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On the Trichoptera of the Caucasus, with emphasis on the *Plectrocnemia latissima* and *P. zekaria* species complexes, and the genera *Cerasma* and *Notidobia*

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Abstract. In our third paper on the Caucasian Trichoptera we have described 56 new caddisfly species mostly from Georgia: *Wormaldia felkora* Oláh & Vinçon sp. nov., *W. goderdza* Oláh & Vinçon sp. nov., *W. halchala*, Oláh & Vinçon sp. nov., *W. kintrisha* Oláh & Vinçon sp. nov., *W. omala* Oláh & Vinçon sp. nov., *Tinodes doberad* Oláh & Memishishi sp. nov., *T. radzen* Oláh & Memishishi sp. nov., *Plectrocnemia arasbaranica* Ibrahimi & Oláh sp. nov., *P. kartlia* Oláh & Vinçon sp. nov., *P. kopetdagha* Oláh & Ibrahimi sp. nov., *P. mashukana* Oláh sp. nov., *P. mingrelica* Oláh & Vinçon sp. nov., *P. svanetica* Oláh & Vinçon sp. nov., *P. ucnobi* Oláh sp. nov., *P. gomista* Oláh & Vinçon sp. nov., *P. kintrisha* Oláh & Memishishi sp. nov., *Cheumatopsyche busherica* Oláh sp. nov., *C. erzincana* Oláh sp. nov., *C. iorica* Oláh & Memishishi sp. nov., *Hydropsyche dashbasha* Oláh & Vinçon sp. nov., *H. iorica* Oláh & Memishishi sp. nov., *H. gaghma* Oláh & Memishishi sp. nov., *H. akhalchala* Oláh & Vinçon sp. nov., *H. goderdza* Oláh & Vinçon sp. nov., *H. mestia* Oláh & Vinçon sp. nov., *H. tsabnara* Oláh & Memishishi sp. nov., *Agapetus akhalchal* Oláh & Vinçon, sp. nov., *A. bakhmar* Oláh & Vinçon, sp. nov., *A. lashijal* Memishishi & Oláh sp. nov., *Micrasema kaskadian* Oláh & Memishishi sp. nov., *Thremma kintricum* Oláh & Memishishi sp. nov., *T. adjaricum* Oláh & Memishishi sp. nov., *Martynomyia bakhmara* Oláh & Vinçon sp. nov., *M. kintrisha* Oláh & Memishishi sp. nov., *M. omala* Oláh & Vinçon sp. nov., *Drusus akhalchala* Oláh & Vinçon, sp. nov., *D. gudaur* Oláh & Vinçon, sp. nov., *D. kheled* Oláh & Vinçon, sp. nov., *D. zekar* Oláh & Vinçon, sp. nov., *Sakala gourica* Oláh & Vinçon, sp. nov., *S. javaketica* Oláh & Vinçon, sp. nov., *Rizeiella bakhmara* Oláh & Vinçon sp. nov., *Stenophylax botos* Oláh & Memishishi sp. nov., *S. chokhiensis* Oláh & Vinçon sp. nov., *Ernodes gouriensis* Oláh & Vinçon sp. nov., *Cerasma artvina* Oláh sp. nov., *C. bakhmara* Oláh & Vinçon sp. nov., *C. goderda* Oláh & Vinçon sp. nov., *C. goma* Oláh & Vinçon sp. nov., *C. kintrisha* Memishishi & Oláh sp. nov., *C. zarzma* Oláh & Vinçon sp. nov., *Notidobia kintrisha* Oláh & Memishishi sp. nov., *N. kvariati* Oláh & Memishishi sp. nov., *N. marielucae* Oláh & Vinçon sp. nov., *N. vekona* Oláh & Memishishi sp. nov., *Setodes ioricus* Oláh & Memishishi sp. nov. The following 13 species are recorded as new for the Georgian Fauna: *Wormaldia daga* Oláh, 2014, *Lype phaeopa* Stephens, 1836, *Plectrocnemia rizeiensis* Sipahiler, 1987, *Cheumatopsyche flavellata* Mey, 2004, *Hydropsyche sciligra* Malicky, 1977, *Agapetus caucasicus*, Martynov, 1913, *Hydroptila armathai* Schmid, 1959, *H. taurica* Martynov, 1934, *Stactobia wimmeri* Malicky, 1988, *Limnephilus auricula* Curtis, 1834, *Stenophylax meridiorientalis* Malicky, 1980, *S. solotarewi* (Martynov, 1913), *Triaenodes kawraiskii* Martynov, 1909.

Keywords. Caucasus, Georgia, Trichoptera, species complexes, new species.

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INTRODUCTION

This is our third paper on the Trichoptera of the Caucasus (Oláh *et al.* 2020, Oláh & Vinçon 2024). Our current sampling and study activities are mostly restricted to Georgia and a small part of the Lesser Caucasus (also known as the Caucasus Minor or Anticaucasus) and the Greater Caucasus mountain ranges. The two ranges run parallel for around 600 kilometres through six countries: Russia, Turkey, Georgia, Armenia, Azerbaijan and Iran. Only a very small number of limited habitats were sampled. To compensate the limits of sample size we applied the principle and practices of "put together" procedure in order to have a little more than nothing, a really very small study material at our disposal for taxonomic research. Nevertheless, even from this small private trial we have described many new caddisfly species. This clearly reflects the almost pristine state of the entire Caucasus, which has been sampled sporadically and studied by only a few experts, such as the Russian Andrei Vasilievich Martynov, the German Wolfram Mey, and the Turkish Füsun Sipahiler. The discovery and description of 173 new caddisfly species from such small, fragmented samples highlights the inadequacy of support for the institutional scientific network of taxonomy – the natural history museums, universities, and aquatic and ecological research institutes – and demonstrates how this hinders their ability to carry out vital biodiversity research. Furthermore, it clearly shows how little we know about the structure of living aquatic communities in such a vast, mountainous region with its highly diverse and isolated habitats. Unfortunately this rather sad scenario of the contemporary institutional taxonomic research is not confined to Trichoptera and to the Caucasus, but it is also evident in other groups and throughout Europe (Páll-Gergely *et al.* 2024).

MATERIAL AND METHODS

Our present study is based on caddisfly specimens sampled by the second author Gilles Vinçon in Georgia during his early spring (20.IV–4.V) and midsummer (2–18.VIII) collecting trips in the year of 2024 covering the basic aquatic habitats of all the basic regions mapped already before (Oláh & Vinçon 2024). Halil Ibrahimi has contributed to the knowledge of *Plectrocnemia latissima* new species complex by his specimens collected in Iran, East Azerbaijan, and the Elburz Mountains. Aleksi Memishishi and Kristina Dzuilashvili realised some collecting trips in unexplored habitats of Georgia, as well as identified a part of a material from a big Malaise trap research project of Illia State University with traps installed in 18 locations up to the spring area on the Kintrishi River in the Adjara region. Some specimens were collected and presented to Aleksi Memishishi by the Finnish lepidopterologist, Jari Junnilainen as byproduct of his Lepidoptera collections using light traps.

Photographs (Appendix 1) illustrating the ecology and distribution of each new species are included at the end of the text.

The abbreviations of the depository institutions are as follows:

Department of Biology, Faculty of Mathematics and Natural Sciences, University of Prishtina „Hasan Prishtina", Pristinë, Kosovo (UPK).

Institute of Zoology, Ilia State University, Tbilisi, Georgia (IZISUT)

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

TAXONOMY

Philopotamidae Stephens, 1829

Wormaldia McLachlan, 1865

Wormaldia daga Oláh, 2014

(Photos 7a–7b)

Material examined. **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.7476°N, 42.095°E, 29.VI.–13.VII.2018, leg. GGBC members (5 males, OPC).

Remarks. This species is described and known only from Bulgaria (Bosna Mts., Strandzha Mts.). After its description it is first recorded here in the Kintrishi stream of Adjara, Georgia far from the locus typicus. There is a sibling specie, *Wormaldia ditta* Sipahiler, 2020 described from Northeast Turkey, Artvin, Borcka with almost identical endothecal spine pattern, little diverged head of segment X, and with more diverged periphallic organ of truncated cerci. Surprisingly, the five Malaise-trapped specimens in Kintrishi stream having even the cerci rounded, not truncated; during a careful comparison with the paratype from Strandzha Mts we were unable to find any divergences. We do not know which kind of mechanisms retained its identity here in Kintrishi valley and altered slightly in Artvin. Also we do not know how continuous is its distribution in between of Strandzha and Kintrishi mountains and how far spread further eastward.

Wormaldia davidi Oláh & Vinçon, 2020

Material examined. **Georgia,** High Svaneti, above Nakra, brook and spring, 1520m, 43.0781° N, 42.3695°E, 16.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Remark. This species was known only by the holotype.

Wormaldia felkora Oláh & Vinçon, sp. nov.

(Figures 1–3, Photos 1–2)

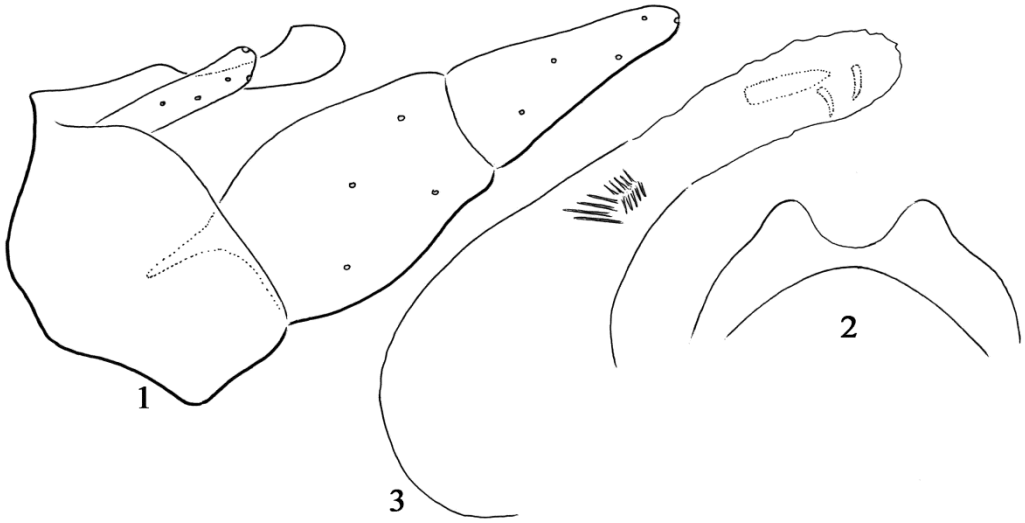
Wormaldia kimera Oláh & Vinçon, 2020:10–11 (part.). "Paratype: Georgia, Kakhetia region, above Lechuri, in direction of Omalo, big torrent above the bridge, tributary of Stori Aragvi River, 880m, 42°12'19"N, 45°27'45"E, 3.X.2019, leg. G. Vinçon (1 male, OPC)." **Misidentification**.

Wormaldia holaga Oláh & Manko, 2020 in Oláh *et al*. 2020: Oláh & Vinçon 2024:3–4. Georgia, Samtskhe-Javakheti, Ktsia-Tabatskuri Managed Reserve, spring and brook, 2380m, 41.6555°N, 43.49°E, 23.IX.2022, leg. Gilles Vinçon (2 males, 6 females; OPC). Georgia, Samtskhe-Javakheti, SE Tsaghveri, nice brook, 1210m, 41.791°N, 43.489° E, 23.IX.2022, leg. Gilles Vinçon (6 males, 2 females; OPC). Georgia, Kakhetie, above Lapankuri, Lopota valley, torrent and nice lateral spring and brooklet, 1580m - 1620m, 42.15°N, 45.6668°E, 21.IX.2022, leg. Gilles Vinçon (2 males, OPC). **Misidentification**.

Wormaldia obola Oláh, 2020:13–14: Oláh *et al.* 2024:8. "Georgia, Kakhetia, Lagodekhi National Park, above Khizabavra, Ninoskhevi valley, spring and brook, 630m, 41.8778N, 46.2425E, 13.V.2023, leg. Gilles Vinçon (1 male, OPC). Georgia, Kakhetia, above Khizabavra, Ninoskhevi valley, brook, 930m, 41.8826N, 46.2561E, 13.V.2023, leg. Gilles Vinçon (5 males, OPC)." **Misidentification**.

Material examined. Holotype: **Georgia,** Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC). Paratypes: same as holotype (2 males, OPC). Georgia, Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 24.IV.2024 leg. Gilles Vinçon (2 males, OPC). Georgia, Kakhetia region, above Lechuri, in direction of Omalo, big torrent above the bridge, tributary of Stori Aragvi River, 880m, 42°12'19"N, 45°27'45"E, 3.X.2019, leg. G. Vinçon (1 male OPC). Georgia, Samtskhe-Javakheti, Ktsia-Tabatskuri Managed Reserve, spring and brook, 2380m, 41.6555°N, 43.49°E, 23.IX.2022, leg. Gilles Vinçon (2 males, 6 females; OPC). Georgia, Samtskhe-Javakheti, SE Tsaghveri, nice brook, 1210m, 41.791°N, 43.489° E, 23.IX.2022, leg. Gilles Vinçon (6 males, 2 females; OPC). Georgia, Kakhetie, above Lapankuri, Lopota valley, torrent and nice lateral spring and brooklet, 1580m – 1620m, 42.15°N, 45.6668°E, 21.IX.2022, leg. Gilles Vinçon (2 males, OPC). Georgia, Kakhetia, Lagodekhi National Park, above Khizabavra, Ninoskhevi valley, spring and brook, 630m, 41.8778°N, 46.2425°E, 13.V.2023, leg. Gilles Vinçon (1 male, OPC). Georgia, Kakhetia, above Khizabavra, Ninoskhevi valley, brook, 930m, 41.8826°N, 46.2561°E, 13. V.2023, leg. Gilles Vinçon (5 males, OPC). Georgia, Samtskhe-Javakheti, above Patara Pamaji, spring, 1950m, 41.560°N, 42.927°E, 7.VIII. 2024, leg. Gilles Vinçon (3 males, OPC).

Diagnosis. Its tapering harpago relates it to the *Wormaldia triangulifera* species group, and having three endothecal stout spines it belongs the *W.*



Figures 1–3. *Wormaldia felkora* sp. nov. Holotype male: 1 = genitalia in left lateral view; 2 = tergite VIII in dorsal view;3 = phallic organ in left lateral view.

khourmai species complex. Its relatively short head of segment X resembles it to *W. holaga* Oláh & Manko, 2020; *W. khourmai* Schmid, 1959; *W. obola* Oláh, 2020 and *W. sima* Oláh & Chvojka, 2019. This was the reason why we have regularly misidentified previously this abundant species (Oláh et al. 2020, Oláh & Vinçon 2024). A detailed and comparative re-examination revealed the stability of the semi-circular lateral profile of the head of segment X compared to full circular (*holaga*), anterad turning (*khourmai*), elongated half-circular (*obola*) and rounded triangular (*sima*) head. These subtle divergences in this sensitive titillatory organ seem stable, but could be exposed to various deformations during copulation and preparation.

Description. Male (in alcohol). Large castanean brown animal. Sclerites medium brown, setal warts both on head and thorax and legs brown. Maxillary palp formula is I-II-IV-III-V. Forewing length 7 mm. Spur formula is 244.

Male genitalia. Tergite VIII with very deep and wide mesal excision on the apical margin with pronounced lateral lobes. Lateral profile of segment X characterized by semi-circular head, pronounced subapical concavity and by straight basal region. Cerci with downward oblique truncated rounded apex. Harpago straight tapering and slightly shorter than coxopodite. Phallic organ with one large straight stout and two almost equally sized slender curving stout spines accompanied by a small cluster of small and short mirror spines (spines arranged in two lines) as well as by some longer and slender spines.

Etymology. Species name reflects the character state of the speciation trait, the lateral profile of the head of segment X. It is being semi-circular; therefore "*felkora*" epithet was coined from "félkör" half circular in Hungarian.

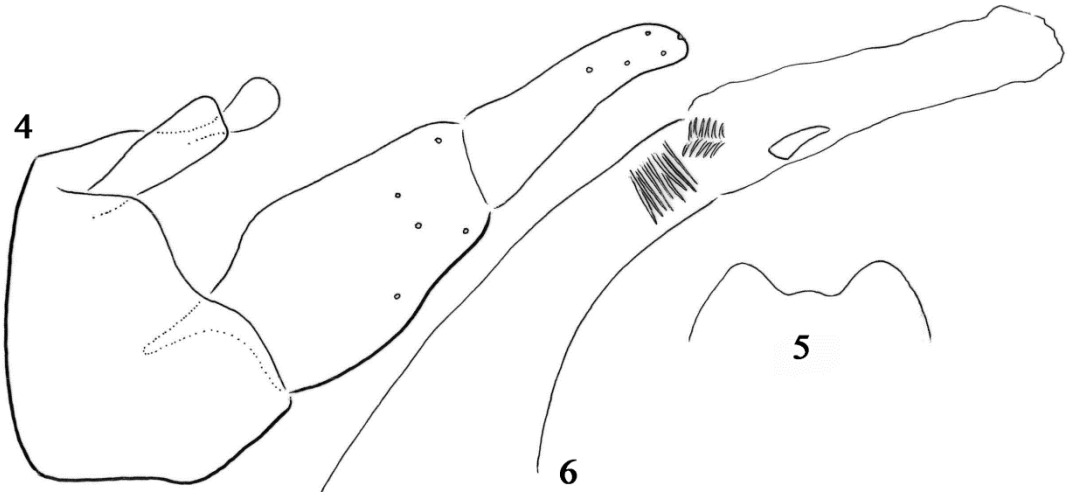
Remarks. *W. obola* Oláh, 2020 is no longer recorded for Georgia since the specimens reported in Oláh *et al.* 2024 are assigned here to *W. felkora* Oláh & Vinçon, sp. nov**.**

***Wormaldia goderdza* Oláh & Vinçon, sp. nov.**

(Figures 4–6, Photos 3–4)

*Material examined***.** Holotype: **Georgia,** Adjara, Goderdzi Pass, below Green Lake, large brook below the swamp, 2050m, 41.682°N, 42.500°E, 8.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Having tapering harpago belongs to the *Wormaldia triangulifera* species group.



Figures 4–6. *Wormaldia goderdza* sp. nov. Holotype male: 4 = genitalia in left lateral view; 5 = tergite VIII in dorsal view; 6 = phallic organ in left lateral view.

Having single stout spine belongs to *Wormaldia bulgarica* species complex. In this rapidly increasing complex, there is an increasing species unit with short head of segment X: *Wormaldia bulgarica* Novák, 1971; *W. daga* Oláh, 2014; *W. ditta* Sipahiler, 2020; *W. elvesta* Oláh, 2020; *W. erzincanica* Sipahiler, 2012; *W. harma* Oláh & Vinçon, 2020; *W. kintrisha* Oláh & Vinçon sp. nov., *W. kumanskii* Oláh & Chvojka, 2019.

It is not easy to distinguish the ninth species *W. goderdza* Oláh & Vinçon sp. nov. of the *triangulifera* species group from its relatives. The single male was collected from the distributional area of *W. harma* and it is most close to it, but differs by shorter and broader and distinctly truncated cerci, by shorter and slightly upward turning head and by the nine, not three long slender spines in endotheca of phallic organ.

Description. Male (in alcohol). Small castanean brown animal. Sclerites medium brown, setal warts both on head and thorax and legs brown. Maxillary palp formula is I-II-IV-III-V. Forewing length 7 mm. Spur formula is 244.

Male genitalia. Tergite VIII with deep and wide mesal excision on the apical margin formed by pronounced lateral lobes. Segment X characterized by a dorsal gradually broadening, slightly upward directed rounded head, distinctly, exactly and precisely visible in lateral view; the head obliquely and smoothly sloping anterad without any point or any angle. Cerci rather short and broad with truncate apex. Harpago tapering long, with slightly downward turning apical region, little shorter than coxopodit. Phallic organ with a single small stout spine accompanied by a small cluster of small and short double clustered spines as well as by nine longer and slender spines.

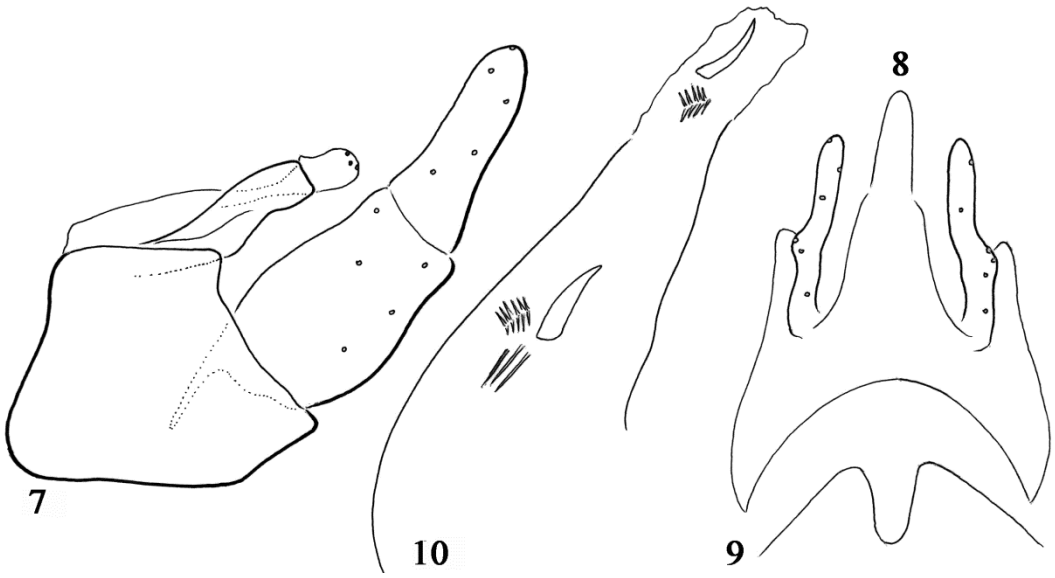
Etymology. Species name was coined from the type locality, a noun in apposition.

Wormaldia halchala Oláh & Vinçon, sp. nov.

(Figures 7–10, Photos 5–6)

*Material examined***.** Holotype: **Georgia,** Racha-Lechkhumi and Lower-Svaneti, below Akhalchala, nice springs, 1870m, 42.6768°N, 42.6482° E, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Paratype: Georgia, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, nice brook and spring, 2120m, 42.6928°N, 42.6447°E, 13.VIII. 2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Having tapering harpago it belongs to the *Wormaldia triangulifera* species group, and having two stout spines it is a member of the *W. khourmai* species complex. It is a recently diverged sibling species of *Wormaldia kulbaka*



Figures 7–10. *Wormaldia halchala* sp. nov. Holotype male: 7 = genitalia in left lateral view; 8 = genitalia in dorsal view; 9 = tergite VIII in dorsal view; 10 = phallic organ in left lateral view.

Oláh & Vinçon, 2024 described from above Kulbaki, downwards Akhalchala, but differs by the deep and broader excision on tergite VIII, by the dorsally middle angled and laterally slightly S-shaped cerci; by the shorter head of segment X with slightly concave, not straight head dorsum as well as by the endothecal spine pattern armed with an additional cluster of small spines.

Description. Male (in alcohol). Small castanean brown animal. Sclerites medium brown, setal warts both on head and thorax and legs brown. Maxillary palp formula is I-II-IV-III-V. Forewing length 6 mm. Spur formula is 244.

Male genitalia. Tergite VIII with very deep and narrow mesal excision on the apical margin with pronounced triangular lateral lobes. Segment X characterized by elongated rounded head with concave dorsum, shallow subapical concavity and by straight basal region. Cerci S-shaped in lateral and middle angled in dorsal views. Harpago straight tapering, as long as coxopodite. Phallic organ with two almost equally large stout spines accompanied by two clusters of small and short spines as well as by some longer and slender spines.

Etymology. Species name was coined from the type locality, a noun in apposition.

Wormaldia harma Oláh & Vinçon, 2020

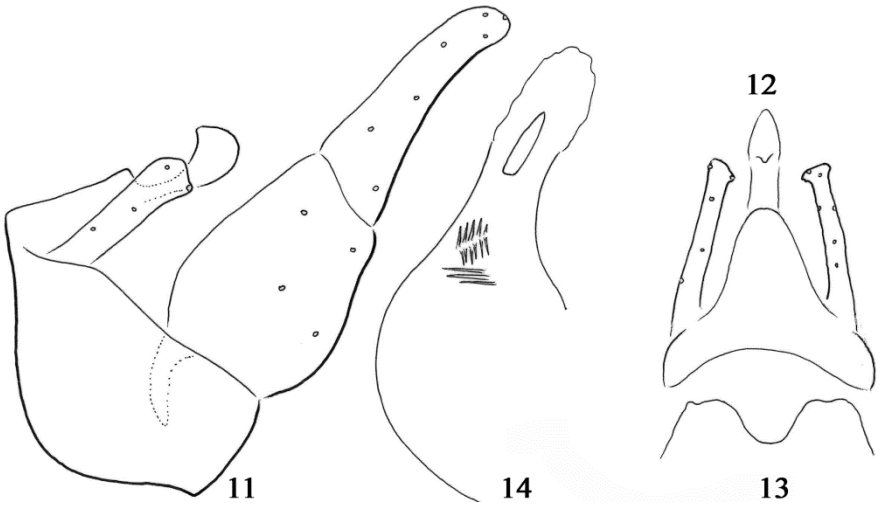
Material examined. **Georgia,** High Svanetie, above Mestia, brook and springs above the fish farm in construction, 1550m, 43.0477°N, 42.8091°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Wormaldia holaga Oláh & Vinçon, 2020

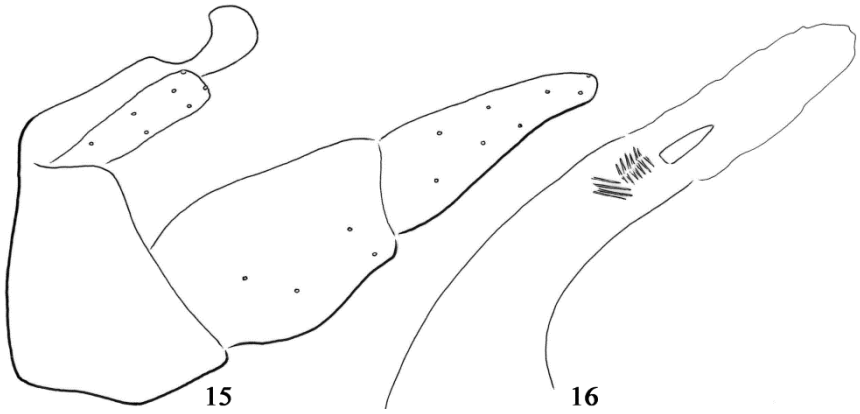
Material examined. **Georgia,** High Svanetie, above Mestia, brook and springs above the fish farm, 1550m, 43.0477°N, 42.8091°E, 3.V.2024, leg. Gilles Vinçon (4 males, OPC). Georgia**,** Mtskheta-Mtianeti, Ghelisvake, 42.5289°N, 44.921°E, 9.X.2024, leg. A. Memishishi (1 male, OPC). Georgia**,** Mtskheta-Mtianeti, Betischrdili, 42.41133°N, 44.92827°E, 10.X. 2024, leg. A. Memishishi (3 males, OPC).

Wormaldia kera Oláh, 2019

Material examined. **Georgia,** Racha-Lechkhumi and Lower Svaneti, Sori, spring, 710m,



Figures 11–14. *Wormaldia kintrisha* sp. nov. Holotype male: 11 = genitalia in left lateral view; 12 = genitalia in dorsal view; 13 = tergite VIII in dorsal view; 14 = phallic organ in left lateral view.



Figures 15–16. *Wormaldia kintrisha* sp. nov. Paratype male: 15 = genitalia in left lateral view; 16 = phallic organ in left lateral view.

42.58117°N, 43.28706°E, 26.IV.2024, leg. A. Memishishi (1 male, 3 females; IZISUT).

Wormaldia kimera Oláh & Vinçon, 2020

Material examined. **Georgia,** Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC).

Remark. This species was only known from the holotype collected in the High Caucasus. Here we report it for the first time from the Lesser Caucasus.

Wormaldia khizabavra Oláh & Vinçon, 2024

Material examined. **Georgia**, Kakhetia, above Khizabavra, brook, 1000m, 41.8829°N, 46.2585° E, 21.IV.2024, leg. Gilles Vinçon (4 males, OPC).

Wormaldia kintrisha Oláh & Vinçon, sp. nov.

(Figures 11–16, Photos 7–9)

Material examined. Holotype: **Georgia,** Adjara, Kintrishi, torrent and brooklets, 1040m, 41.733°N, 42.082°E, 29.IV.2024, leg. Gilles Vin

çon (1 male, OPC). Paratypes: Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.7476°N, 42.0951°E, 29.VI.–13.VII.2018, leg. GGBC members (6 males, 6 females, IZISUT; 6 males, 2 females; OPC).

Diagnosis. This new species having tapering harpago and a single stout spine in the endotheca belongs to the *Wormaldia bulgarica* species complex of the *Wormaldia triangulifera* species group. According to the *Wormaldia* speciation trait, that is the lateral profile of the head of segment X this new species is similar to *Wormaldia varjanulia* Oláh & Vinçon, 2024, but differs by the unique clavate head of cerci, the very deep and wide subapical dorsal excision in the lateral profile of segment X, the pointed anterad turning anterior corner of head of segment X as well as by the single, not double stout endothecal spine. We have recorded some slight variation in the lateral profile of segment X head of the examined twelve males.

Description. Male (in alcohol). Unusually large castanean brown animal. Sclerites medium brown, setal warts both on head and thorax and legs brown. Maxillary palp formula is I-II-IV-III-V. Forewing length 10 mm. Spur formula is 244.

Male genitalia. Tergite VIII with very deep and wide mesal excision on the apical margin with pronounced quadratic lateral lobes. Lateral profile of segment X characterized by short anterad pointed head, very deep subapical concavity and by straight basal region. Cerci with unique clavate apex in dorsal view. Harpago straight tapering with downward turning apex, slightly longer than coxopodite. Phallic organ with a single large straight stout accompanied by a small cluster of small and short mirror spines as well as by some longer and slender spines.

Etymology. Species name was coined from the type locality, a noun in apposition.

Wormaldia kumanskii Oláh & Chvojka, 2019

Material examined. **Georgia,** Samtskhe-Javakheti, Zeda Vardzia, nice brook and spring, 1410m, 41.383°N, 43.258°E, 25.IV.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Adjara, Kintrishi, nice torrent with mosses, 700m, 41.7385°N, 42.01°E, 29.IV.2024, leg. Gilles Vinçon (1 male, 1 female, in copula; OPC). Georgia, Adjara, Mtirala National Park, nice torrent, 330m, 41.6762°N, 41.8707°E, 30.IV.2024, leg. Gilles Vinçon (5 males, OPC). Georgia, Adjara, Kvatia, spring, 41.57335°N, 42.41838°E, 1.V.2024, leg. A. Memishishi (2 males, 1 female; IZISUT). Georgia, Adjara, Varjanauli, spring, 41.788°N, 41.9629°E, 29.IV.2024, leg. A. Memishishi (2 males, IZISUT). Georgia, Adjara, Dunga, waterfall, 41.47544°N, 41.85622°E, 29.IV.2024, leg. A. Memishishi (2 males, 1 female; IZISUT). Georgia, Adjara, Murala, spring, 41.6831°N, 41.8442° E, 29.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Gouria, road to Bakhmaro, nice brook and spring, 1780m, 41.8818°N, 42.3567°E, 10.VIII.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Adjara, Goderdzi Pass, after Beshumi Botanic Garden, brook and spring, 1970m, 41.6216°N, 42.5383°E, 7.VIII.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI.–13.VII.2018, leg. GGBC members et al. (3 males, 6 females; OPC).

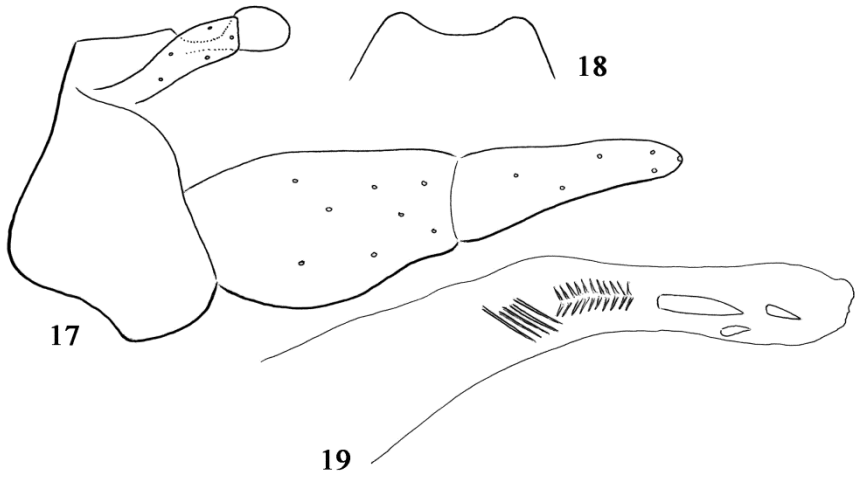
Wormaldia omala Oláh & Vinçon, sp. nov.

(Figures 17–19, Photos 9–10)

Material examined. Holotype: **Georgia**, Kakheti, road to Omalo, nice brook under cascade, 1500m, 42.2373°N, 45.4921°E, 5.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Its tapering harpago relates it to the *Wormaldia triangulifera* species group, and having three endothecal stout spines it belongs the *W. khourmai* species complex. Most close to *Wormaldia felkora* sp. nov. but differs by the longer and roundedhead, shorter and deeper subapical dorsal excision on segment X as well as by the shallow, wide not deep and narrow dorsoapical excision of segment VIII.

Description. Male (in alcohol). Large castanean brown animal. Sclerites medium brown, se-



Figures 17–19. *Wormaldia omala* sp. nov. Holotype male: 17 = genitalia in left lateral view; 18 = tergite VIII in dorsal view; 19 = phallic organ in left lateral view.

setal warts both on head and thorax and legs brown. Maxillary palp formula is I-II-IV-III-V. Forewing length 7 mm. Spur formula is 244.

Male genitalia. Tergite VIII with very deep and wide mesal excision on the apical margin with pronounced lateral lobes. Lateral profile of segment X characterized by semi-circular head, pronounced subapical concavity and by straight basal region. Cerci with downward oblique truncated rounded apex. Harpago straight tapering and slightly shorter than coxopodite. Phallic organ with one large straight stout and two almost equally sized slender curving stout spines accompanied by a small cluster of small and short mirror spines (spines arranged in two lines) as well as by some longer and slender spines.

Etymology. Species name was coined from the type locality, a noun in apposition.

Wormaldia sima Oláh & Chvojka, 2019

Wormaldia holaga Oláh & Manko, 2020: Oláh & Vinçon 2024:3. Georgia, Mingrelia - High Svanetia, Markhi Valley, brooklet, 1980m, 43.0796°N, 42.231°E, and spring, 2030m, 43.081°N, 42.231°E, 29.IX.2022, leg. Gilles Vinçon (3 males, OPC). Misidentification.

Material examined. Georgia, Mingrelia-High Svanetia, Markhi Valley, brooklet, 1980m, 43.079°N, 42.231°E, and spring, 2030m, 43.081° N, 42.231°E, 29.IX.2022, leg. Gilles Vinçon (3 males, OPC). Georgia, High Svanetie, above Mestia, brook and springs above the fish farm in construction, 1550m, 43.0477°N, 42.8091°E, 3.V. 2024, leg. Gilles Vinçon (11 males, OPC). Georgia, Mtskheta-Mtianeti, bellow Tsinamkhari, nice spring and brook, 1200m, 42.3267°N, 44.6469°E, 22.IV.2024, leg. Gilles Vinçon (4 males, OPC). Georgia, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, torrent above cascade, 2400m, 42.7°N, 42.6455°E, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

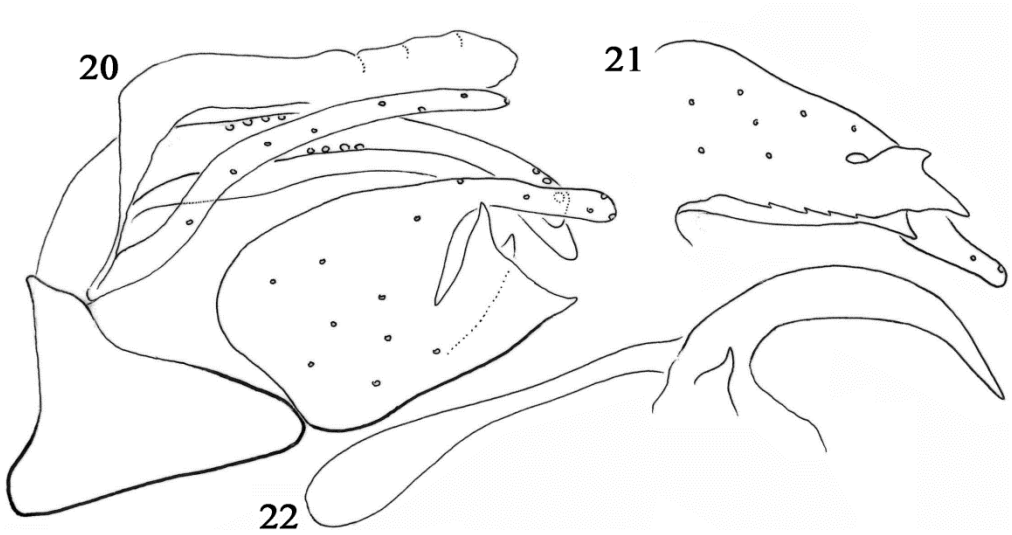
Remarks. The endothecal spine pattern of *W. sima* Oláh & Chvojka, 2019 and *W. holaga* Oláh & Manko, 2020 is very similar, almost identical. However, the lateral profile of the head of segment X is distinctly divergent if it is compared carefully.

Psychomyiidae Walker, 1852

Lype phaeopa Stephens, 1836

Material examined. **Georgia**, Adjara, Mirveti, waterfall, 41.53056°N, 41.71035°E, 30.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Remark. This is the first report from Georgia.



Figures 20–22. *Tinodes doberad* sp. nov. Holotype male: 20 = genitalia in left lateral view; 21 = left gonopod in ventral view; 22 = basal plate of gonopods in left lateral view.

Tinodes cheitani Schmid, 1959

Material examined. **Georgia**, Samegrelo – Zemo Svaneti, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Racha Lechkhumi and Lower Svaneti, Rachka, spring, 500m, 42.54357°N, 42.64466°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Racha-Lechkhumi and Lower Svaneti, Uravi, spring, 1000m, 42.65771°N, 43.29736°E, 26.IV. 2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Mtskheta-Mtianeti, Jinvali, Qalilo, 950m, 42.30445°N, 44.86915°E, 25.IV.2024, leg. A. Memishishi (2 males, IZISUT). Georgia, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (2 males, OPC). Georgia, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Tinodes difficilis Martynov, 1927

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Babili, spring, 790m, 42.79156°N, 42.74598°E, 27.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Adjara, Kintrishi, spring, 410m, 41.77359°N, 41. 965029°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44’36.3336, E42°4’54.4296, 24. VIII.–7.IX.2018, leg. GGBC members (1 male, IZISUT).

Tinodes doberad Oláh & Memishishi, sp. nov.

(Figures 20–22, Photo 35)

*Material examined***.** Holotype: **Georgia**, Samegrelo – Zemo Svaneti, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, OPC).

Diagnosis. This new species has resemblance to *Tinodes janssensi* Jaquemart, 1957 described from Greece, but differs by different pattern of megasetae on paraproct; by both the lateral and ventral shape of apicoventral plate of gonopod as well as by the location of basal spine on the basal plate of gonopod.

Description. Small medium brown animal. Sclerites medium brown, setal warts both on head and thorax lighter. Grooves are dark, cranial areas are medium and warts are light brown. Maxillary

palp formula is I-IV-III-II-V, second segment is almost as long as the fifth. Forewing length 5 mm.

Male genitalia. Segment IX represented by tergite and sternite; tergite elongated and roofing directly the dorsal paraproctal processes and the phallic apparatus; the triangular sternite with produced ventroproximal and ventrodistal angles; dorsoapical angle obscure due to forming the fulcrum complex where it meets with tergite IX, cerci and paraproct as well as the median bridge providing sclerotized connection between phallic apparatus and the sternite IX. Vestigial membranous segment X used to fuse to the tergum IX in *Tinodes*, poorly discernible. Cerci setose elongated as usual nearly equal rod-shaped, bending basad. Paraproct is represented by a pair of obtuse-headed dorsal paraproctal processes longer than cerci, arching horizontal in lateral view with basal part turning to the fulcrum; armed with megasetae with well-developed alveoli dorsad on apex, ventrad on midway and slightly basad on dorsad. Gonopods the largest genital element composed of the rounded coxopodite with apicodorsal fat digitiform elongation and apicoventral quadrangular plate of diverging pointed apical corners; harpago indiscernible, its possible vestigium is the mesal ridge of the plate; the basal plate of gonopods forming long clavate anterior apodeme and a pair of arching spine-like posterior processes with an additional short spine located basad. Simple rod-like phallic apparatus located below and between the paraproctal processes.

Etymology. Species name was coined from the type locality, a noun in apposition.

Tinodes radzen **Oláh & Memishishi, sp. nov.**

(Figures 23–25, Photo 35)

Material examined. Holotype: **Georgia**, Samegrelo – Zemo Svaneti, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, OPC).

Diagnosis. This new species relates to *Tinodes nehirae* Sipahiler, 1992 but differs by the shape of both the apicodorsal and apicoventral processes of the gonopod as well as by the lateral profile of the basal plate of gonopods being more slender and suppled with an additional shorter spine.

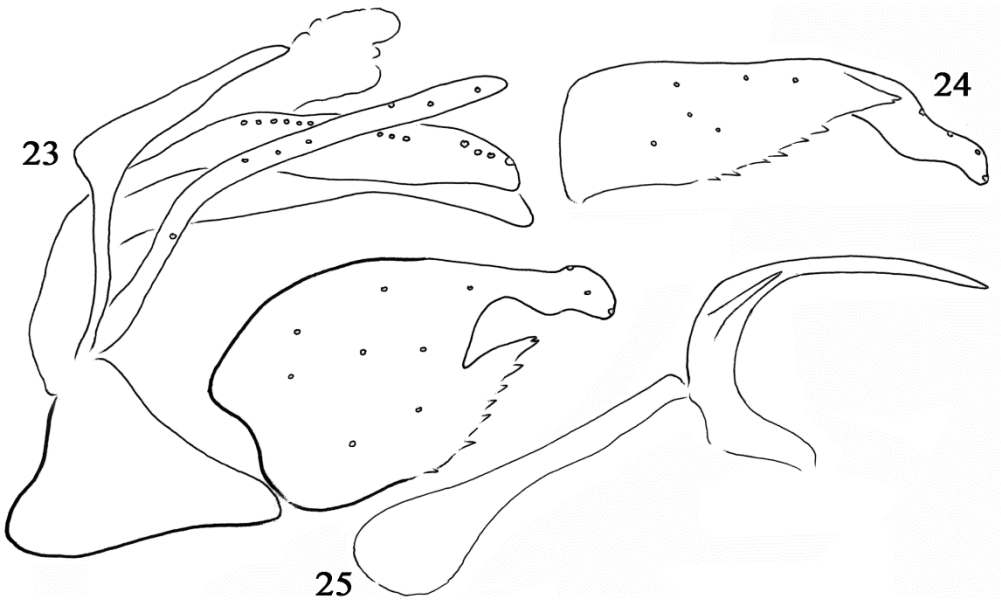
Description. Small yellowish brown animal. Sclerites from yellow to light brown, setal warts both on head and thorax lighter. Grooves are dark, cranial areas are medium and warts are light brown. Maxillary palp formula is I-IV-II-III-V. Forewing length 6 mm.

Male genitalia. Segment IX represented by tergite and sternite; tergite elongated and roofing directly the dorsal paraproctal processes and the phallic apparatus; the triangular sternite with produced ventroproximal and ventrodistal angles; dorsoapical angle obscure due to forming the fulcrum complex where it meets with tergite IX, cerci and paraproct as well as the median bridge providing sclerotized connection between phallic apparatus and the sternite IX. Vestigial membranous segment X used to fuse to the tergum IX in *Tinodes*, poorly discernible. Cerci setose elongated as usual nearly equal rod-shaped, bending basad. Paraproct is represented by a pair of obtuse-headed dorsal paraproctal processes little longer than cerci, arching horizontal in lateral view with basal part turning to the fulcrum; armed with megasetae with well-developed alveoli only on dorsum, shorter on apex longer on middle. Gonopods the largest genital element composed of the rounded coxopodite with apicodorsal fat irregular digitiform elongation and apicoventral narrow triangular plate with serrated apical margin; harpago indiscernible; the basal plate of gonopods forming long clavate anterior less sclerotized apodeme and a pair of arching spine-like posterior processes with additional short lateral spine. Simple rod-like phallic apparatus located below and between the paraproctal processes.

Etymology. Species name was coined from the type locality, a noun in apposition**.**

Tinodes turbulentus **Martynov, 1913**

Material examined. Holotype: **Georgia**, Adjara, Mirveti, waterfall, 160m, 41.53056°N, 41.71035°E, 30.IV.2024, leg. A. Memishishi (1 male, OPC).



Figures 23–25. *Tinodes radzen* sp. nov. Holotype male: 23 = genitalia in left lateral view; 24 = left gonopod in ventral view; 25 = basal plate of gonopods in left lateral view.

Tinodes verethraghna Schmid, 1959

Material examined. **Georgia,** Mtskheta-Mtianeti, Jinvali, Qalilo, 950m, 42.30445°N, 44.86915°E, 25.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Polycentropodidae Ulmer, 1903

During our present studies on the Caucasian Trichoptera we have found two surprisingly diverse species complexes in the *Plectrocnemia* genus of the Polycentropodidae family. The members of this ancient family are robust, medium-sized and heavy-bodied animals. Their broad-wings frequently marbled, mottled or irrorated in golden-yellow; that is speckled, covered with little spots. They are heavily calcarated animal (Greek polykentropodos: *poly*= many, *kentron*=spine, spur; *podos*=foot) with spur formula of 344.

This old family has a very unique character trait. They have short first and second segments of maxillary palp and the longer third segment is inserted mesally subapicad on the second segment. As a result, there is a mesoapical lobe, cushion or at least a small spiny process on the terminal of the second segment of the maxillary palp, an easy diagnostic character trait to identify easily any members of Polycentropodidae family. As a result, it can be recognised as an innovative variation of the maxillary palp character; a unique character state of caddisfly maxillary palp. Genera of the family have been distinguished most simply by wing venation character traits (Oláh & Johanson 2010).

Plectrocnemia Stephens, 1836

This genus is widely distributed with extremely diverse and highly modified genital morphology in the Western and Eastern Palaearctic, and Oriental Faunal Regions and present also in Australasia as well.

Plectrocnemia latissima new species complex

(Map 1)

Having shorter cerci, longer gonopod and hooded basodorsal lobe on gonopods this new species complex belongs to the *Plectrocnemia conspersa* species group. They have one pair of

Map 1. *Plectrocnemia latissima* species complex (10 species): *P. abraracourcix* Malicky, 1979, *P. arasbanica* sp. nov., *P. hajastanica* Mey & Jung, 1986, *P. intermedia* Martynov, 1916, *P. kartlia* sp. nov., *P. kopetdagha* sp. nov., *P. latissima* Martynov, 1913, *P. mashukana* sp. nov., *P. mingrelica* sp. nov., *P. svanetica* sp. nov.

long paramere with corrugated, notched terminal region. Incipient, sibling, or sister species of this new species complex are distinguished easily and distinctly by their adaptive speciation trait, by the subtly, but stably diverged and heavily sclerotized spine-like dorsal arm of paraproct. Four known and seven unknown, new, here described species comprise this complex, but many more is waiting to be discovered: *Plectrocnemia abraracourcix* Malicky, 1979, *P. arasbanica* sp. nov., *P. hajastanica* Mey & Jung, 1986, *P. intermedia* Martynov, 1916, *P. kartlia* sp. nov., *P. kopetdagha* sp. nov., *P. latissima* Martynov, 1913, *P. mashukana* sp. nov., *P. mingrelica* sp. nov., *P. svanetica* sp. nov., *P. ucnobi* sp. nov.

Plectrocnemia abraracourcix Malicky, 1979

(Map 1)

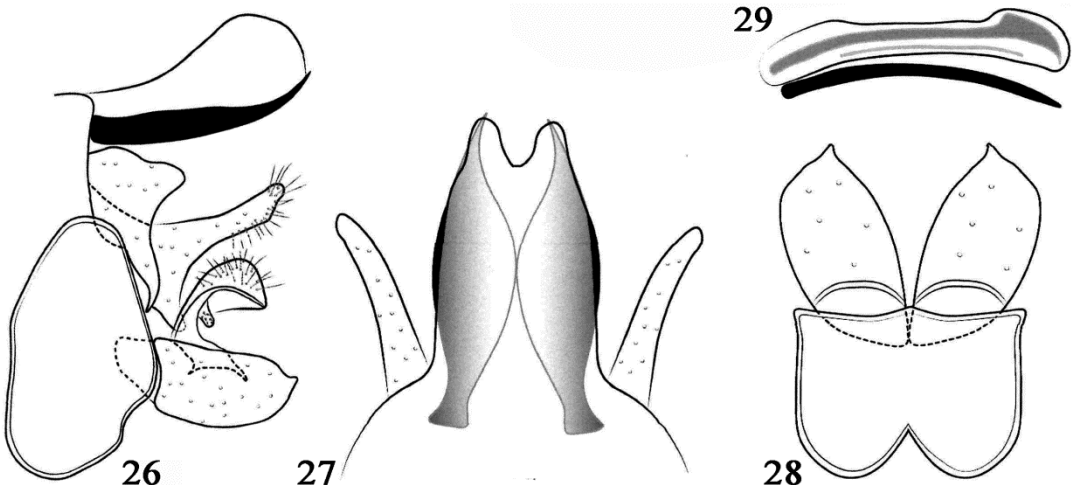
Plectrocnemia abraracourcix Malicky, 1979: 7: "Holotype ♂: Iran, Mazandaran, Weisar SSE Novshar, 1500m, 9.VI.1977, leg Holzschuh & Ressl, coll Malicky." "Close relationships to any other western Palaearctic species are not evident."

Plectrocnemia arasbaranica Ibrahimi & Oláh, sp. nov.

(Figures 26–29, Map 1)

Material examined. Holotype: **Iran,** East Azerbaijan, Elburz Mountains, Kaleybar, 38.8406797°N, 46.9986879°E, 1675m; 14.VI. 2022, leg. H. Ibrahimi (1 male, UPK). Paratypes: Iran, East Azerbaijan, Elburz Mountains, Kaleybar, 38.8406797°N, 46.9986879°E, 1675 m; 14.VI.2022; leg. H. Ibrahimi. (1 male, UPK, 1 male, OPC).

Diagnosis. This is a sibling of *Plectrocnemia latissima* complex. Most similar to *P. abraracourcix* Malicky, 1979 described from Iran, particularly its speciation trait, the heavily sclerotized dorsal arm of paraproct is almost identical, but differs with its low, not high lateral profile as well as by the mesad, not latera S-forming shape in dorsal view; the sclerites in aedeagus are differently shaped in the two species.



Figures 26–29. *Plectrocnemia arasbaranica* sp. nov. Holotype male: 26 = genitalia in left lateral view; 27 = genitalia in dorsal view; 28 = genitalia in ventral view; 29 = phallic organ in left lateral view.

Description. Medium-sized *Plectrocnemia* species of light brown body and wing colour, with forewing length of 11 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX subovoid, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX small, indistinct, vertically elongated giving supports to the membranous segment X that is long, with deeply excised apical margin in dorsal view. Cerci are setose triangular structures; their lateral ending with narrower lobe. Paraproct bipartite; its dorsal arms flattened in coronal plane, very broad in dorsal view; its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate and broad based setose process and a heavily sclerotized ventral arm directed downward deep. Ventral arm of gonopods medium long, elongated ovoid in ventral view pointed mesoapicad; basodorsal part of gonopod with rounded dorsoapical and straight ventral margins. Phallic organ supplied with one pair of long parameres; both parameres slightly downward curving; aedeagus with a more pigmented fused mesal rod, possibly the partially sclerotized ductus ejaculatorius with upward broadened apical head representing the phallotremmal sclerites; both the sclerotized mesal rod of aedeagus and the corrugated parameres are embedded in membranous matrix.

Etymology. Coined from the name of locus typicus, a noun in apposition.

Plectrocnemia hajastanica **Mey & Jung, 1986**

(Map 1)

Plectrocnemia hajastanica Mey & Jung, 1986:269–270: "Holotypus ♂: Armenien, Abojanski rayon, Asat bei Chuts, Weg von Garni, 3.VII.1985, leg Jung." "*P. hajastanica* n. sp. ist die Schwesterart von *P. abraracourcix* Malicky."

Plectrocnemia intermedia **Martynov, 1916**

(Map 1)

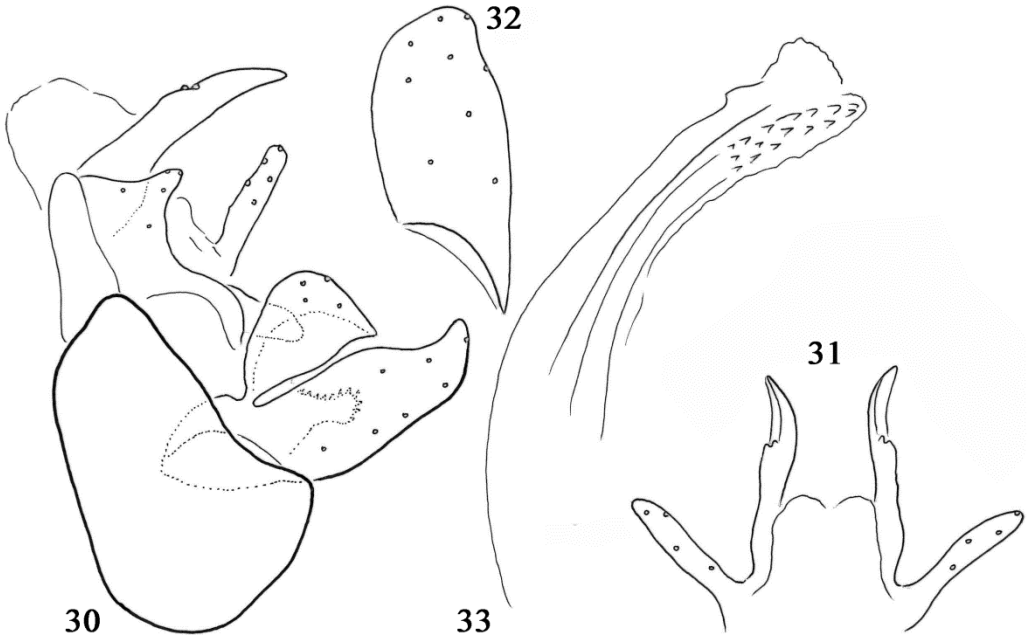
Plectrocnemia intermedia Martynov, 1916:170–173: "Crimea. Closely allied to *Pl. latissima* Mart. and *Pl. minima* Klp.

Plectrocnemia kartlia **Oláh & Vinçon, sp. nov.**

(Figures 30–33, Map 1)

Plectrocnemia latissima Martynov, 1913: Oláh *et al.* 2020:18. **Misidentification**.

Material examined. Holotype: **Georgia,** Kvemo Kartli region, Aiazmi, Zhamindzori Stream



Figures 30–33. *Plectrocnemia kartlia* sp. nov. Holotype male: 30 = genitalia in left lateral view; 31 = genitalia in dorsal view; 32 = left gonopod in ventral view; 33 = phallic organ in left lateral view.

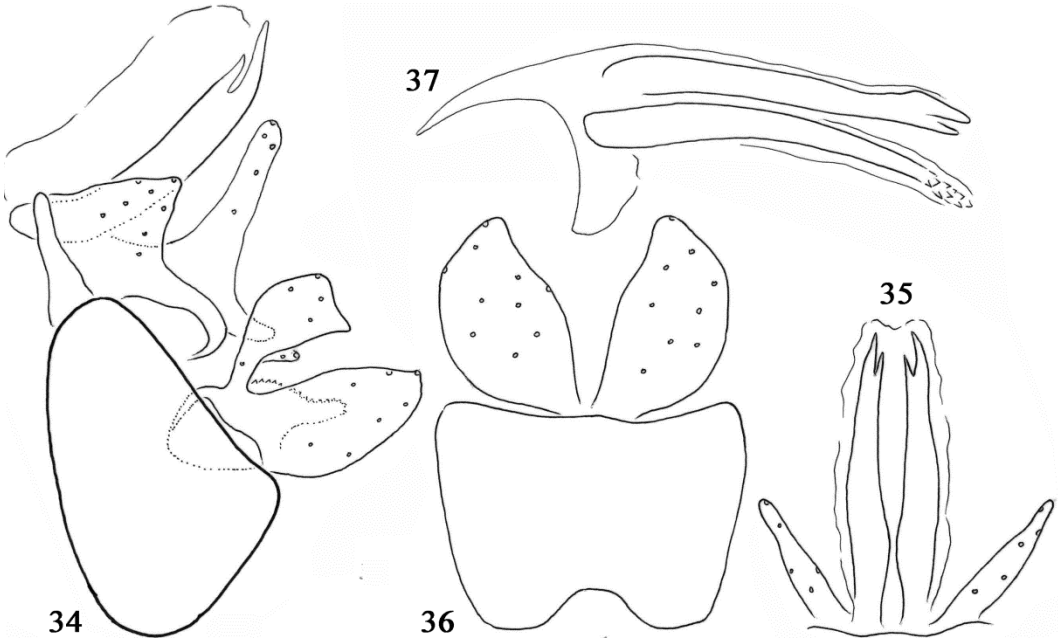
above (S of) the village, 1755m, N41°33.579' E43°54.282', 15.VII.2019, leg. T. Kovács, D. Murányi & G. Vinçon (1 male, OPC).

Diagnosis. This is a sibling of *Plectrocnemia latissima* complex. Most similar to *P. svanetica* sp. nov., particularly its speciation trait, the heavily sclerotized dorsal arm of paraproct is almost identical, differs only by the smooth, not irregularly corrugated spoon-like terminal excavation. There are distinct divergences in the lateral shape of cerci and the basodorsal arm of gonopod. Cerci with digitate, not rounded apical margin. Basodorsal arm of gonopod rounded dorsad, not straight.

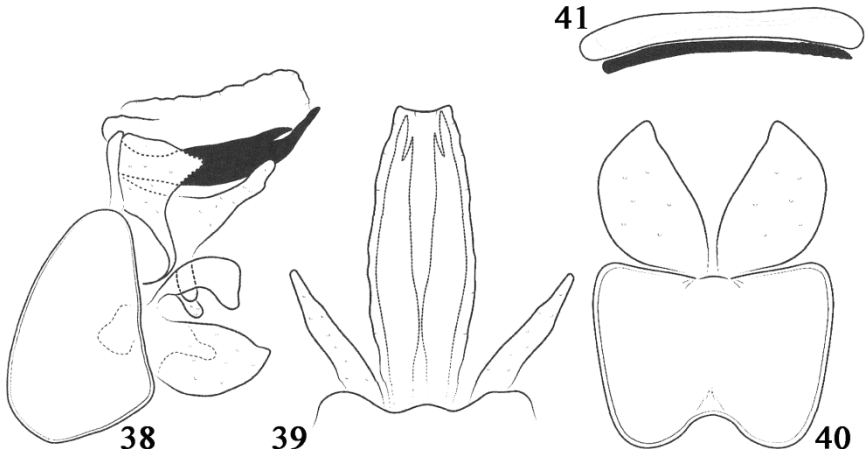
Description. Medium-sized *Plectrocnemia* species of light brown body and wing colour with forewing length of 11 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX subtriangular, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX small vertically elongated giving supports to the membranous segment X that is short, quadrangular both in lateral and dorsal profiles. Cerci are small setose sharp triangular structures; its lateral ending almost digitate. Paraproct bipartite; its dorsal arms sagittally flattened, very high (broad) in lateral view, its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate setose process and a heavily sclerotized ventral arm directed downward deep. Ventral arm of gonopods medium long, elongated ovoid in ventral view with rounded apical margin; basodorsal part of gonopod with rounded dorsal and straight apical margins. Phallic organ supplied with one pair of parameres corrugated on its terminal third, both parameres slightly downward curving; aedeagus with a more pigmented fused mesal rod, possibly the partially sclerotized ductus ejaculatorius with upward broadened apical head representing the phallotremmal sclerites; both the sclerotized mesal rod of aedeagus and the corrugated parameres are embedded in membranous matrix.

Etymology. Coined from the name of locus typicus, a noun in apposition.



Figures 34–37. *Plectrocnemia kopetdagha* sp. nov. Holotype male: 34 = genitalia in left lateral view; 35 = genitalia in dorsal view; 36 = gonopods in ventral view; 37 = phallic organ in left lateral view.



Figures 38–41. *Plectrocnemia kopetdagha* sp. nov. Holotype male, drawn in the style of *P. arasbaranica*: 38 = genitalia in left lateral view; 39 = genitalia in dorsal view; 40 = gonopods in ventral view; 41 = phallic organ in left lateral view.

Plectrocnemia kopetdagha Oláh & Ibrahimi, sp. nov.

(Figures 34–41, Map 1)

Plectrocnemia abraracourcix Malicky, 1979: Oláh 1994:282. "Turkmenistan, Kopet-Dagh Mts., 10 km Aidere, 27.VI.1992 leg. Z. Varga (1 male, 2 females; OPC). **Misidentification**.

*Material examined***.** Holotype: **Turkmenistan,** Kopet-Dagh Mts., Aldere, 27.VI.1992, light leg. Z. Varga (1 male, OPC). The taxonomic status of the 2 associated females is uncertain.

Diagnosis. This is a sibling of *Plectrocnemia latissima* complex, the most eastern member of the complex. Most similar to *P. ucnobi* sp. nov.,

a Malicky drawn species of unknown origin and misidentified as *P. latissima*. However, *P. copet-dagha* sp. nov. differs from *P. ucnobi* sp. nov. by the different lateral and dorsal shape of the dorsal arm. Dorsal arm of paraproct upward arching in lateral view with visible bifid apex, not downward arching and with distinct visibility of its bifid apex; in dorsal view the smaller spine of the bifid apex located mesad, subapicad, not laterad and middle.

Description. Large-sized *Plectrocnemia* species of light brown body and wing colour, with forewing length of 12 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX subtriangular, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX small vertically elongated giving supports to the membranous segment X that is elongated, as long as the dorsal arm of paraproct, subquadrangular both in lateral and dorsal profiles. Cerci are small setose triangular structures; almost right-angled. Paraproct bipartite; its dorsal arms sagittally flattened, high (broad) in lateral view, characterized by its bifid terminal well visible both in lateral and dorsal views; its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate broad-based setose process and a heavily sclerotized ventral arm directed downward deep. Ventral arm of gonopods short, narrowing apicad in ventral view; basodorsal part of gonopod with rounded dorsal and straight, slightly concave, apical margins. Phallic organ supplied with one pair of parameres corrugated on its very end, both parameres slightly downward curving; aedeagus with a more pigmented fused mesal rod, possibly the partially sclerotized ductus ejaculatorius with upward broadened apical head representing the phallotremmal sclerites; both the sclerotized mesal rod of aedeagus and the corrugated parameres are embedded in membranous matrix.

Etymology. Coined from the name of locus typicus, a noun in apposition

Plectrocnemia latissima **Martynov, 1913**

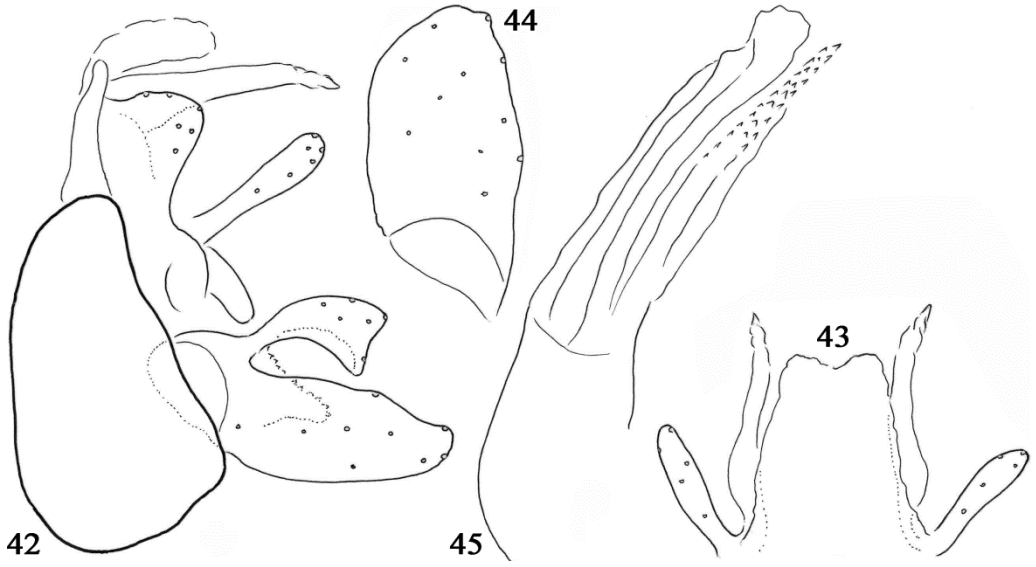
(Map 1)

Plectrocnemia latissima Martynov, 1913:36–37: "1♂. Georgi**a** Stream at Sakaraulo, 24.VI.1911. 1♂. Lagodekhi, 10.X.1896. Mlokosevich."

Material examined. **Georgia**, Kakhetia, Lagodekhi National Park, above Khizabavra, Ninoskhevi valley, spring, 1250m, 41.8852°N, 46.2652° E, 13.V.2023, leg. Gilles Vinçon (1 male, OPC). Georgia, Mtskheta-Mtianeti, above Ukanamkhari, nice spring and brook, 1680–1730m, 42.324°N, 44.607°E, 31.VIII.2023, leg. Gilles Vinçon (1 male, OPC).

Remark. The nominate species of the *Plectrocnemia latissima* complex. This Caucasian species was described by two males, both collected in Kakhetia. One specimen was collected by Martynov himself in 1911 from Sakaraulo Mts. The other specimen was collected in 1896 by Mlokosevich from Lagodekhi. Martynov, as usual, supplied his species description with drawings of very high quality. According to his description and drawings the lateral profile of dorsal arm of paraproct is very slender, almost spine-like.

Recently we have collected genuine *P. latissima* specimens in Kakhetia, from the region of the locus typicus as well as from Mtskheta-Mtianeti having exactly the same genital structure, including the slender, spine-like lateral profile of paraproct as presented by Martynov's original drawings (Oláh & Vinçon 2024). In Malicky's atlases (1983, 2004) there are several drawings of a specimen without any locality information given, under the name of *P. latissima* however, with completely different lateral and dorsal profile of dorsal arm of paraproct. On his drawings the lateral profile of the dorsal arm of the paraproct is depicted as being very broad and spoon-shaped, rather than slender spine-like so clearly characterising the genitalia of genuine *P. latissima*. Therefore, Malicky's specimen is misidentified and is not *P. latissima*. It is described here as a new species, *Plectrocnemia ucnobi* Oláh, sp. nov.



Figures 42–45. *Plectrocnemia mashukana* sp. nov. Holotype male: 42 = genitalia in left lateral view; 43 = genitalia in dorsal view; 44 = left gonopod in ventral view; 45 = phallic organ in left lateral view.

***Plectrocnemia mashukana* Oláh, sp. nov.**

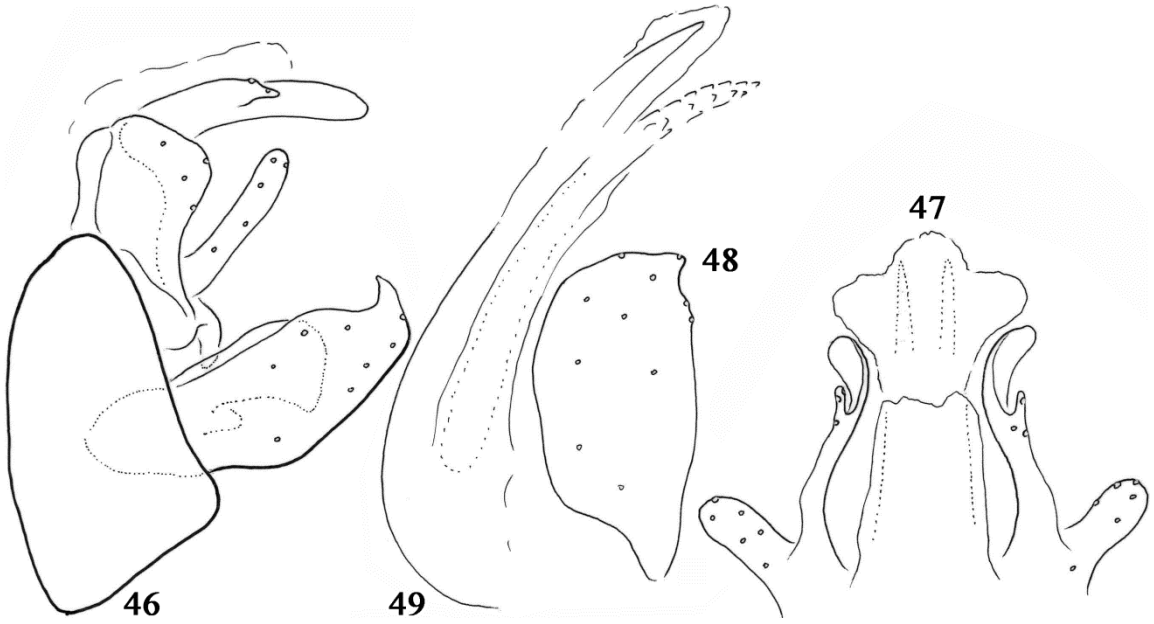
(Figures 42–45, Map 1)

Material examined. Holotype: **Russia,** Stavropol Krai, Pyatigorsk, Beshtau Mts. (Five peaks), at Mashuk Mt., 44.05°N, 43.09°E, 21.VI.1924, leg. Rjabov (1 male, OPC).

Diagnosis. This is a sibling in the *Plectrocnemia latissima* complex, the most north western member known of the species complex. Most similar to the nominate species of the complex, *P. latissima* Martynov, 1913. Particularly its speciation trait, the heavily sclerotized dorsal arm of paraproct is almost identical, but differs in a closer examination by the irregularly corrugated and obliquely notched, not smooth terminal tip of this titillating organ. It certainly has importance for female choice whether the surface of the terminal region on the titillating organ is smooth or harsh, scabrous due to the corrugated notched surface texture.

Description. Medium-sized *Plectrocnemia* species of light brown body and wing colour, with forewing length of 11 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX rounded subtriangular, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX is small vertically elongated giving supports to the membranous segment X that is shorter than the dorsal arm of paraproct. Cerci are small setose rounded triangular structures. Paraproct bipartite; its dorsal arms stout spine-like in lateral view, slightly S-shaped in dorsal view; its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate setose process and a heavily sclerotized ventral arm directed downward deep. Ventral arm of gonopods medium long, elongated ovoid in ventral view with rounded apical margin; basodorsal part of gonopod with rounded dorsal and slightly concave apical margin. Phallic organ supplied with one pair of parameres corrugated from its middle, both parameres slightly downward curving; aedeagus with a more pigmented fused mesal rod, possibly the partially sclerotized ductus ejaculatorius with upward broadened apical head representing the phallotremmal sclerites; both the sclerotized mesal rod of aedeagus and the corrugated parameres are embedded in membranous matrix.



Figures 46–49. *Plectrocnemia mingrelica* sp. nov. Holotype male: 46 = genitalia in left lateral view; 47 = genitalia in dorsal view; 48 = left gonopod in ventral view; 49 = phallic organ in left lateral view.

Etymology. Coined from the name of the locus typicus, a noun in apposition. Mashuk Mountain is near Pyatigorsk (Five Peaks) not far from the Beshtau Mountains where Mikhail Lermontov had his famous duel with Nikolai Martynov.

Plectrocnemia mingrelica **Oláh & Vinçon sp. nov.**

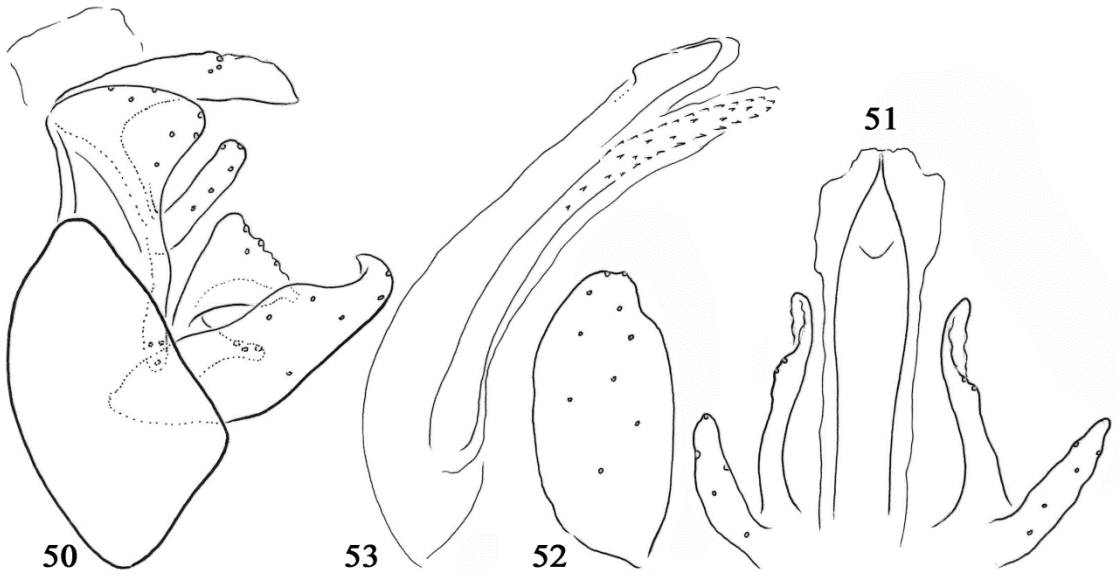
(Figures 46–49, Map 1, Photos 12–13)

Material examined. Holotype: **Georgia**, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Most similar to *Plectrocnemia svanetica* sp. nov., but differs by the presence of digitate setose process on the dorsal arm of paraproct as well as by the rounded, not straight truncated apical margin of the basodorsal arm of gonopod. The slightly sclerotized mesal structure in the head of membranous aedeagus discernible as a spine-like distinctly doubled, not a single fused mesal elongation.

Description. Large-sized *Plectrocnemia* species of light brown body and wing colour with forewing length of 12 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX subtriangular, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX small vertically elongated giving support to the membranous segment X with elongated quadrangular lateral and dorsal profile. Cerci are large rounded triangular setose structure. Paraproct bipartite; its dorsal arms sagittally flattened, very high (broad) in lateral view its ventral fusion forming part of the phallocrypt giving both dorsal and ventral supports for the phallic organ, its ventral arm directed downward deep; dorsal arm supplied with a small, but defined digitate and setose process subapicad, visible both in lateral and dorsal views. Ventral arm of gonopods short, elongated ovoid in ventral view with small apicomesal lobe; basodorsal part of gonopod with rounded apical margin. Phallic organ supplied with one pair of parameres corrugated on its apical region, both parameres slightly downward



Figures 50–53. *Plectrocnemia svanetica* sp. nov. Holotype male: 50 = genitalia in left lateral view; 51 = genitalia in dorsal view; 52 = left gonopod in ventral view; 53 = phallic organ in left lateral view.

curving; aedeagus less pigmented with an embedded pair of spine-like rod just discernible; both the less sclerotized mesal part of aedeagus and the corrugated parameres are hidden in membranous matrix.

Etymology. Coined from the name of the locus typicus, a noun in apposition.

Plectrocnemia svanetica Oláh & Vinçon, sp. nov.

(Figures 50–53, Map 1, Photos 14–15)

Material examined. Holotype: **Georgia,** High Svanetie, above Mestia, brook and springs above the fish farm in construction, 1550m, 43.0477°N, 42.8091°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This is a sibling of *Plectrocnemia latissima* Martynov, 1913. Has resemblance to *P. mingrelica* sp. nov. but differs by the absence, not presence of digitate setose process on the dorsal arm of paraproct as well as by the straight truncated, not rounded apical margin of the basodorsal arm of gonopod. The slightly sclerotized mesal structure in the head of membranous aedeagus discernible as a single fused mesal elongation not a distinct pair of doubled spine-like structure.

Description. Large-sized *Plectrocnemia* species of light brown body and wing colour with forewing length of 13 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX subtriangular, dominating over the entire genitalia articulating and holding the periphallic organs of fused cerci-paraproct complex and the gonopods. Tergite IX small vertically elongated giving support to the membranous segment X with quadrangular lateral and dorsal profile. Cerci are large triangular setose structures with a long digitate highly setose ventral process. Paraproct bipartite; its dorsal arms sagittally flattened, very high (broad) in lateral view its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate setose process, the heavily sclerotized ventral arm directed downward deep. Ventral arm of gonopods short, elongated ovoid in ventral view with rounded apical margin; basodorsal part of gonopod with straight truncated apical margin. Phallic organ supplied with one pair of parameres corrugated from middle, both parameres slightly downward curving; aedeagus with a more pigmented

fused mesal rod, possibly the partially sclerotized ductus ejaculatorius with upward broadened apical head; both the sclerotized mesal rod of aedeagus and the corrugated parameres are embedded in membranous matrix.

Etymology. Coined from the name of locus typicus, a noun in apposition.

Plectrocnemia ucnobi Oláh, sp. nov.

Plectrocnemia latissima Martynov, 1913: Malicky 1983:85. Drawings, original figures without any locality information about the specimen drawn. **Misidentification**.

Plectrocnemia latissima Martynov, 1913: Malicky 2004:102. Drawings, original figures without any locality information about the specimen drawn. **Misidentification**.

*Material***. Holotype.** Malicky 1983: 85, 2004: 102. Drawings from a Caucasian specimen of unknown locality, deposited in Malicky's Private Collection (1 male, MPC).

Diagnosis. This species presented by Malicky (1983, 2004) as *Plectrocnemia latissima* Martynov, 1913 without any collecting data was already questioned and remarked (Oláh & Vinçon 2024). Because the dorsal arm of the paraproct is spine-like, that is slender in Martynov's original species description and drawing, and on a real *P. latissima* specimen collected newly nearby the locus typicus, not broad and not with an additional subapical spine visible only in dorsal view on the drawing. This additional subapical spine on the dorsal arm of paraproct is unique, not present on any of the other members of the species complex.

Description. Sternite IX subtriangular, tergite IX very short (narrow) long digitiform and less sclerotized. Segment X membranous elongated. Cerci almost sharp triangular in lateral view. Paraproct bipartite; its dorsal arms sagittally flattened, very high (broad) in lateral view its ventral fusion forming part of the phallocrypt giving membranous ventral supports for the phallic organ with a digitate setose process, the heavily sclerotized ventral arm directed downward deep. In lateral view basodorsal process of gonopod with truncated apical margin; ventral arm of gonopod short and broad. Phallic organ with a pair of long parameres; its apical region corrugated notched.

Etymology. "*ucnobi*" unknown in Georgian language referring to the drawn specimen without collecting details.

Plectrocnemia zekaria new species complex

(Map 2)

Having shorter cerci, longer gonopod and hooded basodorsal lobe on gonopods this new species complex belongs to the *Plectrocnemia conspersa* species group. They have two pairs of parameres with corrugated, notched terminal region. Incipient, sibling, or sister species of this new species complex is distinguished easily and distinctly by their adaptive speciation trait, by the subtly, but stably diverged less sclerotized abbreviated arm of paraproct.

Plectrocnemia gomista Oláh & Vinçon, sp. nov.

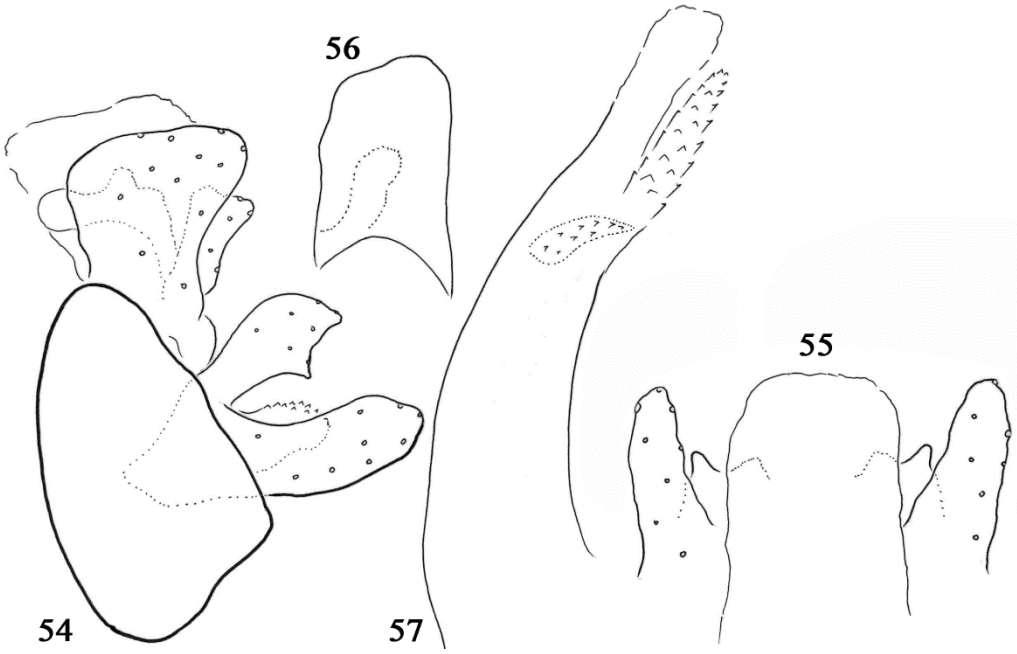
(Figures 54–57, Map 2, Photos 16–17)

*Material examined***. Georgia,** Adjara, above Gomismta, nice brook, 2120–2150m, 41.8108°N, 42.1821°E, 11.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Close both to *Plectrocnemia rizeiensis* Sipahiler, 1987 described from Turkey (near Rize) and to *Plectrocnemia zekaria* Oláh & Vinçon, 2024 described from Georgia, Imereti. However differs from both having dorsal arm of paraproct bilobed as well as two pairs of spines of endotheca differently shaped and corrugated parameres present on phallic organ not lacking.

Description. Small-sized *Plectrocnemia* species of light brown, almost yellowish body and wing colour with forewing length of 7 mm. Forewing densely covered with recumbent setae.

Male genitalia. In lateral view sternite IX rounded subtriangular, dominating over the entire



Figures 54–57. *Plectrocnemia gomista* sp. nov. Holotype male: 54 = genitalia in left lateral view; 55 = genitalia in dorsal view; 56 = left gonopod in ventral view; 57 = phallic organ in left lateral view.

genitalia articulating and holding the periphallic organs of cerci-paraproct fused complex and the gonopods. Tergite IX small vertically elongated giving support to the membranous segment X. Cerci large foliform. Paraproct bipartite vertically elongated its dorsal arms highly reduced forming a small bilobed structure, its ventral arm directed downward. Gonopods very short, subquadrangular in ventral view with rounded apical margin; its dorsobasal part with excised apical margin. Phallic organ supplied with two pairs of spine-like structures embedded in endotheca and a pair of free corrugated parameres just discernible, less pigmented and less sclerotized.

Etymology. Coined from the name of locus typicus, a noun in apposition.

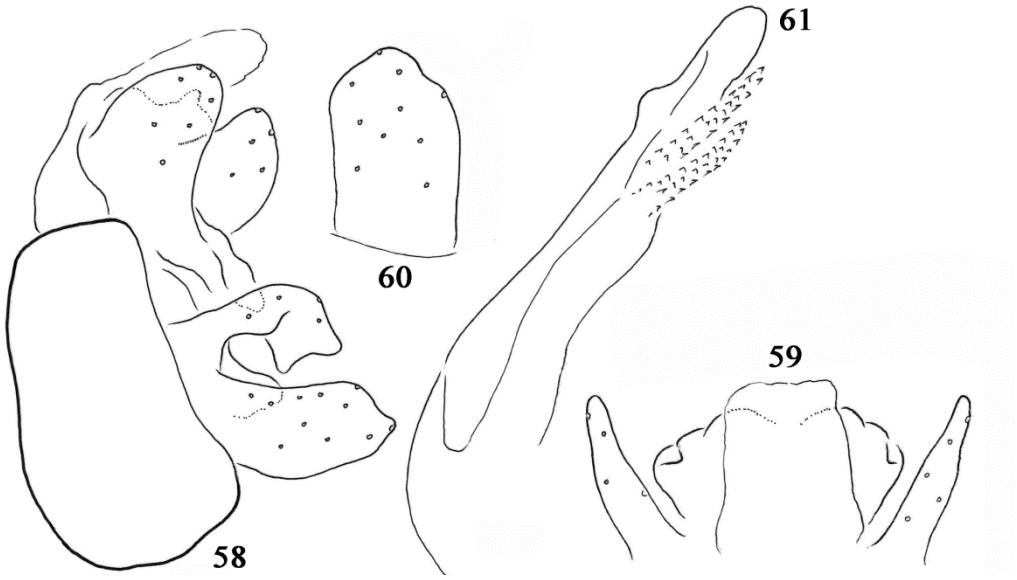
Plectrocnemia kintrisha Oláh & Memishishi, sp. nov.

(Figures 58–61, Map 2, Photos 7–8)

Material examined. Holotype: **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI.–13.VII. 2018, leg. GGBC members (1 male, OPC). Paratype: Georgia**,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 13.VII–27.VII. 2018, leg. GGBC members (1 male, IZISUT). Georgia**,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 24.VIII.–7.IX. 2018, leg. GGBC members (3 males, 1 female; OPC).

Diagnosis. Close to both *Plectrocnemia rizeiensis* Sipahiler, 1987 described from Turkey (near Rize) and to *Plectrocnemia zekaria* Oláh & Vinçon, 2024 described from Georgia, Imereti. However, differs from both by having the reduced and less sclerotized dorsal arm of paraproct just a rounded, superficially subdivided structure without any lobes just with only a small upward turning flap is present which difficult to discern.

Description. Small-sized *Plectrocnemia* species of light brown, almost yellowish body and wing colour, with forewing length of 8 mm. Forewing densely covered with recumbent setae.



Figures 58–61. *Plectrocnemia kintrisha* sp. nov. Holotype male: 58 = genitalia in left lateral view; 59 = genitalia in dorsal view; 60 = left gonopod in ventral view; 61 = phallic organ in left lateral view.

Map 2. *Plectrocnemia zekaria* species complex (4 species): *P. gomista* sp. nov., *P. kintrisha* sp. nov. *P. rizeiensis* Sipahiler, 1987, *P. zekaria* 2024.

Male genitalia. In lateral view sternite IX rounded subquadrangular, dominating over the entire genitalia articulating and holding the peri-phallic organs of cerci-paraproct fused complex and the gonopods. Tergite IX small indistinct and vertically elongated giving support to the membranous segment X, tergal and paraproctal complex. Cerci large foliform. Paraproct bipartite vertically elongated, its dorsal arms highly reduced forming a small rounded structure subdivided superficially, its ventral arm directed downward. Gonopods very short, subquadrangular in ventral view with rounded apical margin; its dorsobasal part with downward directed and excised apical margins. Phallic organ supplied with two pairs of spine-like corrugated parameres just discernible, less pigmented and less sclerotized.

Etymology. Coined from the name of locus typicus, a noun in apposition.

Plectrocnemia rizeiensis Sipahiler, 1987

(Map 2)

Plectrocnemia rizeiensis Sipahiler, 1987: "Holotype ♂: Türkiye, Rize, Ikizdere, Aşağı Vice Köyü, 19.VII. 1984. Paratype: Rize, Ikizdere, Çamhhemşin? Çat, 1250 m, (in light) 13.VII.1984 leg. and coll. F. Sipahiler." "This new specie is well characterized by the shape of the inferior and preanal appendages. It is somewhat related to *P. brevis* McL. and *P. kydon* Mal. (Malicky 1983:83), but the differences of the genitalia, especially the inferior appendages and the aedeagus distinguish this new species."

Material examined. Georgia, Samtskhe-Javakheti, above Utkisubani, nice spring, 1920m, 41.6748°N, 42.5691°E, 8.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Remark. First report from Georgia.

Plectrocnemia zekaria Oláh & Vinçon, 2024

(Map 2, Photos 26–29)

Material examined. **Georgia**, Samtskhe-Javakheti, above Utkisubani, nice spring, 1920m, 41.6748°N, 42.5691°E, 8.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Hydropsychidae Curtis, 1835

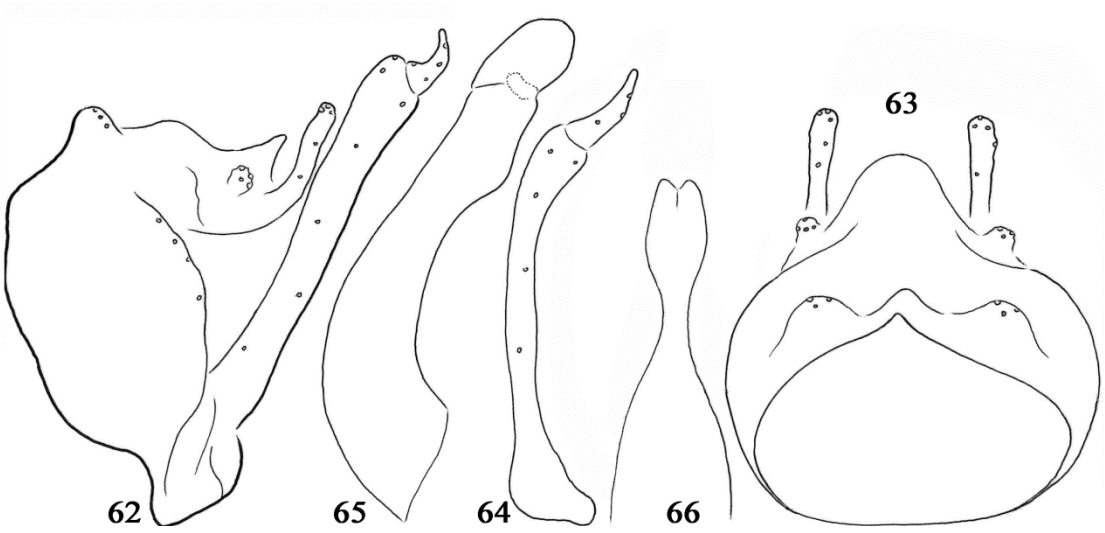
Diplectroninae Ulmer, 1951

Diplectrona georgica Oláh & Vinçon, 2020

Material examined. **Georgia**, Adjara, Chakhati, spring, 90m, 41.8791 41.91601, 29.IV. 2024, leg. A. Memishishi (8 males, 2 females; IZISUT). Georgia, Adjara, Dunga, waterfall, 880m, 41.47544°N, 41.85622°E, 30.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Adjara, Kintrishi, spring, 270m, 41.77359°N, 41.96808°E, 29.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Adjara, above Keda, brook, 430m, 41.5844°N, 41.964°E, 1.V.2024, leg. Gilles Vinçon (1 male, 9 females; OPC). Georgia, Adjara, Mtirala National Parc, nice brook, 160m, 41.697°N, 41.823°E, 30.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 15.VI. – 29.VI. 2018, leg. GGBC member (38 males, IZISUT; 9 males, OPC).

Diplectrona robusta Martynov, 1934

Material examined. **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Mingrelie-High Svanetia, dripping rocks, above Inguri lake, 590m, 42.8585°N, 42.0336°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Samegrelo – Zemo Svaneti, Debaradzeni, spring, 375m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Imereti, Khvereti, spring, 530m, 42.3740°N, 43.4378°E, 25.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Racha-Lechkhumi and Lower Svaneti, Babili, spring, 790m, 42.79156°N, 42.74598°E, 27.IV.2024, leg. A. Memishishi (5 males, 1 female; IZISUT). Georgia, Mingrelie-High Svanetia, South Tobari, brooklet and cas



Figures 62–66. *Cheumatopsyche busherica* sp. nov. Holotype male: 62 = genitalia in left lateral view; 63 = genitalia in dorsal view; 64 = left gonopod in ventral view; 65 = phallic organ in left lateral view; 66 = phallic organ in ventral view.

cade, 650m, 42.9571°N, 42.1952°E, 3.V.2024, leg. Gilles Vinçon (6 males, 8 females; OPC).

Hydropsychinae Curtis, 1835

***Cheumatopsyche* Wallengren, 1891**

***Cheumatopsyche busherica* Oláh, sp. nov.**

(Figures 62–66)

Cheumatopsyche flavellata Mey, 2004: Oláh 2010:79. **Misidentification**.

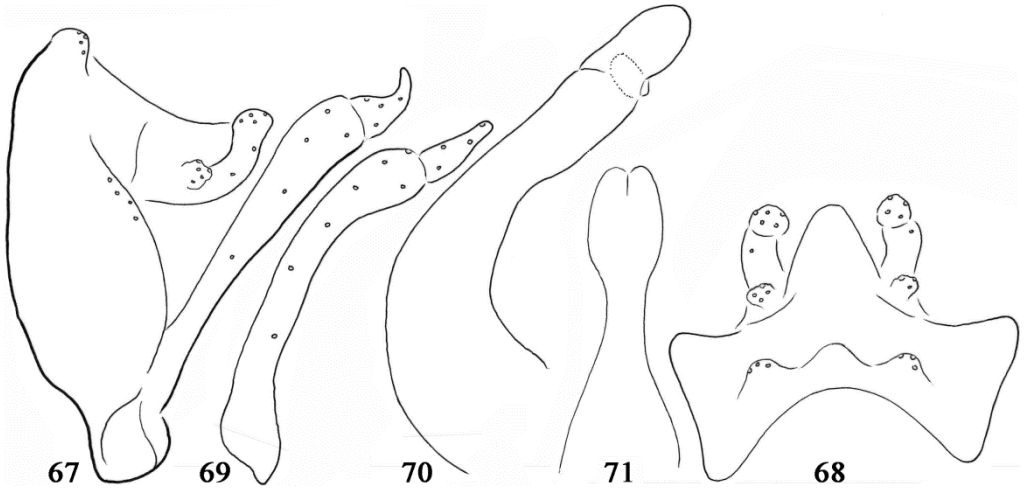
Material examined. **Iran**, Province Bushehr, 5 km S of Delvaz, 5−6.V.2001, leg. GY. Fábián (1 male, OPC). Paratypes: same as holotype (5 males, OPC, 5 males, HNHM).

Diagnosis. *Cheumatopsyche busherica* sp. nov., a species of *Cheumatopsyche lepida* species group was determined earlier by the first author (Oláh, 2004) as *C. flavellata* Mey, but having examined genuine comparative specimens from Georgia and East Turkey by fine phenomics, the specimens from Busher Province, Iran represent a new species with its extremely elongated apicoventral setose lobe as well as with the different lateral profile of phallic organ.

Description. Brown coloured small-sized species with forewing length of 7 mm; forewing without any discernible pattern.

Male genitalia. Abdominal segment IX fused annular, rather long; both anterior and posterior margin arciform, resulted in an extremely short dorsum and longer ventrum; posterior lobe above coxopodite less produced rounded and high; intersegmental depression between the ninth and tenth segments present, but low. Body of segment X longer than high; circular lateral setose area (cerci) in apical position; apicoventral setose lobe discernible both in lateral and dorsal views as a slender rather elongated obliquely upward turning structure; in dorsal view exhibits peculiar pattern of long digitate rod with very wide dorsal interlobular gap; unsetosed, smooth mesocaudal lobe very produced rounded in dorsal view. The basal segment of the gonopods almost equally wide and straight rod with only slightly dilated apical ending; harpago, the terminal segment broader basad and narrowing apicad both in lateral and ventral views. Phallic apparatus with rather robust phallotheca with ventro subapical keel; pair of endothecal sclerites well developed elongated ovoid.

Etymology. Coined from the name of the *locus typicus* of the holotype, a noun in apposition.



Figures 67–71. *Cheumatopsyche erzincana* sp. nov. Holotype male: 67 = genitalia in left lateral view; 68 = genitalia in dorsal view; 69 = left gonopod in ventral view; 70 = phallic organ in left lateral view; 71 = phallic organ in ventral view.

Cheumatopsyche erzincana Oláh, sp. nov.

(Figures 67–71)

Cheumatopsyche flavellata Mey, 2004: Oláh 2010: 79. **Misidentification**.

Material examined. Holotype: **Turkey**, vil. Erzincan Ganiefendi, Ciflik Köyü 1200m, 27−28.VI.1996, leg. A. Podlussány (1 male, OPC). Paratypes: same as holotype (3 males, OPC).

Diagnosis. *Cheumatopsyche erzincana* sp. nov., a species of *Cheumatopsyche lepida* species group was determined earlier by the first author (Oláh, 2004) as *C. flavellata* Mey, but having examined genuine comparative specimens from Georgia and East Turkey by fine phenomics the specimens from middle Turkey represent a new species with its inward turning capitate apicoventral setose lobe as well as with the different lateral profile of phallic organ.

Description. Brown coloured small-sized species with forewing length of 7 mm; forewing without any discernible pattern.

Male genitalia. Abdominal segment IX fused annular, rater short; both anterior and posterior margins arciform, resulted in an extremely short dorsum and longer ventrum; posterior lobe above coxopodite less produced rounded and high; intersegmental depression between the ninth and tenth segments present, but low. Body of segment X longer than high; circular lateral setose area (cerci) in apical position; apicoventral setose lobe discernible both in lateral and dorsal views as a stout mesad turning capitate structure; in dorsal view this mesad turning pattern well discernible; dorsal interlobular gap reduced; unsetosed, smooth mesocaudal lobe as long as ventroapical setose lobes with rounded terminal half in dorsal view. The basal segment of the gonopods straight rod with broadening apical half; harpago, the terminal segment broader basad and narrowing apicad both in lateral and ventral views. Phallic apparatus with rather robust phallotheca with ventro subapical keel; pair of endothecal sclerites well developed elongated ovoid.

Etymology. Coined from the name of the *locus typicus* of the holotype, a noun in apposition.

Cheumatopsyche flavellata Mey, 2004

Material examined. **Georgia**, Kakethia, Chachuna Managed Reserve, Ioiri River valley, Chachuna hotel, 260m, 41.220°N, 45971°E, 28–30.VI.2024, light leg. Jari Junnilainen (3 males, OPC). **Turkey,** Province Hakkori, 30 km NE of

Hakkori, 1500 m, 43 55'E, 37 41'N, 4.VII.2002, light leg. B. Benedek & T. Csővári (12 males, HNHM).

Remark. It is remarkable how stable are the speciation traits of specimens from Hakkori Province, Turkey through Kakethia, Georgia to the locus typicus of the holotype Chaharmahal-va-Bakhtiyari and the paratypes of Esfahan, Irán. Those are the lateral profile of the phallic organ with its very slender apical half and both the lateral and particularly the dorsal profiles of the ventroapical setose lobe of segment X with its straight posterad directed capitate head.

Cheumatopsyche iorica Oláh & Memishishi, sp. nov.

(Figures 72–76)

Material examined. Holotype: **Georgia**, Kakethia, Chachuna Managed Reserve, Ioiri River valley, Chachuna hotel, 260m, 41.220°N, 45.971° E, 28–30.VI.2024, light leg. Jari Junnilainen (1 male, OPC).

Diagnosis. *Cheumatopsyche iorica* sp. nov., is a species in the *Cheumatopsyche lepida* species group related to *Cheumatopsyche busherica* sp. nov. but differs by having stouter and shorter ventroapical setose lobes, triangled, not rounded unsetosed mesocaudal lobe as well as phallic organ has differently shaped lateral and ventral profiles.

Description. Brown coloured small-sized species with forewing length of 7 mm; forewing without any discernible pattern.

Male genitalia. Abdominal segment IX fused annular, rather long; both anterior and posterior margin arciform, resulted in short dorsum and ventrum; posterior lobe above coxopodite less produced rounded and high; intersegmental depression between the ninth and tenth segments present, right angled. Body of segment X about as long as high; circular lateral setose area (cerci) in apical position; apicoventral setose lobe discenible both in lateral and dorsal views as an elongated obliquely upward turning structure; in dorsal view exhibits peculiar pattern of long digitate rod with very wide dorsal interlobular gap; unsetosed, smooth mesocaudal lobe very produced triangled in dorsal view. The basal segment of the gonopods almost equally wide and straight rod with only slightly dilated apical ending; harpago, the terminal segment broader basad and narrowing apicad in lateral view and parallel-sided in ventral views. Phallic apparatus with rather robust phallotheca with ventro subapical keel; pair of endothecal sclerites well developed elongated subquadrangular.

Etymology. Coined from the name of the *locus typicus* of the holotype, a noun in apposition.

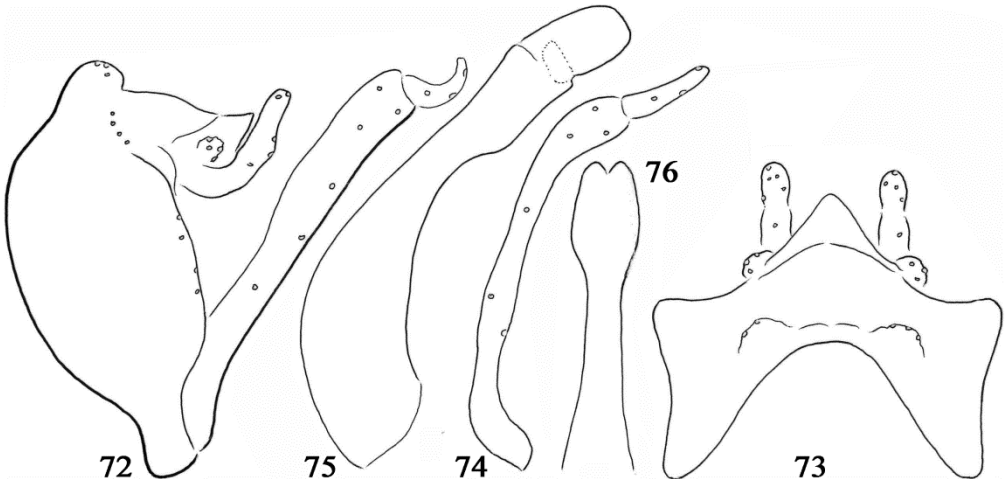
Hydropsyche Pictet, 1834

Hydropsyche angustipennis species group

This species group is characzetised by immovable, highly sclerotised, fused endothecal processes. In the *H. angustipennis* species group distributed in the Palaearctic and Nearctic faunal regions the reduced lobe-like pair of endothecal processes are firmly and completely fused to the phallothecal head forming together a tube-like structure without any visible sutures of the fused structures or even sulci of strengthening grooves. *Hydropsyche angustipennis* species group is subdivided into three subgroups: *Hydropsyche guttata*, *Hydropsyche pellucidula* and *Hydropsyche instabilis*.

Hydropsyche guttata species subgroup

Species in this subgroup are characterised by the fused sclerotised endothecal processes without angular, subapical lateral projection before the cleft apex of the phallotheca of the *Hydropsyche pellucidula* lineage and without digitiform apicoventral setose lobes of the *Hydropsyche instabilis* lineage. Based upon the lateral profile of the basal curvature shape of the phallic organ we have distinguished two units in the *H. guttata* species subgroup with a number of species complexes (Oláh *et al.* 2020). *Hydropsyche angustipennis* unit has deep curvature and *Hydropsyche modesta* unit has shallow curvature.



Figures 72–76. *Cheumatopsyche iorica* sp. nov. Holotype male: 72 = genitalia in left lateral view; 73 = genitalia in dorsal view; 74 = left gonopod in ventral view; 75 = phallic organ in left lateral view; 76 = phallic organ in ventral view.

Hydropsyche modesta species clade

This species clade has shallow or low basal curvature in the lateral view of the phallic organ that is the tube-like phallotheca headed with the sclerotized and completely fused endothecal processes has the basal curvature, the downward directed section of the phallothecal tube, curving or arching only shallow, not deep.

Hydropsyche dashbasha Oláh & Vinçon, sp. nov.

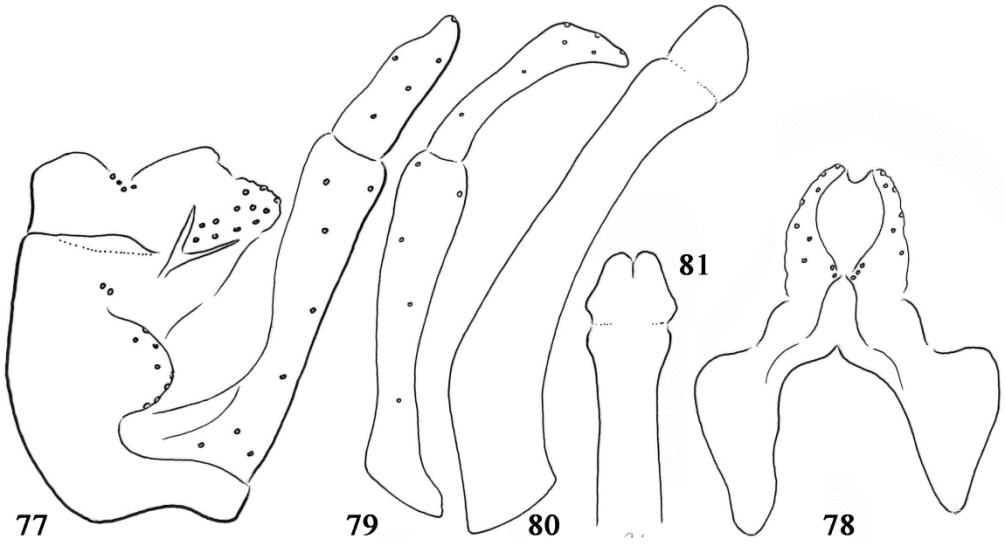
(Figures 77–81, Photos 1–2)

Material examined. Holotype: **Georgia**, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC). Paratypes: Georgia, Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 6.VIII.2024, leg. Gilles Vinçon (9 males, OPC).

Diagnosis. This light brown, medium-sized new species, a member of *Hydropsyche angustipennis* species group is unique and differs from all known members of this species group by the pair of reduced endothecal processes that seems fused to phallothecal head and unmovable but vestigial sutures of plesiomorphic articulation of movable pair of endothecal processes are present and discernible. Without angular, subapical lateral projection before the cleft apex and without digitiform apicoventral setose lobes it belongs to the *Hydropsyche guttata* species subgroup. Its low basal curvature of the phallic organ relates to the *Hydropsyche modesta* species unit. However the presence of vestigial suture of endothecal processes indicates some relationship to the Oriental species group of *Hydropsyche asiatica*.

Description. Male (in alcohol). Medium sized species. Body light brown. Forewing brown, without any discernible pattern. Length of forewing is 9 mm.

Male genitalia. Segment IX fused annular and short, particularly on its ventrum; its median keel broader basad and narrowing apicad with granulose dorsal surface; apical lobe on posterolateral margin well produced, rounded, almost half circular. Intersegmental profile between the ninth and tenth segments deep right-angled. Segment X slightly longer than dorsal keel of segment IX, with produced elongated setaless winglets in lateral view having setose proximal region and elongated ovoid trough in dorsal view; lateral setose area, the cerci horizontally elongated and produced in apical position; ventroapical setose lobes indistinct. The coxopodite of the gonopod longer than apex of segment X, harpago parallel-sided in lateral view with narrowing apical region and



Figures 77–81. *Hydropsyche dashbasha* sp. nov. Holotype male: 77 = genitalia in left lateral view; 78 = genitalia in dorsal view; 79 = left gonopod in ventral view; 80 = phallic organ in left lateral view; 81 = phallic organ in ventral view.

mesad curving in ventral view. Phallic organ almost a parallel-sided tube, basal bending low in lateral view; pair of endothecal processes short produced both in lateral and ventral view with slight basal dilatation and invagination.

Etymology. Coined from the name of locus typicus, as a noun in apposition.

Hydropsyche sciligra Malicky, 1977

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Lentekhi cottage, 775m, 42.788588°N, 42.713356°E, 27.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Remark. This species is new for Georgia.

Hydropsyche angustipennis species clade

This species clade has deep basal curvature in the lateral view of the phallic organ that is the tube-like phallotheca headed with the sclerotized and completely fused endothecal processes has the basal curvature, the downward directed section of the phallothecal tube, curving or arching deep, not shallow.

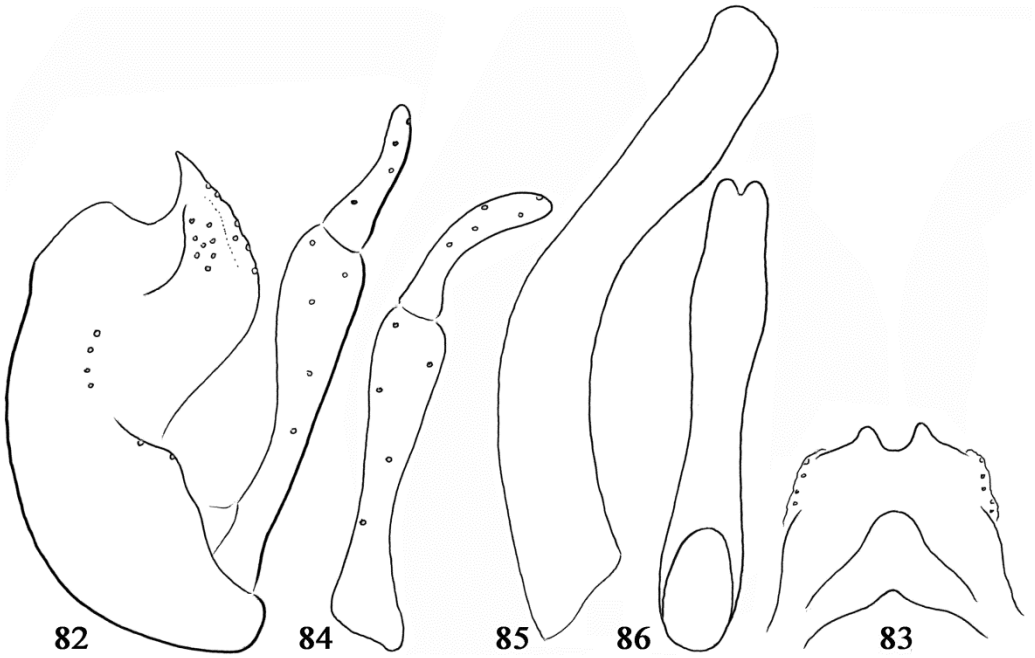
Hydropsyche iorica Oláh & Memishishi, sp. nov.

(Figures 82–86)

Material examined. Holotype: **Georgia**, Kakethia, Chachuna Managed Reserve, Ioiri River valley, Chachuna hotel, 260m, 41.220°N, 45.971° E, 28–30.VI.2024, light leg. Jari Junnilainen (1 male, OPC). Paratypes: same as holotype (4 males, OPC). Georgia**,** Kakheti region, Vaslovani National Park, Mijniskure 100m, 41.111°N, 46.645°E, 2–3.VII.2024, leg. Jari Junnilainen (1 male, OPC).

Diagnosis. This new species belongs to the *Hydropsyche angustipennis* species clade of *H. guttata* lineage. Most close to *Hydropsyche contubernalis*, but differs by having very broad kell on segment IX; the tip of unsetosed rim of segment X very produced not blunt; phallic organ with and not without a slight and distinct subapical rounded broadening in ventral view.

Description. Male. Cephalic and thoracic sclerites are brown. Wings light brown, without pronounced pattern. Maxillary palp formula I-III-II-IV-V. Spur formula 244. Forewing length 9 mm.



Figures 82–86. *Hydropsyche iorica* sp. nov. Holotype male: 82 = genitalia in left lateral view; 83 = genitalia in dorsal view; 84 = left gonopod in ventral view; 85 = phallic organ in left lateral view; 86 = phallic organ in ventral view.

Male genitalia. Segment IX fused annular and short; its median keel broad triangular with granulose dorsal surface; apical lobe on posterolateral margin reduced, anterior margin convex. Intersegmental profile between the ninth and tenth segments deep. Segment X upward pointing in lateral view, quadrangular in dorsal view; lateral setose area, the cerci almost fused with ventroapical setose lobe, located in posterad position; dorsoapical setose lobes reduced to the apical margin below dorsolateral rim of segment X in lateral view. The coxopodit of the gonopod as long as the apex of segment X; harpago almost parallel-sided both in dorsal and ventral views. Lateral profil of the phallic organ with long and deep curving basal region in lateral view, slight subapical rounded broadening in ventral view.

Etymology. Coined from the name of the type locality, a noun in apposition.

Hydropsyche pellucidula species subgroup

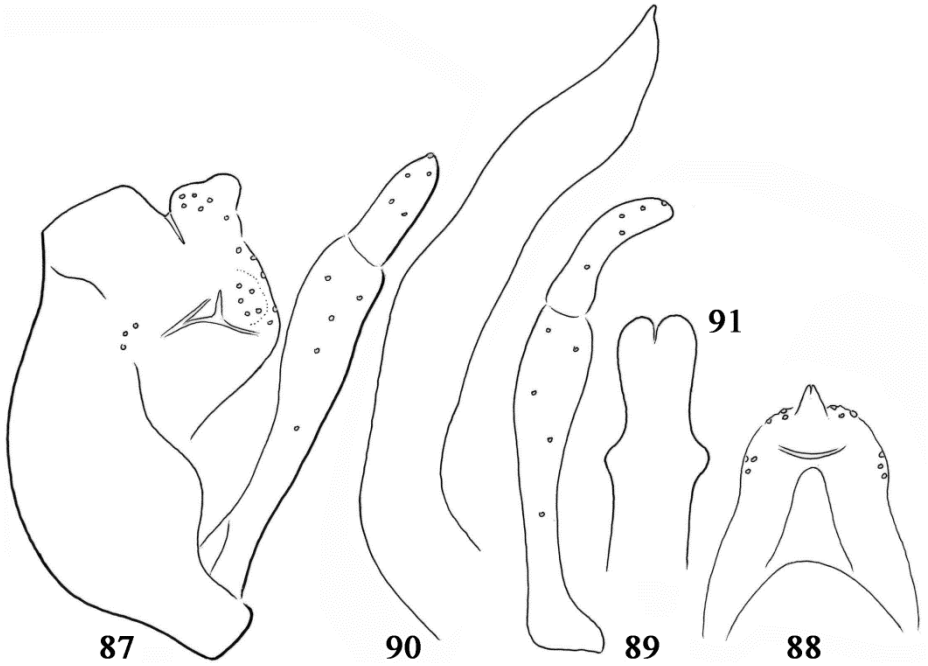
Species in this subgroup have the sclerotized endothecal processes fused completely to the phallothecal apex. Apical region of the phallic organ with angular, subapical lateral projection before the cleft apex of the phallotheca, without variously developed digitiform apicoventral setose lobes on segment X.

Hydropsyche gaghma Oláh & Memishishi, sp. nov.

(Figures 87–91)

Material examined. Holotype, **Georgia**, Gouria, Ozurgeti Municipality, Gaghma Dvabzu, 130m, 41.94639°N, 42.06317°E, 2.IX.2024, leg. Giorgi Makharadze (1 male, OPC).

Diagnosis. This new species belongs to the *Hydropsyche pellucidula* lineage in the *H. angustipennis* species group and is characterized by fused sclerotized endothecal processes, without digitiform apicoventral setose lobe and with angular subapical lateral projections before the cleft apex of the phallotheca (Oláh & Johanson 2008). This single male represents a new taxon in the *H. pellucidula* lineage among the group of species having lateral profile of the phallic organ with



Figures 87–91. *Hydropsyche gaghma* sp. nov. Holotype male: 87 = genitalia in left lateral view; 88 = genitalia in dorsal view; 89 = left gonopod in ventral view; 90 = phallic organ in left lateral view; 91 = phallic organ in ventral view.

significantly and abruptly narrowing apex, like *H. belisirma*, *H. botosaneanui*, *H. cerkesica*, *H. iberomaroccana*, *H. iokaste*, *H. konya*, *H. morettii* and *H. smiljae*, *H. punica*, *H. togana, H. trabzonica*. *Hydropsyche gaghma* sp. nov. most close to *H. togana* described from Azerbaijan but differs by the narrowing, not broadening apical region of dorsal keel of segment IX, by fused, not bifid unsetosed terminal rim of segment X and by the uniquely pointed tip of phallic organ in lateral view.

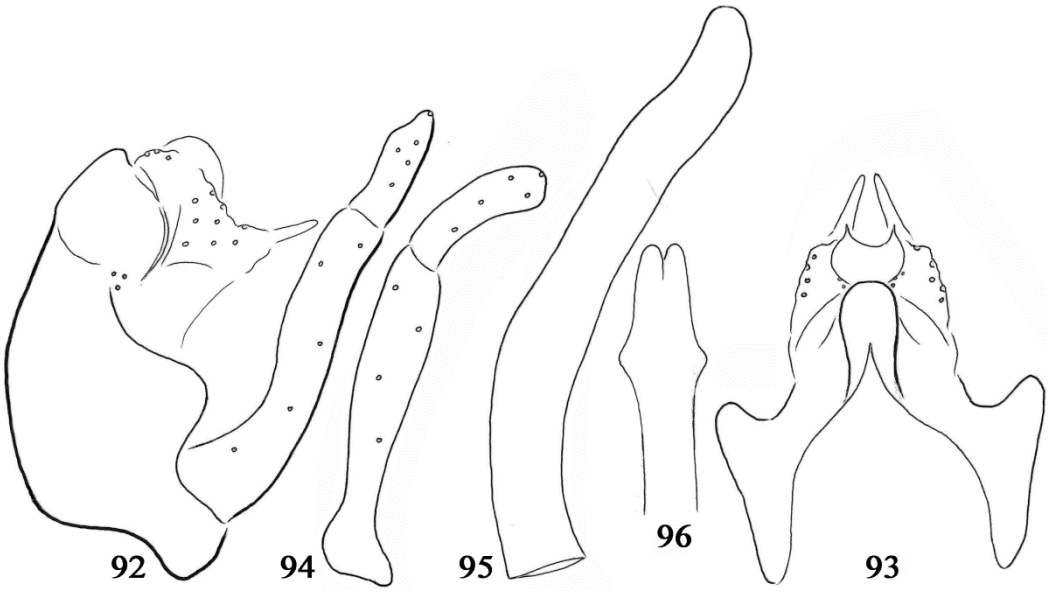
Description. Cephalic and thoracic sclerites are brown. Wings light brown, without pronounced pattern. Maxillary palp formula I-III-II-IV-V. Spur formula 244. Forewing length 10 mm.

Male genitalia. Segment IX fused annular and short; its median keel broad based and narrowing apicad with granulose dorsal surface; apical lobe on posterolateral margin small and rounded, anterior margin convex. Intersegmental profile between the ninth and tenth segments short and deep. Segment X short and high, narrow in dorsal view; lateral setose area, the cerci fused with ventroapical setose lobe, located in posterad position; dorsoapical setose lobes reduced to the setose anterior area of the unsetose dorsolateral rim of segment X in lateral view; this unsetosed rim outstanding semicircular. The coxopodit of the gonopod longer than the apex of segment X; harpago parallel-sided in ventral view. Lateral profile of the phallic organ slightly undulating, apex abruptly narrowing ventrad and distinctly pointed; rounded triangular subapical lateral projection pronounced in ventral view.

Etymology. Coined from the name of the type locality, a noun in apposition.

***Hydropsyche instabilis* species subgroup**

Species in this subgroup have the sclerotized endothecal processes fused completely to the phallothecal apex. Apical region of the phallic organ with or without angular, subapical lateral projection before the cleft apex of the phallotheca, but variously developed digitiform apicoventral setose lobes always present on segment X.



Figures 92–96. *Hydropsyche akhalchala* sp. nov. Holotype male: 92 = genitalia in left lateral view; 93 = genitalia in dorsal view; 94 = left gonopod in ventral view; 95 = phallic organ in left lateral view; 96 = phallic organ in ventral view.

Hydropsyche akhalchala **Oláh & Vinçon, sp. nov.**

(Figures 92–96, Photo 6)

Material examined. Holotype: **Georgia**, Racha -Lechkhumi and Lower-Svaneti, Akhalchala, nice brook and spring, 2120m, 42.6928°N, 42.6447°E, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This dark new species has a genital structure similar to *Hydropsyche ejsaka* Oláh, 2020, but differs by having the median keel on tergite IX with a long triangular clear window from basad to midway, lacking in *H. ejsaka*; by the intersegmental profile between segments IX and X simple right angled, not a deep gap; by less downward directed apical region of phallic organ as well as by the slightly narrowing, not parallel-sided ventral profile of phallic head.

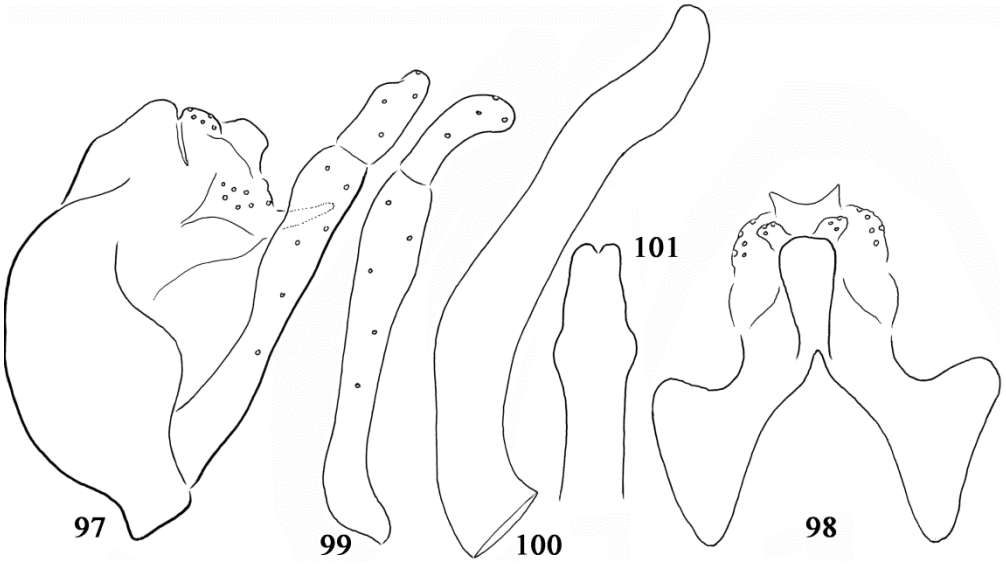
Description. Male. Body dark, dorsal thoracic sclerites darker. Wings dark brown, with dense recumbent hairs. Maxillary palp formula I-III-II-IV-V. Spur formula 244. Forewing length 9 mm

Male genitalia. Segment IX fused annular and short; its median keel broad, V-shaped clear window from basad almost to midway, rounded apicad with granulose dorsal surface; apical lobe on posterolateral margin short and rounded, anterior margin convex. Intersegmental profile between the ninth and tenth segments low, right angled. Segment X short, subquadrangular in dorsal view; lateral setose area, the cerci fused with ventroapical setose lobe, located in posterad position; dorsoapical setose lobes reduced to the setose anterior area of the unsetose dorsolateral rim of segment X in lateral view. The coxopodit of the gonopod longer than the apex of segment X, slightly S-shaped; harpago spatulate in ventral view and with narrowing apex in lateral view. Phallic organ with slightly downward directed apical region and further narrowed head in lateral view; head slightly narrowing and pronounced triangular subapical lateral projection in ventral view.

Etymology. Coined from the name of the type locality, a noun in apposition.

Hydropsyche ejsaka **Oláh, 2020**

Material examined. **Georgia**, Samegrelo - Zemo Svaneti, Debaradzeni, spring, 375m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A.



Figures 97–101. *Hydropsyche goderdza* sp. nov. Holotype male: 97 = genitalia in left lateral view; 98 = genitalia in dorsal view; 99 = left gonopod in ventral view; 100 = phallic organ in left lateral view; 101 = phallic organ in ventral view.

Memishishi (2 males, IZISUT; 1 male, OPC). Georgia, Racha-Lechkhumi and Lower Svaneti, Uravi, spring, 1000m, 42.65771°N, 43.29736°E, 26.IV.2024, leg. A. Memishishi (1 male, IZI SUT).

Remark. This species was only known from the Lesser Caucasus (Kvemo Kartli). We report it for the first time from the High Caucasus.

***Hydropsyche goderdza* Oláh & Vinçon, sp. nov.**

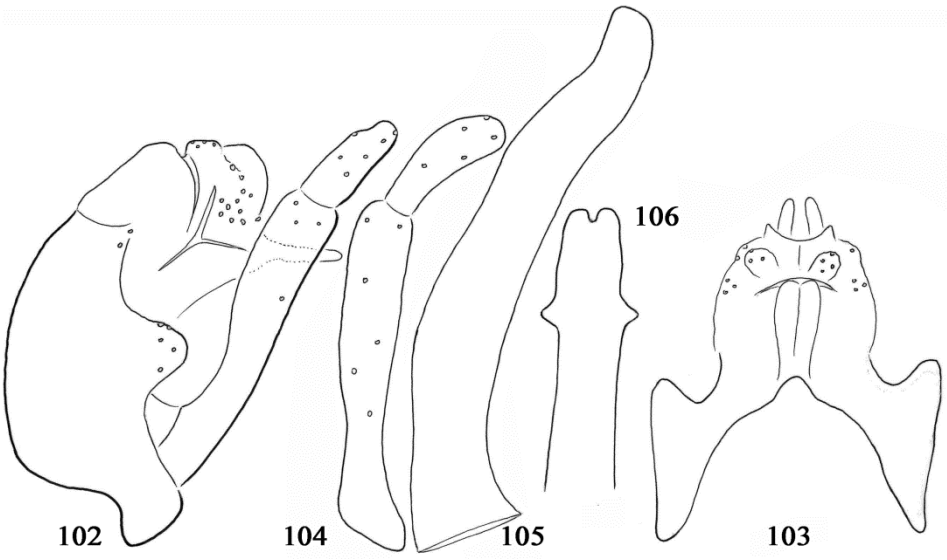
(Figures 97–101, Photos 3–4)

*Material examined***.** Holotype: **Georgia,** Adjara, Goderdzi Pass, below Green Lake, large brook below the swamp, 2050m, 41.682°N, 42.5°E, 8.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Paratypes: same as holotype (8 males, OPC).

Diagnosis. This dark, new species has a genital structure similar to *Hydropsyche adjaria* Oláh & Vinçon, 2024, but differs by having the median keel on tergite IX broadening apicad, not parallel-sided in dorsal view; the apicomesal lobe of segment IX rounded not triangular; the unsetose dorsolateral rim of segment X variously flat, not triangular in lateral view. Curvature of the phallic organ differently patterned. However, these diverged character states have some range of variation at *Hydropsyche goderdza* sp. nov. and these variation ranges are not known at *Hydropsyche adjaria* represented only by holotype. New collections are required to compare and to confirm their exact taxonomic status.

Description. Male. Body dark, dorsal thoracic sclerites darker, almost black. Wings dark brown, without pronounced pattern. Maxillary palp formula I-III-II-IV-V. Spur formula 244. Forewing length 8 mm.

Male genitalia. Segment IX fused annular and short; its median keel broadening apicad, magnitude of this broadening character varies among paratypes; apical lobe on posterolateral margin flat rounded, anterior margin convex. Intersegmental profile between the ninth and tenth segments modified into a tiny deep and short gap. Segment X short, rounded quadrangular in dorsal view; lateral setose area, the cerci fused with ventroapical setose lobe, located in posterad position; subtriangular in lateral view; dorsoapical setose lobes reduced to the setose anterior area of the unsetose dorsolateral rim of segment X in lateral view. The coxopodit of the gonopod little longer than the apex of segment X; harpago



Figures 102–106. *Hydropsyche mestia* sp. nov. Holotype male: 102 = genitalia in left lateral view; 103 = genitalia in dorsal view; 104 = left gonopod in ventral view; 105 = phallic organ in left lateral view; 106 = phallic organ in ventral view.

spatulate in ventral view and narrowing ventrad in lateral view. Phallic organ with downward directed apical region and upward directed blunt head in lateral view; pronounced semicircular subapical lateral projection in ventral view.

Etymology. Coined from the name of the type locality, a noun in apposition.

***Hydropsyche mestia* Oláh & Vinçon, sp. nov.**

(Figures 102–106, Photos 14–15)

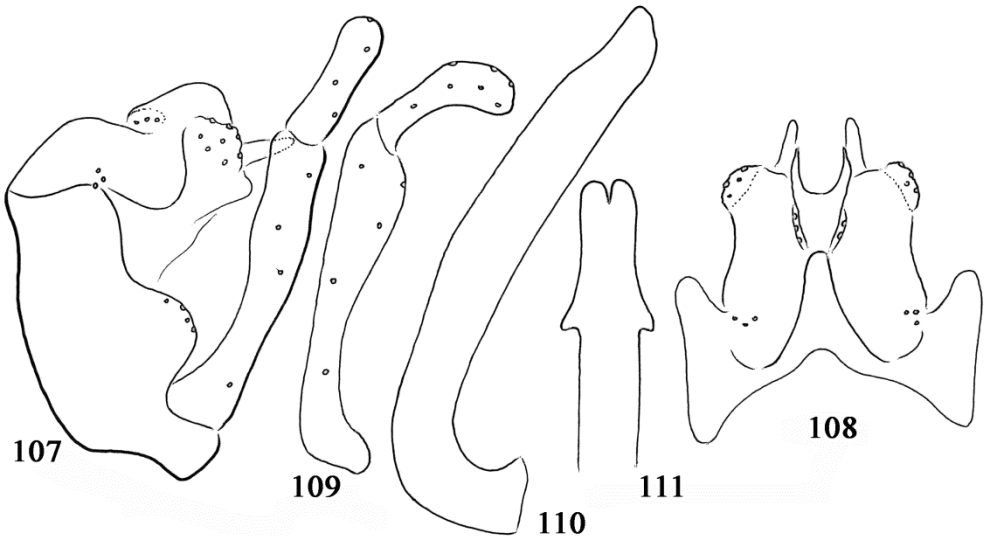
Material examined. Holotype: **Georgia**, High Svaneti, above Mestia, brook and spring above the fish farm in construction, 1550m, 43.0477°N, 42.8091°E, 16.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Paratype: same as holotype (1 male, OPC).

Diagnosis. This dark new species has a genital structure similar to *Hydropsyche akhalchala* sp. nov., but differs by having the median keel on tergite IX narrower and without long triangular basal window; by the more robust, broad phallic organ with parallel-sided, not narrowing head of phallic organ and by abruptly, not gradually produced triangular subapical lateral projection on the phallic organ in ventral view.

Description. Male. Small species. Body dark, dorsal thoracic sclerites darker. Wings dark brown, with dense recumbent hairs. Maxillary palp formula I-III-II-IV-V. Spur formula 244. Forewing length 7 mm.

Male genitalia. Segment IX fused annular and short; its median keel slightly narrower basad with granulose dorsal surface; apical lobe on posterolateral margin short and rounded, anterior margin convex. Intersegmental profile between the ninth and tenth segments deep and short. Segment X short, rounded quadrangular in dorsal view; lateral setose area, the cerci fused with ventroapical setose lobe, located in posterad position; dorsoapical setose lobes reduced to the setose anterior area of the unsetose dorsolateral rim of segment X in lateral view. The coxopodit of the gonopod longer than the apex of segment X, slightly widened apical half; harpago spatulate in ventral view and with slightly narrowing apex in lateral view. Phallic organ with downward directed apical region and little narrowed head in lateral view; head almost parallel-sided with small triangular subapical lateral projection in ventral view.

Etymology. Coined from the name of the type locality, a noun in apposition.



Figures 107–111. *Hydropsyche tsabnara* sp. nov. Holotype male: 107 = genitalia in left lateral view; 108 = genitalia in dorsal view; 109 = left gonopod in ventral view; 110 = phallic organ in left lateral view; 111 = phallic organ in ventral view.

Hydropsyche tsabnara Oláh & Memishishi, sp. nov.

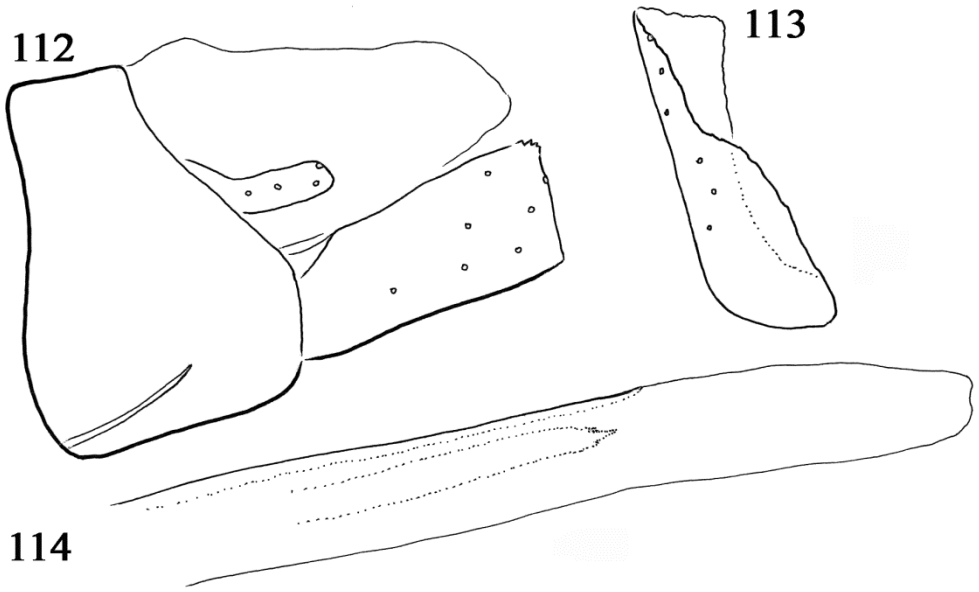
(Figures 107–111, Photos 7–8)

Material examined. Holotype: **Georgia**, Adjara, Tsablnari, waterfall, 480m, 41.67055°N, 41.87795°E, 29.IV.2024, leg. A. Memishishi (1 male, OPC). Paratype: Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 15.VI.–28.VII. 2018, leg. GGBC members (1 male, OPC).

Diagnosis. This new species belongs to the *Hydropsyche instabilis* subgroup of the *H. angustipennis* species group and is characterized by fused sclerotized endothecal processes, with digitiform apicoventral setose lobe and with angular subapical lateral projections before the cleft apex of the phallotheca (Oláh & Johanson, 2008). The angular subapical projection is anterad directed. *Hydropsyche tsabnara* sp. nov. is characterized by the very pronounced, but very low basal curve of the phallobase. Such a low and pronounced basal curve on the phallic organ is present only in a few species of the *Hydropsyche instabilis* subgroup: the nominate species *H. instabilis* (Curtis, 1834); *H. jordanensis* Tjeder, 1951; *H. orduensis* Sipahiler, 1987; *H. peristerica* Botosaneanu & Marinkovic, 1966; *H. perseus* Malicky, 2001; *H. pictetorum* Botosaneanu & Schmid, 1973. However, *H. tsabnara* sp. nov. differs from each by the elongated triangular dorsal shape of the dorsal keel of segment IX as well as by the anterad directed lateral projections on the subapical region of the phallic organ.

Description. Male (in alcohol). Medium sized species. Body brown, but dorsal thoracic sclerites darker. Forewing brown, without any discernible pattern. Length of forewing is 12 mm.

Male genitalia. Segment IX fused annular and short, particularly on its ventrum; its median keel broad-based and gradually narrowing apicad forming an elongated triangular shape in dorsal view with granulose dorsal surface; apical lobe on posterolateral margin well produced, rounded, almost half circular. Intersegmental profile between the ninth and tenth segments short, forming a shallow concavity. Segment X as long as the dorsal keel of segment IX, with produced elongated setaless winglets in lateral view having setose proximal region and elongated trough in dorsal view; lateral setose area, the cerci circular and located in apical position; ventroapical setose lobes indistinct; digitiform process short and stout with apical setae. The coxopodite of the gonopod



Figures 112–114. *Agapetus akhalchal* sp. nov. Holotype male: 112 = genitalia in left lateral view; 113 = left gonopod in ventral view; 114 = phallic organ in left lateral view.

as long as the apex of segment X, harpago parallel-sided in lateral view with slight apical dilatation and mesad curving clavate in ventral view. Phallic organ almost a parallel-sided tube, basal bending very pronounced, but very low in lateral view; the subapical lateral projection on the phallic head anterad directed, apical region parallel-sided.

Etymology. Coined from the name of the locus typicus, as a noun in apposition.

Glossosomatidae Wallengren, 1891

Agapetus Curtis, 1834

***Agapetus caucasicus* Martynov, 1913**

Material examined. **Georgia,** Samtskhe-Javakheti, Zeda Vardzia, nice brook and spring, 1410m, 41.383°N, 43.258°E, 25.IV.2024, leg. Gilles Vinçon (13 males, OPC). Georgia, Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 24.IV.2024, leg. Gilles Vinçon (2 males, OPC).

Remark. This species described from Turkey and also reported from Armenia (Oláh 1985). It is newly reported here from Georgia.

***Agapetus gouriensis* species complex**

(Map 3)

This species complex is characterized by elongated quadratic gonopods with fine and definite divergences. Unfortunately the probable speciation trait in the *Agapetus gouriensis* complex, the internal aedeagal sclerite is very badly visible even at higher magnification. It is difficult to examine. These internal phallic sclerites or spines are not evident immediately, visible mostly by laborious searching. Moreover aedeagal sclerite is sometimes accompanied by dark pigmented long filiform dorsal brace structure, probably the variously enforced, almost separately embodied supporting dorsum of aedeagus and by fiber-composed variously shaped structures, ventrad or dorsad of the aedeagal sclerite, depending probably on the copulatory state of the male. Sometimes the dorsal band is lightly sclerotized, indistinct. The aedeagus is deeply located inside the coverage of segments IX and X not transparent enough, and only seldom pullable out from the cover of dark pigmented segment IX. Therefore its exact structure is practically indiscernible, just its outline visible by multiply maceration, microsurgical manipulation under binocular and

Map 3. *Agapetus gouriensis* species complex (5 species): *A. akhalchal* sp. nov., *A. bakhmar* nov., *A. gorgitensis* Sipahiler, 1996, *A. gouriensis* Oláh & Vinçon, 2020; *A. lashijal* sp. nov.

examination by compound microscopes. If you have enough specimens and patience to repeat many times and are lucky enough you can see and draw the three structures properly. The combination of badly visible internal aedeagal structures and the well visible but subtle divergence of gonopods together help to recognise and to describe siblings in the *Agapetus gouriensis* species complex. Five sibling species comprise the complex: *Agapetus akhalchal* Oláh & Vinçon, sp. nov., *A. bakhmar* Oláh & Vinçon sp. nov., *A. gorgitensis* Sipahiler, 1996, *A. gouriensis* Oláh & Vinçon, 2020; *A. lashijal* Memishishi & Oláh sp. nov.

Agapetus akhalchal Oláh & Vinçon, sp. nov.

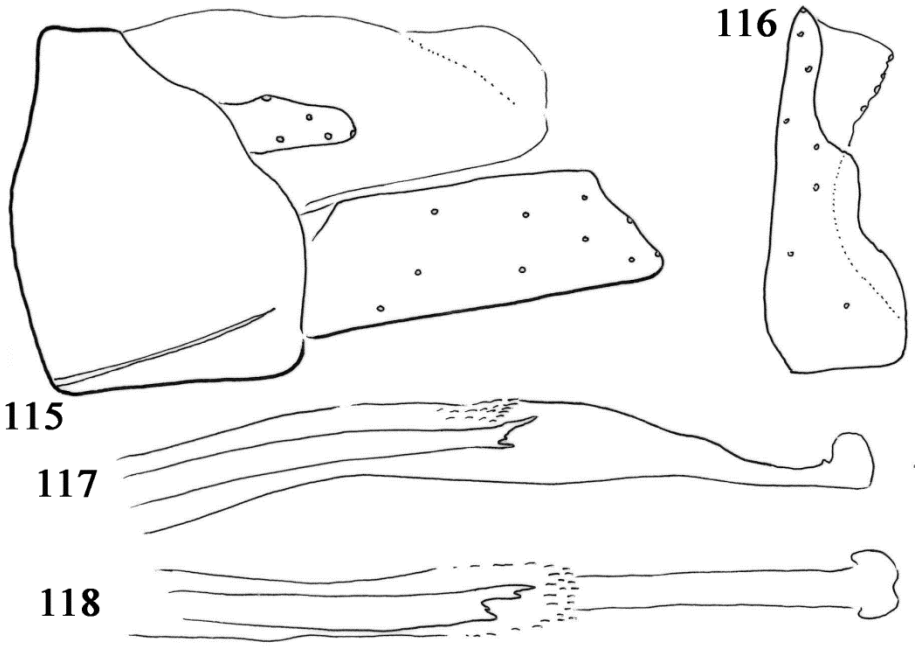
(Figures 112–114, Map 3, Photo 6)

Material examined. Holotype: **Georgia**, Racha -Lechkumi and Lower-Svaneti, Akhalchala, brook and spring, 2170m, 42.6947°N, 42.6463°E, 13. VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This new species is close to *Agapetus gouriensis* Oláh & Vinçon, 2020 described from Gouria region of Georgia, but differs by both the lateral and ventral views of the gonopods; truncated apical margin regularly straight vertical with right angles, not straight oblique and not with rounded angles; differs also by the shape of the sclerite of the aedeagus being pointed, not trifid.

Description. Male (in alcohol). Dark brown animal, with legs and venter slightly lighter. Maxillary palp formula: I-II-IV-V-III, second segment with globular mesolateral projection. Wing membrane brown; forewing length 4 mm; Fork I on hindwing lost. Blister-like protuberance on the dorsal margin of sternite V absent, upward directed filament present; ventral process on sternite VI short.

Male genitalia. Segment IX synsclerotized with slightly concave anterior and convex pos



Figures 115–118. *Agapetus bakhmar* sp. nov. Holotype male: 115 = genitalia in left lateral view; 116 = left gonopod in ventral view; 117 = phallic organ in left lateral view; 118 = phallic organ in dorsal view.

terior margins in lateral view; its dorsum half as long as ventrum. Segment X less pigmented, deeply divided upto the basement in dorsal view. Cerci elongated. Gonopods quadrangular, elongated clavate, straight vertically truncated in lateral view. Aedeagus indistinct tube with distinct pointed sclerite inside.

Etymology. Named after the region of type the locality, a noun in apposition.

Agapetus bakhmar Oláh & Vinçon, sp. nov.

(Figures 115–118, Map 3, Photos 18–19)

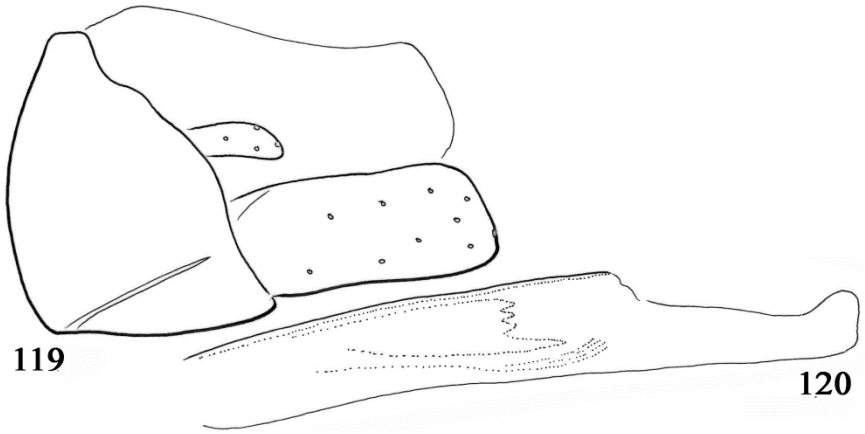
Agapetus gouriensis Oláh & Vinçon, in Oláh *et al.* 2020:43–45: Oláh & Vinçon 2024:25. Georgia, Gouria, NE Bakhmaro, nice brook tributary of Sashualo River, 1990–2000m, 41.859°N, 42.357°E, 27.IX.2022, leg. Gilles Vinçon (1 male, OPC). **Misidentification**.

*Material examined***.** Holotype**: Georgia**, Gouria, NE Bakhmaro, nice brook tributary of Sashualo River, 1990–2000m, 41.859°N, 42.357° E, 27.IX.2022, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This new species is close to *Agapetus gouriensis* Oláh & Vinçon, 2020 described from Gouria region of Georgia, but differs by both the lateral and ventral views of the gonopods; differs also by the shape of the sclerite of the aedeagus.

Description. Male (in alcohol). Dark brown animal, with legs and venter slightly lighter. Maxillary palp formula: I-II-IV-V-III, second segment with globular mesolateral projection. Wing membrane brown; forewing length 7 mm; Fork I on hindwing lost. Blister-like protuberance on the dorsal margin of sternite V absent, upward directed filament present; ventral process on sternite VI short.

Male genitalia. Segment IX synsclerotized with slightly convex anterior and more obliquely convex posterior margins in lateral view; its dorsum one third as long as ventrum. Segment X less pigmented, deeply divided upto the basement in dorsal view. Cerci elongated. Gonopods quadrangular, obliquely truncated in lateral view. Aedeagus indistinct tube with just discernible pattern of sclerite head inside; dorsum with setose plate.



Figures 119–120. *Agapetus gouriensis* Oláh & Vinçon, 2020. Holotype male redrawn: 119 = genitalia in left lateral view; 120 = phallic organ in left lateral view.

Etymology. Named after the region of the type locality, noun in apposition.

Agapetus gouriensis Oláh & Vinçon, 2020

(Figures 119–120, Map 3)

Material examined. **Georgia**, Gouria, road to Gomismta, springs, 1900m, 41.8317°N, 42.1556° E, 11.VIII.2024, leg. Gilles Vinçon (12 males, OPC).

Agapetus lashijal Memishishi & Oláh, sp. nov.

(Figures 121–125, Map 3, Photos 7–8)

Material examined. Holotype: Georgia, High Caucasus, Imereti, Lashijala, spring, 590m, 42.64795°N, 42.84235°E, 26.IV.2024, leg. A. Memishishi (1 male, IZISUT). Paratypes: same as holotype (7 males, 3 fmales IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 41.743426°N, 42.0 81814°E, 1252m, 19.V.–1.VI.2018, leg. GGBC members et al. (1 male, IZISUT).

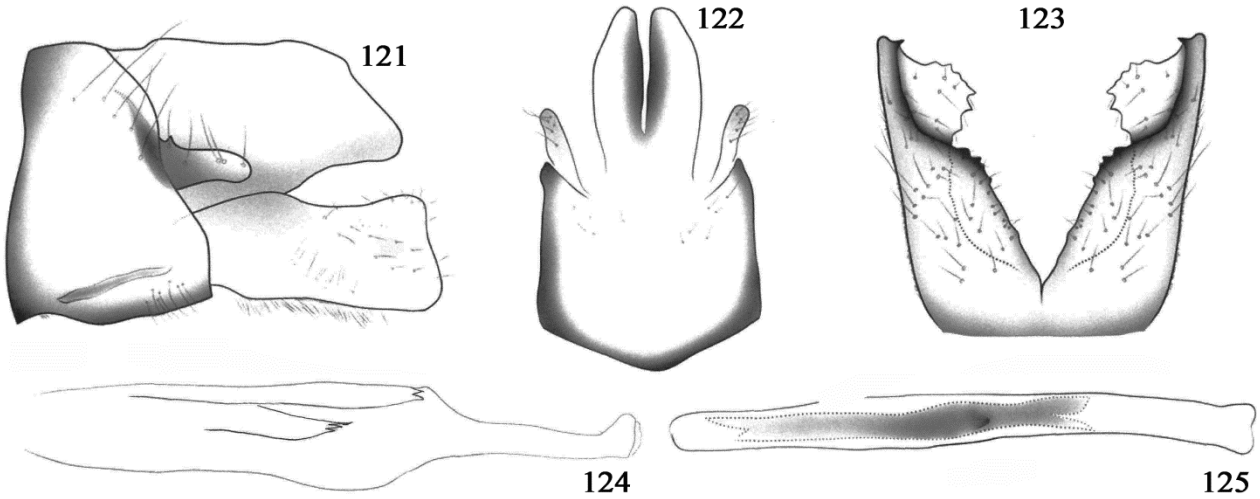
Diagnosis. This new species is close to *Agapetus gouriensis* Oláh & Vinçon, 2020 described from Gouria region of Georgia, but differs by both the lateral view of the gonopods; dorsoapical margin of gonopod produced into a roundly lobe, absent at *A. gouriensis*; in ventral view distinctly pronounced single spine present at the terminal end in the apex of gonopod like *Agapetus gorgitensis* (Sipahiler, 1996), absent at *A. gouriensis*; *A. lashijal* sp. nov. differs from *A. gouriensis* also by the shape of aedeagal sclerite with tripointed, not with trifid apical ending.

Description. Male (in alcohol). Dark brown animal, with legs and venter slightly lighter. Maxillary palp formula: I-II-IV-V-III, second segment with globular mesolateral projection. Wing membrane brown; forewing length 6 mm; Fork I on hindwing lost. Blister- like protuberance on the dorsal margin of sternite V absent, upward directed filament present; ventral process on sternite VI short.

Male genitalia. Segment IX synsclerotized with slightly concave anterior and obliquely waving posterior margins in lateral view; its dorsum half as long as ventrum. Segment X less pigmented, deeply divided near to the basement in dorsal view. Cerci elongated whith a sharp point dorsobasad. Gonopods quadrangular, elongated clavate, slightly obliquely truncated in lateral view. Aedeagus indistinct tube with distinct tripointed aedeagal sclerite inside.

Etymology. Named after the region of type locality, noun in apposition.

Remarks. Final taxonomic status of the single paratypes from Adjara region, Kintrishi has to be confirmed after having more specimens for a



Figures 121–125. *Agapetus lashijal* sp. nov. Holotype male: 121 = genitalia in left lateral view; 122 = genitalia in dorsal view; 123 = gonopods in ventral view; 124 = phallic organ in left lateral view; 125 = phallic organ in dorsal view.

detailed study. It could represent an independent sibling.

Agapetus kintrisha Oláh & Vinçon, 2024

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Rachka, waterfall, 510m, 42.54357°N, 42.64466°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Remark. This species close to *Agapetus sarayensis* (Sipahiler, 1996) described from Turkey was only known from the type locality in the Lesser Caucasus (Adjara). It is the first report from the High Caucasus.

Glossosoma capitatum Martynov, 1913

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Sori, spring, 710m, 42.58117°N, 43.28706°E, 26.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Imereti, Khvereti, spring, 530m, 42.3740942°N, 43.4378 85°E, 25.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Zemo artani, 42.23669°N, 45.00394°E, 10.X.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Shuapkho, 42.41558°N, 44.99855°E, 7.X.2024, leg. A. Memishishi (1 male, 8 females; IZISUT).

Hydroptilidae Stephens, 1836

Hydroptila armathai Schmid, 1959

Material examined. **Georgia**, High Caucasus, Imereti, Lashijala, river, 580m, 42.64795°N, 42.84235°E, 25.IV.2024, leg. A. Memishishi (3 males, 1 female; IZISUT). Georgia, Samegrelo - Zemo Svaneti, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Remarks. This species, described from Iran, was also reported from Azerbaijan (Oláh *et al.* 2020). We report it for the first time in Georgia.

Hydroptila taurica Martynov, 1934

Material examined. **Georgia**, Samegrelo - Zemo Svaneti, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT).

Remark. This species described from Turkey is reported for the first time from Georgia.

Stactobia wimmeri Malicky, 1988

Material examined. **Georgia,** Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 6.VIII.2024, leg. Gilles Vinçon (3 males, OPC).

Remark. This species described from Turkey is reported for the first time in Georgia.

Ptilocolepidae Martynov, 1913

***Ptilocolepus colchicus* Martynov, 1913**

Material examined. **Georgia**, Kakhetia, road to Omalo, small brook with mosses, tributary of Stori River, 1230m, 42.2192°N, 45.4768°E, 22.IV.2024, leg. Gilles Vinçon (4 males, 1 female; OPC). Georgia, Imereti, above Sairme, brook from 1270m, 41.883°N, 42.756°E, to its spring 1370m, 41.885°N, 42.758°E, 27.IV.2024, leg. Gilles Vinçon (1 female, OPC). Georgia, Mtskheta-Mtianeti, above Pakhviji, 2 nice springs, 1450m, 42.4479°N, 44.7896°E, 22.IV.2024, leg. Gilles Vinçon (2 males, 2 females; OPC). Georgia, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 10.VIII.–24.VIII.2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, N41°44'36.3336, E42°4'54.4296, 1252m, 5.VI. - 20.V. 2018, leg. GGBC members et al. (2 males, 2 females, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 13.VII–27.VII. 2018, leg. GGBC members (2 males, 9 females, IZISUT). Georgia, Racha-Lechkhumi and Lower Svaneti, Rachka, waterfall, 510m, 42.54357°N, 42.64466°E, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Sakhdari, spring, 42.82056°N, 42.79773°E, 27.IV. 2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Gouria, road to Gomismta, steep brook, 1430m, 41.8373°N, 42.144°E, up to its spring, 1460m, 41.8376°N, 42.1437°E, 28.IV.2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V. 2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Gouria, road to Bakhmaro, nice spring, 'Tskhratsqaro', 1380m, 41.8911°N, 42.3718°E, 28.IV. 2024, leg. Gilles Vinçon (2 males, 1 female; OPC). Georgia, Adjara, Mtirala National Parc, nice brook, cascade and lateral spring, 1180m, 41.647°N, 41.883°E, 30.IV.2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Adjara, road to Gomismta, nice brook, 2150-2200m, 41.8098°N, 42.1827°E, 11.VIII.2024, leg. Gilles Vinçon (2 males, 1 female; OPC).

***Ptilocolepus dilatatus* Martynov, 1913**

Material examined. **Georgia**, Adjara, Kintrishi, nice torrent with mosses, 700m, 41.7385°N, 42.01°E, 29.IV.2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Adjara, above Namonastrevi, nice brook and spring, 1200m, 41.568°1N, 42.0682°E, 1.V.2024, leg. Gilles Vinçon (2 males, 3 females; OPC**).** Georgia, Gouria, road to Bakhmaro, nice brook and spring, 1240m, 41.9°N, 42.37°E, 28.IV.2024, leg. Gilles Vinçon (1 female, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 5.V–20.V.2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5' 0.2904, 13.VII.–27.VII. 2018, leg. GGBC members (1 female, IZISUT). Georgia, Racha-Lechkhumi and Lower Svaneti, Sori, spring, 710m, 42.58117°N, 43.28706°E, 26.IV.2024, leg. A. Memishishi (3 males, IZISUT). Georgia, Chkhutuneti, spring, 41.58117°N, 41.85786°E, 30.IV.2024, leg. A. Memishishi (9 males, 7 females; IZISUT). Georgia, Adjara, Chakhati, spring, 90m, 41.8791°N, 41.91601°E, 29.IV.2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Imereti, above Sairme, Zekari Pass, below Didimaghala Pic, nice brook with mosses and spring, 2055m, 41.85°N, 42.8°E, 9.VIII.2024, leg. Gilles Vinçon (4 males, 2 females; OPC).

Rhyacophilidae Stephens, 1836

***Philocrena trialetica* Lepneva, 1956**

Material examined. Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise

trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 27.VII.–10.VIII.2018, leg. GGBC members (1 male, IZISUT). Georgia, Imereti, above Sairme, nice brook, from 1540m, 41.8765°N, 42.778°E, to its spring 1600m, 41.8776°N, 42.781°E, 27.IV. 2024, leg. Gilles Vinçon (2 males, OPC). Georgia, Adjara, above Keda, nice brook, 920m, 41.5727°N, 42.0498°E, 1.V.2024, leg. Gilles Vinçon (1 male, 1 female; OPC).

Rhyacophila aberrans Martynov, 1913

Material examined. Georgia, Adjara, Kintrishi, torrent, 220m, 41.7882°N, 41.9626°E, 29.IV. 2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Samtskhe-Javakheti, Zeda Vardzia, nice brook and spring, 1410m, 41.383°N, 43.258°E, 25.IV.2024, leg. Gilles Vinçon (7 males, OPC). Georgia, Chkhutuneti, spring, 41.4817°N, 41.857 86°E, 30.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Adjara, Kintrishi, spring, 270m, 41.77359°N, 41.96808°E, 29.IV.2024, leg. A. Memishishi (1 male, 1 female; OPC). Georgia, Adjara, Mtirala National Park, nice torrent, 330m, 41.6762°N, 41.8707°E, 30.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Adjara, Kintrishi, 2 nice cascades, 750m, 41.7275°N, 42.0406° E, 29.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Imereti, above Sairme, Zekari Pass, below Didimaghala Pic, nice brook with mosses and spring, 2055m, 41.85°N, 42.8°E, 9.VIII.2024, leg. Gilles Vinçon (1 males, OPC). Georgia, Adjara, road to Gomismta, nice brook, 2120–2150m, 41.8108°N, 42.1821°E, 11.VIII. 2024, leg. Gilles Vinçon (3 males, 4 females; OPC).

Rhyacophila aliena Martynov, 1916

Material examined. **Georgia**, Mtskheta-Mtianeti, Sonda, 1000m, 42.25384°N 44.67465°E, 7.X. 2024, leg. A. Memishishi (1 male, IZISUT). Georgia, Mtskheta-Mtianeti, Abudelauri, 2620m, 42.54301°N 44.83866°E, 9.X.2024, leg. A. Memishishi (1 male, OPC).

Rhyacophila bacurianica Lepneva, 1961

Material examined. **Georgia**, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, torrent above cascade, 2400m, 42.7°N, 42.6455°E, 13. VIII.2024, leg. Gilles Vinçon (3 males, OPC).

Rhyacophila clavalis Martynov, 1913

Material examined. **Georgia**, Gouria, road to Bakhmaro, nice brook and spring, 1240m, 41.9°N, 42.37°E, 28.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia**,** Adjara, Mtirala National Park, nice torrent, 330m, 41.6762°N, 41.8707°E, 30.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Qedqedi, spring, 41.51639°N, 41.77626° E, 30.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Gouria, road to Gomismta, steep brook, 1430m, 41.8373°N, 42.144°E, up to its spring, 1460m, 41.8376°N, 42.1437°E, 28.IV.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Adjara, Kintrishi, brook, 220m, 41.7907°N, 41.9565°E, 29.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Adjara, above Keda, brook, 430m, 41.5844°N, 41.964°E, 1.V.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Gouria, road to Bakhmaro, spring, 2040m, 41.8586°N, 42.3564° E, 10.VIII.2024, leg. Gilles Vinçon (1 male, 3 females; OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI. – 13.VII. 2018, leg. GGBC members (6 males, 3 females; OPC).

Rhyacophila cupressorum Martynov, 1913

Material examined. **Georgia**, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (1 male, 1 female; OPC).

Rhyacophila forcipulata Martynov, 1926

*Material examined***. Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 7.IX.–21.IX.2018, leg. GGBC members (1 male, IZISUT). Georgia, Adjara, above Namonastrevi, nice brook and spring, 1710m, 41.555°N, 42.0853°E, 12.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

***Rhyacophila kimara* Oláh & Vinçon, 2020**

(Photos 7–8)

Material examined. **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 29.VI. - 13.VII. 2018, leg. GGBC members et al. (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 24.VIII.–7.IX. 2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 10. VIII. – 24.VIII. 2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 27.VII.–10.VIII. 2018, leg. GGBC members (1 female, IZISUT). Georgia, Kintrishi, spring, 270m, 41.77 359°N, 41.96808°E, 29.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Adjara, Mtirala National Park, nice brook, cascade and lateral spring, 1180m, 41.64°N, 41.88°E, 30.IV.2024, leg. Gilles Vinçon (2 males, 1 female; OPC).

***Rhyacophila kokoa* Oláh & Vinçon, 2024**

Material examined. **Georgia**, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (2 males, OPC).

***Rhyacophila mtirala* Oláh & Vinçon, 2020**

(Photos 7–8)

*Material examined***. Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 13.VII. - 27.VII. 2018, leg. GGBC members et al. (1 male, IZISUT). Georgia, Adjara, Kintrishi, spring, 270m, 41.77359°N, 41.96808°E, 29.IV. 2024, leg. A. Memishishi (1 male, OPC). Georgia, Adjara, above Namonastrevi, brooklet and spring, 1720m, 41.5528°N, 42.0892°E, 12.VIII.2024, leg. Gilles Vinçon (3 males, 6 females; OPC).

***Rhyacophila nubila* (Zetterstedt,1840)**

Material examined. Georgia, Mtskheta-Mtianeti, Zemo artani, 1280m, 42.23669°N, 45.00394° E, 10.X.2024, leg. A. Memishishi (1 male, OPC).

***Rhyacophila subovata* Martynov, 1913**

Material examined. **Georgia**, Samtskhe-Javakheti, West Utkisubani, nice brook and spring, 1540m, 41.658°N, 42.604°E, 26.IV.2024, leg. Gilles Vinçon (5 males, 1 female; OPC). Georgia, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 5.V.–20.V.2018, leg. GGBC members (1 female, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, without date, leg. GGBC members (1 female, IZISUT). Georgia, High Svanetie, above Mestia, brook and springs above the fish farm in construction, 1550m, 43.0477°N, 42.8091°E, 3.V.2024, leg. Gilles Vinçon (5 males, 2 females; OPC). Georgia, Adjara, above Gomismta, nice brook, 2120–2150m, 41.8108°N, 42.1821°E, 11.VIII. 2024, leg. Gilles Vinçon (1 male, 1 female; OPC).

Brachycentridae Ulmer, 1903

***Micrasema bifoliatum* Martynov, 1925**

Material examined. **Armenia**, five localities, 16.VI.–26.VII.1956, leg. L.A. Zhiltzova (9 males, OPC). **Azerbaijan**, Nakhchivan AR, Ordubad District, Tivi village, river Tivi, sweep netting, 1960m, N39°8'0.24" E45°55'47.07", 25.VI. 2019, leg. I. Kerimova (6 males, OPC). **Georgia**, Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 6.VIII. 2024, leg. Gilles Vinçon (1 male, OPC). **Russia**, Abkhazia, stream at Lidzava village, 4.VII.1948, leg. A. Guskova (1 male, OPC). Russia, Caucasus, Dombai Mts. stream of Baduk Lake, 15.VI.1955, leg. L. A. Zhiltzova (5 males, OPC).

Turkey, Agri Province, Karasu-Aras Mts., 5 km SE of Sarican, 2000m, 39°47'N 42°28'E, 10.VII. 2002, leg. B. Benedek & T. Csővári (2 males, OPC). Erzerum Province, 8 km NW of Kop Pass, 2000m, 40°02'N 40°28'E, 11.VII.2002, leg. B. Benedek & T. Csővári (3 males, 2 females; OPC). Georgia, Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238° E, 6.VIII.2024, leg. Gilles Vinçon (9 males, OPC).

Remark. Comparing with *Micrasema kaskadian* sp. nov. we have re-examined all the 25 male specimens.

Micrasema kaskadian Oláh & Memishishi, sp. nov.

(Figures 126–130, Photos 7–8)

Material examined. Holotype: **Georgia**, Imereti, Kaskadiani, spring, 310m, 42.49007°N 42.62388°E, 28.IV.2024, leg. A. Memishishi (1 male, OPC). Paratypes: Georgia, Imereti, Khvereti, spring, 530m, 42.3740942°N, 43.437 885°E, 28.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, subalpine meadow, malaise trap 18, 2450m, N41°45'41.8, E42°06'56.9, 29.VI–13.VII.2018, leg. GGBC members et al. (2 males, 1 female; OPC).

Diagnosis. This new species belongs to the *Micrasema bifoliatum* Martynov, 1925 species complex represented by three known species: *M. anatolicum* Botosaneanu, 1974 (Turkey); *M. bifoliatum* Martynov, 1925 (Caucasus) and *M. mencilis* Sipahiler, 1995 (Turkey). Most close to *M. anatolicum*, but differs by vertical, not oblique lateral profile of segment IX, by shorter and more quadrangular lateral profile of cerci, by the downward, not mesad directed inferior lobe of coxopodite as well as by the very tip of this inferior lobe composed of several spines at *M. kaskadian* sp. nov. these spines are lacking on the tip at *M. anatolicum*. This spine cluster on the tip of inferior lobe of coxopodite at the new species is discernible only at higher magnification of a compound microscope. Botosaneanu (1974, personal communication) used the same magnification of a compound microscope and the tip of inferior lobe of coxopodite of his species *M. anatolicum* is bare on his drawings without spine cluster. There is distinct divergence between *M. kaskadian* sp. nov. and *M. anatolicum* in the shape of phallotremmal sclerites in dorsal view; proximal end of the sclerites turning mesad in *M. kaskadian* sp. nov. and turning laterad in *M. anatolicum*.

Description. Male (in alcohol). Antennae, palpi, thorax and legs brownish. Medium brown, large-sized species with forewing length of 7 mm.

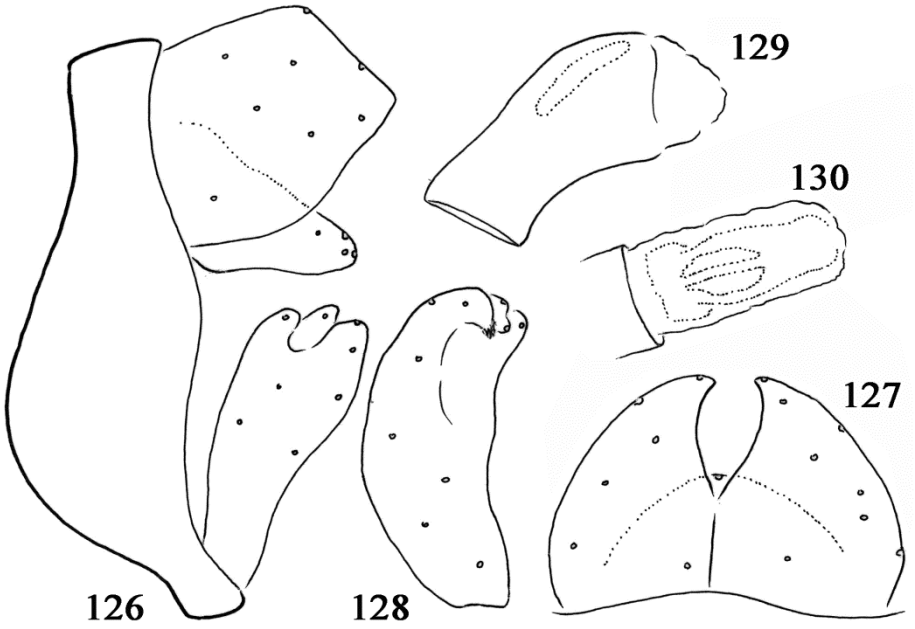
Male genitalia. Segment IX fused annular and short; lateral profile of segment IX longer laterad, short dorsad and ventrad, particularly on its ventrum. Segment X forming a hood over phallic organ as long as cerci, triangular in lateral and rounded in dorsal view without produced sclerotization ventrobasad. Cerci short, shorter than high, straight truncated apicad. Gonopods dominated by long apicad broadening and bilobed coxopodite; ventral (inferior) lobe turning mesad with pointed apex, dorsal (superior) lobe blunt; short harpago hidden between the apical lobes turning mesad with narrowed apex. Phallic organ short and broad; pair of elongated phallotremmal sclerites present, its exact shape indistinct.

Etymology. Coined from the name of the locus typicus, as a noun in apposition.

Goeridae Ulmer, 1903

Lithax incanus Hagen, 1859

Material examined. **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (2 males, 1 female; OPC). Georgia, Adjara, above Namonastrevi, nice brook and lateral springs, 1660–1700m, 41.56°N, 42.0807°



Figures 126–130. *Micrasema kaskadian* sp. nov. Holotype male: 126 = genitalia in left lateral view; 127 = genitalia in dorsal view; 128 = left gonopod in ventral view; 129 = phallic organ in left lateral view; 130 = phallic organ in dorsal view.

E, 1.V.2024, leg. Gilles Vinçon (4 males, 1 female; OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 20.IV. - 5.V. 2018, leg. GGBC members et al. (2 males, IZISUT). Georgia, Doberadzeni, spring, 370m, 42.59264°N, 42.32199°E, 28.IV.2024, leg. A. Memishishi (2 males, 1 female; IZISUT). Georgia, Babili, spring, 790m, 42.79156°N, 42.74598°E, 27.IV.2024, leg. A. Memishishi (1 male, 1 female; IZISUT). Georgia, High Svaneti, above Lukhi, torrent, 43.0669°N, 42.0623°E, 2440m, 17.VIII.2024, leg. Gilles Vinçon (2 males, 1 female; OPC). Georgia, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, nice brook and spring, 42.6928°N, 42.6447°E, 2120m, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Silo proximus Martynov, 1913

Material examined. Georgia, Adjara, Mtirala National Park, nice steep brook and lateral spring, 1340m, 41.645°N, 41.886°E, 30.IV.2024, leg. Gilles Vinçon (1 male, OPC).

Uenoidae Iwata, 1927

Thremmatinae Martynov, 1935

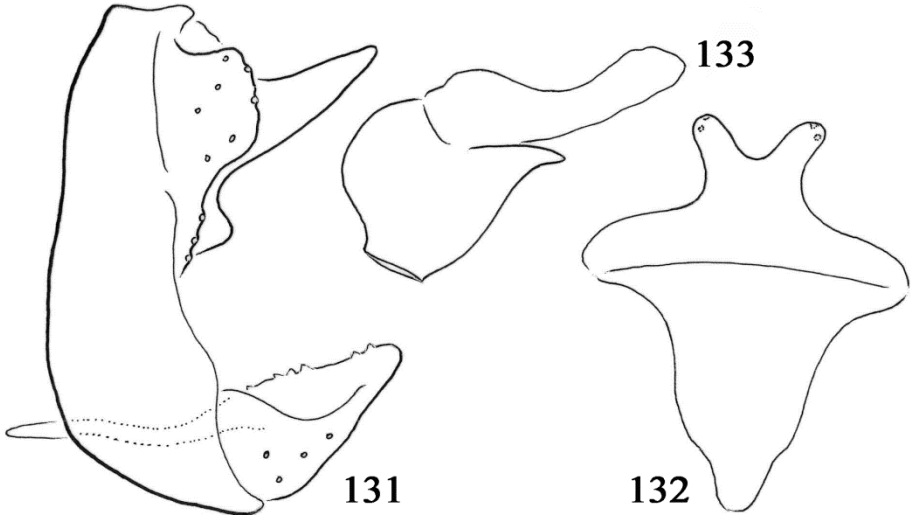
Thremma anomalum species complex

Apical ending of the fused gonopods is bilobed that is deeply cleft on the middle. Five species belongs to this complex: *Thremma anomalum* McLachlan, 1876; *T. artvinicum* Sipahiler, 2020; *T. balcanum* Oláh & Vinçon, 2024; *T. kintricum* sp. nov., *T. svaneticum,* Oláh & Vinçon, 2024

Thremma kintricum Oláh & Memishishi, sp. nov.

(Figures 131–133, Map 4, Photos 7–8, 18–19)

Material examined. Holotype: **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 20.IV.–5.V. 2018, leg. GGBC members (1 male, OPC). Paratypes: Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N,



Figures 131–133. *Thremma kintricum* sp. nov. Holotype male: 131 = genitalia in left lateral view; 132 = fused gonopod in ventral view; 133 = phallic organ in left lateral view.

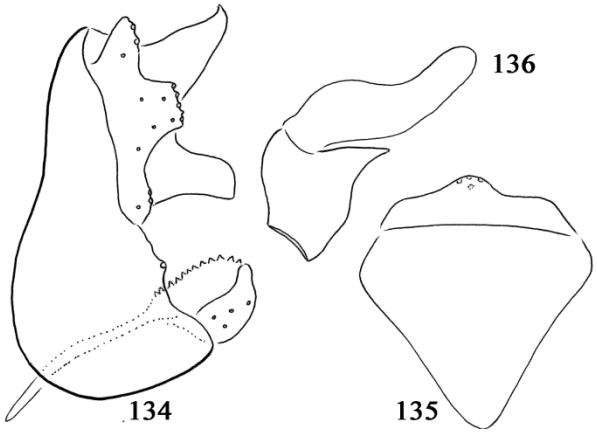
Map 4. Caucasian *Thremma* species (4 species): *T. adjaricum* sp. nov., *T. artvinicum* Sipahiler, 2020; *T. kintricum* sp. nov., *T. svaneticum,* Oláh & Vinçon, 2024.

42.0951°E, 1.VI.–15.VI. 2018, leg. GGBC members (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N 42.0951°E, 1.VI.–15.VI. 2018, leg. GGBC members et al. (1 male, IZISUT; 1 male, OPC). Georgia, Gouria, road to Bakhmaro, brook, 1990m, 41.8592°N, 42.3566°E, 10.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

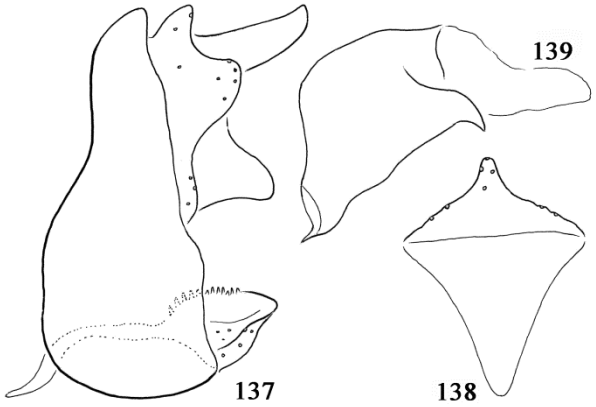
Diagnosis. This new species from the Lesser Caucasus has resemblance to *Thremma svaneticum* Oláh & Vinçon, 2024, but differs by the neutral, non-adaptive periphallic organ of cercus having regular quadrangular upper half, not irregular apical margin. Phallotheca short and high, not long and low. The apical bilobed head of the fused gonopods is long, longer and not shorter than its basis; the basement of the fused gonopods low and rounded, not high and parallel-sided. The proximal apical lip of the phallotheca lacking.

Description. Dark brown species with forewing length of 4 mm. Sternite VII with ventral comb composed by 3 teeth of equal length, but the middle one is very slim.

Male genitalia. Dorsal half of segment IX is only little shorter, than ventral half. Segment X reduced. Cerci very high, with quadrangular upper half. Paraproct elongated triangular, slightly upward directed in lateral view. Gonopods fused with elongated basal plate of gonopods; in ventral view the bilobed head of the fused gonopods long,



Figures 134–136. *Thremma adjaricum* sp. nov. Holotype male: 134 = genitalia in left lateral view; 135 = fused gonopod in ventral view; 136 = phallic organ in left lateral view.



Figures 137–139. *Thremma adjaricum* sp. nov. Paratype male: 137 = genitalia in left lateral view; 138 = fused gonopod in ventral view; 139 = phallic organ in left lateral view.

laterad directed; longer than its laterally dilated basis. Phallic organ is composed of the more sclerotized phallotheca and of the less sclerotized membranous apical half; the phallotheca is without proximal ventral lip and with short ventroapical lip.

Etymology. Named after the region of the *locus typicus*.

Thremma gallicum species complex

Apical ending of the fused gonopods is monolobous forming various apicomesal processes in the ventral profile. Seven known species belong to this complex: *Thremma adjaricum* sp. nov., *T. africanum* Malicky & Lounaci, 1987; *T. arvernense* Giudicelli, 1971, *T. gallicum* McLachlan, 1880; *T. martynovi* Malicky, 1976; *T. sardoum* Costa, 1884; *T. tellae* Gonzalez, 1978.

Thremma adjaricum Oláh & Memishishi, sp. nov.

(Figures 134–139, Map 4, Photos 7–8)

Material examined. Holotype: **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44’38.8824”, E42°5’ 0.2904”, 20.IV.–5.V.2018, leg. GGBC members et al. (1 male, OPC). Paratype: Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1264m, N41°44’38.8824”, E42° 5’0.290”, 13.VII.–27.VII.2018, leg. GGBC members (1 male, OPC).

Diagnosis. This new species from the Lesser Caucasus lives together with *Thremma kintricum* sp. nov. It was collected in the same Malaise trap, both in early spring. It has resemblance to *Thremma martynovi* Malicky, 1975, but differs by the neutral, non-adaptive periphallic organ of cercus having regular quadrangular, not rounded middle lobe. The membranous apical region of the phallic organ is longer and S-shaped, not short and straight. The apical mesal process of the fused gonopods is very short rounded, not pointed triangular. The proximal apical lip of the phallotheca lacking.

Description. Dark brown species with forewing length of 4 mm. Sternite VII with ventral comb reduced to single long and stout tooth.

Male genitalia. Dorsal half of segment IX shorter than ventral half; its very dorsum is very short. Segment X reduced. Cerci trilobed in lateral view, its middle lobe is regular quadrangular. Paraproct elongated triangular, slightly upward directed in lateral view with upturned pointed terminal. Gonopods fused with elongated basal plate of gonopods; in ventral view the monolobed mesal process very short. Phallic organ is composed of the more sclerotized phallotheca and of the less sclerotized membranous S-shaped apical

half; the phallotheca is without proximal ventral lip and with short ventroapical lip.

Etymology. Named after the region of the *locus typicus*.

Remark. There are pronounced differences between the genital structure of the holotype and paratypes. Particularly the apicomesal process diverged significantly that is well visible both in lateral and ventral views. In the holotype it is less produced. We need to have other specimens to study the real nature of this divergence.

Lepidostomatidae Ulmer, 1903

Lepidostomatinae Ulmer, 1903

***Lepidostoma chaldyrense* (Martynov, 1909)**

Material examined. **Georgia,** Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 24.IV.2024 leg. Gilles Vinçon (1 male, OPC). Georgia, Samtskhe-Javakheti, Zeda Vardzia, nice brook and spring, 1410m, 41.383°N, 43.258°E, 25.IV.2024, leg. Gilles Vinçon (12 males, OPC). Georgia, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC).

***Lepidostoma iranicum* Schmid, 1959**

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Lentekhi, spring, 760m, 42.79081 42.73402, 27.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Adjara, Chkhutuneti, spring, 700m, 41.4817°N, 41.857 86°E, 30.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Racha-Lechkhumi and Lower Svaneti, Uravi, spring, 1000m, 42.65771°N, 43.29736°E, 26.IV.2024, leg. A. Memishishi (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 10.VII. - 27.VII.2018, leg. GGBC members et al. (1 male, IZISUT). Georgia, Mtskheta-Mtianeti, S. Tsdo, nice brook, 1700m, 42.6824°N, 44.6328°E, 2.VIII.2024, leg. Gilles Vinçon (11 males, 8 females; OPC). Georgia, Khakhmati, 42.52761°N, 45.01662°E, 8.X.2024, leg. A. Memishishi (1 male, OPC).

Remarks. This species, described from Iran, was later collected in the Georgian High Caucasus (Oláh & Vinçon 2024). Here we report it for the first time in the Georgian Lesser Caucasus.

***Lepidostoma longiplicatum* Martynov, 1913**

Material examined. Georgia, Kakhetia, road to Omalo, small brook with mosses, tributary of Stori River, 1230m, 42.2192°N, 45.4768°E, 22. IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Kakhetia, above Lagodekhi, Shromis-Khevi valley, big torrent, below Iron Bridge, 740m, 41.8585°N, 46.3076°E, 20.IV.2024, leg. Gilles Vinçon (2 males, OPC).

Theliopsychinae Weaver, 1992

***Martynomyia bakhmara* Oláh & Vinçon, sp. nov.**

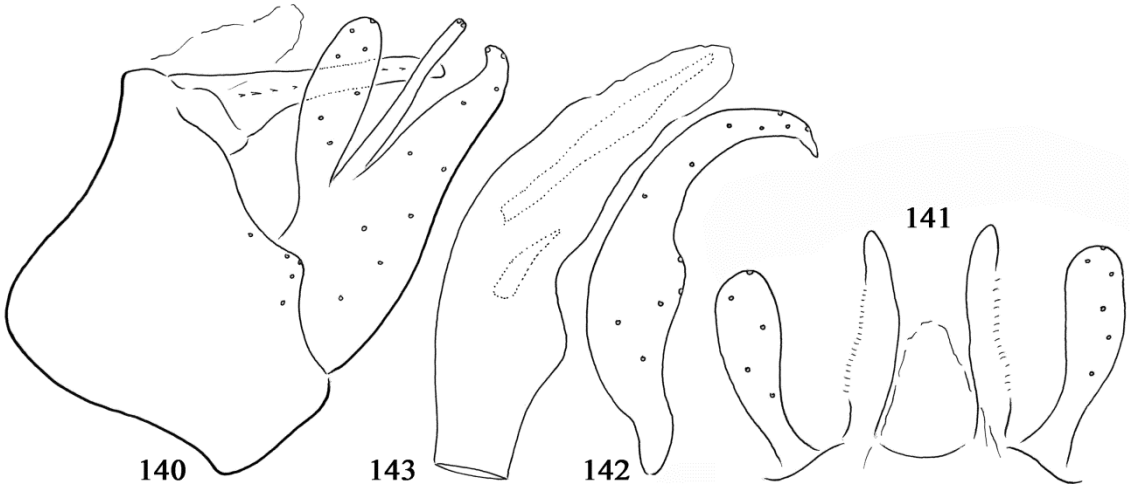
(Figures 140–143, Map 5, Photos 20–21)

Material examined. Holotype: **Georgia**, Gouria, above Bakhmaro, brook and spring, 1980m, 41.8386°N, 42.331°E, 10.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Most close to *Martynomyia zazai* Oláh & Vinçon, 2024 but easily distinguished from all the known species of the complex by the fused cerci and paraproct complex having simple rod shape supplied with lateral row of fine setae, by very long and very slender digitiform middle process on gonopod as well as by the straight very long dorsal and straight very short ventral spines in the endotheca of phallic organ.

Description. Small, dark brown animal with forewing length of 6 mm. Apicomesal lobe on sternite VII narrow elongated.

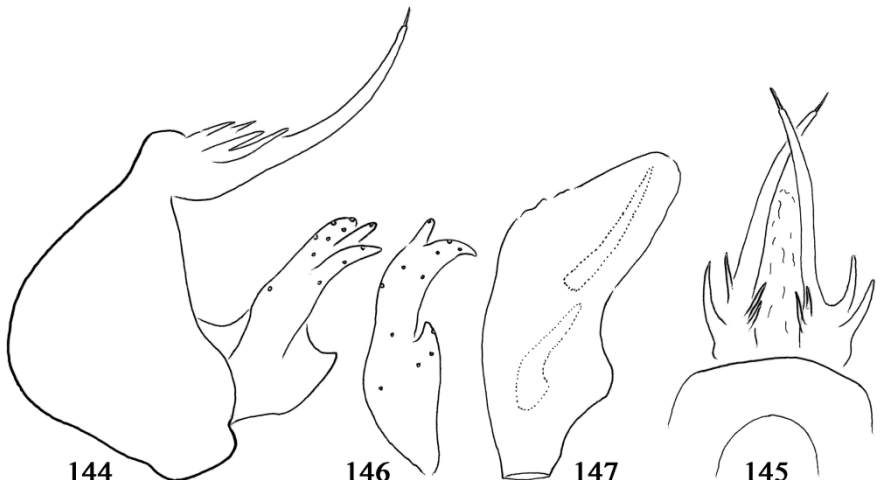
Male genitalia. Segment IX has short dorsum, ventrum longer and anterior margin convex



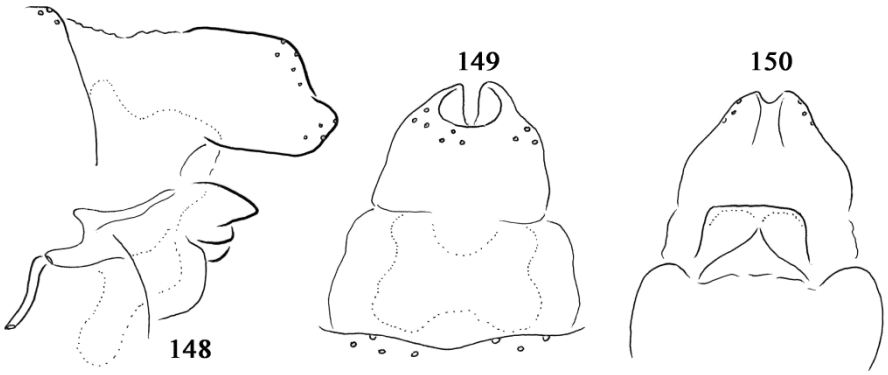
Figures 140–143. *Martynomyia bakhmara* sp. nov. Holotype male: 140 = genitalia in left lateral view; 141 = genitalia in dorsal view; 142 = left gonopod in ventral view; 143 = phallic organ in left lateral view.

Map 5. *Martynomyia* genus (8 species): *M. ayderensis* Sipahiler, 1989, *M. bakhmara* sp. nov., *M. kintrisha* sp. nov., *M. martynovi* Sipahiler, 1995, *M. omala* sp. nov., *M. svanetia* Oláh & Vinçon, 2024, *M. tripartita* (Martynov, 1913), *M. zazai* Oláh & Vinçon, 2024.

rounded triangular. Segment X membranous with upward turning apex. The fused complex of cerci and paraproct is not dentate, armed only with short setae; particularly concentrated along its lateral margin; in lateral view broadening basad. The tripartite gonopods composed of ovoid highly setose dorsal, less setosed long and slender digitiform middle and setose lower lobes discernible in lateral view; the digitiform middle process setosed only on its apical region with a few long setae; the highly setosed dorsal ovoid process represents probably the harpago, the second segment of the gonopods but fused with articulation on the very basal region of the coxopodite; the apical region of the lower lobes curving mesad ending in aviform head in ventral view, basal part broadening. Phallic organ with two pairs of parameres embedded inside the phallotheca or endotheca; dorsal spine very long, ventral spine short, both straight.



Figures 144–147. *Martynomyia kintrisha* sp. nov. Holotype male: 144 = genitalia in left lateral view; 145 = genitalia in dorsal view; 146 = left gonopod in ventral view; 147 = phallic organ in left lateral view.



Figures 148–150. *Martynomyia kintrisha* sp. nov. Allotype female: 148 = genitalia in left lateral view; 149 = genitalia in dorsal view; 150 = genitalia in ventral view.

Etymology. Coined from the name of holotype's locality, a noun in apposition.

Martynomyia kintrisha Oláh & Memishishi, sp. nov.

(Figures 144–150, Map 5, Photos 7–8)

Material examined. Holotype: **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1264m, N41°44'38.8824", E42° 5'0.2904", 24.VII–7.IX.2018, leg. GGBC members (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (2 males, IZISUT; 4 males, OPC).

Diagnosis. Fused complex of cerci and paraproct is bare spine-like, not dentate, not bare rod-like and not short plate-like. This new species is a sibling of *Martynomyia ayderensis* Sipahiler, 1989, but differs by the highly diverged spine pattern of the fused cerci and paraproct as described below. Tripartite gonopod is also diverged as visible both in lateral and ventral views; middle digitiform bare process almost as long as the others, not much longer; lower mesad curving process differently shaped; broad based, not slender along its entire length. There are divergences also in female genitalia; fused tergite IX and X longer as visible in lateral view; its lobes

with rounded apices, not pointed and not mesad turning, the lateral shape of sternite X also differs.

Description. Small, dark brown animal with forewing length of 5 mm, both holotype and allotype. Apicomesal lobe on sternite VII short rounded triangular.

Male genitalia. Segment IX has dorsum, shorter than ventrum; anterior margin convex rounded triangular; posterior margin straight vertical. Segment X membranous, just discernible with indistinct apex. The fused complex of cerci and paraproct is not dentate as *M. svanetia* and *M. tripartita*, not bare rod-like as *M. omala* and *M. zazai* and not short plate-like as *M. martynovi*; it is spine-like as *M. ayderensis*; spine-like fused cerci and paraproct has two basomesal and two basolateral small spines, there is no spines along the stalk and there is no additional apical spine. The tripartite gonopods composed of ovoid highly setose dorsal, less setose digitiform middle and setose lower lobes discernible in lateral view; the digitiform middle process setose only on its apical region with a few long setae; the highly setosed dorsal more broad process represents probably the harpago, the second segment of the gonopods but fused with articulation on the very basal region of the coxopodite; the apical digitiform region of the lower lobes slightly curving mesad with tapering pointed head in ventral view, middle and basal part broadening. Phallic organ with two pairs of parameres embedded inside endotheca distal pair straight, basal curving.

Female genitalia. Basic architecture of female genitalia similar to *Martynomyia ayderensis* Sipahiler, 1989, but the membranous protruded structure visible intruded; this less visible, just discernible structure is rather a part of the vaginal sclerite complex somehow intruded-protruded during copulation; its shape is rather flexible having no stable diagnostic value. In the intruded state of the membranous structure there is a membranous connection between tergite VIII and the fused tergit IX and X. It seems this membranous connection pressed very short when the membranous structure is protruded possibly as a result of copulation. Sclerotized fused tergit IX and X short, but longer compared to *M. ayderensis*. In dorsal view bilobed, apical head rounded. Sternite X regular rectangular in ventral view.

Etymology. Coined from the name of holotype's locality, a noun in apposition.

***Martynomyia omala* Oláh & Vinçon, sp. nov.**

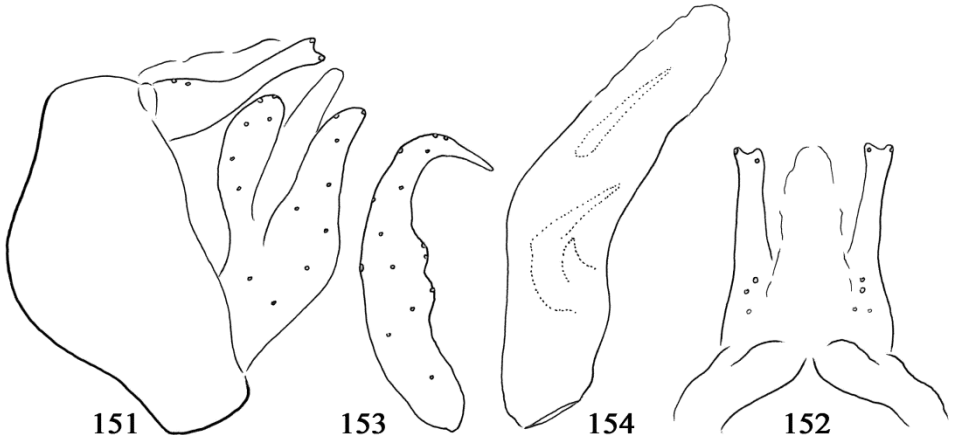
(Figures 151–157, Map 5, Photos 10–11)

*Material examined***.** Holotype: **Georgia,** Kakhetia, road to Omalo, nice brook and lateral spring, tributary of Stori River, 650m, 42.177°N, 45.431° E, 22.IV.2024, leg. Gilles Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (4 males, 1 female; OPC). Georgia, Kakheti, road to Omalo, nice brook under cascade, 1500m, 42.2373°N, 45.4921°E, 5.VIII.2024, leg. Gilles Vinçon (4 males, OPC).

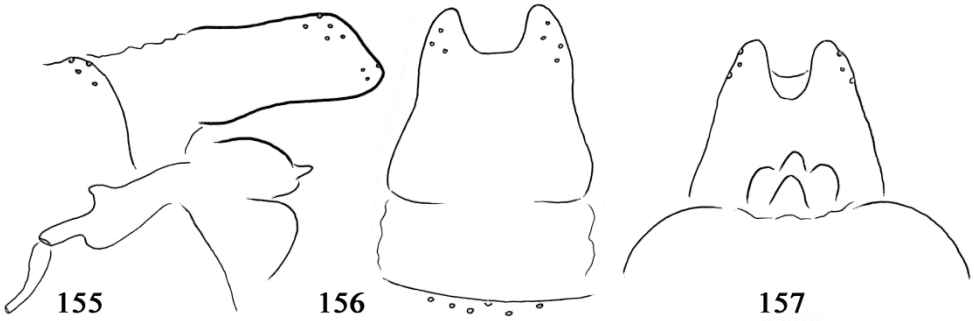
Diagnosis. Fused complex of cerci and paraproct is bare, not dentate. This new species is a sibling of *Martynomyia zazai* Oláh & Vinçon, 2024, but differs by the straight, not S-shaped dorsal profile of the fused cerci and paraproct as well as by the clearly excised, not rounded head of fused cerci and paraproct. The beak of aviform head of the ventral arm of coxopodite is long, not short in ventral view.

Description. Small, dark brown animal with forewing length of 5 mm. Apicomesal lobe on sternite VII short rounded triangular.

Male genitalia. Segment IX has dorsum, and ventrum of almost equal length; anterior margin convex rounded triangular; posterior margin straight vertical. Segment X membranous with indistinct apex. The fused complex of cerci and paraproct is not dentate, armed only with a few long setae; two at apex and three-four at the basal region; in lateral view the basal part is broad; its apex slightly excised as visible both in lateral and dorsal views. The tripartite gonopods composed of ovoid highly setose dorsal, less setose digitiform middle and setose lower lobes discernible in lateral view; the digitiform middle process setose only on its apical region with a few long setae; the highly setosed dorsal ovoid process represents



Figures 151–154. *Martynomyia omala* sp. nov. Holotype male: 151 = genitalia in left lateral view; 152 = genitalia in dorsal view; 153 = left gonopod in ventral view; 154 = phallic organ in left lateral view.



Figures 155–157. *Martynomyia omala* sp. nov. Allotype female: 155 = genitalia in left lateral view; 156 = genitalia in dorsal view; 157 = genitalia in ventral view.

probably the harpago, the second segment of the gonopods but fused with articulation on the very basal region of the coxopodite; the apical digitiform region of the lower lobes slightly curving mesad with tapering pointed head in ventral view, middle and basal part broadening. Phallic organ with two pairs of parameres embedded inside endotheca distal pair straight, basal curving.

Female genitalia. Basic architecture of female genitalia similar to *Martynomyia zazai* Oláh & Vinçon, 2024, but the lateral shape of the highly scalerotized structure of vaginal sclerite as well as both the lateral and particularly ventral shape of sternite X different.

Etymology. Coined from the name of holotype's locality, a noun in apposition.

Martynomyia svanetia Oláh & Vinçon, 2024

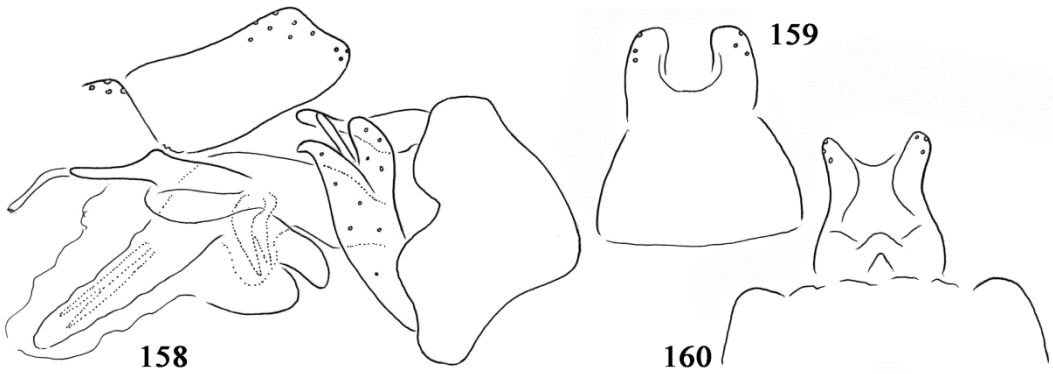
(Map 5, Photos 12–13)

Material examined. **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Martynomyia tripartita (Martynov, 1913)

(Map 5)

Material examined. **Georgia**, Racha-Lechkhumi and Lower Svaneti, Rachka, waterfall, 42.54357°N, 42.64466°E, 510m, 28.IV.2024, leg. A. Memishishi (1 male, IZISUT).



Figures 158–160. *Martynomyia zazai* Oláh & Vinçon, 2024. Female: 158 = genitalia in left lateral view; 159 = genitalia in dorsal view; 160 = genitalia in ventral view.

Martynomyia zazai Oláh & Vinçon, 2024

(Figures 158–160, Map 5)

Material examined. **Georgia**, Kakhetie, road to Omalo, above Lechuri, nice brook, 650m, 42.1643°N, 45.419°E, 24.V.2023, leg. Gilles Vinçon (in copula: 1 male, 1 female; OPC).

Female description. We have a great luck having our female in copula with a paratype male; therefore we have drawn the copula position without detaching them. Similarly to the comparison of *M. ayderensis* Sipahiler and *M. kintrisha* sp. nov. it seems during copulation the long membranous region between tergite VIII and fused tergite IX and X pressed to almost disappearance. Female of *M. zazai* is similar to *M. omala*, although in copula position comparison of *M. zazai* and *M. omala* not easy. Fortunately even in copula position differences in the lateral and ventral shape of bilobed ending of fused tergite IX and X, sternite X as well as the lateral profile of the highly sclerotized vaginals sclerite complex is well visible and comparable on the drawings.

Apataniidae Wallengren, 1886

Apatania subtilis Martynov, 1909

*Material examined***. Georgia,** Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 24.IV.2024 leg. Gilles Vinçon (12 males, 3 females; OPC). Georgia, Mtskheta-Mtianeti, above Dzegvi, spring, 1420m, 41.782°N, 44.512°E, 24.IV.2024, leg. Gilles Vinçon (2 males, OPC). Georgia, Mtskheta-Mtianeti, above Kvemo Mleta, springs and cascades, 1560m, 42.4364°N, 44.49 46°E, 23. IV.2024, leg. Gilles Vinçon (6 males, 3 females; OPC). Georgia, Mtskheta-Mtianeti, above Kvemo Mleta, spring and brook, 1480m, 42.432°N, 44.50 75°E, 23.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Kvemo Kartli, Dashbashi cascades, 1410m, 41.595°N, 44.124°E, 24.IV.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Tsana, spring, 42.85197°N, 43.16296°E, 1510m, 27.IV. 2024, leg. A. Memishishi (4 males, IZISUT). Georgia, Imereti, Lashijala, river, 42.64 795°N, 42.84235°E, 26.IV.2024, leg. A. Memishishi (4 males, IZISUT). Georgia, High Svanetie, above Mestia, brook and springs above the fish farm, 1550m, 43.0477°N, 42.80 91°E, 3.V.2024, leg. Gilles Vinçon (4 males, 3 females; OPC). Georgia, Kakhetia, above Lagodekhi, Shromis-Khevi valley, brook, 580m, 41.84056° N, 46.2844°E, 20.IV.2024, leg. Gilles Vinçon (2 males, 1 female; OPC). Georgia, Racha-Lechkhumi and Lower-Svanetie, above Kulbaki, nice brook, 980 m, 42.6385°N, 42.611°E, 2.V. 2024, leg. Gilles Vinçon (2 males, OPC). Georgia, High Svaneti, near Zagari Pass, lateral spring, 2320m, 42.9 29°N, 43.133°E, 14.VIII.2024, leg. Gilles Vinçon (4 males, 11 females; OPC). Georgia, Mtskheta-Mtianeti, Gudani 42.53277°N, 44.95968°E, 8.X. 2024, leg. A. Memishishi, (1 male, OPC).

Limnephilidae Kolenati, 1848

Drusinae Banks, 1916

***Drusus akhalchala* Oláh & Vinçon, sp. nov.**

(Figures 161–168, Photo 6)

Material examined. Holotype: **Georgia**, Racha-Lechkumi and Lower-Svaneti, Akhalchala, brook and spring, 2170m, 42.6947°N, 42.6463°E, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratype: same as holotype (1 female, OPC).

Diagnosis. Having gigantic parameres, distally dilated aedeagus and vertical plan of gonopods this interesting species belongs to the small *Drusus budtzi* species group. *Drusus akhalchala* Oláh & Vinçon, sp. nov. is the fifth member of this highly modified apomorphic species group of the *Drusus* genus. This unique group represents an independent lineage in the genus with great character state transformations initiated by drastic stochastic impacts and created during integrative organisation. The enlargement of paramere shaft is coupled with the shift of spine organising centre to the paramere terminal. The basic architectural plan of the genitalia of *D. akhalchala* is identical with that of *D. budtzi* (Ulmer, 1913), *D. janjulae* Oláh, 2020, *D. kheled* Oláh & Vinçon, sp. nov., *D. maculosus* Malicky & Oláh, 1979, but the periphallic organs of cerci, paraproct, gonopod diverged from that of *D. budtzi*, *D. maculatus* and *D. janjulae*, but closely related to *D. kheled*. *Drusus akhalchala* sp. nov. differs from *D. kheled* sp. nov. by the less developed sweeping structure on the paramere head. Its functional importance is discussed in the diagnosis of *D. kheled*.

Description. Large-sized animal with yellowish, stramineous body and wing colour. Its forewing length is 14 mm.

Male genitalia. Segment IX short and high rounded convex anterad with sudden narrowing dorsad resulted in a very short band-like dorsum, but longer ventrum. Cerci downward directed ovoid setose large plate basally connected to the paraproct. The dorsal branch of the paraproct composed of an apical pair of heavily sclerotized dentate black circular lobes arching laterad visible in caudal view and a setose dorsal region having putative cercal origin. Gonopods almost vertical directed with more developed posterad directed dorsal and less produced ventral regions. Phallic organ has a robust aedeagus with capitate head and a pair of vertically flat enlarged parameres armed with a small group of few spines on its dorsoapical narrowing tip and covered on the distal half with tightly packed elongated and decumbent fine scales of sharp tip.

Female genitalia. Tergite of fused segments IX and X forming a short tube closed ventrally, dorsum with large rounded mesal excision; lateral lobes triangular in dorsal view; the lateral setose lobe of sternite IX elongated with rounded apical margin. Supragenital plate (upper vaginal lip) of segment X well-developed and quadrangular both in lateral and ventral views. Median lobe of the vulvar scale (lower vaginal lip) present as a small digitiform slender process compared to the much produced lateral lobes.

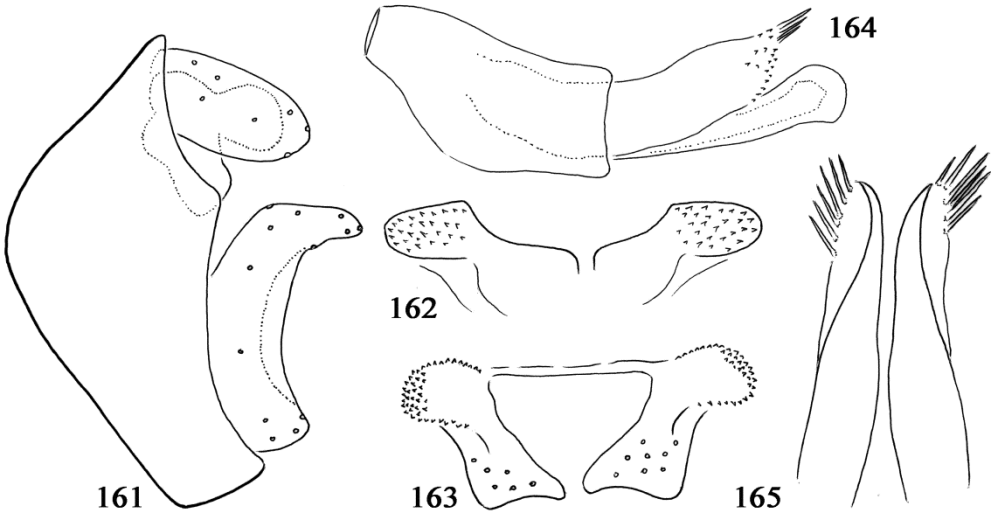
Etymology. Coined from the name of holotype's locality, a noun in apposition.

***Drusus alapos* Oláh, 2020**

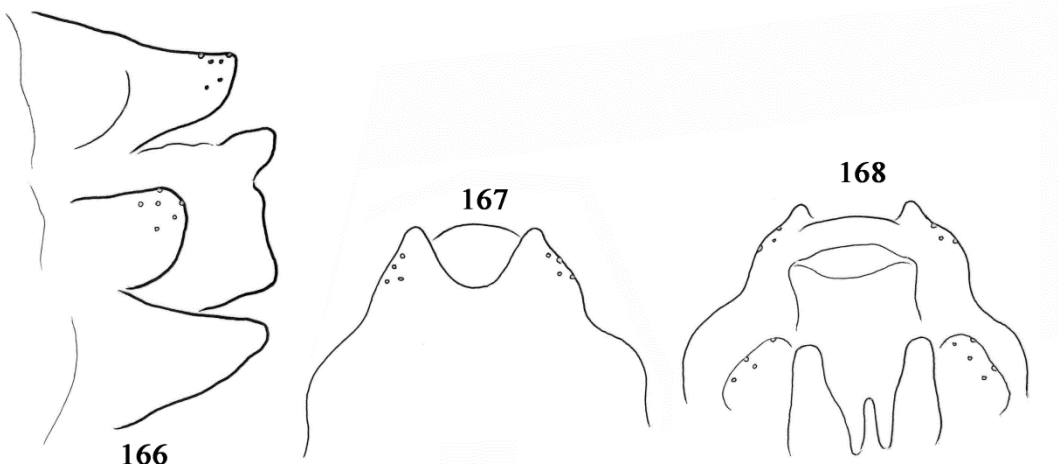
Material examined. **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 13.VII. –27.VII. 2018, leg. GGBC members (1 male, IZISUT). Georgia, Adjara, road to Gomismta, brook, 2150–2200m, 41.8098°N, 42.1827°E, 11.VIII.2024, leg. Gilles Vinçon (3 males, 3 females; OPC). Georgia, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, brook and spring, 2120m, 42.6928°N, 42.6447°E, 13.VIII.2024, leg. Gilles Vinçon (4 males, OPC). Georgia, Adjara, above Gomismta, brook, 2120–2150m, 41.8108° N, 42.1821°E, 11.VIII.2024, leg. Gilles Vinçon (4 males, OPC).

***Drusus erdes* Oláh & Vinçon, 2020**

*Material examined***. Georgia,** Mtskheta-Mtianeti, above Kvemo Mleta, nice springs and cas



Figures 161–165. *Drusus akhalchala* sp. nov. Holotype male: 161 = genitalia in left lateral view; 162 = paraproct in dorsal view; 163 = paraproct in dorsocaudal view; 164 = phallic organ in left lateral view; 165 = parameres in ventral view.



Figures 166–168. *Drusus akhalchala* sp. nov. Allotype female: 166 = genitalia in left lateral view; 167 = genitalia in dorsal view; 168 = genitalia in ventral view.

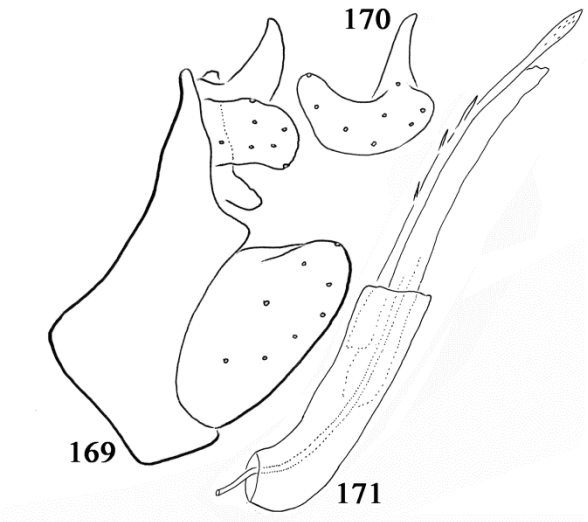
cades, 1560m, 42.4364°N, 44.4946°E, 23.IV. 2024, leg. Gilles Vinçon (6 males, OPC). Georgia, Gouria, road to Gomismta, springs, 1900m, 41.8317°N, 42.1556°E, 11.VIII.2024, leg. Gilles Vinçon (2 males, OPC). Georgia, Imereti, above Sairme, Zekari Pass, below Didimaghala Pic, nice brook with mosses and spring, 2055m, 41.85°N, 42.8°E, 9.VIII.2024, leg. Gilles Vinçon (4 males, 3 females; OPC). **Georgia**, Gouria, above Bakhmaro, brook and spring, 1980m, 41.8386°N, 42.331°E, 10.VIII.2024, leg. Gilles Vinçon (5 males, 4 females; OPC).

Drusus gudaur Oláh & Vinçon, sp. nov.

(Figures 169–171, Photos 22–23)

Material examined. Holotype: **Georgia**, Mtskheta-Mtianeti, between Stephantsminda and Gudauri, south Almasiani, nice brook, 2350m, 42.5342°N, 44.4978°E, 2.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Having inflated paramere terminal section with piliferous-tomentose-pubescent para-



Figures 169–171. *Drusus gudaur* sp. nov. Holotype male: 169 = genitalia in left lateral view; 170 = cercus and dorsal arm of paraproct in caudal view; 171 = phallic organ in lateral view.

mere surface and recumbent primary and secondary paramere spines, it belongs to the *Drusus caucasicus* species group. The plate-shaped setose cercus is fused to a digitiform setaless process of paraproct origin, a character combination of the *Drusus caucasicus* species complex (Oláh et al. 2017). Most close to *Drusus caucasicus* Ulmer, 1907, but differs by having paramere with more inflated head and with pronounced subapical constriction. The mesal arm of the bilobed fused complex cercal structure that is the setaless fused dorsal arm of the paraproct is even more robust, especially in lateral view. The neutral periphallic organ of the gonopod is slightly tapering, not rounded truncate.

Description. Light brown animal with forewing length of 11 mm. Segment IX short, very short dorsad and longer ventrad; anterior traingular lobe shifted ventrad. Basal part of paraproct with closed trapezoid frame. Highly modified dorsal arm of paraproct fused to cerci and developed particularly robust in lateral view. Gonopods short and rounded. Parameres supplied with three recumbent spines and dilated piliferous head.

Etymology. Coined from the name of the type locality.

***Drusus kheled* Oláh & Vinçon, sp. nov.**

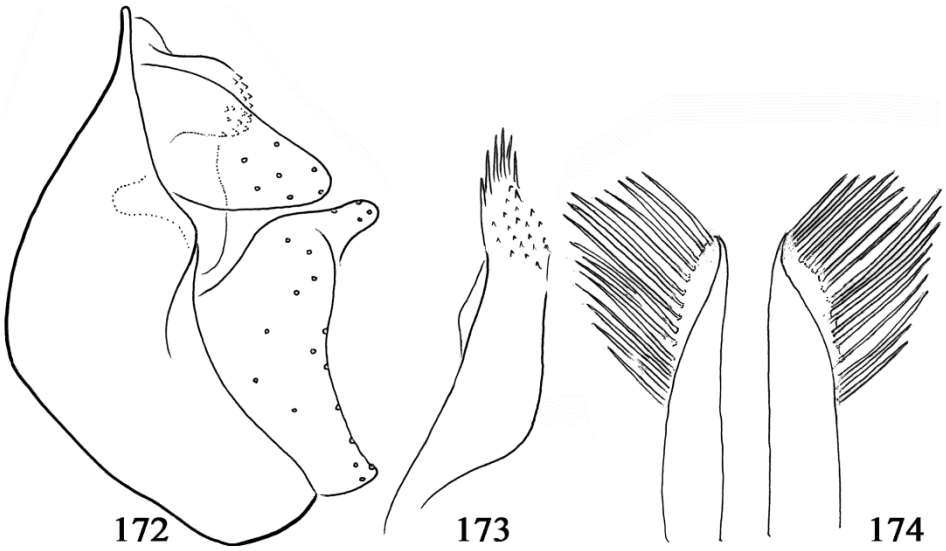
(Figures 172–174, Photos 24–25)

*Material examined***.** Holotype: **Georgia,** Racha-Lechkhumi and Lower-Svaneti, above Kheledi, spring, 1180m, 42.8037°N, 42.6335°E, 14. VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Having gigantic parameres, distally dilated aedeagus and vertical plan of gonopods this interesting species belongs to the small *Drusus budtzi* species group. This unique group represents an independent lineage in the genus with great character state transformations initiated by drastic stochastic impacts and created during integrative organisation. The enlargement of paramere shaft is coupled with the shift of spine organising centre to the paramere terminal. The basic architectural plan of the genitalia is similar to *D. maculosus* Malicky & Oláh, 1979, but the periphallic organs of cerci, paraproct and gonopod diverged and the paramere is highly modified with its scale covered apical surface and with its mesal ridge. *Drusus kheled* is a sibling, a close relative of *D. akhalchala* but differs by the highly modified sweeping terminal, the titillating power of the paramere.

Apart from the small divergences in the periphallic organ between *D. akhalchala* and *D. kheled* there is a significant modification in the sweeping terminalia of the paramere. Compared to *D. akhalchala*, *D. kheled* has the terminal sweeping spine structure highly modified and diversified by producing more, over fifteen thick and long spines on paramere head to enforce its titillating sweeping function in the cryptic female choise processes. Bird males are recognised and accepted by their females by recognising them with their song pattern and plumage colour of reproductive isolation barriers, in prezygotic mating processes.

Drusus kheled male is recognised and accepted by female by its sweeping power during copulation. These adaptive divergences seem subtle for human capacity, they are integratively organised by large networks of DNA sequences. Even subtle



Figures 172–174. *Drusus kheled* sp. nov. Holotype male: 172 = genitalia in left lateral view; 173 = left paramere in left lateral view; 174 = parameres in ventral view.

structural divergences are produced by a very complex combination of large number of quantitative trait loci; among the detected 8000 genes 2261 genes were differentially expressed in small posterior lobe modification of genital imaginal disc between two diverging *Drosophila* species (Masly *el al.* 2011).

These minor shape modifications establishing reproductive isolation of incipient sibling species are created in complex interactive genetic processes by integrative organisation. In morphological alpha taxonomy such minor shape divergences of speciation expressed by speciation magic traits need stability test by visual trait matrix or by simple or stereo quantitative morphometry. In morphological alpha taxonomy of fine phenomics the reproductive isolation of incipient sibling species in its initial stage is demonstrated by these minor, subtle but stable trait divergences. This means that the stability of the sweeping structure on the paramere head of *Drusus akhalchala* needs to be tested but, we need to collect more specimens for this stability test.

Description Medium-sized animal with yellowish, stramineous body and wing colour; forewing with indistinct light spots. Its forewing length is 11 mm. Segment IX short and high parallel-sided with sudden narrowing dorsad resulted in a very short band-like dorsum; ventrum longer. Cerci downward directed with ovoid setose rather large plate basally connected to the paraproct. The dorsal branch of the paraproct composed of an apical pair of heavily sclerotized black laterad arching lobes visible in caudal view and a setose dorsal region having putative cercal origin. Gonopods almost vertical directed with more developed dorsal and less produced ventral regions. Phallic organ has a robust aedeagus with dilated head and a pair of vertically flat enlarged parameres armed with over fifteen long, thick spines on its dorsoapical half of the head and covered on the distal region with fine scaly and short spines; there is a mesal ridge on its apical mesal surface.

Etymology. Coined from the name of the type locality, a noun in apposition.

***Drusus megnot* Oláh & Vinçon, 2020**

Material examined. Georgia, Greater Caucasus Mountains, Mtskheta-Mtianeti region, Pasanauri, 42.353°N, 44.709°E, 1100m, 7.X.2024, leg. Jari Junnilainen (1 male, OPC).

Remark. This species was previously known only by the holotype.

Drusus stephantsmind Oláh & Vinçon, 2024

Material examined. **Georgia,** Mtskheta-Mtianeti, above Stephantsminda, nice brook, 2150–2200m, 42.6627°N, 44.6103°E, 23.IV.2024, leg. Gilles Vinçon (2 males, OPC). Georgia, Kakheti, road to Omalo, torrent with lateral seeps, 2420m, 42.2716°N, 45.508°E, 5.VIII.2024, leg. Gilles Vinçon (2 males, 1 female; OPC).

Remark. This species was previously known only from Mtskheta-Mtianeti, but it also occurs in Kakheti.

Drusus sukul Oláh & Vinçon, 2020

Material examined. **Georgia,** High Svaneti, near Zagari Pass, torrent, 2250–2300m, 42.9266° N, 43.13°E, 15.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, High Svaneti, near Zagari Pass, torrent, 2280m, 42.927°N, 43.123°E, 15. VIII.2024, leg. Gilles Vinçon (4 males, 2 females; OPC). Georgia, Mtskheta-Mtianeti, near Chaukhi Pass, 3075m, brooklet and spring, 42.5627°N, 44.8°E, 3.VIII.2024, leg. Gilles Vinçon (4 males, 3 females; OPC). Georgia, High Svaneti, above Lukhi, torrent, 2440m, 43.0669°N, 42.0623°E, 17.VIII.2024, leg. Gilles Vinçon (9 males, 6 females; OPC). Georgia, High Svaneti, above Lukhi, nice spring, 2320m, 43.0578°N, 42.0684° E, 17.VIII.2024, leg. Gilles Vinçon (5 males, 6 females; OPC). Georgia, High Svaneti, Tetnuldi Massif, nice torrent, 2690m, 43.021°N, 42.917°E, 15.VIII.2024, leg. Gilles Vinçon (8 males, 11 females; OPC). Georgia, Imereti, above Sairme, Zekari Pass, below Didimaghala Pic, nice brook with mosses and spring, 2055m, 41.85°N, 42.8°E, 9.VIII.2024, leg. Gilles Vinçon (4 males, 5 females; OPC). Georgia, High Svaneti, above Lukhi, torrent up to its spring, 255–2670m, 43.0726°N, 42.0666°E, 17.VIII.2024, leg. Gilles Vinçon (3 males, 6 females; OPC).

Remark. It is reported for the first time from the Lesser Caucasus (Imereti).

Drusus teslenkoae Oláh & Vinçon, 2020

Material examined. **Georgia,** Gouria, road to Gomismta, steep brook, 1430m, 41.8373°N, 42.144°E, up to its spring, 1460m, 41.8376°N, 42.1437°E, 28.IV.2024, leg. Gilles Vinçon (22 males, OPC). Georgia, Gouria, road to Bakhmaro, nice spring, 'Tskhratsqaro', 1380m, 41.8911°N, 42.3718°E, 28.IV.2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Adjara, above Namonastrevi, brooklet and spring, 1720m, 41.5528°N, 42.0892°E, 12.VIII.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Gouria, road to Bakhmaro, nice brook and spring, 1780m, 41.8818°N, 42.3567°E, 10.VIII.2024, leg. Gilles Vinçon (6 males, 5 females; OPC). Georgia, Gouria, road to Gomismta, springs, 1900m, 41.8317°N, 42.1556°E, 11.VIII.2024, leg. Gilles Vinçon (2 males, OPC).

Drusus zekar Oláh & Vinçon, sp. nov.

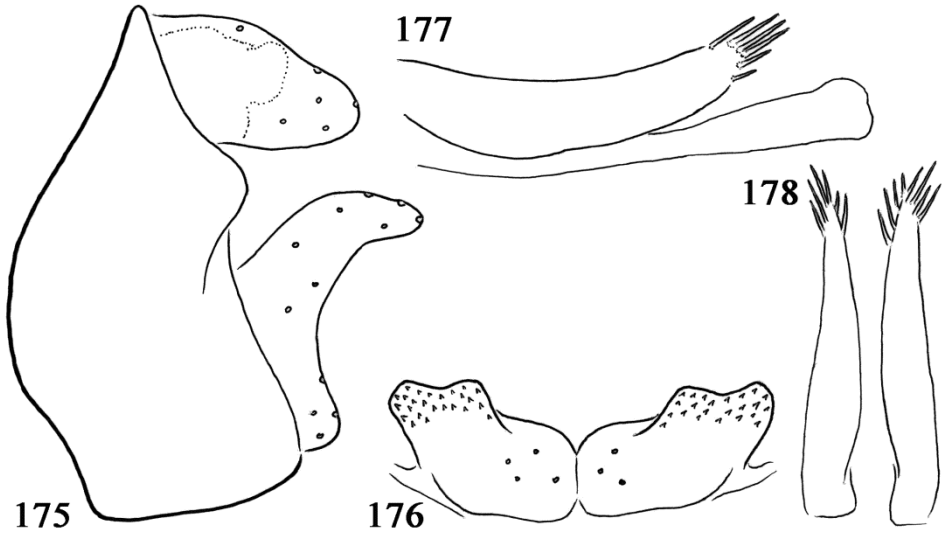
(Figures 175–178, Photos 26–27)

Material examined. Holotype: **Georgia**, Samtskhe-Javakheti, above Abastumani, Zekari Pass, spring, 2180m, 41.826°N, 42.8512°E, 9. VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Having gigantic parameres, distally dilated aedeagus and vertical plan of gonopods this interesting species belongs to the small *Drusus budtzi* species group. Most close to *Drusus akhalchala* sp. nov. but differs by the dentate black pair of dorsal arms of paraproct excise concave on apical margin, not straight in dorsal view; gonopode lateral profile more curved and pattern of apical spines on paramere head different.

Description. Large-sized animal with yellowish, stramineous body and wing colour. Forewing has some lighter maculated pattern. Forewing length is 14 mm.

Male genitalia. Segment IX short and high subtriangular, rounded convex anterad with sudden narrowing dorsad resulted in a very short band-like dorsum, but longer ventrum. Cerci downward directed ovoid setose large plate



Figures 175-178. *Drusus zekar* sp. nov. Holotype male: 175 = genitalia in left lateral view; 176 = paraproct in dorsal view; 177 = phallic organ in left lateral view; 178 = parameres in ventral view.

basally connected to the paraproct. The dorsal branch of the paraproct composed of an apical pair of heavily sclerotized dentate black lobes, excised or concave apicad as visible in dorsal view and directed laterad as visible in caudal view; setose dorsal region having putative cercal origin. Gonopods almost vertical directed with more developed posterad directed dorsal and less produced ventral regions. Phallic organ has a robust aedeagus with capitate head and a pair of vertically flat enlarged parameres armed with stout spines on its head.

Etymology. Coined from the name of holotype's locality, a noun in apposition.

Limnephilinae Kolenati, 1848

Limnephilini Kolenati, 1848

***Limnephilus affinis* Curtis, 1834**

Material examined. **Georgia,** Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 1.VI.–15.VI.2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 4.V.–20.V.2018, leg. GGBC members (1 male, IZISUT).

***Limnephilus auricula* Curtis, 1834**

Material examined. **Georgia**, Gouria, above Bakhmaro, brook and spring, 1980m, 41.8386, 42.331, 10.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Remark. This species, reported from Turkey, Artvin by Sipahiler & Malicky (1987), is new for Georgia.

***Limnephilus bipunctatus* Curtis, 1834**

Material examined. **Georgia,** Samtskhe-Javakheti, Upper Vardsia, Apnia, Guest house Vania, 41.374°N, 43.262°E, 1290m, 5-7.X.2024 leg. J. Junnilainen (1 male, OPC).

***Limnephilus lunatus* Curtis, 1834**

Material examined. **Georgia,** Mtskheta-Mtianeti, Gudani 42.53277°N, 44.95968°E, 8.X. 2024, leg. A. Memishishi, (1 male, OPC). Georgia, Samtskhe-Javakheti, Upper Vardsia, Apnia, Guest house Vania, 41.374°N, 43.262°E, 1290m, 5–7.X.2024 leg. J. Junnilainen (3 males, OPC).

Map 6. *Sakala* genus (4 species): *S. adjarica* Oláh & Vinçon, 2020, *S. gourica* sp. nov., *S. javaketica* sp. nov., *S. peculiaris* (McLachlan, 1875) described from Gouria without precise location.

Limnephilus microdentatus Martynov, 1913

Material examined. **Georgia**, Adjara, Goderdzi Pass, below Green Lake, brooks and springs, 2050m, 41.6784°N, 42.499°E and 41.6781°N, 42.4987°E, 8.VIII.2024, leg. Gilles Vinçon (1 male, 1 female; OPC).

Limnephilus stigma Curtis, 1834

Material examined. **Georgia**, Adjara, Goderdzi Pass, below Green Lake, large brook below the swamp, 2050m, 41.682°N, 42.5°E, 8.VIII. 2024, leg. Gilles Vinçon (1 male, OPC).

Sakala adjarica Oláh & Vinçon, 2020

(Map 6, Photos 7–8)

Material examined. **Georgia**, Adjara, Goderdzi Pass, after Beshumi Botanic Garden, brook and spring, 1970m, 41.6216°N, 42.5383°E, 7. VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI.–13.VII.2018, leg. GGBC members (1 male, OPC).

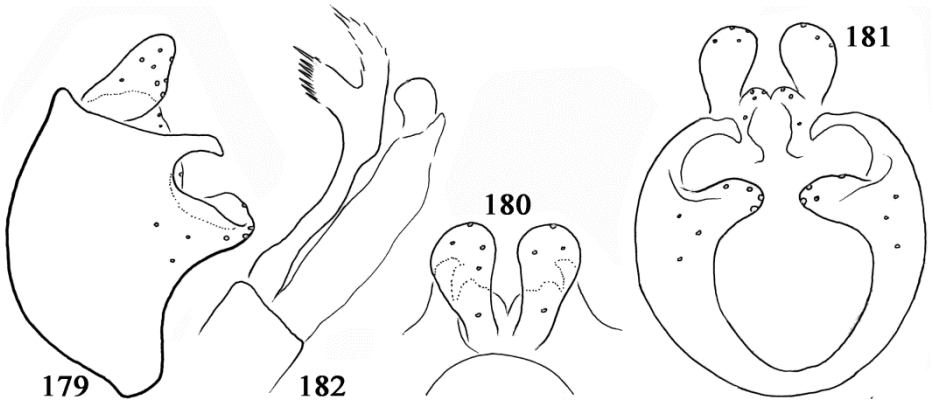
Remark. This species was known only by one male and five females. The second male was collected in the type locality and the third one rather far from the type locality.

Sakala gourica Oláh & Vinçon, sp. nov.

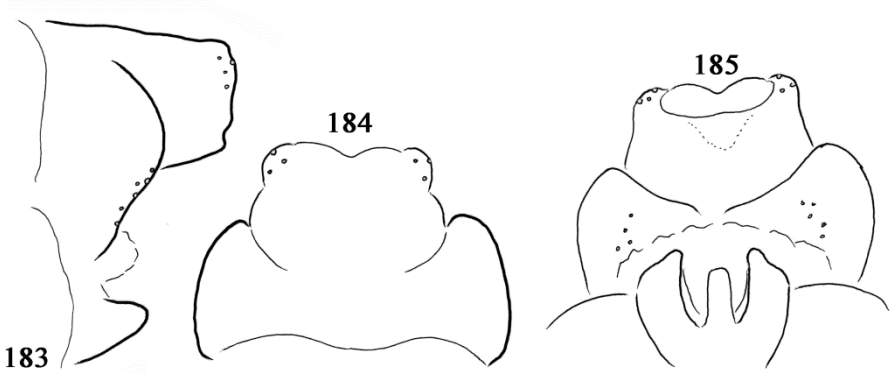
(Figures 179–185, Map 6, Photos 16–17)

*Material examined***.** Holotype: **Georgia**, Gouria, road to Gomismta, springs, 1900m, 41.8317° N, 42.1556°E, 11.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Allotype: Georgia, Adjara, road to Gomismta, nice brook, 2150–2200m, 41.8098°N, 42.1827°E, 11.VIII.2024, leg. Gilles Vinçon (1 female, OPC). Paratypes: Georgia, Adjara, road to Gomismta, nice brook, 2120–2150m, 41.8108°N, 42.1821°E, 11.VIII.2024, leg. Gilles Vinçon (4 males, 3 females; OPC).

Diagnosis. This new species of our recently described genus is similar to *Sakala adjarica* Oláh & Vinçon, 2000 but differs by having long, not extremely short and high ventrum of segment IX; the unique hook formation of segment IX short and stout, not long and slender as well as the dorsal arm of parameres broad not slender tapering.



Figures 179–182. *Sakala gourica* sp. nov. Holotype male: 179 = genitalia in left lateral view; 180 = genitalia in doprsal view; 181 = genitalia in caudal view; 182 = phallic organ in left lateral view.



Figures 183–185. *Sakala gourica* sp. nov. Allotype female: 183 = genitalia in left lateral view; 184 = genitalia in dorsal view; 185 = genitalia in ventral view.

Description. Male (in alcohol). Head and thoracic sclerites, as well as antennae, labial and maxillary palps and femurs are variously yellowish brown; maxillary palp segments yellow, legs yellowish. Antennae are rather stout. Spur number 134. Forewing membrane light brown, covered with small thin setae in recumbent position; forewing veins armed with upright erected strong setae; forewing length 8 mm.

Male genitalia. The spinulose apicomedian zone on tergite VIII is poorly developed, but present and represented by pigmentless mesal lobe with thin and short scattered setae, not covered with peg-like spines. The lateral profile of segment IX and the fused gonopod are very particularly shaped; characterized with very short dorsum, longer ventrum, rounded convex anterad, and subtriangular posterad and has a very unique character, a subdorsal pair of posterad directed heavily sclerotized processes of stout, not slender hook formation. This is unique in the entire family of Limnephilidae. Cerci large subtriangular characterized by long setae directed posterad. Paraproct is poorly discernible, reduced vestigial, represented by a pair of vertical bands setose dorsad, setaless bare on the very ventral part. Gonopods completely fused to segment IX, subtriangular with blunt mesad turning apices. Phallic organ is composed of the phallotheca, endotheca, aedeagus, endophallus and the parameres; parameres setose bilobed; dorsal lobe broad with short black setae. Aedeagus is a simple tube with well discernible endophallus, protruded apicad.

Female (in alcohol). Forewing membrane brown, covered with small thin setae in recumbent position; forewing with brachyptery tendency,

forewing tip is just surpassing the abdomen. Spur number is 134. Head and thoracic sclerites as well as antennae, labial and maxillary palps and femurs are yellowish-brown.

Female genitalia. Tergite IX forming a tube together with the less sclerotized tergite X encircling anus; the sternite of segment IX heavily sclerotized, dominating on the entire female genitalia. Supragenital plate of sternum X is less developed forming a rounded less sclerotized lobe. Median lobe of the vulvar scale (lower vaginal lip) shorter than lateral lobes.

Etymology. Named after the region of the locus typicus, Gouria, a biodiversity hotspot in the Lesser Caucasus of Georgia.

***Sakala javaketica* Oláh & Vinçon, sp. nov.**

(Figures 186–190, Map 6, Photos 28–29)

Material examined. Holotype: **Georgia**, Samtskhe-Javakheti, above Utkisubani, brook and spring, 1870m, 41.676°N, 42.5765°E, 8.VIII. 2024, leg. Gilles Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC).

Diagnosis. This new species of our recently described genus *Sakala* differs from all the know taxa, including the poorly known *Sakala peculiaris* (McLachlan, 1875) by its very stout, long posterad directed elongated unique process of segment IX, by slender digitiform cerci and by the particularly shaped dorsal lobe of paramere. Female genitalia is diverged from all known species by very low, almost digitiform shape of genital tube more high and robust at all the other species.

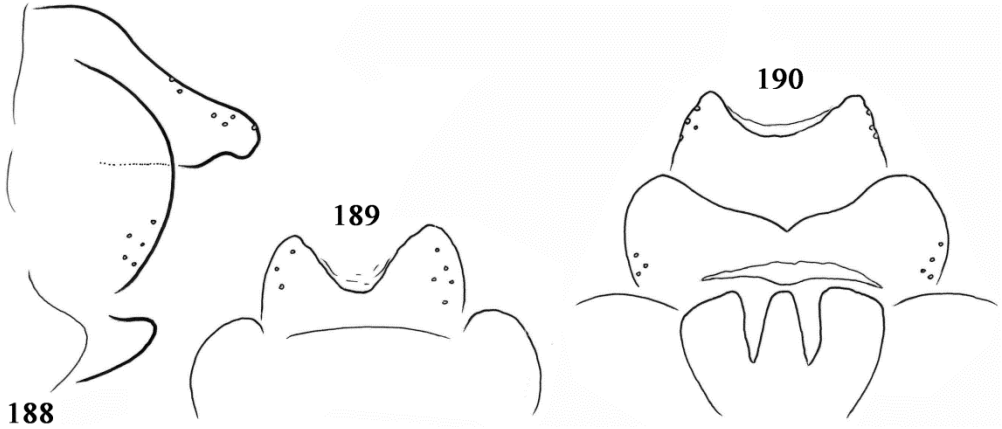
Description. Male (in alcohol). The largest sized *Sakala*. Head and thoracic sclerites, as well as antennae, labial and maxillary palps and femurs are variously yellowish brown; maxillary palp segments yellow, legs yellowish. Antennae are rather stout. Spur number 134. Forewing membrane light brown, covered with small thin setae in recumbent position; forewing veins armed with upright erected strong setae; forewing pattern is very pronounced, especially on female; there is a brown pigmented streak between subcosta and sector radius and in the apical cell III of fork 2 reaching to the corneus point of nygma and spreading triangularly broadening and fading to postcosta from arculus to termen; forewing length 10 mm.

Male genitalia. The spinulose apicomedian zone on tergite VIII is poorly developed, but present and represented by pigmentless mesal lobe with thin and short scattered setae, not covered with peg-like spines. The lateral profile of segment IX and the fused gonopod are very particularly shaped; characterized with very short dorsum, longer ventrum, rounded convex anterad, and subtriangular posterad and has a very unique character, a subdorsal pair of posterad directed heavily sclerotized processes of stout, not slender hook formation; terminal hood directed mesoventrad. This is unique in the entire family of Limnephilidae. Cerci large elongated stout digitiform characterized by long setae directed posterad. Paraproct is poorly discernible, reduced vestigial, represented by a pair of vertical bands partially setosed. Gonopods completely fused to segment IX, subtriangular with blunt mesad turning apices. Phallic organ is composed of the phallotheca, endotheca, aedeagus, endophallus and the parameres; parameres setose bilobed; dorsal lobe short with dorsal finger tipped with a few short strong spines and longer ventral lobe with dense longer and thinner setae. Aedeagus is a simple tube with well discernible endophallus, protruded apicad.

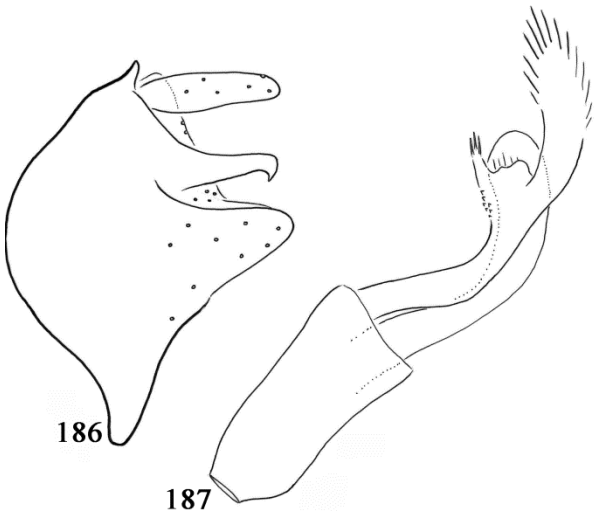
Female (in alcohol). Forewing membrane brown, covered with small thin setae in recumbent position; forewing pattern as described at male. Spur number is 134. Head and thoracic sclerites as well as antennae, labial and maxillary palps and femurs are yellowish-brown.

Female genitalia. Tergite IX forming a tube together with the less sclerotized tergite X encircling anus; the sternite of segment IX heavily sclerotized, dominating on the entire female genitalia. Supragenital plate of sternum X is less developed forming a rounded less sclerotized lobe. Median lobe of the vulvar scale (lower vaginal lip) shorter than lateral lobes.

Etymology. Coined from the region name of the locus typicus.



Figures 188–190. *Sakala javaketica* sp. nov. Allotype female: 188 = genitalia in left lateral view; 189 = genitalia in dorsal view; 190 = genitalia in ventral view.



Figures 186–187. *Sakala javaketica* sp. nov. Holotype male: 186 = genitalia in left lateral view; 187 = phallic organ in left lateral view.

Chaetopterygini Hagen, 1858

Badukiella kinula Oláh & Vinçon, 2020

(Photos 36, 38)

Material examined. **Georgia,** Mtskheta-Mtianeti, Abudelauri, 2350m, 42.55183°N, 44.86783° E, 9.X.2024, leg. A. Memishishi, (2 males, IZISUT; 3 males, OPC). Georgia, Mtskheta-Mtianeti, Abudelauri, 2490m, 42.54855°N, 44.85105°E, 9.X.2024, leg. A. Memishishi, (1 male, 1 female; IZISUT; 4 males, 1 female; OPC). Georgia, Mtskheta-Mtianeti, Sno, 2150m, 42.59 906°N, 44.6669°E, 6.X.2024, leg. A. Memishishi, (1 male, 1 female; OPC). Georgia, Mtskheta-Mtianeti, Gudani, 1600m, 42.53277°N, 44.95968° E, 8.X.2024, leg. A. Memishishi, (2 males, 1 female; OPC). Georgia, Mtskheta-Mtianeti, Abudelauri, 2260m, 42.55047°N, 44.87727°E, 9.X. 2024, leg. A. Memishishi, (7 males, 3 females; OPC). Georgia, Mtskheta-Mtianeti, Abudelauri, 2240m, 42.54807°N, 44.8803°E, 9.X.2024, leg. A. Memishishi, (1 male, 1 female; IZISUT; 4 males, 1 female; OPC).

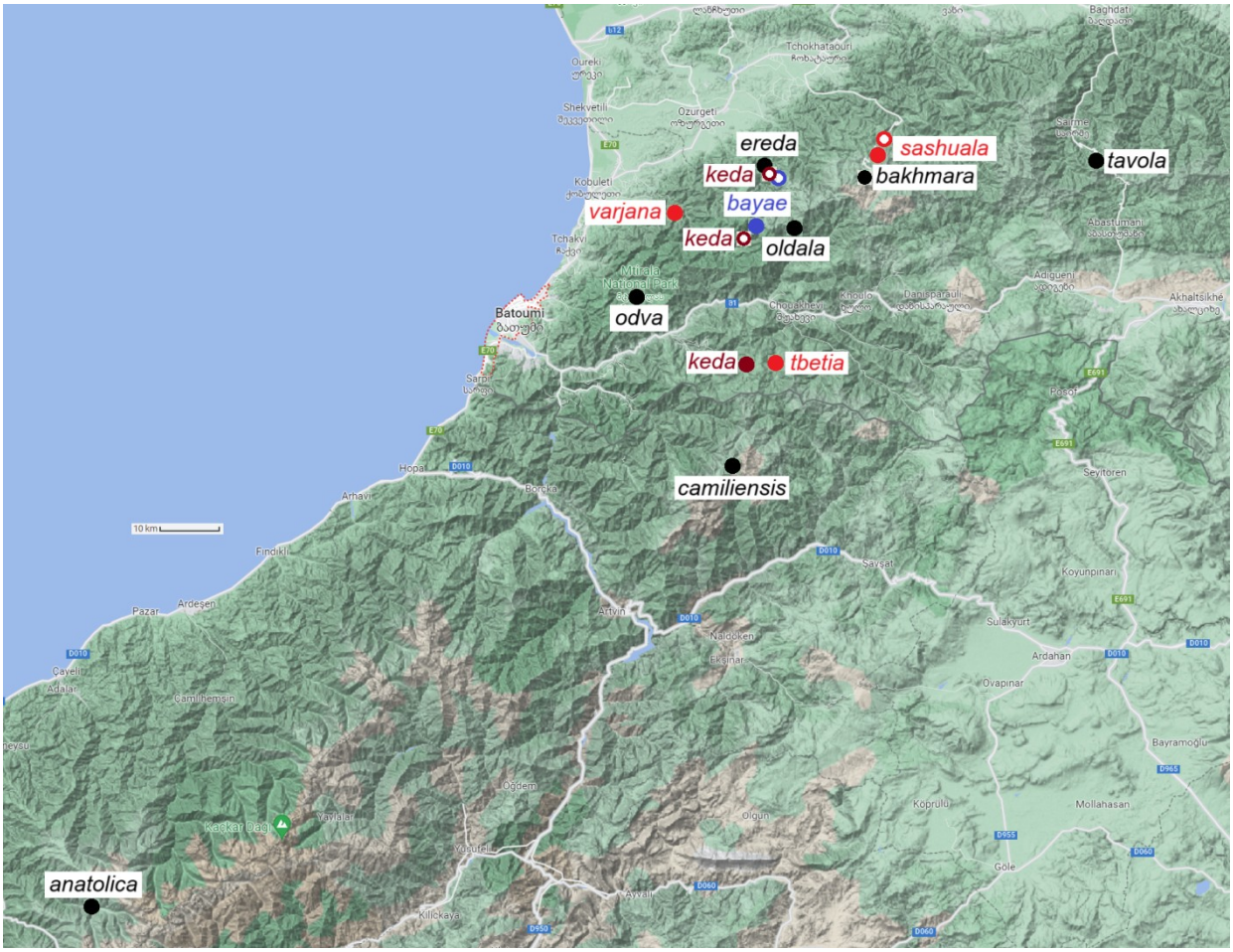
Chaetopteryx abchazica (Martynov, 1916)

Material examined. **Georgia,** High Svaneti, above Lukhi, nice spring, 2320m, 43.0578°N, 42.0684°E, 17.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Kelgena kelensis (Martynov, 1926)

(Photo 38)

Material examined. **Georgia**, Mtskheta-Mtianeti, Arakhveti, 1425m, 42.42355°N, 44.540 83°E, 7.X.2024, leg. A. Memishishi, (1 male, IZISUT). Georgia, Mtskheta-Mtianeti, Gudani, 1600m, 42.53277°N, 44.95968°E, 8.X.2024, leg. A. Memishishi, (2 males, 1 female; OPC). Georgia, Mtskheta-Mtianeti, Sno, 2150m, 42.599 06°N, 44.6669°E, 6.X.2024, leg. A. Memishishi,



Map 7. *Rizeiella* genus (12 species): *R. anatolica* Sipahiler, 1986, *R. bakhmara* sp. nov., *R. bayae* Vinçon & Oláh, 2020, *R. camiliensis*, Sipahiler, 1999, *R. ereda* Oláh & Vinçon, 2020, *R. keda* Oláh & Vinçon, 2024, *R. odva* Oláh & Vinçon, 2020, *R. oldala* Oláh & Kovács, 2020, *R. sashuala* Oláh & Vinçon, 2024, *R. tavola* Oláh & Vinçon, 2020, *R. tbetia* Oláh & Vinçon, 2024, *R. varjana* Oláh & Vinçon, 2024.

(1 male, OPC). Georgia, Mtskheta-Mtianeti, Zemo Artani, 1290m, 42.24664 45.01273, 10.X. 2024, leg. A. Memishishi, (1 male, OPC). Georgia, Mtskheta-Mtianeti, Betischrdili, 1160m, 42.41133°N, 44.92827°E, 10.X.2024, leg. A. Memishishi, (1 male, OPC).

Rizeiella bakhmara Oláh & Vinçon sp. nov.

(Figures 191–197, Map 7, Photos 20–21)

Material examined. Holotype: **Georgia**, Gouria, above Bakhmaro, brook and spring, 1980m, 41.8386°N, 42.331°E, 10.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratype: same as holotype (1 female, OPC).

Diagnosis. This new species has resemblance to *Rizeiella sashuala* Oláh & Vinçon, 2024 and *R. varjana* Oláh & Vinçon, 2024 but differs from both by having and not lacking paramere on the phallic organ, although the development of this vestigial structure could be not stable. Also differs from both by the semicircular cerci, the abbreviated paraproct and more elongated apical region of gonopods. It differs also by both the lateral and dorsal patterns of the head of the strongly sclerotized pair of the aedeagal apicodorsal processes. The ventral lobe on the anal tube of the female is

shorter than the dorsal lobe in lateral view and the dorsal profile of segment IX has wider mesal excision.

Description. Male and female (in alcohol). Yellowish pale brownish medium-sized species with pale testaceous body appendages and with yellowish-testaceous wings. Forewing with less rounded apices, very long erect spine-like setae present on the membrane and on the veins; around every second setae on the veins stronger; there is some few pubescence present between costal and subcostal veins. Tibial spur number is 033 at male and 133 at female. Forewing length is 8 mm both at male and female with variation.

Male genitalia. Protuberance of spinulose area of vestitural noncellular microtrichia on tergite VIII present and enlarged. Segment IX longer middle; very short strap or bridle-like dorsally. Segment X partly fused to basal region of cerci forming together a short dorsal concavity. Cerci heavily and entirely sclerotized, semicircular in lateral and almost circular in caudal views. Paraproct short, broad finger-like in lateral view and completely fused to the equally strongly sclerotized cerci forming together a circular cup-like structure with the caudad directed process of vestigial ventral branch of the paraproct. Gonopod slightly concave apicad in lateral narrowing apicodorsad. Phallic organ is of *Rizeiella* type with a single strongly sclerotized pair of aedeagal apicodorsal processes with pegged apex and specific lateral and ventral views; pair of paraproct present as a single slender digitiform process with an apical strong spine.

Female genitalia. There is a closed "anal tube" formed by the complex of the variously fused tergite IX and segment X; its apical region bilobous both in lateral and dorsal views; the dorsal lobe pin-pointed in dorsal and lateral views; ventral lobe of the tube is slightly shorter than the dorsal in lateral view; the dorsum deeply and roundly excised and ventrum not excised apicomesad. Setose sternite IX connected by less glabrous mesal plate; this ventral surface, the supragenital plate functions like the upper vaginal lip. The lower vaginal lip, the vulvar scale is membranous badly visible. Vaginal sclerite complex visible subquadrangular with apicolateral lobes in dorsal view.

Etymology. Name was coined from the name of the type locality, a noun in apposition.

Rizeiella keda **Oláh & Vinçon, 2024**

(Map 7)

Material examined. **Georgia,** Adjara, above Namonastrevi, brooklet and spring, 1720m, 41.55 28°N, 42.0892°E, 12.VIII.2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Gouria, road to Gomismta, springs, 1900m, 41.8317°N, 42.1556°E, 11.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Adjara, above Namonastrevi, nice brook and spring, 1710m, 41.555°N, 42.0853°E, 12.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 21.IX –5.X. 2018, leg. GGBC members (3 males, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 24.VIII.–7.IX.2018, leg. GGBC members (3 males, OPC).

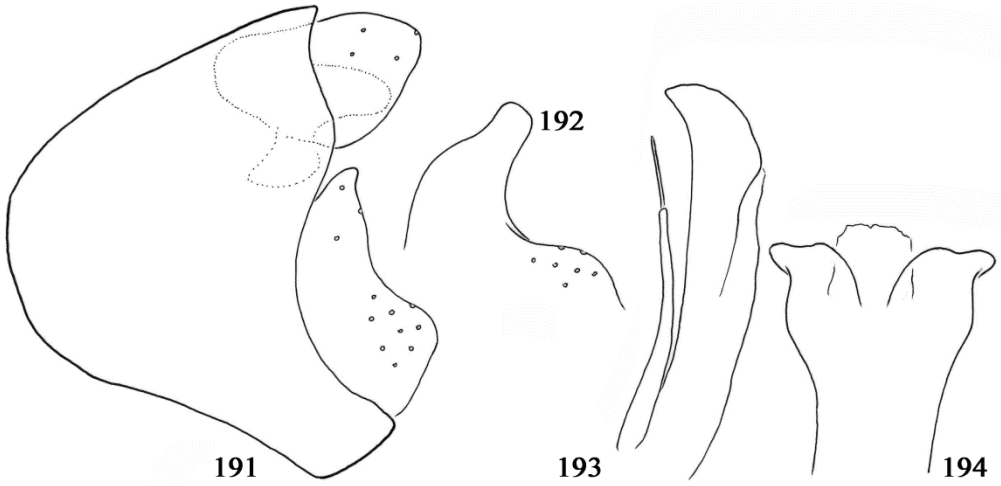
Remark. This species was only known from the type locality, in southern Adjara close to the Turkish border. It widely extends in the Lesser Caucasus, up to Gouria.

Stenophylacini Schmid, 1955

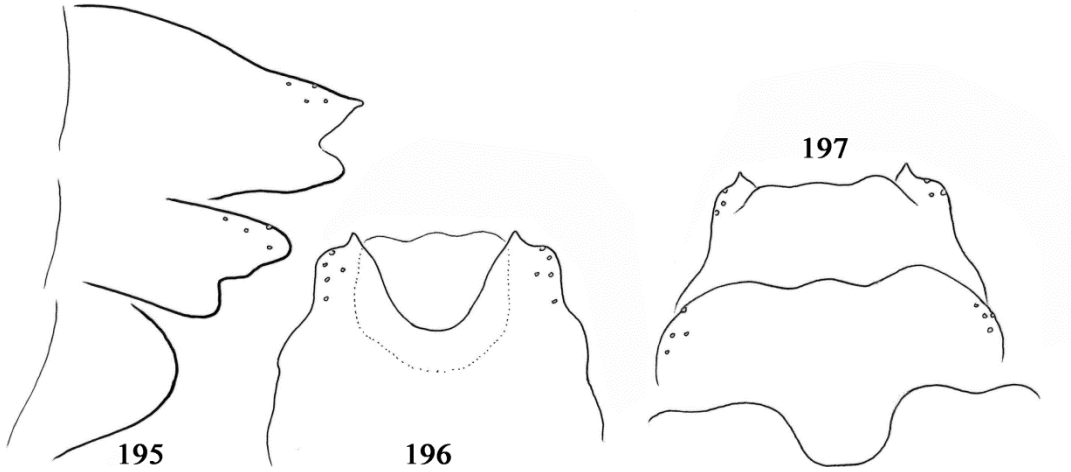
Halesus caucasicus **Oláh, 1985**

Material examined. **Georgia**, Mtskheta-Mtianeti, Khakhmati, 1990m, 42.52761°N, 45.016 62°E, 8.X.2024, leg. A. Memishishi (3 males, IZISUT). Georgia, Samtskhe-Javakheti, Apnia, Upper Vardsia, Guest house Vania, 1290m, 41.374°N, 43.262°E, 5-7.X.2024 leg. J. Junnilainen (5 males, OPC).

Remark. In our original description (Oláh 1985), we have recognised and drawn the two additional tiny spines at the end of the paramere of the holotype. Unfortunately these additional



Figures 191–194. *Rizeiella bakhmara* sp. nov. Holotype male: 191 = genitalia in left lateral view; 192 = left gonopod in ventral view; 193 = phallic organ in left lateral view; 194 = apex of phallic organ in ventral view.



Figures 195–197. *Rizeiella bakhmara* sp. nov. Allotype female: 195 = genitalia in left lateral view; 196 = genitalia in dorsal view; 197 = genitalia in ventral view.

tiny spines were not discernible during reexamination and redrawing (Oláh *et al.* 2020). They moved in the righ side cover of the paramere terminal. Upon examining more specimens, we realised that the position of the additional spines was unstable and that the number of additional spines could be reduced to one.

Potamophylax armeniacus Mey, 1979

Material examined. **Georgia,** Kvemo Kartli, Khrami River at Dashbashi cascades, 1400m, 41.5945°N, 44.1238°E, 24.IV.2024 leg. Gilles Vinçon (14 males, 2 females; OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44' 36.3336, E42°4'54.4296, 19.V.–1.VI.2018, leg. GGBC members (2 males, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42° 5'0.2904, 1.VI.–15.VI.2018, leg. GGBC members (2 males, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, subalpine meadow, malaise trap 18, 2450m, N41°45'41.8, E42°06'56.9, 29.VI.–

13.VII.2018, leg. GGBC members (1 male, IZISUT).

***Potamophylax latipennis* (Curtis, 1934)**

Material examined. **Georgia**, Greater Caucasus Mountains, Mtskheta-Mtianeti region, Pasanauri, 42.353°N, 44.709°E, 1100m, 7.X2024, leg. Jari Junnilainen (5 males, OPC).

***Stenophylax botos* Oláh & Memishishi, sp. nov.**

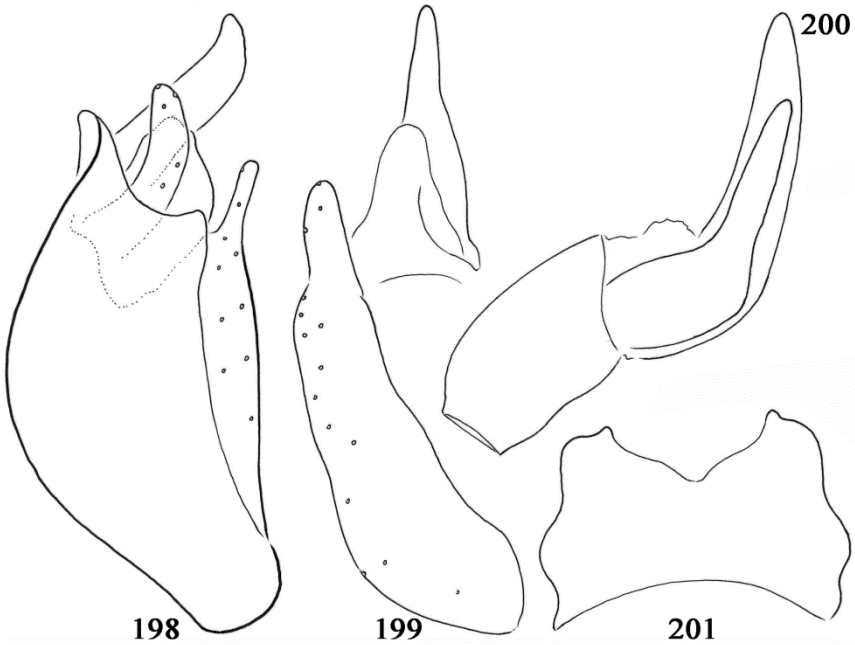
(Figures 198–201)

Material examined. Holotype: **Georgia,** Mtskheta-Mtianeti, Shuapkho, 1210m, 42.41558° N, 44.99855°E, 7.X.2024, leg. A. Memishishi, (1 males, OPC). Allotype: same as holotype (1 female, OPC).

Diagnosis. Among the siblings of the *Stenophylax nycterobius* species complex *Stenophylax botos* sp. nov. is most close to *Stenophylax. vallas* Oláh & Kovács, 2020, but differs by having much larger size, darker body colour; by the distinct rod-shape structure of the free terminal of gonopod both in lateral and dorsal views as well as by the extremely enlarged basal region of paramere.

Description. (In alcohol) Medium-sized light brown species with darker body and wing colour. Its forewing length is 16 mm with rounded apices. Forewing veins and membrane densely covered with strong and long erect hairs. Spur number 034.

Male genitalia. Tergite VIII with much developed black setose protuberance divided by a middle line. Segment IX is short and high, parallel-sided with gradual narrowing dorsad resulted in a very short band-like dorsum; narrowing but longer ventrad. Cerci rod-like slightly curving dorsad. Paraproct much produced dominating on the genital structure; the dorsal branch of the paraproct straight rod-like, slightly narrowing apicad both in lateral and caudal views; ventral branch produced upward forming a distinct shoulder pronounced both in lateral and caudal views. Gonopods almost vertical directed,



Figures 198–201. *Stenophylax botos* sp. nov. Holotype male: 198 = genitalia in left lateral view; 199 = left gonopod and paraproct in caudal view; 200 = phallic organ in left lateral view; 201 = Allotype female: fused segments IX and X in dorsal view.

narrowly fused to segment IX with low free rod-like or digitate apices. Phallic organ composed of the upward curving aedeagus and the strong spine-like paramere with extremely broad basal region; upward curving apical half of the aedeagus is heavily sclerotized, black and narrowing apicad; parameres shorter than aedeagus.

Female description. Slightly smaller than male. Light brown. Forewing length 15 mm. Contrary to male forewing without long and erect spine-like hairs. Fused IX and X tergite with specially patterned dorsal shape, unique among the known species of the *Stenophylax nycterobius* species complex. Other substructure of the genitalia partially injured during cleaning and clearing processes.

Etymology. *botos*, from "*botos*" rod-like in Hungarian, refers to elongated rod or stick-like shape of several genital substructures: cerci, paraproct, gonopod and paramere.

***Stenophylax chokhiensis* Oláh & Vinçon, sp. nov.**

(Figures 202–205, Photos 30–31)

Material examined. Holotype: **Georgia**, Mtskheta-Mtianeti, above Chokhi, nice brook with mosses, 1800-1900m, 42.4858°N, 44.7384° E, 4.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Paratype: same as holotype (1 male).

Diagnosis. Comparison with its sibling species is based on the phallic organ and on the peri-phallic organs drawn mostly in caudal view. In lateral view the gonopod head triangular. In caudal view cerci band-like with mesad curving apical region; paraprocts with triangular lateral process, but with digitate apical region and broadening basad; gonopod with triangular lobulated lateral and longer digitate mesal processes. Aedeagus is right-angled almost parallel-sided along its upward curving apical half in lateral view. This character combination delineates this new species from the siblings of the *Stenophylax solotarewi* species complex. Most close to *Stenophylax kulbak* Oláh & Vinçon, 2024, but differs by more patterned cerci, by bilobed caudal structure of gonopod as well as by the curvature of aedeagus.

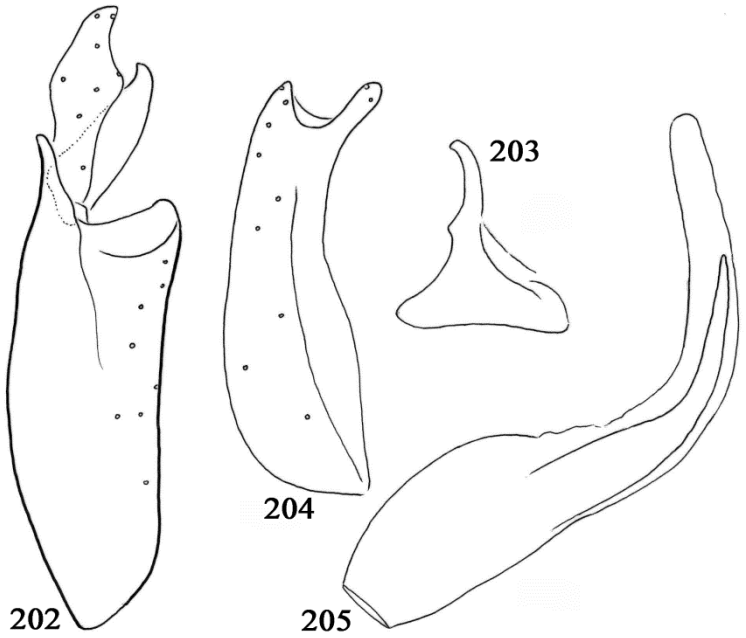
Description (In alcohol). Compared to other members of the species complex *Stenophylax chokhiensis* sp. nov. is a large-sized light faded animal with brownish, stramineous body and wing colour. Its forewing length is 15 mm with light-spotted marbled membrane.

Male genitalia. Segment IX extremely short and high, parallel-sided with gradual narrowing dorsad resulted in a very short band-like dorsum; its narrowing ventrum discernible as fully fused to gonopod. Cerci elongated in lateral view; narrow band-like but specifically patterned. Paraproct broad in lateral view and thin in caudal view, apical half of the dorsal branch almost filiform in caudal view broadening basad armed on midway with lateral triangular outgrowth; ventral branch of the paraproct triangular horizontally and produced laterad. Gonopods almost vertically directed, enlarged its dorsal region longer than segment IX, with tapering triangular apex in lateral view; bi-processed in caudal view, lateral process rounded lobulated, mesal process longer digitate. Phallic organ composed of the almost right-angled upward directed aedeagus and spine-like paramere with vertically flat, plate-like, broad-based basal half; upward-curving apical half of the aedeagus almost parallel-sided.

Etymology. The name was derived from that of the type locality.

***Stenophylax clavatus* (Martynov, 1916)**

Material examined. **Georgia**, Mingrelie-High Svanetia, dripping rocks, above Inguri lake, 42.8585°N, 42.0336°E, 590m, 3.V.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4' 54.4296, 7.IX.–21.IX.2018, leg. GGBC members (2 males, 5 females; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4' 54.4296, 21.IX.–5.X.2018, leg. GGBC members (3 males, 3 females; IZISUT). Georgia, Lesser



Figures 202–205. *Stenophylax chokhiensis* sp. nov. Holotype male: 202 = genitalia in left lateral view; 203 = left paraproct in caudal view; 204 = left gonopod in caudal view; 205 = phallic organ in left lateral view.

Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42° 4'54.4296, 19.V.–1.VI.2018, leg. GGBC members (1 male, 1 female; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4' 54.4296, 10.VIII.–24.VIII.2018, leg. GGBC members (2 males, 1 female; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44' 38.8824, E42°5'0.2904, 24.VIII.–7.IX.2018, leg. GGBC members (4 females, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44' 38.8824, E42°5'0.2904, 27.VII.–10.VIII.2018, leg. GGBC members (1 female, IZISUT). Georgia, Samtskhe-Javakheti, above Patara Pamaji, spring, 1950m, 41.56°N, 42.927°E, 7.VIII.2024, leg. Gilles Vinçon (1 male, 2 females; OPC).

Stenophylax meridiorientalis Malicky, 1980

Material examined. **Georgia**, Samtskhe-Javakheti, Apnia, Upper Vardsia, Guest house Vania, 41.374°N, 43.262°E, 1290m, 5–7.X.2024 leg. J. Junnilainen (1 male, OPC).

Remark. This species is new for Georgia.

Stenophylax permistus McLaclan, 1895

Material examined. **Georgia,** Kakheti region, Vaslovani National Park, Mijniskure 100m, 41.111°N, 46.645°E, 2-3.VII.2024, leg. Jari Junnilainen (2 male, 1 female; OPC).

Stenophylax solotarewi (Martynov, 1913)

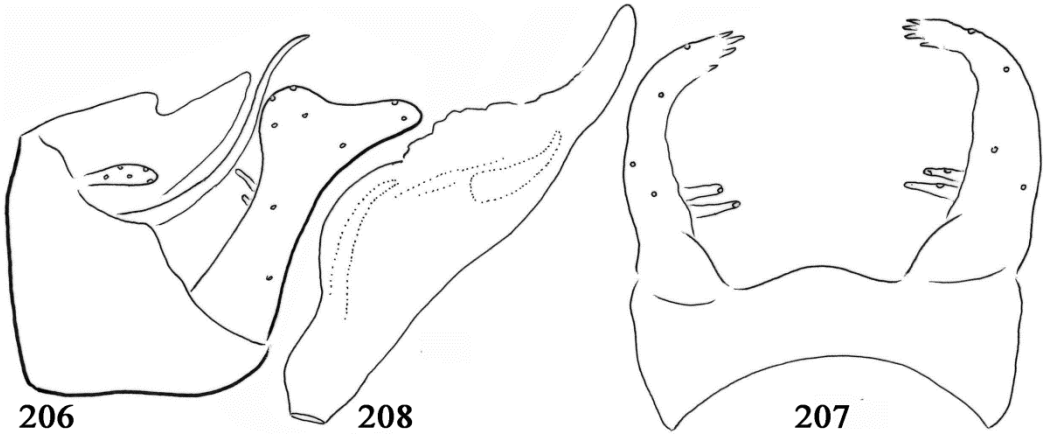
Material examined. **Georgia,** High Svaneti, above Lukhi, nice spring, 2320m, 43.0578°N, 42.0684°E, 17.VIII.2024, leg. Gilles Vinçon (3 males, OPC).

Remark. This species, described from Russia (Teberda), is new for Georgia.

Beraeidae Wallengren, 1891

Beraea rostrata (Martynov, 1913)

*Material examined***. Georgia,** Mtskheta-Mtianeti, Jinvali, Qalilo, 950m, 42.30445°N, 44.86915°E, 25.IV.2024, leg. A. Memishishi (1



Figures 206–208. *Ernodes gouriensis* sp. nov. Holotype male: 206 = genitalia in left lateral view; 207 = genitalia in ventral view; 208 = phallic organ in left lateral view.

male, IZISUT; 2 males, OPC). Georgia, Samegrelo - Zemo Svaneti, Doberadzeni, spring, 42.59264°N, 42.32199°E, 370m, 28.IV.2024, leg. A. Memishishi (2 males, 5 females, IZISUT).

Remark. This species was first described in Kakheti (Lagodekhi), but it now appears to have a wider distribution across the High Caucasus.

Ernodes bakhmarensis Oláh & Vinçon, 2024

(Photos 7–8)

Material examined. **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 13.VII.–27.VII.2018, leg. GGBC members (1 male, IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI. - 13.VII.2018, leg. GGBC members et al. (5 males, 5 females, IZISUT; 46 male, 19 females; OPC).

Ernodes gouriensis Oláh & Vinçon, sp. nov.

(Figures 206–208, Photos 16–17)

*Material examined***. Georgia,** Gouria, Adjara, road to Gomismta, nice brook, 2120–2150m, 41.8108°N, 42.1821°E, 11.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. Without the apomorphic apicomesal spine-like process of *Ernodes saltans* Martynov, 1913 and its relatives, *Ernodes bakhmarensis* Oláh & Vinçon, 2024; *Ernodes macahelensis* Sipahiler, 1997 and *Ernodes ordubadensis* Oláh & Kerimova, 2020, this new species has relation to *Ernodes rizeiensis* Sipahiler, 1987 described from Turkey, but differs by the differently shaped aviform apex of gonopods as well as by doubled small filiform and right angled mesal processes of gonopods. It is only single, not double and sharp angled, not right angled at *E. riziensis*. Moreover, the endothecal spine pattern differs, although it is not discernible clearly in neither species.

Description. Male (in alcohol). Sclerites on body and legs brown. Forewing length 6 mm. Segment IX subtriangular, rounded convex anterad, its very dorsum elongated and more sclerotized, its ventrum rounded bulky. Segment X less sclerotized, almost membranous, its apex just discernible. Cerci are very small, elongated ovoid. Paraproct slender, arching only shallow. Gonopods clearly aviform, with very distinct dorsal rounded semicircular head and elongated apical beak armed mesad with two small finger-like processes, right angled to gonopod shaft. Phallic organ with a single distinct stout spine and with indistinct sclerotized arching structures embedded in endotheca.

Etymology. Named after the region of locus typicus.

Ernodes mingreliensis Oláh & Vinçon, 2024

(Photos 12–13)

Material examined. **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024 leg. Gilles Vinçon (10 males, 1 female; OPC). Georgia, Mingrelie, above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V. 2024, leg. Gilles Vinçon (1 male, 1 female; OPC). Georgia, Mingrelie, Southeast Jvari, nice brook and lateral springs, 340–350m, 42.6956°N, 42.0757°E, 3.V.2024, leg. Gilles Vinçon (12 males, OPC). Georgia, Imereti, Southwest Sajavakho, 'Berdnis Tskaro', nice springs and dripping rocks, 80m, 42.0636°N, 42.2693°E and 100m, 42.055°N, 42.275°E, 28.IV.2024, leg. Gilles Vinçon (16 males, OPC).

Remark. This is the first report from the Lesser Caucasus.

Sericostomatoidea Stephens, 1836

Sericostomatidae Stephens, 1836

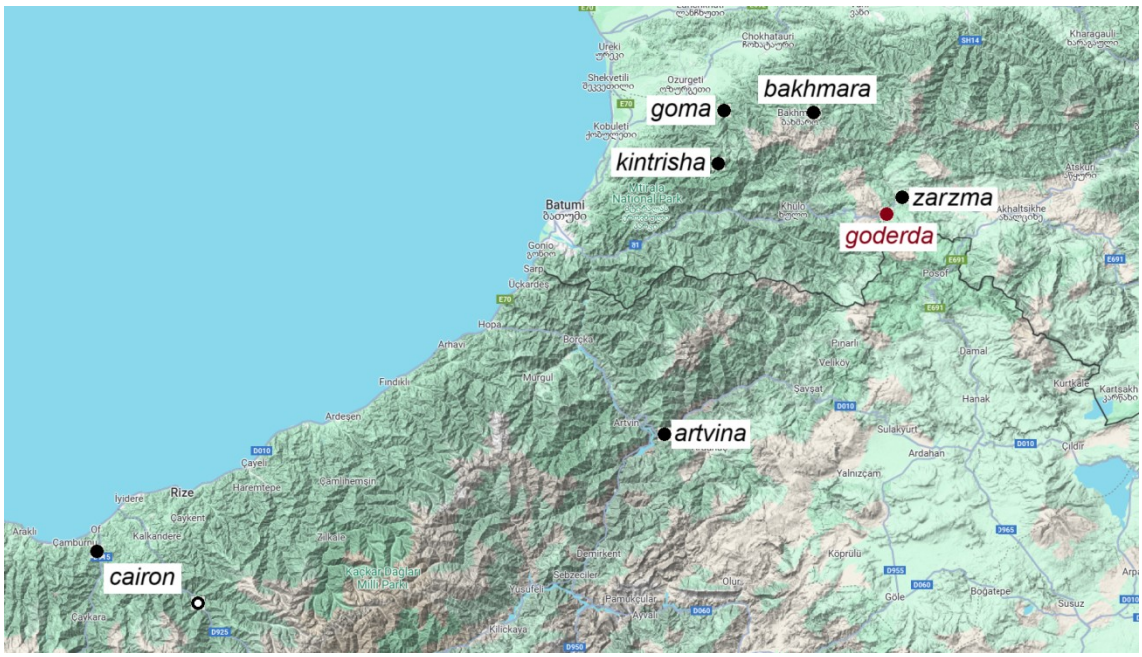
The Sericostomatidae family consists of generic taxa characterized by variable structures developed on the basal segment of the male antennae and on the maxillary palpi. These male-specific structures are the outcome of unusual, accidental, and random genetic developments, expressed through sexual organization processes influenced both by premating courtship and by cryptic female choice during copulation. In spite of this "curiosity shop" the bizarre modifications on head appendages, the European sericostomatid males in most genera have very similar genital structures. These bizarre modifications and neoformations are rather species group specific and not genus specific alterations as was demonstrated by Weaver (2002) for Lepidostomatidae, presented by Oláh and Johanson (2011) for Hydroptilidae and discussed by Oláh and Flint (2012) in the Leucotrichini tribe of Hydroptilidae family.

Cerasma McLachlan, 1876

(Map 8)

Cerasma genus was established mostly by a pair of bizarre horn-like formation on the head of males being produced posteriorly and furnished with a pencil of long hairs. Actually it is the backward directed part of the highly modified scape, the first antennal segment. Both the generic name, *Cerasma* (*keras* horn in Greek) as well as the name of the nominal name-bearing type species, *Cerasma cornuta* McLachlan, 1876 (*cornu* horn in Latin) refers to this horn-like structure on the scape. This monotypic genus was long represented only by the type species described from the single male holotype collected somewhere in Gouria, Georgia. The second species, *Cerasma cairon* was described by Malicky (1986). However, one year later Sipahiler & Malicky (1987: page 96, figure 4a,b,c) published new drawings under the same name, *Cerasma cairon* without explaing why they have changed the drawings for the species and which specimen (holotype redrawing, paratypes or other specimen) was drawn resulting the new drawings with different structural pattern.

Cerasma species are usually difficult to collect. Most species are represented only by few specimens. However, in a Malaise-trap project on the Kintrishi River, Georgia we were lucky to collect altogether 412 males of *Cerasma kintrisha* sp. nov. permitting us to search and study the stability and the variability ranges of the most diverse structure of the male genitalia, the speciation trait. Similarly to *Sericostoma* genus (Oláh *et al.* 2023) we have found the heavily sclerotized titillating structure, the paraproct with character state of speciation trait that is being most diverse and most stable genetically protected adaptive non neutral genital structure. Based on the divergences of the dorsal and ventral arms or branches of paraproct here we describe six new species and we suppose that many more unknown



Map 8. *Cerasma* genus (7 species): *C. artvina* sp. nov., *C. bakhmara* sp. nov., *C. cairon* Malicky, 1986, *C. goderda* sp. nov., *C. goma* sp. nov., *C. kintrisha* sp. nov., *C. zarzma* sp. nov.

species are still waiting to be collected and described.

The "curiosity shop", the bizarre modifications, neoformations developed on the second segment of the maxillary palp and on the scape, the first segment of antennae also in the *Cerasma* genus. The second segment of maxillary palpi pressed against the front of the face transversally and to each other sagittally are convex externally and concave internally; concavity contains three basal slender digitiform white and an apical single spoon-like black structures ending in pencil of hairs; this black structure could be the third segment of the maxillary palp. Scape, the first antennal segment highly modified into backward directed hornlike structure of mesal concavity filled with membranous erectile extendable white structure ending in pencil of hairs. These membranous erective structures together with hairs/scales in the concavities of modified maxillary palp and scape could be involved in the pheromone production, distribution, or olfactory functions of the scent producing androconial organ.

Cerasma artvina Oláh, sp. nov.

(Figure 209, Map 8)

Material examined. Holotype: **Turkey**, vil. Artvin, Col Cancurtalan, 800m, 1–2.VII.1996, leg. A. Podlussány (1 male, OPC). Paratype: same as holotype (1 male, OPC).

Diagnosis. This new species has resemblance to *Cerasma cairon*, but differs by the triangular, not rounded anterior margin of segment X; short, not long cercus; by lateral profile of gonopod as well as by strait, not downward curving dorsal arm of paraproct and more produced apical pattern of ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown;

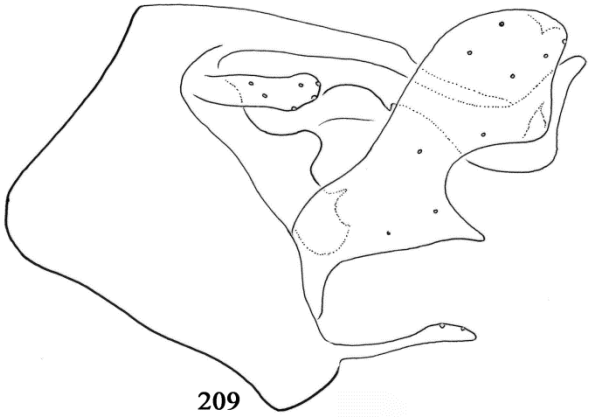


Figure 209. *Cerasma artvina* sp. nov. Holotype male: genitalia in left lateral view.

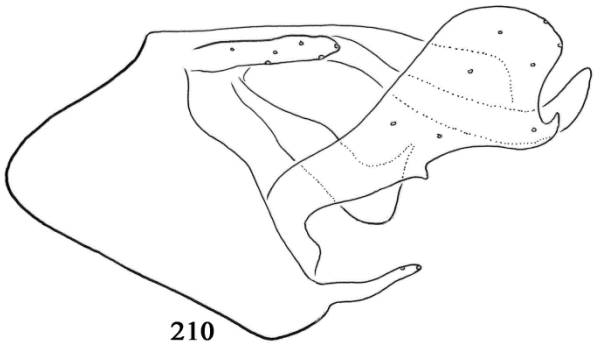


Figure 210. *Cerasma bakhmara* sp. nov. Holotype male: genitalia in left lateral view.

darker on dorsum. Spur number 224. Forewing length 13 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; ventrum little longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arm; dorsal arm straight with upward directed head; its apical margin fully concave; ventral arm of paraproct with a rounded hump and short spine midway on apical margin. Gonopods with much produced basal triangular process in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus typicus*.

Cerasma bakhmara Oláh & Vinçon, sp. nov.

(Figure 210, Map 8, Photos 18–19)

Material examined. Holotype: **Georgia**, Gouria, road to Bakhmaro, spring, 2040m, 41.8586°N, 42.3564°E, 10.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This new species has resemblance to *Cerasma goderda* sp. nov. but differs by the tiny triangular process on midway of gonopod ventrum, less produced upward directed head of the dorsal arm of paraproct and by the backward directed, not right angled dorsoapical process of ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown; darker on dorsum. Spur number 224. Forewing length 12 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX rounded subtriangular in lateral view; ventrum little longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arms; dorsal arm with upward directed, less enlarged head; ventral arm of paraproct with slightly backward directed dorsoapical spine-like process. Gonopods with a small triangular ventral process on midway in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus typicus*.

Cerasma cairon Malicky, 1986

(Map 8)

Cerasma cairon Malicky, 1986:233–235: “Holotypus ♂: Türkei, Provinz Rize, 1 km südlich von Of, 20

m, 40°53'N 40°16'E, 6.9.1985, leg. Hacker. – Paratypus ♂: Türkei, Provinz Rize, Ovit-Paß bei Ikizdere, 1200 m, 31. 7. 1983, leg Schacht. Beide in meine Sammlung."

Cerasma cairon: Sipahiler & Malicky 1987:96, figure 4a,b,c. Only drawings! Without text or any explanation.

Cerasma goderda Oláh & Vinçon, sp. nov.

(Figure 211, Map 8, Photo 32)

Cerasma cornuta McLachlan, 1876: Oláh *et al.* 2020: 136–137. **Misidentification**.

Material examined. Holotype: **Georgia**, Samtskhe-Javakheti region, 1 km before Adjaran border, torrent and cascade, < Goderdzi Pass, Dzindzitskali tributary, 1680–1800m, N41°38'23" E42°34'56", 16.VII.2019, leg. G. Vinçon (1 male, OPC). Paratypes: same as holotype (2 males, OPC).

Diagnosis. This new species is most close to the nominate species *Cerasma cornuta* McLachlan, 1876 but differs by the presence of triangular lobe on midway of gonopod ventrum, by the upward directed and more robust head of the dorsal arm of paraproct and by the differently shaped ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown; darker on dorsum. Spur number 224. Forewing length 12 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; ventrum little longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arms; dorsal arm with enlarged, broadened upward directed head; ventral arm of paraproct with upward directed dorsoapical spine-like process with blunt tip. Gonopods with a triangular ventral lobe on midway in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus typicus*.

Cerasma goma Oláh & Vinçon, sp. nov.

(Figure 212, Map 8, Photo 33)

Cerasma cornuta McLachlan, 1876: Oláh *et al.* 2020: 137. **Misidentification**.

Material examined. Holotype: **Georgia**, Gouria region, brooklet, tributary of Bzhuzhi River, above Gomi, 390m, 41°52'25"N 42°06' 19"E, 24.IX.2019, leg. G. Vinçon (1 male, OPC). Paratype: same as holotype (1 male, OPC).

Diagnosis. This new species is most close to *Cerasma bakhmara* sp. nov. but differs by the absence of any triangular lobe on midway of gonopod ventrum, by the upward directed more robust head of the dorsal arm of paraproct and by the differently shaped ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown; darker on dorsum. Spur number 224. Forewing length 12 mm; wing membrane brown, densely covered with decumbent setae. *Male genitalia*. Segment IX rounded subtriangular in lateral view; ventrum little longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arms; dorsal arm with enlarged, upward directed narrowing head; ventral arm of paraproct with upward directed subapical dorsal spine-like narrowing process with blunt tip.

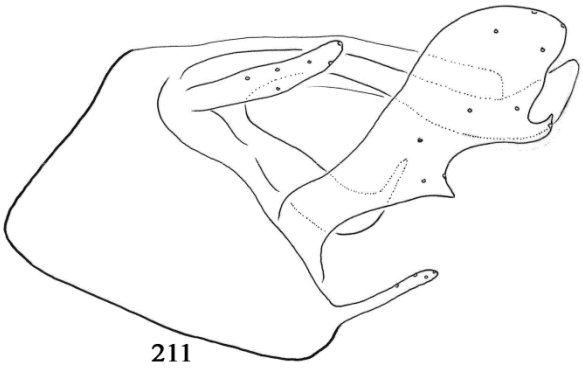


Figure 211. *Cerasma goderda* sp. nov. Holotype male: genitalia in left lateral view.

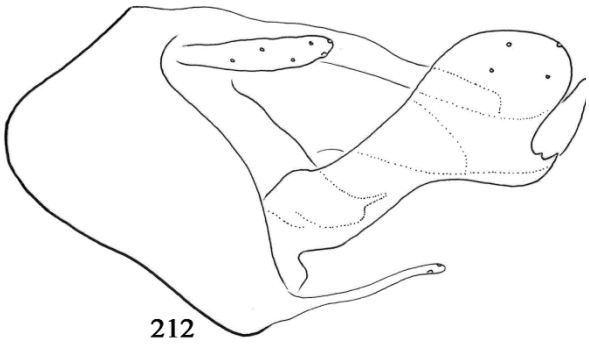


Figure 212. *Cerasma goma* sp. nov. Holotype male: genitalia in left lateral view.

Gonopods without any triangular ventral lobe in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus typicus*.

Cerasma kintrisha **Memishishi, & Oláh sp. nov.**

(Figure 213, Map 8, Photos 7–8)

Material examined. Holotype: **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI.–13.VII.2018, leg. GGBC members (1 male, OPC). Paratypes: same as holotype (84 males, 27 females, IZISUT; 10 males, OPC). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 1.VI.–15.VI.2018, leg. GGBC members (4 males, 1 female; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 27.VII.–10.VIII.2018, leg. GGBC members (3 males, 1 female; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637 m, 41.74769°N, 42.0951°E, 13.VII.–27.VII.2018, leg. GGBC members. (14 males, 12 females; IZISUT). Georgia, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 15.VI.–29.VI. 2018, leg. GGBC members (296 males, 50 females; IZISUT).

Diagnosis. This new species is most close to *Cerasma goma* sp. nov. but differs by the presence of triangular lobe on midway of gonopod ventrum, by the more robust and righ angled upward directed head of the dorsal arm of paraproct and by the differently shaped ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown; darker on dorsum. Spur number 224. Forewing length 12 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX rounded subtriangular in lateral view; ventrum longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arms; dorsal arm with enlarged, almost right angled upward directed head; ventral arm of paraproct with upward directed subapical dorsal spine-like narrowing digitiform process with blunt tip. Gonopods with triangular ventral lobe in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus* typicus.

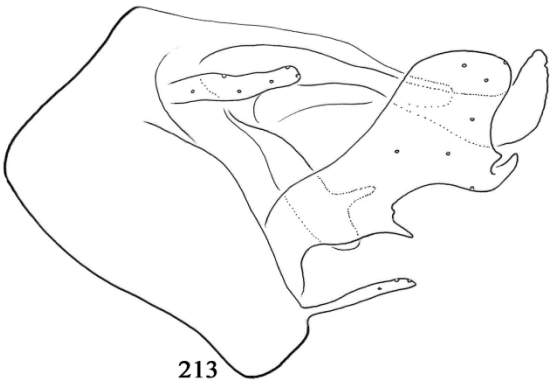


Figure 213. *Cerasma kintrisha sp. nov.* Holotype male: genitalia in left lateral view.

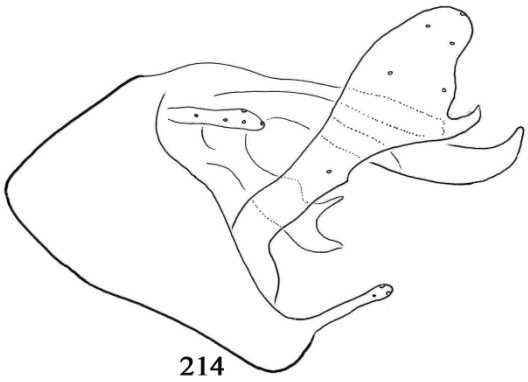


Figure 214. *Cerasma zarzma* sp. nov. Holotype male: genitalia in left lateral view.

Map 9. Georgian *Notidobia* species (4 species): *N. kintrisha* sp. nov., *N. kvariati* sp. nov., *N. marielucae* sp. nov. and *N. vekona* sp. nov.

Cerasma zarzma Oláh & Vinçon, sp. nov.

(Figure 214, Map 8, Photo 34)

Cerasma cornuta McLachlan, 1876: Oláh *et al.* 2020: 137. **Misidentification**.

Material examined. Holotype: **Georgia**, Samtskhe-Javakheti region, Fontaine, brook and spring, > Zarzma village, 1300m, N41°40'22" E42°38'22", 16.VII.2019, leg. G. Vinçon (1 male, OPC).

Diagnosis. This new species has resemblance to *Cerasma bakhmara* sp. nov. but differs by narrow, not broad head of gonopod, less produced and less directed upward head of dorsal arm of paraproct and by more complex pattern of dorsal margin of ventral arm of paraproct.

Description. Male (in alcohol). Median brown species with median brown appendages. Second segment of maxillary palpi and scape, first antennal segment are highly modified into an enlarged complex unit with deep concavity for pheromone production, distribution, or olfactory functions of the scent processing androconial organ. Cephalic and thoracic sclerites brown; darker on dorsum. Spur number 224. Forewing length 12 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; ventrum longer. Segment X less sclerotized delimited laterally by as well as partially fused to the heavily sclerotized pair of spine-like paraprocts. Paraproct composed of longer dorsal and shorter ventral arms; dorsal arm with small narrowing upward directed tip; ventral arm of paraproct with complex pattern of dorsal margin; characterized by slightly upward directed apical end, middle digitiform process and hump. Gonopods with a tiny triangular ventral process on midway in lateral view. Phallic organ slightly curving basad dilated ventrad on its apical region.

Etymology. Named after the region of the *locus typicus*.

Notidobia Stephens, 1829

(Map 9)

The paraproct, the most variable genital structure, serves as a key speciation trait and provides a straightforward diagnostic feature for distinguishing closely related species within the examined sericostomatid genera *Cerasma*, *Sericostoma*, and *Notidobia*. In *Notidobia*, two distinct species groups can be recognized based on the lateral profile of the paraproct which is distributed across Europe, including the Caucasus. (Oláh *et al.* 2022, Oláh & Vinçon 2024).

Notidobia kintrisha Oláh & Memishishi, sp. nov.

(Figure 215, Map 9, Photos 7–8)

Material examined. Holotype: **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI. - 13.VII.2018, leg. GGBC members (5 males, 4 females; OPC). Paratype: same as holotype (2 males, 2 females, IZISUT; 2 males, 2 females; OPC).

Diagnosis. This new species having long, upward directed spine-like paraproct is a member of *Notidobia demelti* species complex (Oláh et al. 2022) and most close to *Notidobia forsteri* Malicky, 1974, but differentiated by elongated triangled, not rounded anterior brace of acrotergite of segment IX, by more right-angled and slender paraproct as well as by quadrangular lateral profile of gonopod with more produced upward directed pointed process.

Description. Dark castanean species with lighter legs. Maxillary palpi pressed against the front of the face, convex externally and concave internally, not any silky hairs discernible in the internal cavity. The first antennal segment, the scape is highly modified as pressing against each other's and located sunken in a deep concavity of clypeus forming together an upward directed joint process and armed with modified setae and white outgrown tissue. Cephalic and thoracic sclerites

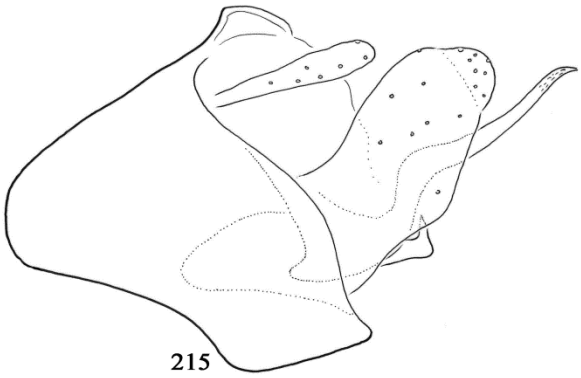


Figure 215. *Notidobia kintrisha* sp. nov. Holotype male: genitalia in left lateral view.

dark brown, almost black especially on the dorsum; appendages including legs lighter brown; haustellum and intersclerital membranous teguments whitish. Forewing length 111 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; triangular intersclerital window in dorsal view that is a putative structure of acrotergite brace. Segment X less sclerotized delimited laterally by the heavily sclerotized pair of spine-like paraprocts. Paraprocts having broad horizontal basal region surrounding segment X and a long, upward turning straight spine right angled midway and with apical region of dental terminal. Gonopods quadrangular bear a ventral process with pointed upward directed process discernible in lateral views. Phallic organ slightly curving regular tube with ventroapical more sclerotized projection.

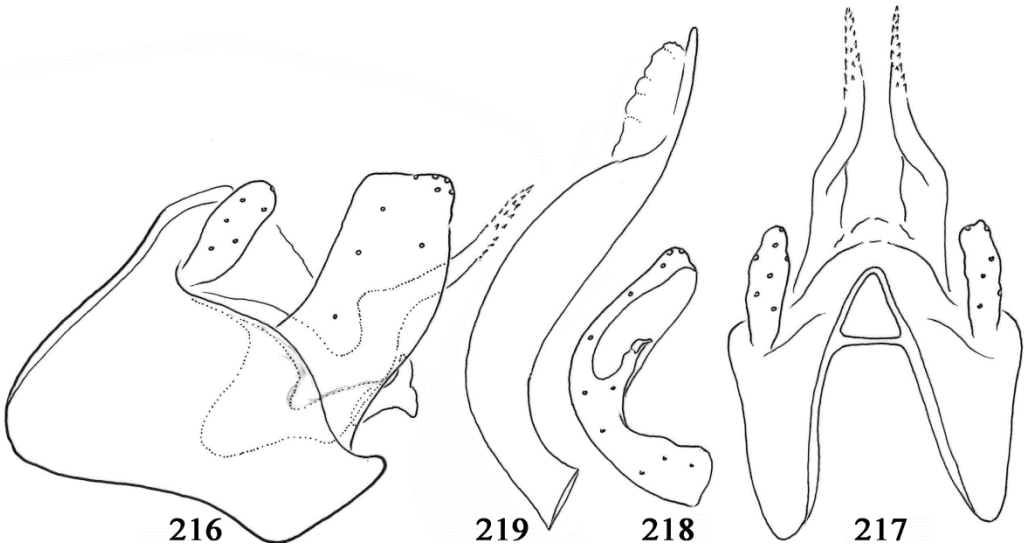
Etymology. Named after the region of the *locus typicus*.

Notidobia kvariati Oláh & Memishishi, sp. nov.

(Figures 216–219, Map 9)

Material examined. Holotype: **Georgia**, Adjara, Kvariati, 50m, 41.54681°N, 41.5649°E, 6.VII.2024 leg. A. Memishishi (1 male, OPC).

Diagnosis. This new species having long, upward directed spine-like paraproct is a member



Figures 216–219. *Notidobia kvariati* sp. nov. Holotype male: 216 = genitalia in left lateral view; 217 = genitalia in dorsal view; 218 = left gonopod in ventral view; 219 = phallic organ in left lateral view.

of *Notidobia demelti* species complex (Oláh *et al*. 2022) and most close to *Notidobia forsteri* Malicky, 1974 described from the Caucasus, but differentiated by elongated triangled, not rounded anterior brace of acrotergite of segment IX, by more right-angled paraproct as well as by quadrangular lateral profile of gonopod and by the bifid apex of the ventral process on gonopods. However bifid apex of the ventral process on gonopods robust, not small, not slender and not pointed than on *Notidobia marielucae* sp. nov.

Description. Dark castanean species with much lighter legs. Maxillary palpi pressed against the front of the face, convex externally and concave internally, not any silky hairs discernible in the internal cavity. The first antennal segment, the scape is highly modified as pressing against each other's and located sunken in a deep concavity of clypeus forming together an upward directed joint process and armed with modified setae and white outgrown tissue. Cephalic and thoracic sclerites dark brown, almost black especially on the dorsum; appendages including legs lighter brown; haustellum and intersclerital membranous teguments whitish. Forewing length 10 mm; wing membrane brown, densely covered with decumbent setae.

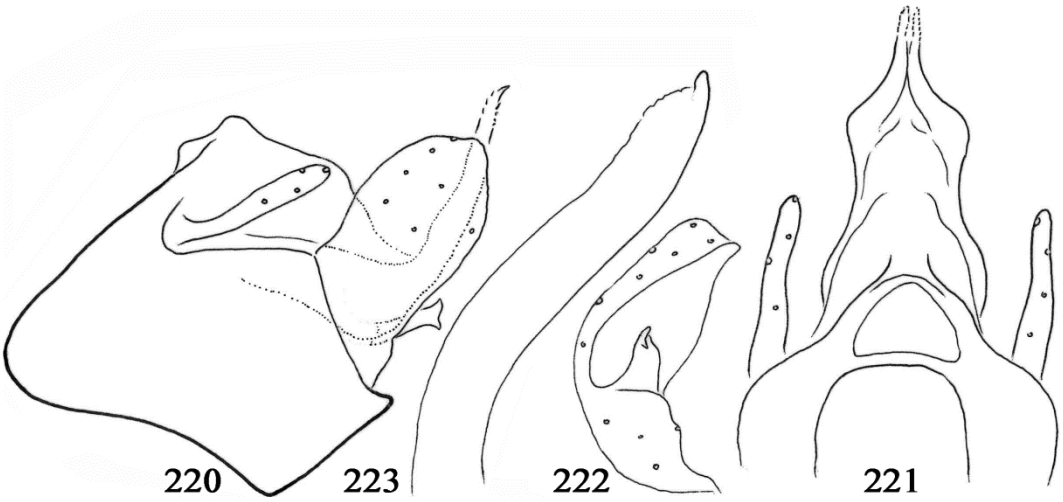
Male genitalia. Segment IX subtriangular in lateral view; triangular interscleritalwindow in dorsal view that is a putative structure of acrotergite brace. Segment X less sclerotized delimited laterally by the heavily sclerotized pair of spine-like paraprocts. Paraprocts having broad horizontal basal region surrounding segment X and a long, upward turning straight spine right angled midway and with apical region of dental terminal. Gonopods quadrangular bear a ventral process with bifid apex discernible both in lateral and ventral views. Phallic organ slightly curving regular tube with ventroapical more sclerotized projection.

Etymology. Named after the region of the *locus typicus*.

Notidobia marielucae Oláh & Vinçon, sp. nov.

(Figures 220–223, Map 9, Photos 12–13)

Material examined. Holotype: **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024 leg. Gilles Vinçon (1 male, OPC). Paratypes: same as holotype (3 males, OPC). Georgia, Mingrelie,



Figures 220–223. *Notidobia marielucae* sp. nov. Holotype male: 220 = genitalia in left lateral view; 221 = genitalia in dorsal view; 222 = left gonopod in ventral view; 223 = phallic organ in left lateral view.

above Koko, nice brooklets and springs near the water catchment, on limestone substratum, 310m, 42.6467°N, 42.2028°E, 3.V.2024, leg. Gilles Vinçon (1 male, OPC).

Diagnosis. This new species having long, upward directed spine-like paraproct is related to *N. demelti*. The new species clearly differentiated from its siblings by the right-angled and straight apical half of the paraproct as well as by the bifid apex of the ventral process on gonopods.

Description. Male (in alcohol). Bluish dark castanean species with much lighter legs. Maxillary palpi pressed against the front of the face, convex externally and concave internally, not any silky hairs discernible in the internal cavity. The first antennal segment, the scape is highly modified as pressing against each other's and located sunken in a deep concavity of clypeus forming together an upward directed joint process and armed with modified setae and white outgrown tissue. Cephalic and thoracic sclerites dark brown, almost black especially on the dorsum; appendages including legs lighter brown; haustellum and intersclerital membranous teguments whitish. Forewing length 10 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; triangular intersclerital window in dorsal view. Segment X less sclerotized delimited laterally by the heavily sclerotized pair of spine-like paraprocts. Paraprocts having broad horizontal basal region surrounding segment X and a long, upward turning straight spine apical half with dental terminal; the upward turning is almost right angled. Gonopods bear a ventral process with bifid apex discernible both in lateral and ventral views. Phallic organ slightly curving regular tube with ventroapical more sclerotized projection.

Etymology. This elegant bluish dark coloured caddisfly species representing this interesting genus in the Caucasus was dedicated to Marie Luce Jaouhari for her complex spiritual support given to our studies.

Notidobia vekona Oláh & Memishishi, sp. nov.

(Figure 224, Map 9, Photos 7–8)

Material examined. Holotype: **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.V.–2.VI.2018, leg. GGBC members (1 male, OPC). Paratype: **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 11, 1637m, 41.74769°N, 42.0951°E, 29.VI.–13.VII.2018, leg. GGBC members et al. (1 male, OPC).

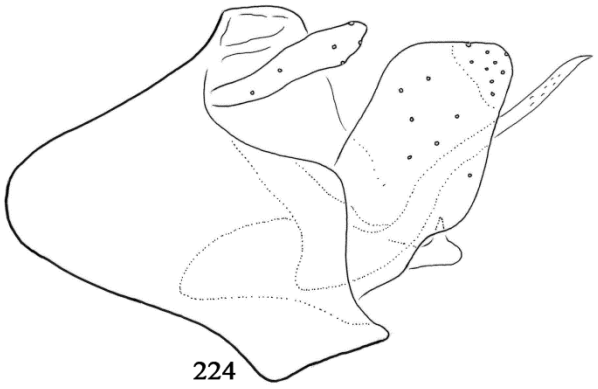


Figure 224. *Notidobia vekona* sp. nov. Holotype male: genitalia in left lateral view.

Diagnosis. This new species having long, upward directed spine-like paraproct is a member of *Notidobia demelti* species complex (Oláh *et al.* 2022) and most close to *Notidobia demelti* Malicky, 1974, but differentiated by the more slender and downward turning paraproct as well as by the ventral process of gonopod with upward, not downward directed apical, subapical poited process.

Description. Dark castanean species with much lighter legs. Maxillary palpi pressed against the front of the face, convex externally and concave internally, not any silky hairs discernible in the internal cavity. The first antennal segment, the scape is highly modified as pressing against each other's and located sunken in a deep concavity of clypeus forming together an upward directed joint process and armed with modified setae and white outgrown tissue. Cephalic and thoracic sclerites dark brown, almost black especially on the dorsum; appendages including legs lighter brown; haustellum and intersclerital membranous teguments whitish. Forewing length 10 mm; wing membrane brown, densely covered with decumbent setae.

Male genitalia. Segment IX subtriangular in lateral view; triangular intersclerital window in dorsal view that is a putative structure of acrotergite brace. Segment X less sclerotized delimited laterally by the heavily sclerotized pair of spine-like paraprocts. Paraprocts having broad basal horizontal region surrounding segment X and a long, upward turning straight slender spine obtuse angled on one third and with apical region of dental terminal. Gonopods quadrangular bear a ventral process with an apex with a subapical upward directed spine-like pointed outhgrowth in lateral view. Phallic organ slightly curving regular tube with ventroapical more sclerotized projection.

Etymology. *vekona*, from "*vékony*" slim, slender in Hungarian, refers to the lateral profile of the dorsal arm of the paraproct, most slender in the species complex

***Schizopelex akhalchala* Oláh & Vinçon, 2024**

(Photos 5–6)

Material examined. Georgia, Racha-Lechkhumi and Lower-Svaneti, below Akhalchala, 2 nice springs, 1870m, 42.6768°N, 42.6482°E, 13. VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Racha-Lechkhumi and Lower-Svaneti, Akhalchala, torrent above cascade, 2400m, 42.7° N, 42.6455°E, 13.VIII.2024, leg. Gilles Vinçon (1 male, OPC). Georgia, Racha-Lechkumi and Lower-Svaneti, Akhalchala, brook and spring, 2170m, 42.6947°N, 42.6463°E, 13.VIII.2024, leg. Gilles Vinçon (2 males, OPC).

Remarks. In ventral view the ventral process is not truncated and different in the two specimens. It is rather convex apicad in the specimen from the spring and with a minute middle excision apicad in the specimen from the torrent.

***Schizopelex mingrelia* Oláh & Vinçon, 2024**

(Photos 5–6, 24–25, 37)

Material examined. **Georgia**, Mingrelia, above Koko, nice brooklet and springs near the water catchment, on limestone substratum, 330m, 42.648°N, 42.2033°E, 3.V.2024 leg. Gilles Vinçon (3 males, OPC). Georgia, Babili, spring, 790m, 42.79156°N, 42.74598°E, 27.IV.2024, leg. A. Memishishi (3 males, 1 female; IZISUT). Georgia, Racha-Lechkhumi and Lower-Svaneti, above Kheledi, spring, 1180m, 42.8037°N, 42.63

35°E, 14.VIII.2024, leg. Gilles Vinçon (10 males, OPC).

Remarks. This species having fused ventral process without dentate or granulised surface belongs to the *Schizopelex anatolica* species group and a sibling species of *Schizopelex akhalchala* Oláh & Vinçon, 2024, but differs by the large dorsal lobe of the gonopod without any vestigial notch formation, shallowly stepwise dorsum of segment X and by the bilobed, not truncate apex of the the ventral process constituted by the basal plate of gonopods and by the ventral process of segment IX. One specimen from the collected three males of above Koko has less bilobed ventral process, but segment X and the gonopod are typical. Another specimen from the collected three males at Babili has some vestigial notch present on the gonopod, but the bilobed ventral process and segment X are typical. Ten males from above Kheledi have gonopod without any vestigial notch formation, shallowly stepwise dorsum of segment X, but variously (shallowly or deeply) bilobed ventral process.

Schizopelex pontica Martynov, 1913

Material examined. **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 4, 1264m, N41°44'38.8824, E42°5'0.2904, 27.VII. - 10.VIII.2018, leg. GGBC members (1 male, IZISUT). Georgia, Adjara, Goderdzi Pass, after Beshumi Botanic Garden, brook and spring, 1970m, 41.6216°N, 42.5383°E, 7.VIII.2024, leg. Gilles Vinçon (3 males, OPC). Georgia, Samtskhe-Javakheti, above Utkisubani, brook and spring, 1870m, 41.676°N, 42.5765°E, 8.VIII. 2024, leg. Gilles Vinçon (1 male, OPC).

Sericostoma grusiense Martynov, 1913

Material examined. **Georgia**, Lesser Caucasus, Adjara, Kintrishi, above the waterfall, malaise trap 5, 1252m, N41°44'36.3336, E42°4'54.4296, 29.VI.–13.VII.2018, leg. GGBC members (1 male, IZISUT).

Leptoceroidea Leach, 1815

Leptoceridae Leach, 1815

Athripsodes fulvicornis Martynov, 1913

Material examined. **Georgia**, Adjara, above Namonastrevi, nice brook and spring, 1710m, 41.555°N, 42.0853°E, 12.VIII.2024, leg. Gilles Vinçon (1 male, OPC).

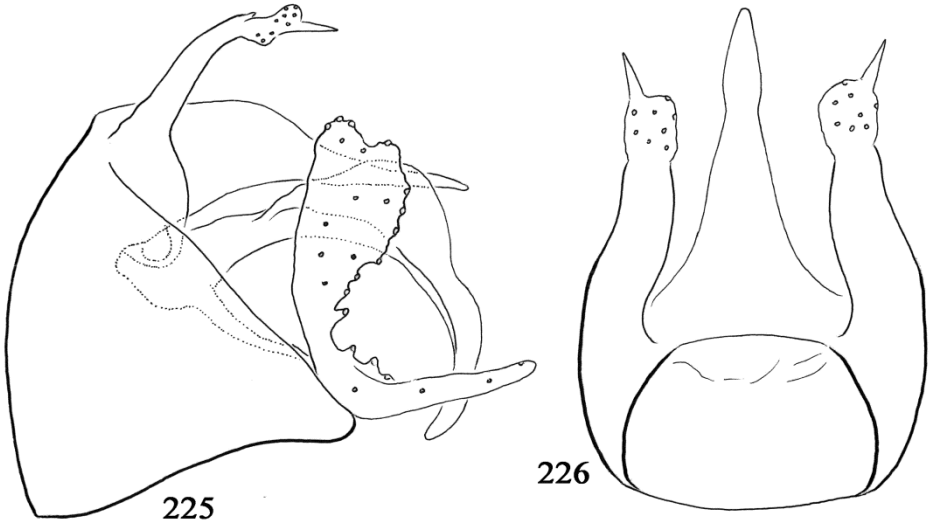
Setodes viridis new species group

While searching and finding the taxonomic position and relation of our new species *Setodes ioricus* Oláh & Memishishi sp. nov. we establish here the *Setodes viridis* new species group. This species group is characterized by fused cerci and paraproct elongated and diversified by various apical endings as well as by gonopod having diversified plate-like basodorsal arm. Botosaneanu & Gasith (1971) while studying caddisfly fauna of Israel described *Setodes viridis huliothica* new subspecies from Israel and *Setodes viridis iranensis* new subspecies from Iran in addition to nominate species *Setodes viridis viridis* Fourcroy, 1785. Later Kumansky in Kumanski & Malicky (1976) described the fourth subspecies *Setodes viridis bulgaricus* from Bulgaria. Here we raise their subspecies to species rank upplying our unified phylogenetic species concept and taking subspecies and race out of science (Oláh *et al.* 2018). Species of *Setodes holocercus* Navas, 1923 described from Spain and *Setodes kugleri* Botosaneanu & Gasith, 1983 described from Israel seem to belong to this species group as well.

Setodes ioricus Oláh & Memishishi, sp. nov.

(Figures 225–226)

Material examined. Holotype: **Georgia,** Kakethia, Chachuna Managed Reserve, Ioiri River valley, Chachuna hotel, 260m, 41.220°N, 45.971° E, 28–30.VI.2024 light leg. Jari Junnilainen, (1 male, OPC).



Figures 225–226. *Setodes ioricus* sp. nov. Holotype male: 225 = genitalia in left lateral view; 226 = genitalia in dorsal view.

Diagnosis. Our new species *Setodes ioricus* sp. nov. differs from all known species by having very diverged and complex head of the fused cerci and paraproct. This particularly produced fused structure is the most diverse character state in this species complex.

Description. (In alcohol) This new *Setodes* is a yellowish light brown very slender and fragile animal with forewing length of 8 mm. *Male genitalia*. Lateral profile of segment IX regular triangular. Segment X less sclerotized and narrowing elongated; its terminal region narrow lying in between the lateral wings produced on the middle region of phallic organ. Fused cerci and paraproct, the most diverse, therefore the probable speciation trait of the *Setodes viridis* species complex has produced a divergent very particularly organised apical region of widened semicircular head armed with an apical pointed spine; the head is heavily and densely coverd with short teeth. Basodorsal arm of gonopod densely covered with longer spine-like setae of elevated alveoli, slightly but distinctly bilobed apicad; lower arm of gonopod straight. Phallic organ curving half circular with a pair of dorsal elevated rounded wings midway housing the apical region of segment X; its basal region connected to fused cerci and paraproct dorsad as well as to gonopods ventrad.

Etymology. Named after the region of the *locus typicus*.

***Triaenodes kawraiskii* Martynov, 1909**

Material examined. **Georgia,** Kakethia, Chachuna Managed Reserve, Ioiri River valley, Chachuna hotel, 260m, 41.220°N, 45.971°E, 28-30.VI.2024, light leg. Jari Junnilainen, (6 males, 5 female; OPC).

Remark. The genus and species are new for the Georgian fauna.

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