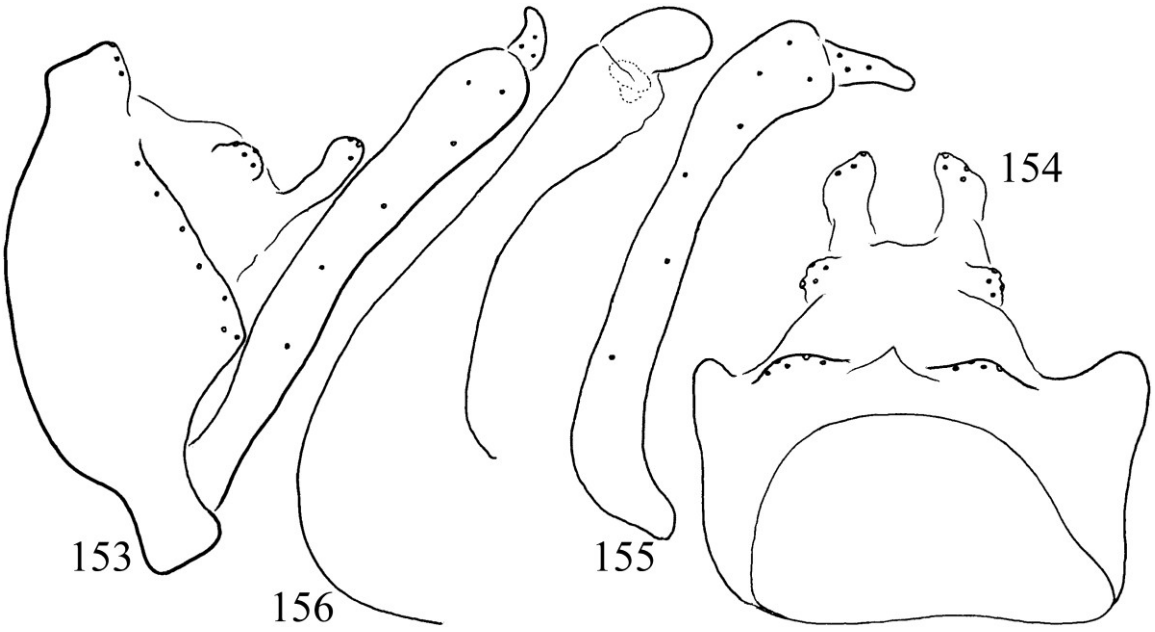
Cheumatopsyche kurtula sp. nov.

(Figures 153–156)

Material examined. Holotype: China, Fujian Province, Wuyishan, Sangang, 740 m, 9.V.2004, leg. Liu Xingyue (1 male, CAU).



Figures 149–152. *Cheumatopsyche bunkos* sp. nov. Holotype. 149 = male genitalia in left lateral view, 150 = male genitalia in dorsal view, 151 = left gonopod in ventral view, 152 = phallic organ in left lateral view.



Figures 153–156. *Cheumatopsyche kurtula* sp. nov. Holotype. 153 = male genitalia in left lateral view, 154 = male genitalia in dorsal view, 155 = left gonopod in ventral view, 156 = phallic organ in left lateral view.

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and reduced setaless apicomesal lobe belongs to the *Cheumatopsyche dubitans* species group (Oláh *et al.* 2008). According to the structure of the apicoventral lobes most close to *Cheumatopsyche bunkos* sp. nov. but differs by having larger size, lighter body colour, spotless forewing; short basal part of segment X; robust coxopodite; gradually narrowing harpago, not constricted mesad and not clavate; more elongated endothecal sclerites on the phallic head.

Description. A medium-sized brown animal without any spots on forewing; forewing length of 9 mm.

Male genitalia. Abdominal segment IX fused annular, short; anterior margin bow-shaped, resulted in a short dorsum and ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments sloping deep in lateral view. Basal body of segment X short; lateral setose area (cerci) shifted apicad, forming a short setose process packed with alveoli; apicoventral setose lobe slightly capitate in lateral and slightly mesad turning in dorsal view; apicomesal lobe reduced, indiscernible. The basal segment of the gonopods robust with dilated apex, especially visible in ventral view; the terminals segment short gradually tapering. Phallic apparatus straight horizontal with middle constriction, phallotremal sclerite pronounce large, endothecal sclerites long, slightly downward directed.

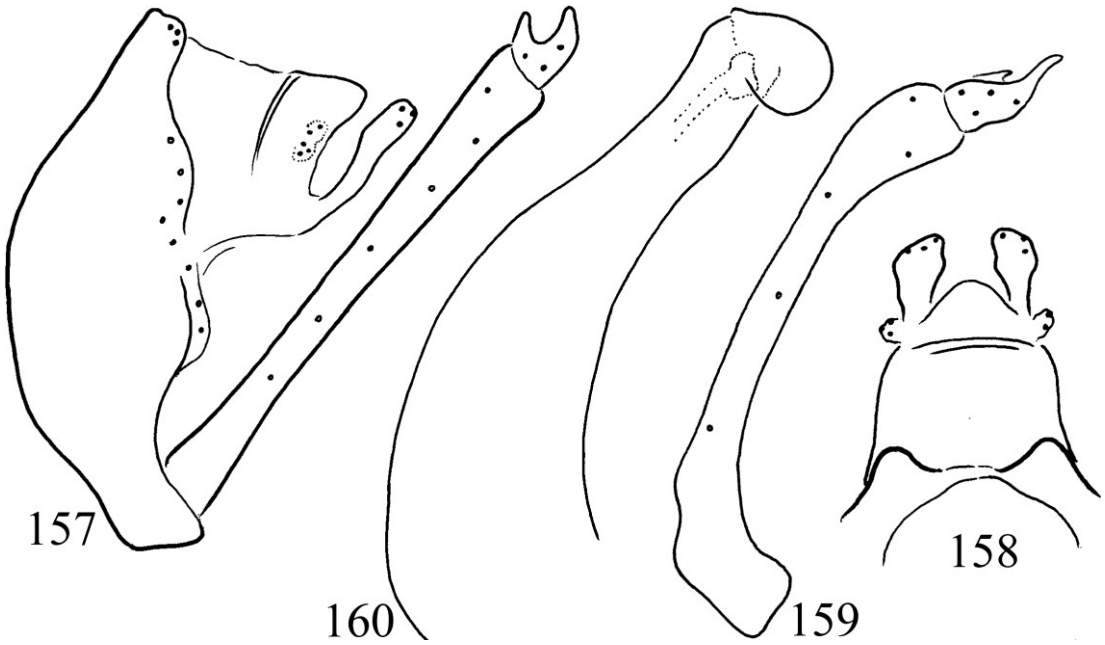
Etymology. *kurtula* coined from "kurta, kurtul" abbreviating in Hungarian, refers to the short harpagones and to the abbreviated basal part of segment X.

***Cheumatopsyche sara* sp. nov**.

(Figures 157–160)

Material examined. Holotype: China, Heibei, Xionglong, Dagoukum, 589 m, 11.VI.2014, leg. Li Xuankun (1 male, CAU).

Diagnosis. This new species having setose bilobed segment X that is the ventroapical pair of setose lobes and elongated setaless apicomesal lobe belongs to the *Cheumatopsyche dubitans* species group (Oláh *et al.* 2008). The bilobed harpago relates this new species to six Oriental species: *C. abhugna*, *C. carna*, *C. ceres*, *C. faniel*, *C. guadunica*, *C. rienga*. It differs from all by having ventroapical setose lobes with pronounced pedicel discernible both from dorsal and lateral view. The lateral profile of the phallotheca also diverged by the produced dorsum on its basal half.



Figures 157–160. *Cheumatopsyche sara* sp. nov. Holotype. 157 = male genitalia in left lateral view, 158 = male genitalia in dorsal view, 159 = left gonopod in ventral view, 160 = phallic organ in left lateral view.

Description. A uniformly brown coloured small species with forewing length of 7 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but longer ventrum; apical margin is straight vertical marked with a row of strong spines; intersegmental depression between the ninth and tenth segments small step-wise in lateral view. Body of segment X as long as high; lateral setose area (cerci) in middle on the apical margin; apicoventral setose lobe stalked with capitate head in dorsal view; stalk especially discernible as a long pedicel in lateral view; smooth apicomesal lobe slightly produced, rounded triangular in dorsal view. The basal segment of the gonopods very straight only slightly dilating apicad; harpago, the terminals segment bilobed; the ventral lobe tapering and S-forming. Phallic apparatus with produced dorsum on its two thirds basal region.

Etymology. *sara* from "szár", pedicle, stalk in Hungarian, refers to stalked shape of the apicoventral setose lobe on segment X.

Cheumatopsyche yangmorseorum Oláh & Johanson, 2008

Material examined. China, Inner Mongolia, Dayinggou, 23.VII.2014, leg. Wang Ning & Yang Ding (1 male, OPC).

Remarks. This species was described from Hubei Province based on the single Holotype deposited in NMNH.

Cheumatopsyche costalis species group

Cheumatopsyche ningmapa Schmid, 1975

Material examined. China, Yunnan Province, Tongbiguanu, Jinzhuzhai, 3.V.2012, leg. Liu Yuanye (50 males, DPP-HIST; 50 males, OPC).

Remarks. New species record for China!

Cheumatopsyche concava species group

Cheumatopsyche kirimaduwa species complex

This new species complex belongs to the *Cheumatopsyche concava* species group by having monolobed segment X with fused ventroapical pair of setose lateral lobes. The monolobed apical margin of segment X is accompanied by an innovation structure that is by the ventrocaudal spiny lobe on the apical margin of sternite IX. This character combination delineates this species complex recorded from the Andaman Islands to Henan Province of China: *C. dhanikari* Malicky, 1978 (Andaman I.); *C. kirimaduwa* Schmid, 1958 (Sri Lanka); *C. kysonia* Oláh & Johanson, 2008, *C. songbua* Oláh & Johanson, 2008, *C. songda* Oláh & Johanson, 2008, *C. zao* Oláh & Johanson, 2008, (Vietnam); *C. suswanad* Oláh & Barnard, 2008 (India); *C. harma* sp. nov. China (Henan), *C. lekera* sp. nov. China (Hainan I.).

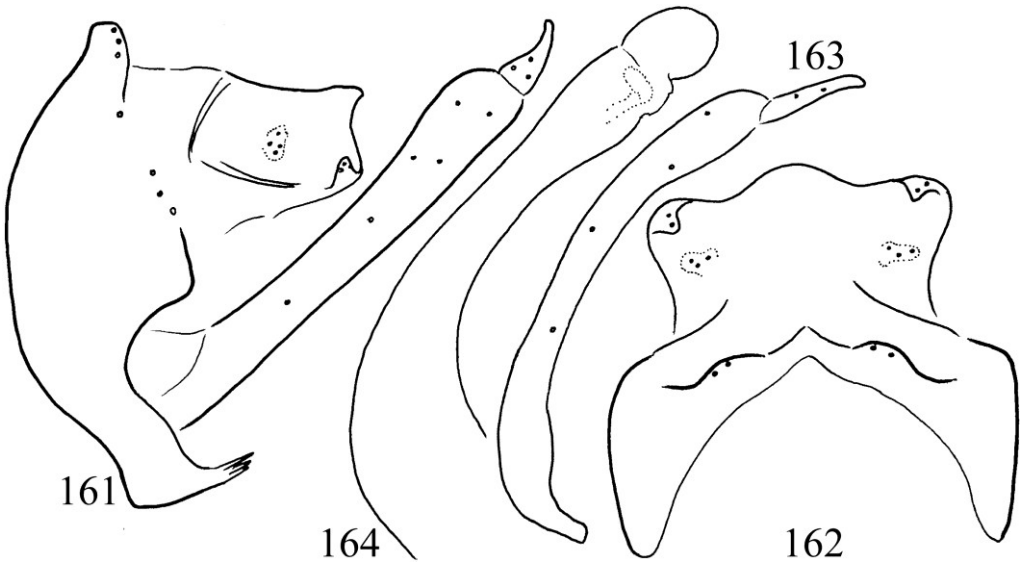
Cheumatopsyche harma sp. nov.

(Figures 161–164)

Material examined. Holotype: China, Henan Province, Song County, Mt. Funiu, Muzhaling, 19.VIII.2012 leg. Weihai Li (1 male, CAU).

Diagnosis. This new species having unilobed segment X that is the ventroapical pair of setose lobes fused to the body of segment X belongs to the *Cheumatopsyche concava* species group (Oláh *et al.* 2008). According to the structure of segment X and the phallic organ this uniform brown species is most close to *Cheumatopsyche dhanikari* Malicky, 1979 described from the Andaman Islands but differs by having the apicoventral setose pair of lobes really lobe-like, clearly posterad produced in dorsal view and strongly developed into upward direction as an independent lobes discernible in oblique lateral view. Malicky (1997) has determined specimens from Thailand and Vietnam as well as we have determined specimens from India (Karnataka State) under the name of *C. dhanikari*. These determinations are doubtful and the exact taxonomic status of specimens from India, Thailand and Vietnam need a comparative trait matrix study on population samples. The new species, *C. harma* sp. nov. from China (Henan Province) is markedly diverged from the specimens of Karnataka at least by the lobe-like setose lateral structures.

Description. A uniformly brown coloured small species with forewing length of 7 mm.



Figures 161–164. *Cheumatopsyche harma* sp. nov. Holotype. 161 = male genitalia in left lateral view, 162 = male genitalia in dorsal view, 163 = left gonopod in ventral view, 164 = phallic organ in left lateral view.

Male genitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but longer ventrum; the ventrum is elongated by the spiny ventrocaudal mesal lobe; apical margin is straight vertical marked with a row of strong spines and ventrad terminated in a triangular lobe above the gonopods; intersegmental depression between the ninth and tenth segments present, deep and stepwise in lateral view. Body of segment X little longer than high; lateral setose area (cerci) in middle position; apicoventral setose lobe discernible as incompletely fused to the apicoventrum of the segment and discernible as a small setose lobe visible both in dorsal and lateral view. The basal segment of the gonopods straight only slightly dilating apicad; harpago, the terminals segment broad-based in lateral and digitate in ventral view. Phallic apparatus with slender curving tube from the phallobase to the phallic head; the pair of endothecal sclerites rounded.

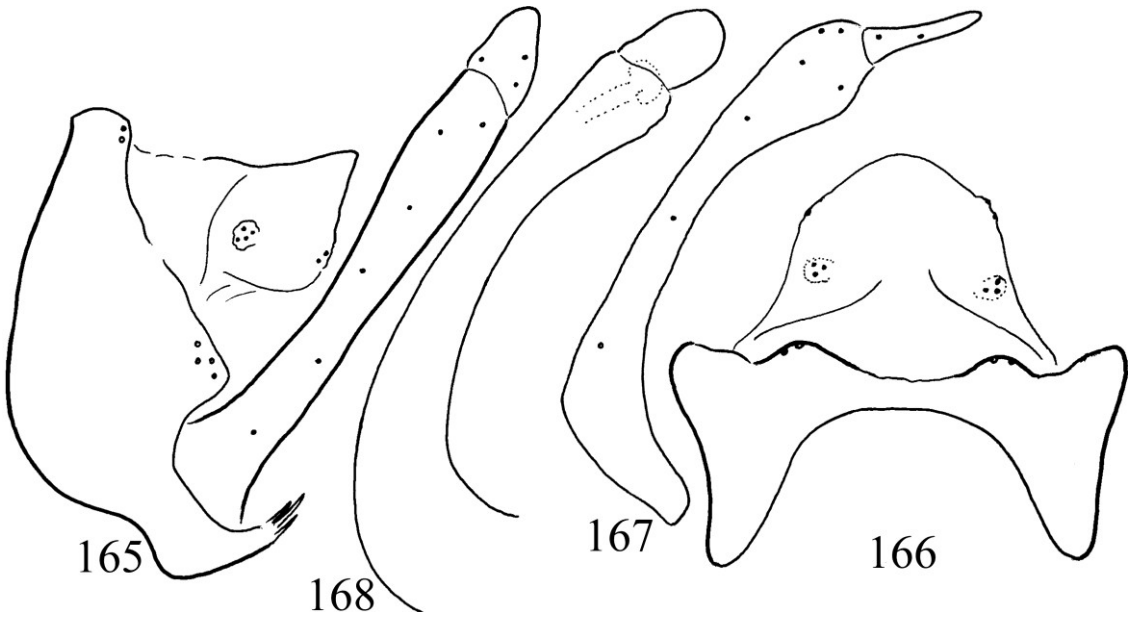
Etymology. *harma* from "hármas", triple in Hungarian, refers to the tripartite dorsal profile of the apical margin on segment X composed of the smooth setaless mesocaudal lobe and the apicoventral pair of setose lobes, mostly fused to the segment body, but anyhow posterad produced in dorsal and upward produced in lateral view.

***Cheumatopsyche lekera* sp. nov**.

(Figures 165–168)

Material examined. Holotype: China, Hainan, Baisha County, Yinggeling, Hongmao, 28.XI. 2011, leg. Weihai Li (1 male, CAU).

Diagnosis. This new species having unilobed segment X with apicoventral setose lobe almost completely fused with segment X belongs to the *Cheumatopsyche concava* species group (Oláh *et al.* 2008). A special innovation of the ventrocaudal spiny lobe on segment IX developed in integrative organisation in this complex of species recorded from Sri Lanka to Vietnam and Malaysia. Species in this complex differ by wing pattern, by the shape of harpago and the complex of segment X. The new species is most close to *C. songda* described from Vietnam, but differs by having no any spot pattern on forewing; the complex of segment X is rounded in dorsal view, not deltoid; as well as the phallobase is slender, not broad based.



Figures 165–168. *Cheumatopsyche lekera* sp. nov. Holotype. 165 = male genitalia in left lateral view, 166 = male genitalia in dorsal view, 167 = left gonopod in ventral view, 168 = phallic organ in left lateral view.

Description. A uniformly brown coloured small species with forewing length of 7 mm.

Male ganitalia. Abdominal segment IX fused annular, short; anterior margin arciform, resulted in a very short dorsum and short but longer ventrum; the ventrum is elongated by the spiny ventrocaudal mesal lobe; apical margin is straight vertical marked with a row of strong spines and terminated in a triangular lobe ventrad above the gonopods; intersegmental depression between the ninth and tenth segments present and step-wise in lateral view. Body of segment X little longer than high high; lateral setose area (cerci) in middle position; apicoventral setose lobe vestigial fused to the apicoventrum of the segment and discernible as a small setose area visible both in dorsal and ventral view. The basal segment of the gonopods straight only slightly dilating apicad; harpago, the terminals segment rounded triangular in lateral and digitate in ventral view as a result of vertically flattened shape. Phallic apparatus with slender curving tube from the phallobase to the phallic head; the pair of endothecal sclerites rounded and elongated.

Etymology. *lekera* from "lekerekített", rounded in Hungarian, refers to the dorsal shape of segment X.

Potamyia genus

Potamyia chinensis (Ulmer, 1915)

Material examined. China, Yunnan Province, Xishuangbanna, 661 m, 9.Vii.2016, leg. W. Li (1 male, DPP-HIST). China, Yunnan Province, Zhaotong, Erxicum, 25.IV.2014, leg. Lu Niumei (1 male, DPP-HIST). China, Shaanxi Province, Hanzhong city, Foping county, Qinling Mts. bank of Ziwu River in Foping old town, 890 m, N33°31.366' E107°59.012', 19.IV.2018(/1), leg. W. H. Li, R. R. Mo & D. Murányi (1 male, OPC). China, Shaanxi, Yang Country, Huanyang Town, Wangjiagou, N33°19'33"68, E107°57'21"43 453 m, light traps, 11.V.2017, leg. Liu Haoyu (4 male, DPP-HIST).

Spicipalpia

Glossosomatidae

***Glossosoma altaicum* (Martynov, 1914)**

Material examined. China**,** Xinjiang, Buerjin, Kanas Beishan river, N48.687120° E87.013350°, 1368, 17-15-1 (sample number), 19.VII.2017. leg. Ren Jinlong (1 male, DPP-HIST).

***Glossosoma subaequale* Schmid, 1971**

Material examined. China, Tibet, Linzhi, N29° 19'53" E94°20'38", 2926 m, 20.IV–20.V. 2017 leg. W. Li, (2 males, DPP-HIST; 2 males, OPC).

Rhyacophilidae

***Rhyacophila simpla* sp. nov.**

(Figures 169–171)

Material examined. Holotype: China, Tibet, Yigong, VI.2016, M. traps for the first time, (1male, CAU). *Paratypes*: same as Holotype (2 males, DPP-HIST). China, Tibet, Sejila Mount, Zhongshan Station, 5.V.–5.VI. 2017. (2 males, OPC)

Diagnosis. This new species belongs to the *Rhyacophila naviculata* species group of the *Rhyacophila naviculata* branch. Based on the shape of harpagones and the apicodorsal lobe of segment IX *R. simpla* sp. nov. is most close to *R. poba* Schmid, 1970 described from Sikkim as well as to *R. macrorrhiza* Sun & Yang, 1995 and *R. vasariah* Malicky, 2016 both described from Sichuan. *Rhyacophila simpla* sp. nov. differs from these species by having the apicodorsal lobe on segment IX very simple abbreviated monolobed, tapering mesad not bilobed and not excised apicomesad. The neutral trait of the apicodorsal lobe has a range of variation. The aedeagus has no any dorsal process, the basal sleeve of penis at Kimmins. It is lost. The dorsal process of the aedeagus is present in most members of this species group. However, both the dorsal process of the aedeagus as well as the parameres may be completely lacking in some species having otherwise the same genital architecture.

Description. Male (in alcohol). Body, appendages and wings brown, forewing length 14 mm with marble spotted pattern.

Male genitalia. Segment IX forms an almost regular ring, its anterior and posterior margins are almost parallel-sided in lateral view. Segment X less produced horizontal. Cerci lacking. Pair of epiproct (anal sclerite) small rounded ventrally elongated, without discernible root. Paraproct (U-shaped or wishbone-shaped apical band and tergal strap or band) present connected to the tergal strap. Gonopod bisegmented, coxopodite high, long and slightly constricted midway; harpago L-shaped. Phallic organ composed of phallobase (just discernible phallotheca and most developed endotheca), aedeagus and parameres; aedeagus long digitiform; parameres filiform.

Etymology. *simpla* from "szimpla" simple in Hungarian, refers to the abbreviated with abruptly narrowing, almost pointed apex of the apicodorsal lobe of segment IX in dorsal view.

***Rhyacophila stenostyla* Martynov, 1930**

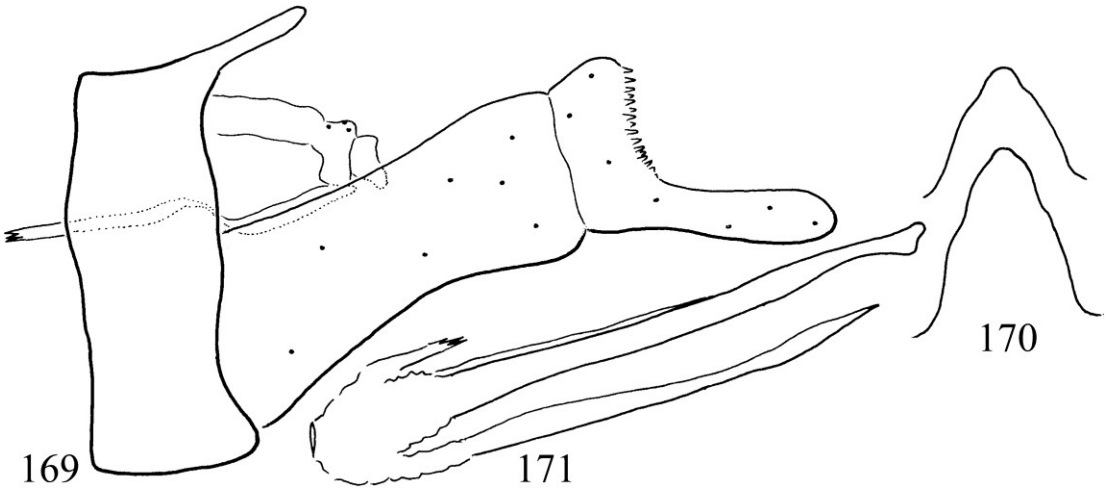
Material examined. China, Tibet, Sejila Mount, Zhongshan Station, 5.V.–5.VI. 2017. (1 male, OPC)

***Rhyacophila taraja* sp. nov.**

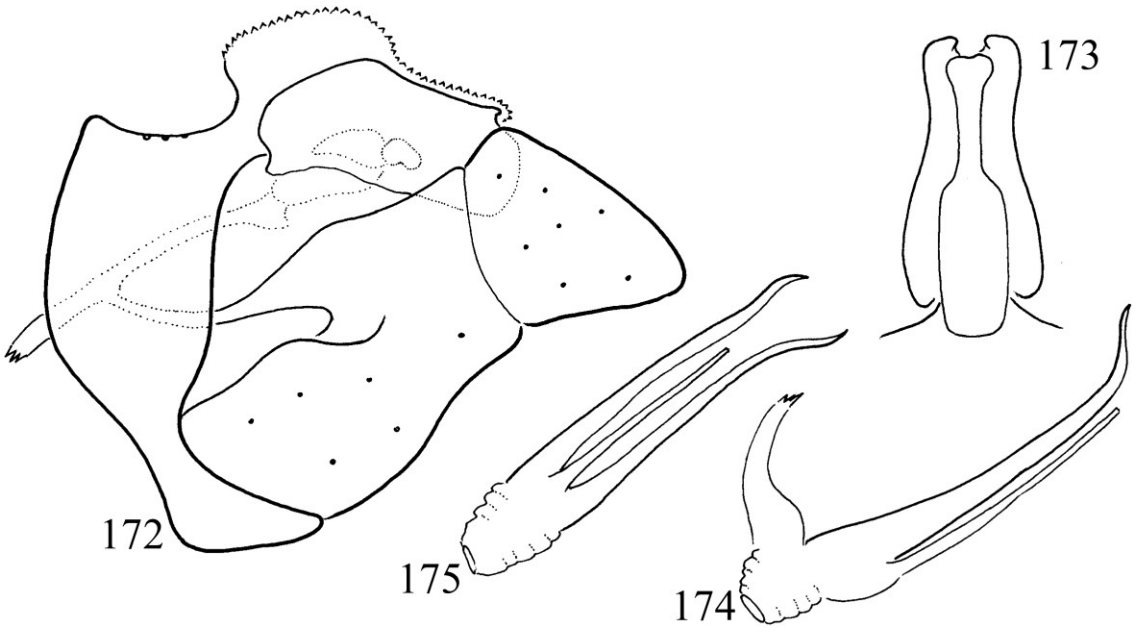
(Figures 172–175)

Material examined. Holotype: China, Tibet, Sejila Mount, Zhongshan Station, 5.V.–5.VI. 2017, (1 male, CAU).

Diagnosis. Having large dorsoapical lobe on segment IX, segment X horizontal, paired anal sclerite small, cerci absent, phallic organ simple and slender, this new species belongs to the *Rhyacophila naviculata* branch. According to Schmid (1970)'s simplified grouping of the *Rhyacophila* genus it is contradicting to find the natural



Figures 169–171. *Rhyacophila simpla sp. nov.* Holotype. 169 = male genitalia in left lateral view, 170 = variation of the dorsal process of segment IX between populations, 171 = phallic organ in left lateral view.



Figures 172–175. *Rhyacophila taraja* sp. nov. Holotype. 172 = male genitalia in left lateral view, 173 = segment X in dorsan view, 174 = phallic organ in left lateral view, 175 = phallic organ in ventral view.

taxonomic status of this new species. But it is not surprising, it is natural. The generality of the taxonomical incongruences due to both stochastic ontology and probabilistic epistemology makes classification of any entities highly artificial. Beside the overall character states of the *R. naviculata* branch, *R. taraja* sp. nov. has abbreviated ventrum of segment IX, horizontal segment X, dorsal process of the phallic organ lost, segment X large, segment X slightly oblique, phallotheca and endotheca reduced in size. Based on this character combination it is most close to the small *R. lieftincki* species group, but the U-shaped apical band and tergal strap less sclerotized

almost fully membranous, anal sclerite with root. Gonopods tendons long connected to the tergal strap. The basement of the tendon is heavily produced, unique in the genus dominating the mesal region of the apical half of the coxopodite. All members of the *R. lieftincki* species group has segment X clearly detached from the apicodorsal lobe of segment IX, but segment X of the new species is tightly adhered or even fused to the apicodorsal lobe.

Description. Male (in alcohol). *Male genitalia*. Segment IX forms an abbreviated ventrum, its anterior and posterior margins constricted in lateral view; apicodorsal process very specially formed, very unique; upward produced and cock-crest shaped; it apical half narrow with clavate apex in dorsal view; fully packed with short peg-like noncellular cuticular processes; dentate in lateral view like the crests of the cocks. Segment X large-sized almost horizontal, slightly oblique adhered to the dorsal lobe, fully covering the paired small anal sclerites and the membranous apical band, the vestigial structures of segment XI. Cerci lacking. Pair of epiproct (anal sclerite) small reniform with discernible root. Paraproct (U-shaped or wishbone-shaped apical band and tergal strap or band) present, membranous, almost indiscernible connected to the tergal strap. Gonopod bisegmented, coxopodite high, mesal region of the apical half modified to basement for the gonopod tendon. Phallic organ composed of less developed phallobase (phallotheca and endotheca) aedeagus and parameres; aedeagus filiform, parameres spine like.

Etymology. *taraja* from "taraj", "taréj", crest in Hungarian, refers to the highly upward produced with cock crest-like shaped apicodorsal process of segment IX.

Integripalpia

Brevitentoria

Leptoceroidea

Molannidae

***Molanna moesta* Banks, 1906**

Material examined. China, Hubei,Yingshan, Taohuachong 600m, 15.VI.2018, leg. Jiang Yunlan **(**1 male, DPP-HIST), China, Da qingkou 2016.VI.13 Light traps. **(**1male, DPP-HIST).

Leptoceridae

***Oecetis clavata* Yang & Morse, 2000**

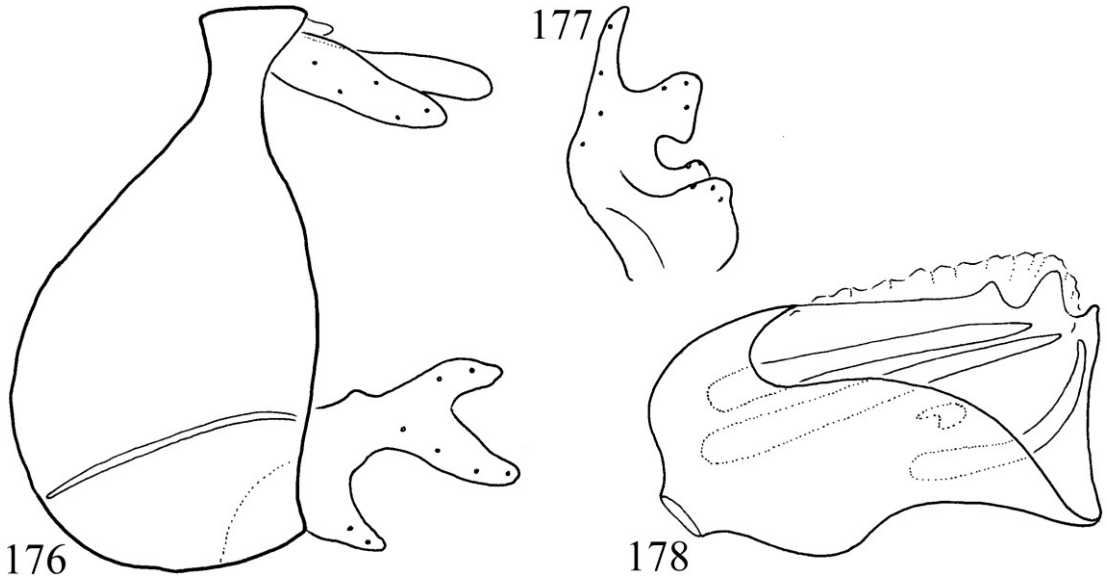
Material examined. China**,** Guangxi, Jinxiu County, Dayaoshan, Yinshan wild Station, light traps, 17.VIII.2016, leg. Weihai Li, Raorao Mo & Guoquan Wang **(**1 female, OPC).

***Oecetis girba* sp. nov.**

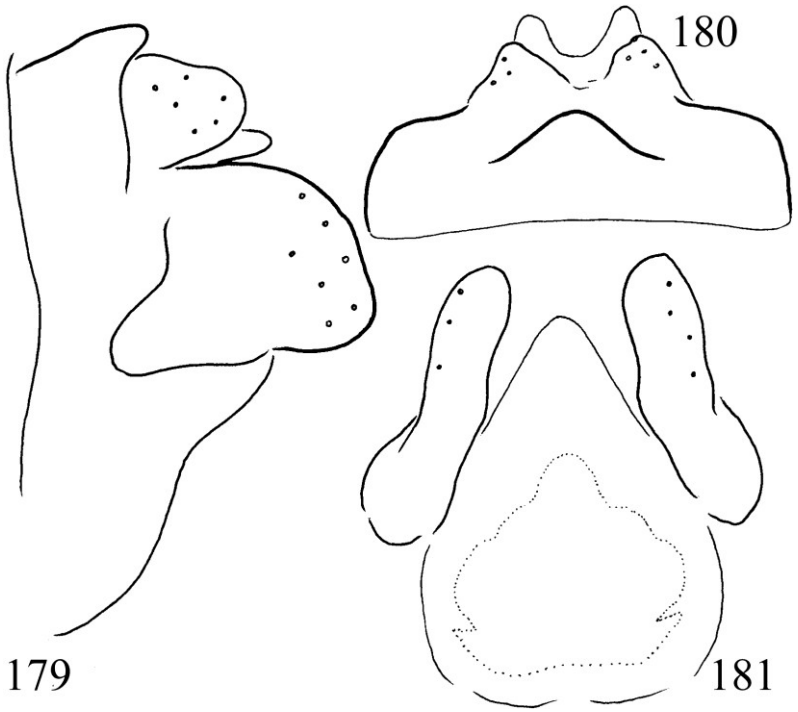
(Figures 176–181)

Material examined. Holotype: **China**, Guangxi, Jinxiu County, Dayaoshan, Yinshan wild Station, light traps, 17.VIII.2016, leg. Weihai Li, Raorao Mo & Guoquan Wang (1 male, CAU). *Allotype*: same as Holotype (1 female, DPP-HIST). *Paratypes*: same as Holotype (1 male, DPP-HIST; 1 male, OPC).

Diagnosis. Phallus asymmetrical with more paramere spines; cerci not fused to segment X; tergum IX short and sternum IX long. This character combination relates *O. girba* to the *Pleurograpt*a subgenus of genus *Oecetis* (Chen, 1993). The second flagellar segment elongated, hindwing median vein divided after m cross-vein, lower part of segment X not fused with segment IX laterally, pregenital tergums without honeycomb structure. This character combination characterizes the *O. hamata* species group. The second flagellar segment has no tuft of long setae. Has similarity to *O. cornuata*, but differs having rather straight vertical anterior margin of segment IX, not abruptly excised posteriorly in dorsal half; rounded cercal apex, not bifid apex; gonopod more complex (*girbe-gurba*); three parameres present, not a single sclerotized stout structure. Differs by the shape of female lamella, cerci and spermathecal sclerite.



Figures 176–178. *Oecetis girba* sp. nov. Holotype. male: 176 = male genitalia in left lateral view, 177 = left gonopod in ventral view, 178 = phallic organ in left lateral view.



Figures 179–181. *Oecetis girba* sp. nov. Allotype female: 179 = female genitalia in left lateral view, 180 = female genitalia in dorsal view, 181 = female genitalia in ventral view.

Description. Male (in alcohol). Body pale yellow, thorax light brown. Antennae with second flagellar segment elongated and without long setae, similarly to *O. cornuata*. Tibial spur 1-2-2. Forewing length 6 mm; forks, cross-veins, anastomosis and apices of the longitudinal veins shaded with brown on the light background.

Male genitalia. Segment IX bottle-like in lateral view, short dorsum, long ventrum; an oblique horizontal suture may delineate ventrum and pleuron. Segment X (upper part of segment X) digitate, slightly longer than cerci. Cerci (preanal or superior appendages) setose digitate or foliform. Paraproct (lower part of segment X) indiscernible, probably vestigial. Gonopod complex composing of almost five variously produced lobes. Phallic organ composed of phallotheca, indistinct endotheca, three spine-like parameres and heavily sclerotized phallotremal sclerite. Phallotheca about twice as long as high; globular closed tube basally with open dorsum distally right distal margin with three heavily sclerotized robust lobes; two parameres straight, one paramere curving.

Female genitalia. Segment IX longest dorsad, tergum IX slightly produced mesad, cerci setose as long as high, lamella slightly downward directed, spermathecal sclerite short and wide.

Etymology. *girba* from "*girbe-gurba*" overly curved in Hungarian, refers to the phallotheca with overly patterned dorsal edge as well as to the complex structure of the gonopods.

Plenitentoria

Limnephiloidea superfamily

Apataniidae

***Apatania trifurca* Tian & Sun, 1992**

Material examined. China, Tibet, Linzhi, N29° 19'53" E94°20'38", 2926 m, 20.IV–20.V. 2017 leg. W. Li, (1 male, DPP-HIST).

Goeridae

***Goera martynowi* Ulmer, 1932**

Material examined. China, Shaanxi, Han zhong, Yang County, Huayang Town, Banqiao Village, N33.6155° E107.5079°, 1154m, light traps, 4.V.2017, (4 males, DPP-HIST).

Limnephilidae

***Asynarchus delies* sp. nov.**

(Figures 182–184)

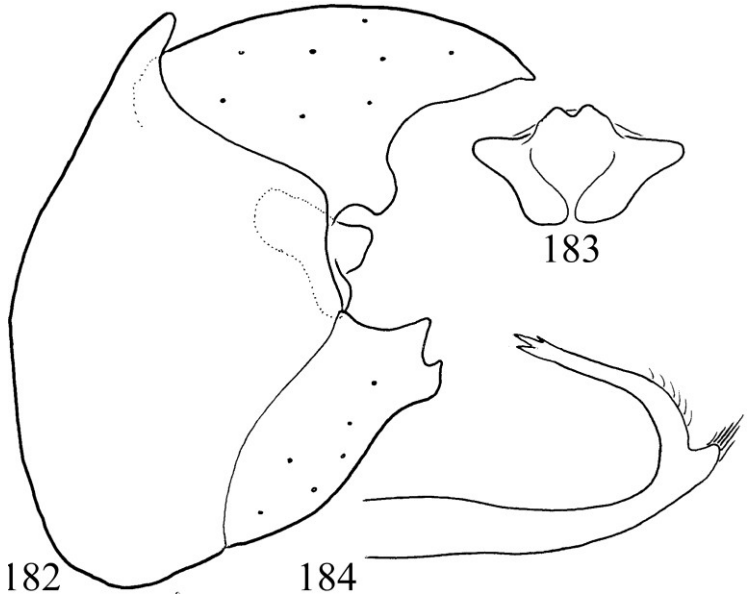
Material examined. Holotype: China, Xinjiang, Qinghe, 2625 m, 14.VII.2016, leg. W. H. Li, (1 male, CAU). *Paratypes*: same as Holotype (1 male, DPP-HIST; 1 male, OPC).

Diagnosis. The new species belongs to the *Asynarchus lapponicus* species group of Schmid. The lateral profile of the cerci resembles *A. lapponicus* and *A. mongolicus,* but differs by having more pointed apex and the ventral process is blunt, not pointed in lateral view. The caudal profile of the paraproct with produced lateral wings. The paramere tips are supplied with two almost equal sized spines, not with a single terminal spine accompanied by several small subapical spines.

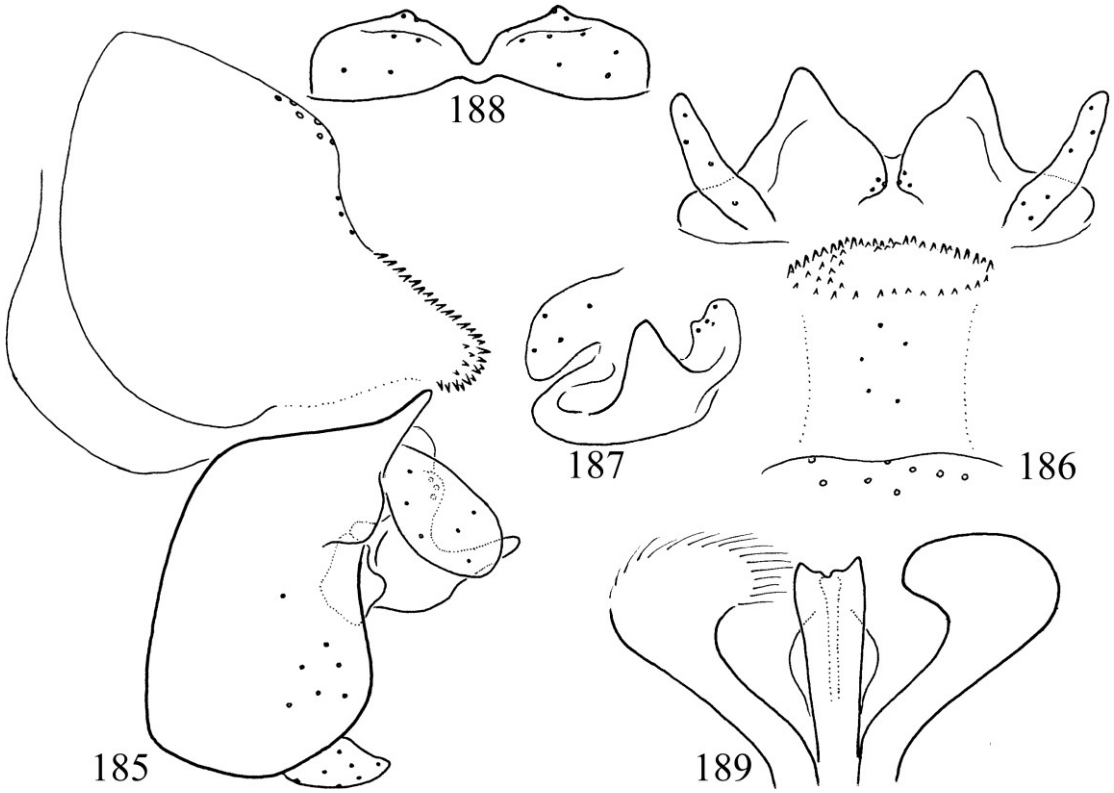
Description. This is a medium-sized animal with dark brown, almost black body sclerites. The forewing length is 16 mm.

Male (in alcohol). Segment IX very short dorsad, longer ventrad. The cerci are large, subtriangular, apex is pointed, ventral lobe broad blunt. The paraproct is truncate apicad and abbreviated in size in lateral view; in caudal view the lateral wings are more developed. Gonopod lateral profile is characterized with larger dorsal and shorter ventral apical lobe. Phallic organ composed of phallotheca (phallobase), endotheca, aedeagus, endophallus and parameres. The parameres are characterized by the anterad curving shaft with two almost equal sized terminal spines; the small lobes armed with long setae are short.

Etymology. *delies* from *"délies"* southern in Hungarian, refers to the most south representative of the *Asynarchus lapponicus* species group.



Figures 182–184. *Asynarchus delies* sp. nov. Holotype. 182 = male genitalia in left lateral view, 183 = paraproct in caudal view, 184 = left paramere in left lateral view.



Figures 185–189. *Pseudostenophylax haromsog* sp. nov. Holotype. 185 = male genitalia with tergite VIII in left lateral view, 186 = male genitalia with tergite VIII in dorsal view, 187 = left paraproct and cercus in caudal view, 188 = gonopods in ventral view, 189 = phallic organ in dorsal view.

***Pseudopotamorites rufescens* (Martynov, 1930)**

Material examined. China, Tibet, Sejila Mount, Zhongshan Station, light trap 5.V.–5.VI.2017 **(**2 males, OPC).

***Pseudostenophylax haromsog* sp. ov.**

(Figures 185–189)

Diagnosis. The new species belongs to the *Pseudostenophylax ichtar* species group of Schmid. Most close to *P. sophar* Schmid and *P. yangae* Malicky but differs from both by having the apical arm of the dorsal branch of paraproct regular triangular in dorsal view, not rounded or laterad hooked.

Description. Male (in alcohol). Dorsum of tergite VIII clearly bipartite as visible both in lateral and dorsal view; basal half elevated, its distal part supplied with strong and long setae; apical half sloping with a few scattered smaller setae on the slope followed by the spinulose apical area, the sloping zone is clearly darker pigmented in a broad band. Segment IX very short dorsad, longer ventrad, almost parallel-sided between. The cerci are as long as the paraproct, elongated ovoid. The paraproct is bilobed, apical lobe/arm strongly sclerotized, long digitate in lateral and regular triangular in dorsal view; basomesal lobe/arm less sclerotized setose. Gonopod lateral profile is characterized by slightly upward directed triangular shape; elongated half-circualr in ventral view with small process middle and with a submarginal ridge. Phallic organ composed of phallotheca (phallobase), endotheca, aedeagus, and parameres. The parameres are characterized by falciform, but very rounded inflated apex.

Material examined. Holotype: China, Shaanxi, Yang County, Huanyang Town, Luojiaping, N 33.6029°, E107.4699°, 131m, 6.V.2017, light traps, leg. Liu Haoyu (1 male, CAU)

Etymology. *haromsog* from *"háromszög"* tri angle in Hungarian, refers to the almost regular triangular shape of the apical arm on the dorsal branch of paraproct.

Phryganeoidea superfamily

Lepidostomatidae family

***Lepidostoma hirtum* (Fabricius, 1775)**

Material examined. China**,** Xinjiang,Buerjin, Kanas, Beishan river, 17-15-1 (sample number), N48.687120° E87.013350°, 1368m, 19.VII.2017, leg. Ren Jinlong. (1 male, DPP-HIST). **(**2 male, DPP-HIST).

***Lepidostoma orientale* (Tsuda, 1942)**

Material examined. China, Shaanxi, Yang Country, Huayang Town, Hanbeicun, N33.5219°, E107.5967°, 893.3m, 6.V. 2017, light traps, leg. Liu Haoyu **(**1 male, DPP-HIST).

Phryganeidae

***Eubasilissa mandarina* Schmid, 1959**

Material examined. China, Shaanxi Province, Zhouzhi, Laoxiancheng, 2057m, 19.VIII.2014, leg. Li Nuankun (1 male, 1 female; OPC).

***Eubasilissa mclachlani* (White, 1862)**

Material examined. China, without any more information about this widely distributed species **(**1 female, DPP-HIST).

***Eubasilissa morsei* Yang & Yang, 2006**

Material examined. China, Henan Province, Luanchuan County, Longyuwan, 18.VIII.2012, (1 male, DPP-HIST). China, Shaanxi Province, Zhouzhi, Houzhenzi, 1278m, 16.VIII.2014, leg. Lu Xiumei (1 female, OPC). China, Shaanxi Province, Zhouzhi, Houzhenzi, 1278m, 17.VIII. 2014, leg. Lu Xiumei (1 female, DPP-HIST).

REFERENCES

BANKS, N. (1939): Notes and description of Oriental Oestropsychinae (Tricoptera). *Psyche,* 46: 52–61.

BANKS, N. (1940): Report on certain groups of neuropteroid insects from Szechwan, China. *Proceedings of the United States National Museum,* 88(3079): 178–220. doi: 10.5479/si.00963801.88-3079.173

BARNARD, P.C. (1980): A revision of the Old World Polymorphanisini (Trichoptera: Hydropsychidae). *Bulletin of the British Museum (Natural History), Entomology series,* 41(2): 59–106.

CHEN, E.Y. (1993): *Revision of the Oecetis (Trichoptera: Leptoceridae) of the world*. Dissertation Presented to the Graduate School of Clemson University. UMA Dissertation Services, 704 pp.

HWANG, C.-L. (1957): Descriptions of Chinese caddis flies (Trichoptera). *Acta Entomologica Sinica,* 12(4): 373–404.

MALICKY, H. (1979): Neue Köcherfliegen (Trichoptera) von den Andaman-Inseln. *Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen,* 30: 97–109.

MALICKY, H. (1997): Ein Beitrag zur Kenntnis asiatischer Arten der Gattungen *Cheumatopsyche* Wallengren, 1891 und *Potamyia* Banks 1900 (Trichoptera, Hydropsychidae). *Linzer biologische Beiträge*, 29(2): 1015–1055.

MALICKY, H. (1998): Ein Beitrag zur Kenntnis asiatischer *Amphipsyche* und *Polymorphanisini* (Trichoptera, Hydropsychidae). (Gleichzeitig 23. Arbeit über thailändische Köcherfliegen). *Stapfia,* 55: 399–408.

MALICKY, H. & CHANTARAMONGKOL, P. (2000): Ein Beitrag zur Kenntnis asiatischer *Hydropsyche*-Arten (Trichoptera, Hydropsychidae). *Linzer biologische Beiträge,* 32(2): 791–860.

MALICKY, H. (2002): Ein Beitrag zur Kenntnis asiatischer Arten der Gattung *Diplectrona* Westwood 1840 (Trichoptera, Hydropsychidae). *Linzer biologische Beiträge,* 34(2): 1201–1236.

MARTYNOV, A.B. (1931): Report on a collection of insects of the order Trichoptera from Siam and China. *Proceedings of the United States National Museum,* 79(25): 1–20. doi: 10.5479/si.00963801.79-2891.1

OLÁH, J. (2018a): Species delineation and description in *Aethaloptera* Brauer genus by phallic head (Trichoptera, Hydropsychidae, Macronematinae). *Opuscula Zoologica, Budapest,* 49(1): 3–16. doi: 10.18348/opzool.2018.1.3

OLÁH J. (2018b): Revisiting the genus *Aethaloptera* Brauer (Trichoptera, Hydropsychidae, Macronematinae): new species and records. *Opuscula Zoologica, Budapest,* 49(2): 181–190. doi: 10.18348/opzool.2018.2.181

OLÁH, J. & JOHANSON, K.A. (2008) Generic review of Hydropsychinae, with description of *Schmidopsyche*, new genus, 3 new genus clusters, 8 new species groups, 4 new species clades, 12 new species clusters and 62 new species from Oriental and Afrotropical regions (Trichoptera: Hydropsychidae). *Zootaxa*, 1802: 1–248. doi: 10.11646/zootaxa.1802.1.1

OLÁH J., JOHANSON, K.A. & BARNARD, P.C. (2008): Revision of the Oriental and Afrotropical species of *Cheumatopsyche* Wallengren (Trichoptera: Hydropsychidae). *Zootaxa*, 1738: 1–171. doi: 10.11646/zootaxa.1738.1.1

OLÁH, J., BESHKOV, S., CHVOJKA, T.P., CIUBUC, C., COPPA, G., IBRAHIMI, H., KOVÁCS, T., MEY, W. & OLÁH, J. JR. (2017): Revision of Drusinae subfamily (Trichoptera, Limnephilidae): divergence by paraproct and paramere, speciation in isolation by integration. *Opuscula Zoologica, Budapest,* 48(1): 3–228. doi: 10.18348/opzool.2017.S1.3

OLÁH, J., ANDERSEN, T., BESHKOV, S., CIUBUC, C., COPPA, G., IBRAHIMI, H., KOVÁCS, T., OLÁH, J. JR. & SZCZESNY, B. (2018): Unified phylogenetic species concept: taking subspecies and race mout of science: postmodern theory applied to the *Potamophylax cingulatus* group (Trichoptera, Limnephilidae). *Opuscula Zoologica, Budapest,* 49(1): 33–70. doi: 10.18348/opzool.2018.1.33

OLÁH, J. ANDERSEN, T., BESHKOV, S., CHVOJKA, P., COPPA, G., JOHANSON, K.A., MALM, T., RUIZ GARCIA, A. & ZAMORA-MUÑOZ, C. (2019): Revision of European *Wormaldia* species (Trichoptera, Philopotamidae): Incongruent chimeric taxa of integrative organization. *Opuscula Zoologica, Budapest*, 50(1): 31–85. doi: 10.18348/opzool.2019.1.31

OLÁH, J. & DE VRIES, P.J. (2019): New *Baliomorpha* species (Trichoptera, Hydropsychidae) from Papua, Indonesia, with plesiomorphic state of phallic or-

gan. *Suara Serangga Papua* (*SUGAPA digital*), 11(2): 87–93. doi: 10.19269/sugapa2019.11(2).05

SCHMID, F. (1958): Trichoptères de Ceylan. *Archive für Hydrobiologie,* 54: 1–173.

SCHMID, F. (959): Quelques Trichoptères de Chine. *Mitteilungen aus dem Zoologischen Museum in Berlin,* 35(2): 317–345. doi: 10.1002/mmnz.19590350207

SCHMID, F. (1965): Quelques Trichoptères de Chine II. *Bonner zoologische Beiträge,* 16: 127–154.

TIAN, L., YANG, L. & LI, Y. (1996): Trichoptera (1): Hydroptilidae, Stenopsychidae, Hydropsychidae, Leptoceridae. *Economic Insect Fauna of China*, 49: 1–195.

YANG, L.F., SUN, C.H., WANG, B.X. & MORSE, J.C. (2005): *Present status of Chinese Trichoptera, with an annotated scecklist.* In. TANIDA, K & ROSSITER, A. (Eds.) Proceedings of the 11th International Symposium on Trichoptera (2003, Osaka), p. 441–465.

YANG, L.F., SUN, C.H. & MORSE, J.C. (2016): An amended checklist of the caddisflies of China (Insecta, Trichoptera). *Zoosymposia,* 10: 451–479. doi: 10.11646/zoosymposia.10.1.42

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The identity of the nomen dubium *Penaincisalia patagonaevaga* Johnson, 1990 (Lepidoptera: Lycaenidae, Polyommatinae)

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Abstract. The holotype of *Penaincisalia patagonaevaga* Johnson, 1990 (type locality: Argentina, prov, Chubut, 40 km N of Rio Mayo) is a chimeric specimen as it is composed of parts belonging to two different species: the neotropical *Penaincisalia penai* Johnson, 1990 (forewings, genitalia) and the oriental *Orthomiella rantaziana* Wileman, 1910 (hindwings) or one of its relatives. For an unambiguous identity the hindwings are excluded from the holotype, resulting the new synonymy *P. penai* = *P. patagonaevaga*. The specimen is considered to be mislabelled because the genus *Penaincisalia* Johnson, 1990 (type species: *Thecla culminicola* Staudinger, 1894) is confined to the high Andean puna and is highly improbable that any of its representatives occurs in Patagonia.

Keywords. Chimera, *patagonaevaga* holotype, mislabelling, *Penaincisalia*, *Orthomiella.*

INTRODUCTION

Amongst Neotropical Lycaenidae chimeric holotypes posed several nomenclatural and taxonomic problems (see Robbins & Lamas 2002). Some of these problems could not be solved, because their holotype specimens were not available for study and remained to be clarified (Benyamini *et al.* 2020). In this paper we report on a case, when the holotype specimen has been successfully located, and the identity of the nominal taxon could be revised.

Penaincislia patagonaevaga Johnson, 1990 a synonym of *P. penai* Johnson, 1990

(Figure 1)

Penaincisalia patagonaevaga Johnson, 1990: 117 Figs 3F (holotype recto, and verso photographic documentation in halftone), 6E (holotype genitalia drawing); Johnson 1992: 164, Figs 82 (holotype genitalia drawing), 177 (holotype recto and verso photographic documentation in halftone); Peña & Ugarte 1997: 224 (artistic image of holotype recto and verso in colour; Robbins 2004b: 122 (as *nomen dubium*).

Penaincisalia penai Johnson, 1990: 118; Robbins 2004b: 122; Prieto 2008: 99. (= *P. patagonaevaga* Johnson, 1990, **syn. nov**.)

Remarks. According to the original description *P. patagonaevaga* was described on the basis of the holotype male, deposited in the "CECUC" (= Central Entomological Collection of the University of Chile), with data: "Argentina, 40 km N Rio Mayo, Chubut Prov. (Patagonia), 20 Nov 1966, nr 700 m, J. Herrera" (Johnson 1990, Fig. 1a-c). As the species has been illustrated in the book „Las Mariposas de Chile", the holotype was certainly in the hands of one of the illustrators. The holotype specimen has been considered to be lost as the depositor "CECUC" does not exist and the specimen could not be located. Most probably this was one of the reasons, why the name has been regarded as *nomen dubium* by Robbins (2004b).

Very recently, the holotype of *P. patagonaevaga* has been found in the private collection of

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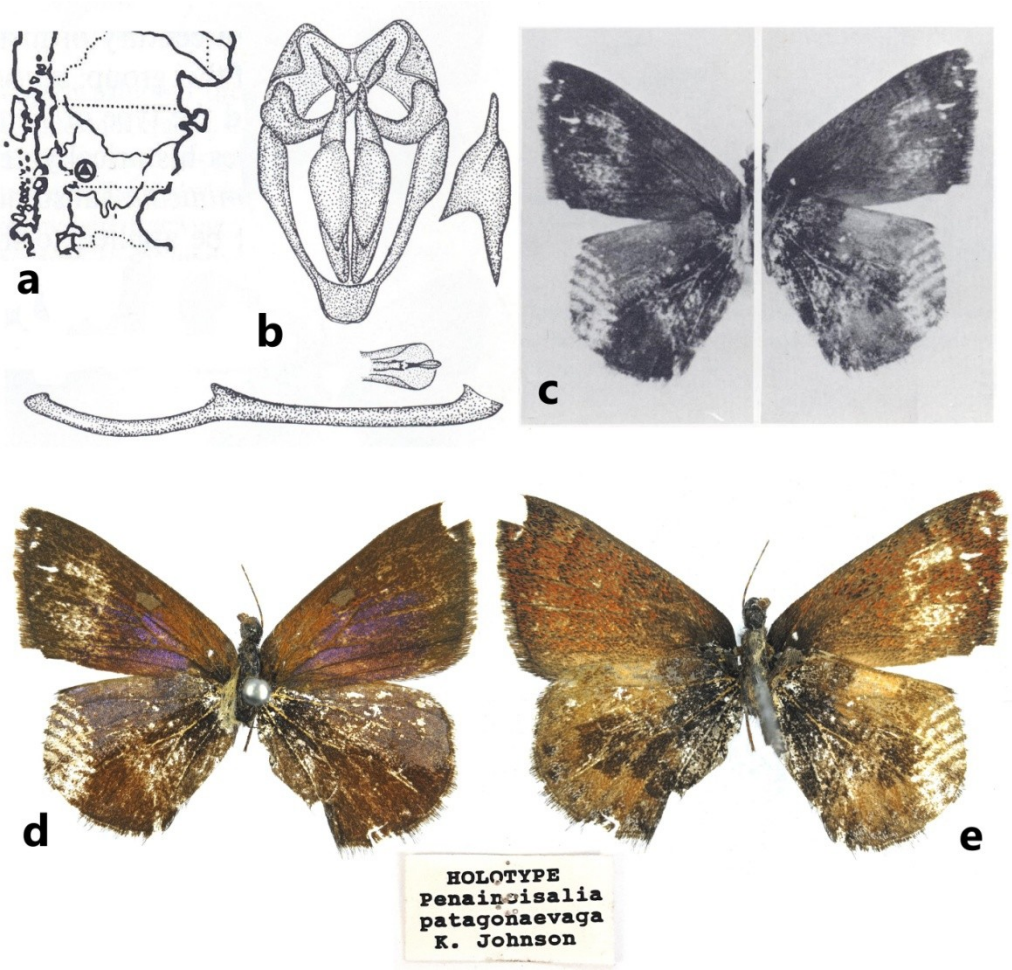

Figure 1. *Penanincisalia patagonaevaga* Johnson, 1990, holotype. Documentation of the original description (a–c): a = indication of the type locality (Chubut, Argentina); b = genitalia organ, c = dissected holotype specimen, left: recto, right: verso (forewing costa length = 22 mm). Documentation of the holotype specimen in colour (d–e; courtesy Marcelo Guerrero), d = recto, e = verso, and the type label (in middle).

Pedro Vidal, Santiago de Chile (ex collection Luis Peña). The specimen turned out to be a chimera as the forewings and the hindwings belong to different species (Figs. 1d–e): The dorsal surface of the forewing possess androconia typical for the *Penaincisalia* genus-group; there is a scent pad in the distal corner of the discal cell and a minute scent patch at the base of vein M3 (Bálint & Wojtusiak 2006, Prieto 2008). The rufous ventral wing surface colouration suggests that the fore wings represent the species *P. penai* Johnson, 1990 (Prieto 2008). The dorsal surface of hindwing area between the costa and vein M3 has a structural blue colouration. This trait can be found in certain calycopidine hairstreaks (cf. "Thecla (? Calystryma) cissusa" in d"Abrera 1995) but in *cissusa* the hindwing costa is slightly bent and the ventral surface of the wing has a simple typical hairstreak pattern with median line and tornal "Thecla spot". The hindwings represent the species group of *Orthomiella rantaizana* Wileman, 1910, an oriental polyommatine species (d'Abrera 1986: 637), which has hindwings identical with those of the *P. patagonaevaga* holotype: hindwing shape with straight costa, dorsal wingsurface colouration between costa and vein M3 is structural blue and ventral wing surface pattern with dark median maculation (see Fig. 2). The male

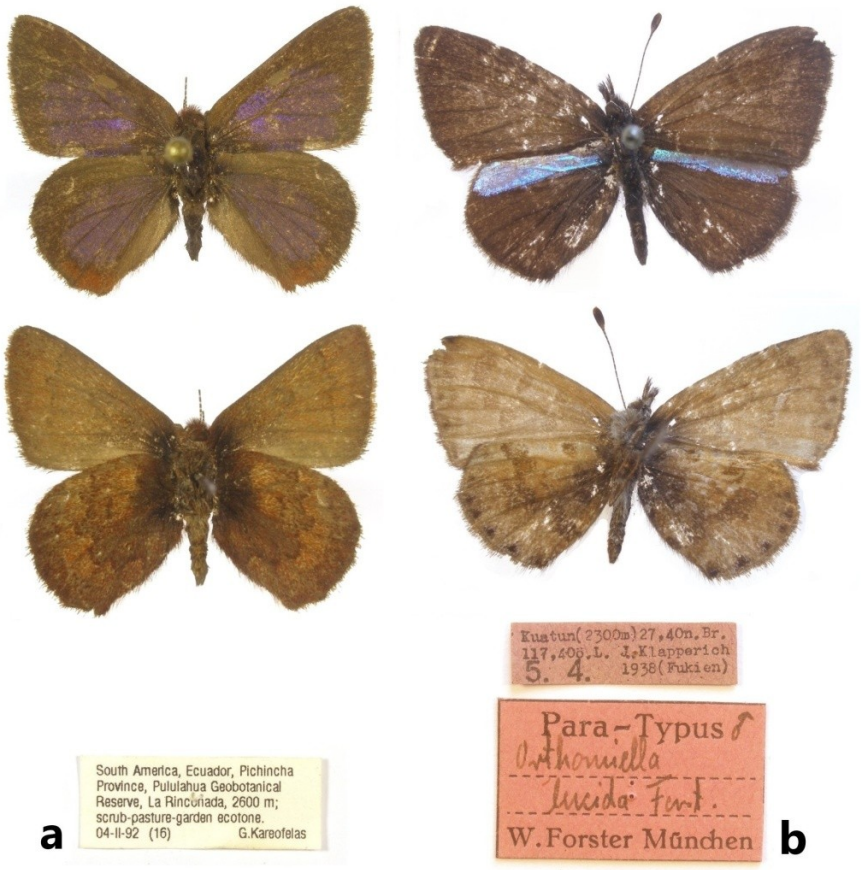

Figure 2. Hungarian Natural History Museum male specimens with their labels of lycaenid butterfly species composing the chimeric holotype *Penaincisalia patagonaevaga* Johnson, 1990: a = *Penaicisalia penai* Johnson, 1990; b = *Orthomiella lucida* Forster, 1942 (in same size; forewing costa length of *P. penai* = 12 mm).

genital organ appears to represent *P. penai* (Prieto 2008), so the dissected abdomen most probably belonged to the specimen provided the holotype forewings.

Under the Article 73.1.5. of the International Code of Zoological Nomenclature (1999), the hindwings of the holotype are excluded from the *P. patagonaevaga* holotype with the taxonomic purpose of best clarifying identification of the name; consequently *Penaincisalia patagonaevaga* Johnson, 1990 represents a **new synonym** of *Penaincisalia penai* Johnson, 1990,

DISCUSSION

Page priority. The species-group name *patagonaevaga* has page priority over *penai*. As First Reviewers we keep the latter name, because it was listed in Robbins (2004b) as valid, while *patagonaevaga* was considered to be doubtful. Prieto (2008) followed Robbins, described and fully documented *Penaincisalia penai*.

Type locality. In the specimen's pin there is the characteristic holotype label of Kurt Johnson, that is usually a type-written tag (Fig. 1). However, the locality label, mentioned in the original description, is missing. The elfin hairstreaks *Penaincisalia* are typical species of the high Andean puna and distributed from Colombia via Ecuador, Peru and Bolivia to the Chilean-Argentina border (Prieto 2008, Bálint *et al.* 2019). It is highly improbable, that any of the representatives of the genus occurs in Patagonia. Therefore we consider the holotype of *P. patagonaevaga* also as mislabelled specimen, and the type locality to be erroneous.

Johnson's neotropical Lycaenidae type problems. Robbins and Lamas (2002) identified the problems induced by the Lycaenidae types of Kurt Johnson. They documented that seven holotypes were composed of parts belonging to more than one species (*Decussata colombiana* Johnson, Austin, Le Crom & Salazar, 1997; *Ignata illepida* Johnson, 1992; *Strymon andrewi* Johnson, & Matusik, 1988; *Strymon nivix* Johnson, Eisele & MacPherson, 1990; *Tmolus victoria* Johnson & Matusik, 1989; *Trochusinus elizabetha* Salazar, Vélez & Johnson, 1997; and *Zigirina minutia* Johnson & Adams, 1997). Problems regarding type locality and labelling of specimens representing Lycaenidae taxa described were documented in Prieto *et al.* (2016) or Benyamini *et al.* (2020). The case of *P. patagonaevaga* underlines again that all these problems are real and researchers working with Neotropical lycaenid butterflies has to be prepared to face them.

Another nomen nudum. As a closing remark we mention the nominal species *Penaincisalia planuma* Johnson, 1992, which was considered also as *nomen dubium* and transferred to Polyommatinae by Robbins (2004a). On the basis of available documentation it seems that this taxon is also a chimera composed from the same two species that constitute *P. patagonaevaga*: the forewings are *Orthomiella*, the hindwings are *Penaincisalia* (*cf.* Fig. 2). This hypothesis can be falsified or verified only via the examination of the *P. planuma* holotype which hitherto is considered to be lost.

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REFERENCES

BÁLINT, ZS., KATONA, G. & KERTÉSZ, K. (2019): A new species of *Penaincisalia* (Lepidoptera: Lycaenidae) from Peru. *Opuscula Zoologica Budapest,* 50(2): 137–144. doi: 10.18348/opzool.2019.2.137

BÁLINT, ZS. & WOJTUSIAK, J. (2006): Contributions to the knowledge of Neotropical Lycaenidae: Notes on *Thecloxurina* with the descriptions of three new species (Lepidoptera: Theclinae: Eumaeini). *Genus,* 17(4): 585–600. Euameini

BENYAMINI, D., UGARTE, A. & BÁLINT , ZS. (2020): An updated list of the butterflies of Chile (Lepidoptera, Papilionoidea and Hesperioidea) including distribution, flight period, conservation status and comments on biology. Part III/1, subfamily Polyommatinae (Lycaneidae) with descriptions of three new species of *Pseudolucia. Boletín del Museo Nacional de Historia Natural, Chile*, 68(1–2): 131–181.

D'ABRERA, B. (1986): *Butterflies of the Oriental Region. Part II. Lycaenidae & Riodinidae.* Hill Hosue, Melbourne, Australia, i–xv, p. 535–672.

D'ABRERA, B. (1995): Butterflies of the Neoptropical Region. Part VII. Lycaenidae. Hill Hosue, Melbourne, Australia, i–xi, p. 1099–1270.

INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE (1999): *International Code of Zoological Nomenclature*. Fourth edition. The International Trust for Zoological Nomenclature, London, United Kingdom.

JOHNSON, K. (1990): *Penaincisalia*, a new genus of "elfin"-like butterflies from the high Andes (Lepidoptera: Lycaenidae). *Pan-Pacific Entomologist,* 66(2): 97–125, 10 figs.

JOHNSON, K. (1992): Genera and species of the Neotropical "elfin"-like hairstreak butterflies (Lepidoptera, Lycaenidae, Theclinae). *Reports of the Museum of Natural History, University of Wisconsin* (Stevens Point), 22(1): 1–135, 205 figs.; (2): 136–279, 241 + 2 figs.

PEÑA, L.E. & UGARTE, A. J. (1997): *Las mariposas de Chile. The butterflies of Chile.* Santiago de Chile, Editorial Universitaria. 359 pp, figs., maps.

PRIETO, C. (2008): *Taxonomía, Biogeographía y Relaciones Filogenéticas del Género Alto-Andino Penaincisalia Johsnon (Lepidoptera: Lycaenidae: Eumaeini)*. Tesis Doctoral. Universisad de Alicante, Alicante, 268 pp.

PRIETO, C., GRISHIN, N.G., HAUSMANN A. & LORENC-BRUDECKA, J. (2016): The *Penaincisalia amatista* species-group (Lepidoptera: Lycaenidae, Eumaeini) in Colombia, insights from mtDNA barcodes and the description of a new species. *Systematics and Biodiversity,* 14(2): 171–183. doi: 10.1080/14772000.2015.1112314

ROBBINS, R.K. (2004a): Introduction to the checklist of Euameini, pp. xxiv–xxx. In. LAMAS, G. (Ed.) *Checklist: Part 4A. Hesperioidea - Papilionoidea*. In. HEPPNER, J.B. (Ed.) *Atlas of Neotropical Lepidoptera. Volume 5A*. Gainesville, Association for Tropical Lepidoptera; Scientific Publishers.

ROBBINS, R.K. (2004b): Lycaenidae. Theclinae. Tribe Eumaeini, pp. 118–137. In. LAMAS, G. (Ed.) *Checklist: Part 4A. Hesperioidea - Papilionoidea*. In. HEPPNER, J.B. (Ed.), *Atlas of Neotropical Lepidoptera. Volume 5A*. Gainesville, Association for Tropical Lepidoptera; Scientific Publishers.

ROBBINS, R.K. & LAMAS, G. (2002): Nomenclatural changes in the Neotropical Eumaeini (Lepidoptera, Lycaenidae, Theclinae). *Revista brasileira de Zoologia,* 19(Suplemento 1): 197–214, 24 figs.