

On the Trichoptera of Western Europe, with surveys of *Platyphylax*, *Simaphylax* genera, *Drusus chapmani*, *Chaetopteryx gessneri*, and *C. gonospina* species complexes

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Abstract. In the present paper on the Western European Trichoptera we revise or overview the *Platyphylax* and *Simaphylax* limnephiline genera, as well as establish and/or overview the *Drusus chapmani*, *Chaetopteryx gessneri* and *C. gonospina* species complexes based on the principles and procedures of our fine phenomics. Having collected a new *Drusus chrysotus* (Rambur, 1842) specimen we have reconfirmed its delineation from its eastern sibling species *Drusus lapos* Oláh, 2017. By the paraproct, the *Drusus spelaeus* siblings in the *Drusus mixtus* species group are related to the *Drusus siveci* species complex in the *Drusus discolor* species group. Our discovery of a population of *Drusus spelaeus* with paramere structure similar to that of the *Drusus discolor* species group indicates further the importance of chimeric processes in species integrative organisation. Due to contradictory drawings published we have re-examined and redescribed the female of *Drusus spelaeus*. After surveying the recent taxonomic history of the *Allogamus auricollis* species subgroup we have raised the subspecies status to species rank of *Allogamus auricollis bauerii* (Kolenati, 1859); *A. brauerii* stat. nov. *Chaetopteryx gessneri tomaszewski* Moretti, 1991 was elevated to species rank: *Ch. tomaszewski* stat. nov. and *Chaetopteryx kimera* Oláh & Vinçon, 2021, a rather unique chimeric species having several character states of different origin was transferred to *Conorophylax* genus: *C. kimera* (Oláh & Vinçon, 2021) comb. nov. Furthermore, 17 new species were described: *Wormaldia ariega*, *W. ligurica*, *W. maritima*, *Drusus alethes*, *D. italiano*, *Chaetopteryx tompula*, *C. cantabrica*, *C. decampsi*, *C. pyrenaica*, *Conorophylax cairos*, *C. lagoverde*, *C. livek*, *C. seolan*, *Platyphylax vinconi*, *Simaphylax coppai*, *S. andorricus* and *S. ariegeus* spp. nov. Among them, ten were collected in France, five in Italy, one in Slovenia and one in Spain. Moreover, we report for the first time *Potamophylax spinulifer* Moretti, 1994 and *Beraemyia gudrunae* Malicky, 2002 from France and *Simaphylax altuspyrenaicus* from Spain.

Keywords. Incipient siblings, species complexes, fine phenomics, paraproct, paramere, new species.

INTRODUCTION

Based on the principles and practices of gross morphology and camouflaged by the so called molecular DNA taxonomy, the European Trichoptera fauna is considered to be well studied, at least by the decaying standard of the recent taxonomy. In the last few years during the course of our studies, applying the principles, practices and procedures of the fine phenomics we have described around 300 new European Trichoptera species. In this paper on Western European Trichoptera we revise or survey of the *Platyphylax* and *Simaphylax* genera, as well as survey or establish the *Drusus chapmani*, *Chaetopteryx gessneri* and *C. gonospina* species complexes.

Here we also describe 17 caddisfly species new to science from Western Europe, but many more unknown species still wait for collection and description.

MATERIAL AND METHODS

Here we have elaborated rich samples of caddisflies collected in Western Europe during spring, summer and autumnal periods by the third author in wide ranges of regions France, Italy, Spain, Slovenia and Switzerland, frequently in high elevations in “sky island” habitats. Our principles and procedures of fine phenomics were applied (Oláh *et al.* 2017) in order to revise the *Platyphylax*, *Simaphylax* genera and the *Drusus*

chapmani, *Chaetopteryx gessneri*, *C. gonospina* species complexes.

Depositories. Civic Natural Science Museum “E. Caffi”, Bergamo, Italy (CNSMB). Natural History Museum, London, England (NHML). Oláh Private Collection, Debrecen, Hungary, under national protection by the Hungarian Natural History Museum, Budapest (OPC). Zoological Museum of the University of Amsterdam (ZMA)

TAXONOMY

Philopotamidae Stephens, 1829

Wormaldia ariega Oláh & Vinçon sp. nov.

(Figures 1–3, Map 1)

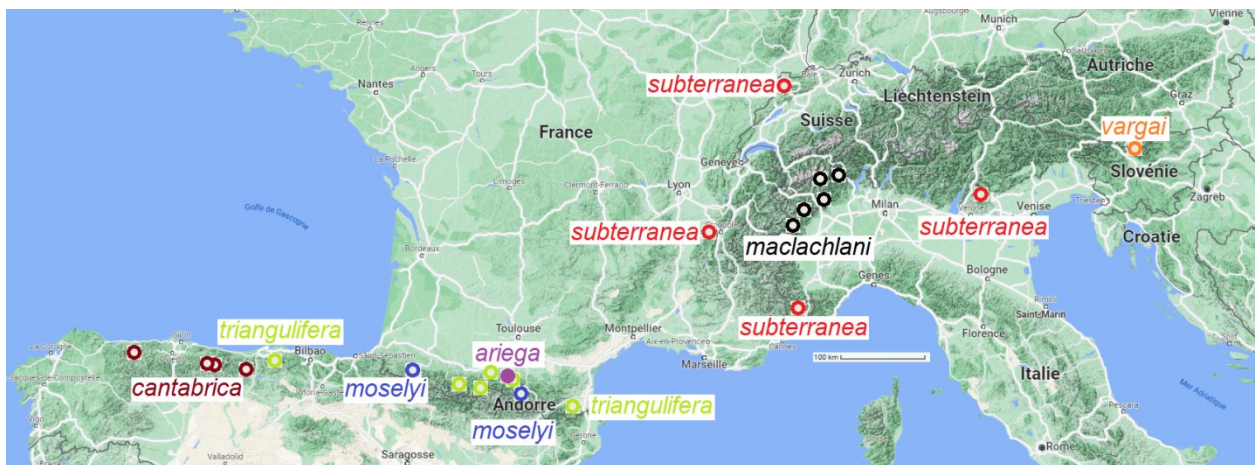
Material examined. Holotype: **France**, Ariège, below Crouzette Pass, spring, 760 m, 42.9137°N, 1.314°E, 12.XI.2021, leg. G. Vinçon (1 male, OPC). Paratype: same as holotype (1 male, 5 associated females; OPC). France, Ariège, SE Rille Pass, brook and spring, 1000 m, 42.946°N, 1.323°E, 12.XI.2021, leg. G. Vinçon (8 males, 8 associated females; OPC).

Diagnosis. Having slightly tapering harpago, capitate head with dorsal subapical pointed pro-

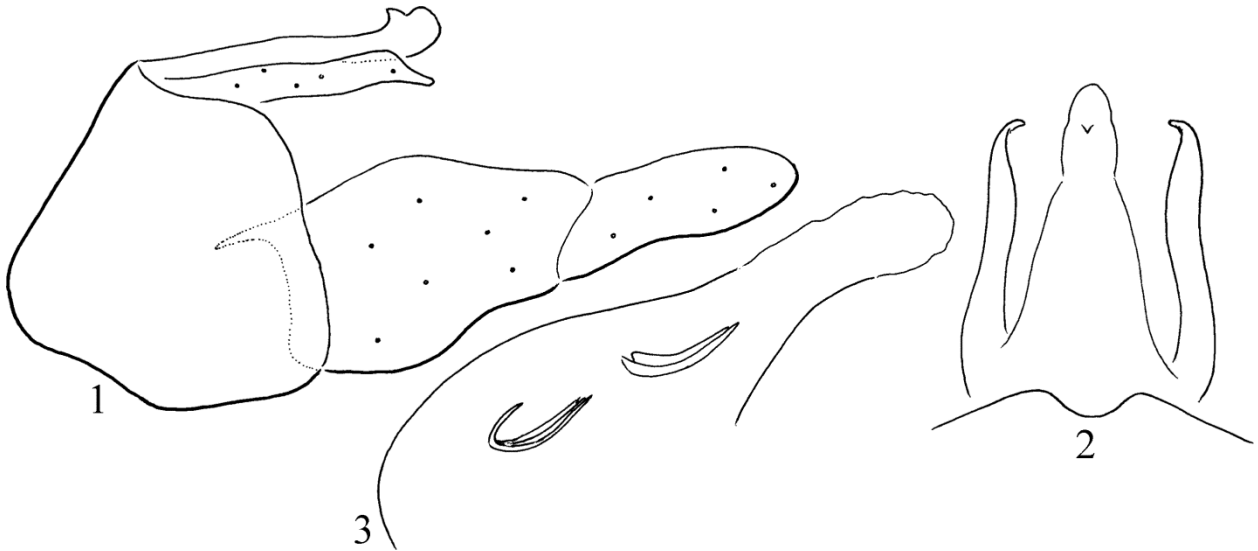
cess and endothecal spine pattern with pronounced basal spine cluster accompanied by some individual variously sized and shaped spines *W. ariega* sp. nov. belongs to the *Wormaldia triangulifera* species complex of the *Wormaldia triangulifera* species group. Most close to *Wormaldia moselyi* Kimmins, 1953 collected in the whole Pyrenees, but mainly in the Atlantic Pyrenees, a dominating inhabitant of Nivelles River system. However, the new species differs from it by the very pronounced and anterad curving subapical dorsal pointed process on segment X; by the dorsal concavity present on the head of segment X, by the much produced ventroapical elongation of cerci as well as by the almost semicircularly curved basal spine cluster in the endotheca and the doubled curving additional spines.

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

Male genitalia. Segment X characterized by narrow parallel-sided and narrowing apex in dorsal view, and by a large, anterad curving dorsal pointed subapical process dominating in lateral view; apex very much abbreviated almost semicircular with a short dorsal concavity in lateral view. Its ending is armed with sensory structures



Map 1. West European *Wormaldia* species (full circles represent the type localities).



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

of *sensilla basiconica* (pegs) or *sensilla coeloconica* (pitted pegs) both on the very dorsal ending of the narrowing apex as well as on the sublateral broadening. Cerci slender with apico-ventrally elongated, mesad curving apex in lateral view. Gonopods very produced, coxopodite and harpago with almost equal length; harpagones short, stout, less tapering in lateral view. Phallic organ with eversible membranous endotheca containing a basal, almost semicircularly curving cluster of 3–4 slender spines and an additional curving set of doubled spines.

Character combination. (1) Dorso-subapical point of segment X is a pronounced pointed process, visible in lateral profile as the top formed by the apical right-angle of the very shallow dorsal concavity. (2) Apex of segment X abbreviated semicircular. (3) Apex of cerci elongated ventrad and mesad curving. (4) Small ventromesal projection of cerci present. (5) Harpagones short, robust with slight middle constriction and with slightly narrowing head. (7) A very pronounced and curved cluster of slender spines present. (8) Two stout curved adhering spines only. (11) No arching cluster of small spines developed.

Etymology. Noun in apposition, named after the region of the type locality.

Remarks. This species inhabits the highs of the Arize Massif, a small prepyrenean mountain range. This wet hilly region is already known for its rich aquatic fauna with two micro-endemic species: *Wormaldia artillac* Sipahiler, 1999 and *Captioneura aptera* Berthélemy, 1969 (Plecoptera). *Wormaldia artillac* was collected early spring in March. According to the shape of harpago, the second segment of gonopod *W. artillac* belongs to the *W. copiosa* species group with roundly truncated apex. *W. ariega* sp. nov. belongs to the *W. triangulifera* species group with a somewhat narrowing apical ending of the harpago. Sometimes the difference is not so distinct. Even the nominate species of the group *W. triangulifera* has not got so distinct narrowing apex, similarly to the less pronounced differences between *artillac* and *ariega*. However, the U-shaped basal spine cluster is also restricted to the *triangulifera* species group. Therefore the *W. artillac* sp. nov. was considered as a member of the *W. triangulifera* species group.

The key speciation trait in *Wormaldia* genus is the lateral profile of the head of segment X. The second most important speciation trait is the endothecal spine pattern of the phallic organ. All these crucial traits completely differ between *W.*

ariega sp. nov. and *W. artillac*. Trait of the lateral profile of the head of segment X is very stable at all of the 8 paratypes. However, it is also possible that the significant and stable difference detected here is actually between the examined type specimens of *W. ariega* sp. nov. and the Sipahiler's drawings of *artillac*. Unfortunately, no type specimens of *W. artillac* were available for direct comparative study.

***Wormaldia cantabrica* Gonzalez & Botosaneanu, 1983**

(Map 1)

Material examined. **Spain**, Cantabria, Puerto del Ponton, Fuente del Infierno, brook and spring, 1260 m, 43.1023N, 5.0303W, 14.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC). Spain, Asturias, Puerto de Tarna, E Tarna, brook and spring, 1130 m, 43.1096N, 5.2183W, 14.XI.2021, leg. G. Vinçon (2 males, 3 females; OPC). Spain, Asturias, Puerto del Palo Allande, brook and spring, 950 m, 43.2778N, 6.6681W up to 1000 m, 43.2764N, 6.6725W, 16.XI.2021, leg. G. Vinçon (5 males, 3 females; OPC). Spain, Cantabria, Arroyo Pesebre, Puerto de la Palombera, 1240 m, 43.0686N, 4.2347W, 14.XI.2021, leg. G. Vinçon (2 males, 2 females; OPC).

***Wormaldia cianficconiae* Neu, 2017**

Material examined. **Italy**, Abruzzi, Val Fondillo, Tornareccia spring, 1120 m, 41.771N, 13.857E, 20.V.2021, leg. G. Vinçon (1 male, OPC). Italy, Campania, N Curticelle, N Giffoni Valle Piana, spring and brooklet, 720 – 820 m, 40.781N, 14.924E, 21.V.2021, leg. G. Vinçon (3 males, OPC). Italy, Abruzzi, Sorgenti del Vera, 650 m, 42.372N, 13.4585E, 26.V.21, leg. G. Vinçon (1 male, OPC). Italy, Basilicata, Pollino, 1210 m, spring, Fontana Impieso, 39.9643N, 16.1888E, 24.V.2021, leg. G. Vinçon (3 males, OPC).

***Wormaldia copiosa* (McLachlan, 1868)**

Material examined. **France**, Alpes-Maritimes, N. Valdeblore, Vallon des Millefonts, spring and

brook, 2120 m, 44.106N, 7.187E, 8.VIII.2021, leg. G. Vinçon (2 males, OPC). France, Hautes Alpes, Orcières-Merlette, brook and spring, 2640 m, 44.7353N, 6.3412E, 11.IX.2021, leg. G. Vinçon (2 males, OPC). France, Drôme, South Vercors Massif, Archiane, nice big resurgence, 770 m, 44.7461N, 5.5064E, 30.X.2021, leg. G. Vinçon (1 male; OPC). **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 24.VIII.2021, leg. G. Vinçon (1 male; OPC). Switzerland, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 14.IX.2021, leg. G. Vinçon (2 females; OPC).

***Wormaldia echinata* Tobias, 1995**

(Map 2)

Material examined. **France**, Alpes-Maritimes, Bevera Valley, junction of 2 torrents, 1200–1250 m, 43.976N, 7.412E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Bevera Valley, brook and lateral spring, 1400 m, 43.981 N, 7.425E, 3.IV.2021, leg. G. Vinçon (3 males, OPC). France, Alpes-Maritimes, Bevera Valley, nice spring and brooklet, 1420 m, 43.9807N, 7.4263E, 16.05.2021, leg. G. Vinçon (6 males, OPC). France, Alpes-Maritimes, Bevera Valley, spring and brook, 1700 m, 43.9856N, 7.4322E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Bévéra Valley, nice spring and brooklet, 1420 m, 43.9807N, 7.4263E, 19.IX.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (1 male, OPC).

***Wormaldia gattolliati* Malicky & Graf, 2017**

(Map 2)

Material examined. **Italy**, Melogno Pass, road to Calizzano, nice springs + brooks, 1200 m, 44.24N, 8.1968E, 17.V.2021, leg. G. Vinçon (11 males, OPC). Italy, Liguria, Melogno Pass, spring and brook, 1180 m, 44.2384N, 8.2E, 10.VI.2021,



Map 2. *Wormaldia* species occurring in the Maritime Alps and Northern Apennines. Few species are reported in Oláh *et al.* 2021 (full circles represent the type localities).

leg. G. Vinçon (11 males, OPC). Italy, Toscana, below Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, 44.3175N, 10.238E, 18.V.2021, leg. G. Vinçon (6 males, OPC). Italy, Toscana, Passo della Pradarena, Capanne di Sillano, 1070 m, brook, 44.254N, 10.3104E, 18.V.2021, leg. G. Vinçon (1 male, OPC).

Remarks. This species resembles to *Wormaldia joani* Oláh & Vinçon, 2021. Each specimen was cleared, cleaned, and endothelial spine pattern exposed and compared. The holotype of *Wormaldia joani* clearly differs by the pronounced and reliable divergences in the long and slender harpago as well as in the more elongated head of segment X. The divergence in the endothelial spine pattern is less discernible and needs more careful comparative study. Spine shapes and length is highly observation-angle dependent! *W. gattolliati* is distributed in France (Alpes-Maritimes) and in Italy (Umbria, Toscana, Emilia-Romagna). Until now *W. joani* Oláh & Vinçon is known only from Liguria.

***Wormaldia joani* Oláh & Vinçon, 2021**

(Map 2)

Material examined. **Italy**, Liguria, Melogno Pass, spring and brook, 1180 m, 44.2384N, 8.2E,

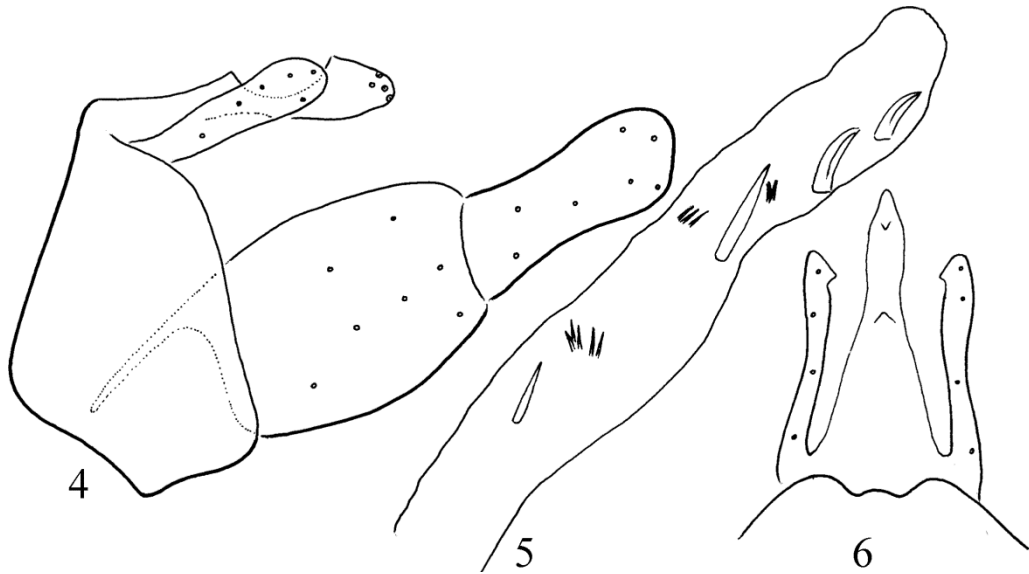
10.VI.2021, leg. G. Vinçon (57 males, OPC). Italy, Liguria, Melogno Pass, road to Calizzano, spring and brook, 1040 m, 44.238N, 8.1875E, 10.VII.2021, leg. G. Vinçon (5 males, OPC).

***Wormaldia ligurica* Oláh & Vinçon sp. nov.**

(Figures 4–6, Map 2, Photo 1)

Material examined: Holotype: **Italy**, Ligurian Apennines, Beigua, 1060 m, brook and spring, 44.427N, 8.543E, 17.V.2021, leg. G. Vinçon (1 male, OPC). Paratypes: same as holotype (1 male, OPC). Italy, Melogno Pass, road to Calizzano, nice springs + brooks, 1200 m, 44.24N, 8.1968E, 17.V.2021, leg. G. Vinçon (7 males, OPC).

Diagnosis. Having parallel-sided harpago, *W. ligurica* sp. nov. belongs to the *Wormaldia occipitalis* species group and having complex endothelial spine system this new species is a member of the *W. occipitalis* species complex. Having obliquely cut apicodorsum of the head of segment X most resembles to the nominate species *W. occipitalis*, but differs by the more elongated head. Moreover the endothelial spine pattern is less complete with a single basal slender spine only, as well as there are only four small spine clusters, not five and the clusters are composed of less spines.



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

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

Male genitalia. Segment X characterized by narrow parallel-sided and narrowing apex in dorsal view, and by a small dorsal pointed subapical process visible in lateral view; apex elongated almost semicircular in lateral view; the ending armed with sensory structures of *sensilla basiconica* (pegs) or *sensilla coeloconica* (pitted pegs) both on the very dorsal ending of the narrowing apex as well as on the sublateral broadening. Cerci slender with rounded apex in lateral view. Gonopods very produced, coxopodite and harpago with almost equal length; harpagones parallel-sided with slightly capitate head in lateral view. Phallic organ with eversible membranous endotheca containing elaborated network of spines as detailed below.

Character combination. (1) Dorso-subapical point of segment X is a small pointed process, visible in lateral profile as the top formed by the apical right-angle of the dorsal concavity. (2) Apex of segment X elongated semicircular. (3) Apex of cerci rounded. (4) Small ventromesal projection of cerci present. (5) Harpagones pa-

rallel-sided with slight middle constriction and with capitate head. (7) Only a single slender basal spine present. (8) Proximal clusters of small spines composed of a few spines. (9) Distal pair of clusters present, but composed of few spines. (10) Two stout curved and one long and stout and straight spines present. (11) No arching cluster of small spines developed.

Etymology. Named after the region of the type locality.

Remarks. In the population from the Melogno Pass there are three specimens with intermediate shorter head of segment X that could be a contact population either with *W. maritima* sp. nov. or *W. toscana* Oláh & Vinçon, 2021. That is also supported by unstable variability of the endothecal spine pattern.

***Wormaldia marilouae* Oláh & Vinçon, 2021**

(Map 2)

Wormaldia ameliae Oláh & Vinçon, 2021:6 (partim).

This species was described from Italy, Toscana, Val di Luce, brook, 44.123N, 10.628E, 1600–1650 m, 7.VI.2020, leg. Gilles Vinçon based on holotype and two accompanied paratypes. The genitalia of

one paratype was not cleared, here it was cleared and re-examined. It is *Wormaldia marilouae* Oláh & Vinçon, 2021 more common in Emilia-Romagna, but forming contact populations with *W. ameliae* Oláh & Vinçon in Toscana. Misidentification.

Material examined. **Italy**, Toscana, Apuane Alps, above Vinca, brook and spring, 980 m, 44.127N, 10.174E, 11.VI.2021, leg. Gilles Vinçon (1 male, OPC). **Italy**, Toscana, Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, very steep, 44.3175N, 10.238E, 11.VII.2021, leg. G. Vinçon (7 males, OPC).

***Wormaldia maritima* Oláh & Vinçon sp. nov.**

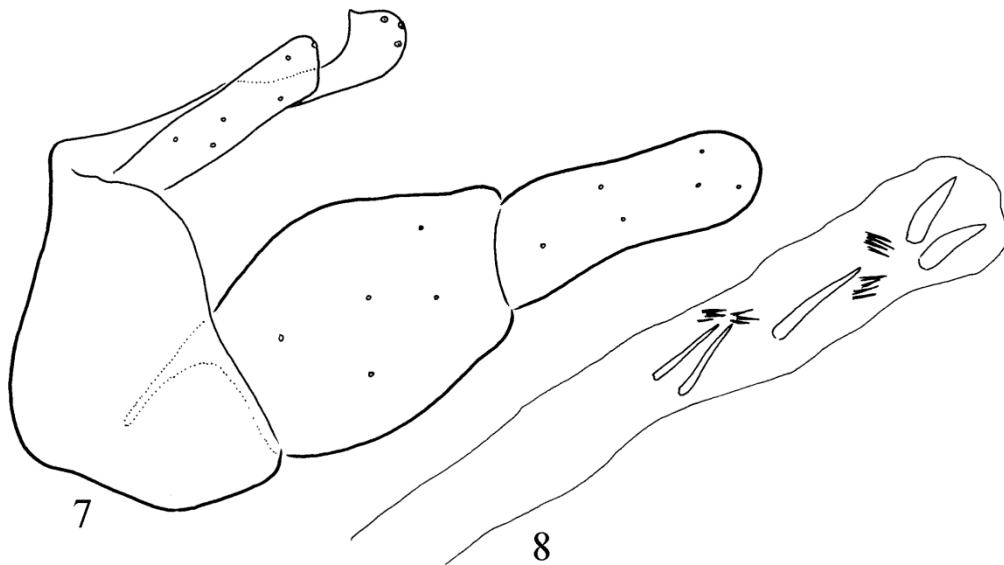
(Figures 7–8, Map 2, Photos 2–3)

Material examined. Holotype: **France**, Alpes-Maritimes, Clars Hamlet, nice spring and brook, Siagne tributary, 1090 m, 43.7473N, 6.74E, 15.V. 2021, leg. G. Vinçon (1 male, OPC). Paratypes: France, Alpes-Maritimes, Cairos Valley, Roya tributary, spring and very steep brooklet, 1260 m, 44.0168N, 7.4425E, 16.V.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, below

Ciapières, Loup tributary, spring and brook, 660 m, 43.787N, 6.9534E, 15.V.2021, leg. G. Vinçon (4 males, OPC).

Diagnosis. Having parallel-sided harpago, *W. maritima* sp. nov. belongs to the *Wormaldia occipitalis* species group and having complex endothecal spine system this new species is a member of the *W. occipitalis* species complex. Most resembles to the complex of species comprised of *W. toscana* Oláh & Vinçon, 2021, and *W. reggella* Oláh & Vinçon, 2021 having rather short head of segment X, but differs by the head of segment X semicircular, not elongated semicircular of *W. reggella* and the dorso-subapical point of segment X small, not enforced and enlarged like at *W. toscana*. Moreover, the endothecal spine pattern is more complete with two basal slender spines. Its forewing length is only 6 mm, not 7 or 9 mm.

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



Figures 7–8. *Wormaldia maritima* sp. nov. Holotype male: 7 = genitalia in left lateral view; 8 = phallic organ in left lateral view.

Male genitalia. Segment X characterized by narrow parallel-sided apex in dorsal view, and by a small dorsal pointed subapical process visible in lateral view; apex semicircular almost regular in lateral view; the ending armed with sensory structures of *sensilla basiconica* (pegs) or *sensilla coeloconica* (pitted pegs) both on the very dorsal ending of the narrowing apex as well as on the sublateral broadening. Cerci slender with truncated apex in lateral view. Gonopods very produced, coxopodite and harpago with almost equal length; harpagones parallel-sided with only slight middle constriction in lateral view. Phallic organ with eversible membranous endotheca containing elaborated network of spines as detailed below.

Character combination. (1) Dorso-subapical point of segment X is a small pointed process, visible in lateral profile as the top formed by the apical right-angle of the dorsal concavity. (2) Apex of segment X semicircular. (3) Apex of cerci truncated. (4) Ventromesal projection of cerci lacking. (5) Harpagones parallel-sided with slight middle constriction. (7) Pair of slender basal spines present. (8) Proximal clusters of small spines disintegrated. (9) Distal pair of clusters present. (10) Two stout curved and one long and stout and straight spines present. (11) No arching cluster of small spines developed.

Etymology. Named after the region of the type locality.

***Wormaldia maclachlani* Kimmins, 1953**

(Map 1)

Material examined. **Italy**, Pennines Alps, Gressoney Valley, below Pillaz, 1230 m, brook and spring, 45.6468N, 7.8735E, 30.V.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Piemont, Pennines Alps, W. Gravellona, Val Strona, between Forno and Marmo, 740 m, brooklet, cascade, 45.917N, 8.301E, 29.V.2021, leg. G. Vinçon (10 males, OPC). **Italy**, Piemont, Pennines Alps, high Sesia Valley, above Sant'Antonio, between Lago Bianco and Lago Nero, dripping cliffs and springs, 2480 m, 45.81N, 7.875E, 12.VII.2021, leg. G. Vinçon (2 males, OPC).

***Wormaldia morettii* Vigano, 1974**

(Map 2)

Material examined. **Italy**, Toscana, Reggello, spring, slopy, with mosses and ferns, 920 m, 43.6906N, 11.582E, 19.V.2021, leg. G. Vinçon (3 males, OPC). **Italy**, Toscana, Reggello, spring, slopy, with mosses and ferns, 920 m, 43.6906N, 11.582E, 11.VI.2021, leg. G. Vinçon (4 males, OPC).

***Wormaldia moselyi* Kimmins, 1953**

(Map 1)

Material examined. **France**, Pyrénées-Atlantiques, Osse-en-Aspe, Labays Pass, Gave d'Is-saux, steep brooklet, 1160 m, 43.004N, 0.7201W, 17.XI.2021, leg. G. Vinçon (1 male, OPC). **France**, Ariège, Vicdessos, Las Rougos, Pla de l'Izard, Mounicou tributary, spring and brook, 1220 m, 42.6949N, 1.4497E, 12.XI.2021, leg. G. Vinçon (1 male, OPC).

***Wormaldia occipitalis* (Pictet, 1834)**

Material examined. **France**, Chartreuse Massif, below Sarcenas, Sarcenas brook, Vence trib., 1100 m, 45.2705N, 5.7528E, 31.III.2021, leg. G. Vinçon (2 males, OPC). **France**, Alpes-Maritimes, Cairas Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 4.IV.2021, leg. G. Vinçon (2 males, OPC). **France**, Alpes-Maritimes, Above Gréolières des neiges, springs and brooks, 760–1100 m, 43.794N, 6.971E and 43.801N, 6.971, 2.IV.2021, leg. Gilles Vinçon (8 males, 2 females; OPC). **France**, Alpes-Maritimes, Clars Hamlet, nice spring and brook, 1090 m, 43.7473N, 6.74E, 15.V.2021, leg. G. Vinçon (1 male, OPC). **France**, Alpes-Maritimes, Bevera Valley, spring and brook, 1400–1500 m, 43.981N, 7.425E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC). **France**, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380–1420 m, 44.729N, 5.66E, 14.VII.2021, leg. G. Vinçon (1 male, OPC). **France**, Hautes-Alpes, Queyras Massif, Vars, Crachet brook and spring, Ubaye trib., 2340 m, 44.5178N, 6.688E, 15.VIII.2021,

leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (3 males, OPC). France, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380–1420 m, 44.729N, 5.66E, 18.IX.2021, leg. G. Vinçon (6 males, OPC). France, Hautes Alpes, Orcières-Merlette, brook and spring, from 2330 m, 44.723N, 6.329E, to 2450 m, 44.7269N, 6.3293E, 11.IX.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Caïros Valley, lateral spring, 1260 m, 44.0168N, 7.4425E, 23.X.2021, leg. G. Vinçon (8 males, 5 females; OPC). France, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380–1420 m, 44.729N, 5.66E, 30.X.2021, leg. G. Vinçon (1 male, OPC). France, Isère, above Laval-en-Belledonne, SE Prabert, brook and spring, 1260 m, 45.232N, 5.991E, 6.XI.2021, leg. G. Vinçon (8 males, 6 females; OPC). France, Alpes-Maritimes, Bévéra Valley, junction of two torrents, 1210 m, 43.977N, 7.4132E and 1210 m, 43.9763N, 7.4112E, 24.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Caïros Valley, lateral spring, 1020 m, 44.011N, 7.4602E, 23.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Clars Hamlet, spring, 1090 m, 43.7473N, 6.7398 E, 23.X.2021, leg. G. Vinçon (3 males, OPC). France, Alpes-Maritimes, Bramafan, brook, 470 m, 43.7615N, 6.9883E, 23.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Tinée Valley, spring near Vens Cascade, 1480 m, 44.3052N, 6.9046E, 24.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-de-Haute-Provence, Above Castellane, Lecques Pass, brook, 1220 m, 43.875N, 6.464E, 22.X.2021, leg. G. Vinçon (7 males, OPC). **Italy**, Piemont, Peninnes Alps, W. Gravelona, Val Strona, between Forno and Marmo, 740 m, brooklet, cascade, 45.917N, 8.301E, 29.V.2021, leg. G. Vinçon (5 males, OPC). Italy, Liguria, Melogno Pass, spring and brook, 1180 m, 44.2384N, 8.2E, 10.VI.2021, leg. G. Vinçon (3 males, OPC). Italy, Atesine Alps, N. Maranza, below Seefeldsee, spring and brook, 2150 m, 46.873N, 11.6586E, 25.IX.2021, leg. G. Vinçon (4 males, OPC). **Switzerland**, Lombardi

an Pre-Alps, Bernina Pass, brook and spring, 2050 m, 46.4093N, 10.0496E, 24.IX.2021, leg. G. Vinçon (1 male, 6 females; OPC).

Remarks. Population in the Val Strona of Piemont, Italy can be a contact population exhibiting heads of segment X intermediate between obliquely-cut apicodorsum of *W. occipitalis* and the more rounded head of *W. maritima* sp. nov. The three specimens from Melogno Pass of Liguria could represent contact population either with *W. maritima* or *W. toscana*.

***Wormaldia reggella* Oláh & Vinçon, 2021**

(Map 2)

Material examined. **Italy**, Toscana, Reggello, spring, slopy, with mosses and ferns, 800 m, 43.693N, 11.58E, 19.V.2021, leg. G. Vinçon (13 males, OPC).

***Wormaldia subterranea* Radovanovic, 1932**

(Map 1)

Material examined. **France**, Isère, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 29.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Bévéra Valley, Vallon des Cabanes Vieilles, lateral spring, 1700 m, 43.9856N, 7.4323E, 24.X.2021, leg. G. Vinçon (11 males, 3 females; OPC). France, Alpes-Maritimes, Bévéra Valley, Vallon des Cabanes Vieilles, lateral spring, 1560 m, 43.9808N, 7.4308E, 24.10.202, leg. G. Vinçon (23 males, 14 females; OPC). France, Alpes-Maritimes, Bévéra Valley, Vallon des Cabanes Vieilles, lateral spring and brook, 1420 m, 43.9807N, 7.4263E 24.X.2021, leg. G. Vinçon (9 males, 8 females; OPC). **Italy**, Trentino Alto Adige, Venetian Pre-Alps, Campogrosso Pass, south slope, E. Malga Ravo, nice spring, below the water catchment, 1020 m, 45.7162N, 11.183E, 27.V.2021, leg. Gilles Vinçon (1 male, OPC). **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600–650 m, 47.3N, 7.06E, 14.IX.2021, leg. G. Vinçon (4 males, OPC).

***Wormaldia toscanica* Oláh & Vinçon, 2021**

(Map 2)

Material examined. **Italy**, Ligurian Apennines, Beigua, spring, 960 m, 44.4233N, 8.5337E, 17.V.2021, leg. Gilles Vinçon (3 males, OPC). **Italy**, Toscana, Passo del Cerreto, 1400 m, brook, 44.2895N, 10.2275E, 18.V.2021, leg. G. Vinçon (8 males, OPC). **Italy**, Toscana, Passo del Cerreto, 1400–1500 m, springs and brooks, 44.285N, 10.2286E, 11.VI.2021, leg. G. Vinçon (8 males, OPC).

Remarks. Ligurian population may represent a possible intermixed contact population between *W. maritima* sp. nov., *W. reggella* Oláh & Vinçon, 2021 and *W. toscanica* Oláh & Vinçon, 2021. One specimen has shorter head of segment X and the pair of slender basal spines are partially lacking at all the 3 specimens.

***Wormaldia triangulifera* McLachlan, 1878**

(Map 1)

Material examined. **France**, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, springs, 930 m, 42.7408N, 0.6146E; 42.7402N, 0.616E, 19.XI.2021, leg. G. Vinçon (1 male, OPC). **France**, Pyrénées-Orientales, Canigou Massif, between Valmanya and Paloumère Pass, steep brooklet, 1020 m, 42.5335N, 2.5601E, 20.XI.2021, leg. G. Vinçon (23 males, 3 females; OPC). **France**, Hautes-Pyrénées, Couplan Valley, spring, 1420 m, 42.812 N, 0.2218E, 18.XI.2021, leg. G. Vinçon (1 male, OPC). **France**, Haute-Garonne, Arbas Massif, Fontaine de l'Ours, spring, 1190 m, 42.9647N, 0.8789E, 19.XI.2021, leg. G. Vinçon (1 male, OPC). **France**, Ariège, SE Rille Pass, brook and spring, 1000 m, 42.946N, 1.323E, 12. XI.2021, leg. G. Vinçon (1 male, OPC). **Spain**, Cantabria, San Roque de Riomiera, Portillo de Lunada, brook and spring, 1100 m, 43.1615N, 3.6756W, 13.XI.2021, leg. G. Vinçon (1 male, OPC).

***Wormaldia vargai* Malicky, 1981**

(Map 1)

Material examined. **Slovenia**, Kranj, Pohorje Mountains, Travertine springs (limestone sub-

stratum), Kokra trib., 850 m, 46.3993N, 14.4698 E, 27.IX.2021, leg. G. Vinçon (1 male, OPC). **Slovenia**, near Italian border, Julian Pre-Alps, below Livek, spring and brook, 600 m, 46.2123N, 13.5939E, 28.IX.2021, leg. G. Vinçon (3 males, OPC).

Psychomyiidae Walker, 1852

***Tinodes apuanorum* Moretti, 1981**

Material examined. **Italy**, Toscana, Apuane Alps, below Vinca, brook, 470-520 m, 44.14N, 10.146E, 11.VI.2021, leg. G. Vinçon (3 males, 3 females; OPC).

***Tinodes consiglioi* Botosaneanu, 1980**

Material examined. **France**, Alpes-Maritimes, Bevera Valley, spring and brook, 1400-1500 m, 43.981N, 7.425E, 7.VIII.2021, leg. G. Vinçon (8 males + 3 pairs in copula, OPC). **Italy**, Abruzzi, Sorgenti del Vera, 650 m, 42.372N, 13.4585E, 26. V.21, leg. G. Vinçon (10 males, OPC).

***Tinodes dives* (Pictet, 1834)**

Material examined. **France**, Drôme, Vercors Massif, Adouin river, near its spring, Vernaison and Bourne tributary, Tourtre, Saint-Martin-en-Vercors (26420), 45°0.120928' N, 5°27.550379' E, 793m, 30.IV.2021, leg. G. Vinçon (2 males, OPC). **France**, Isère, Lalley le Jocou, Vercors Massif, spring Rif Bruyant tributary, 1440 m, 44.729N, 5.66E, 14.V.21, leg. G. Vinçon (7 males, OPC). **Italy**, Trentino Alto Adige, Venetian Pre-Alps, Campogrosso Pass, south slope, E. Malga Ravo, nice spring, below the water catchment, 1020 m, 45.7162N, 11.183E, 27.V.2021, leg. Gilles Vinçon (6 males, OPC).

***Tinodes jeekeli* Botosaneanu, 1980**

Material examined. **Italy**, Carniche Pre-Alps, Dolomiti Friuli, S. Preone, Casali Chiampon, spring and brook below water capture, 780 m, 46.3445N, 12.8785E, 26.IX.2021, leg. G. Vinçon (6 males, 3 females; OPC).

***Tinodes zelleri* McLachlan, 1878**

Material examined. France, Isère, Vercors Massif, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 1.VIII.2021, leg. G. Vinçon (2 males, OPC).

Polycentropodidae Ulmer, 1903

***Plectrocnemia conspersa* (Curtis, 1834)**

Material examined. France, Drôme, Adouin resurgence, Tourtre, 770 – 790 m, 45.002N, 5.459 E, 1.VIII.2021, leg. G. Vinçon (1 male, OPC).

***Plectrocnemia praestans* McLachlan, 1884**

Material examined. France, Hautes-Alpes, Queyras Massif, Aiguilles, torrent below ‘Grand Laus lake’, 2560 m, 44.82N, 6.872E, 15.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Hautes-Alpes, Queyras Massif, Vars, Crachet brook and spring, Ubaye trib., 2340 m, 44.5178N, 6.688E, 15.VIII.2021, leg. G. Vinçon (1 male, OPC).

Hydropsychidae Curtis, 1835

Diplelectroninae Ulmer, 1951

***Diplectronea atra* McLachlan, 187**

Material examined. Italy, Trentino Alto Adige, Venetian Pre-Alps, Raossi, Speccheri, brook below the dam, low current, 670 m, 45.7648N, 11.1301E, 27.V.2021, leg. G. Vinçon (3 males, OPC). Italy, Trentino Alto Adige, Venetian Pre-Alps, Campogrosso Pass, south slope, E. Malga Ravo, nice spring, below the water catchment, 1020 m, 45.7162N, 11.183E, 27.V.2021, leg. Gilles Vinçon (4 males, OPC).

***Diplectronea magna* Mosely, 1930**

Material examined. Italy, Toscana, Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, very steep, 44.3175N, 10.238E, 11.VII.2021, leg. G. Vinçon (2 males, OPC).

Hydropsychinae Curtis, 1835

***Hydropsyche doehleri* Tobias, 1972**

Material examined. Italy, Calabria: Aspromonte, river below Sant’ Eufemia d’Aspromonte, 440 m, 38.2633N, 15.848E, 23.V.2021, leg. Gilles Vinçon (2 males, OPC).

Remarks. The two male specimens from Calabria have differently structured phallic organ probably represent a new sibling taxon, close to *H. doehleri*. Without comparative specimens we cannot describe it.

Glossosomatidae Wallengren, 1891

***Glossosoma boltoni* Curtis, 1834**

Material examined. France, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, steep springs, 930 m, 42.7408N, 0.6146E and 42.7402 N, 0.616E, 19.XI.2021, leg. G. Vinçon (1 male, OPC).

***Glossosoma privatum* McLachlan, 1884**

Material examined. Spain, Cantabria, Rio Saja, Mina da Lapiz, 520 m, 43.1232N, 4.2961W, 14.XI.2021, leg. G. Vinçon (6 males, OPC).

***Agapetus dubitans* McLachlan, 1879**

Material examined. France, Alpes-Maritimes, Clars Hamlet, nice spring and brook, 1090 m, 43.7473N, 6.74E, 15.V.2021, leg. G. Vinçon (3 males; OPC). France, Alpes-Maritimes, Cairos Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 16.V.2021, leg. G. Vinçon (2 males, OPC). France, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 15.V.2021, leg. G. Vinçon (1 male, OPC). France, Isère, Grande-Chartreuse, above Sarcenas, 1190 m, Fontfroide brook up to its spring, 45.28N, 5.7638E, 14.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Isère, Grande-Chartreuse, Road to the ‘Col de Porte’, 1220 m, Ruisset brook up to its spring, 45.2757N, 5.77E, 14.VIII.2021, leg. G.

Vinçon (1 male, OPC). France, Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E, 23.X.2021, leg. G. Vinçon (7 males, 4 females; OPC).

***Agapetus insons* (McLachlan, 1879)**

Material examined. **France**, Hautes-Pyrénées, Couplan Valley, spring, 1420 m, 42.812N, 0.2218 E, 18.XI.2021, leg. G. Vinçon (2 males, OPC). France, Haute-Garonne, Arbas Massif, Fontaine de l'Ours, spring, 1190 m, 42.9647N, 0.8789E, 19.XI.2021, leg. G. Vinçon (1 male, OPC). France, Ariège, Vicdessos, East Soulcem Lake, brook, 1600 m, 42.672N, 1.452E, 12.XI.2021, leg. G. Vinçon (1 male, OPC).

***Agapetus padanus* (Bertuetti, Lodovici & Valle, 2004)**

Material examined. **Italy**, Trentino Alto Adige, Venetian Pre-Alps, Campogrosso Pass, south slope, E. Malga Ravo, nice spring, below the water catchment, 1020 m, 45.7162N, 11.183E, 27.V.2021, leg. Gilles Vinçon (1 male, OPC).

***Catagapetus nigrans* McLachlan, 1884**

Material examined. **Italy**, Toscana, Apuane Alps, below Vinca, brook, 470-520 m, 44.14N, 10.146E, 11.VI.2021, leg. G. Vinçon (1 male, 1 female; OPC). **Italy**, Toscana, Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, very steep, 44.3175N, 10.238E, 11.VII.2021, leg. G. Vinçon (1 male, OPC).

Rhyacophilidae Stephens, 1836

***Rhyacophila abruzzica* Oláh & Vinçon, 2021**

Material examined. **Italy**, Abruzzi, Sorgenti del Vera, 650 m, 42.372N, 13.4585E, 26.V.21, leg. G. Vinçon (2 males, OPC).

***Rhyacophila arcangelina* Navas, 1932**

Material examined. **Italy**, Melogno Pass, road to Calizzano, nice springs + brooks, 1200 m, 44.24N, 8.1968E, 17.V.2021, leg. G. Vinçon (1

male, OPC). **Italy**, Liguria, Melogno Pass, spring and brook, 1180 m, 44.2384N, 8.2E, 10.VI.2021, leg. G. Vinçon (8 males, OPC).

***Rhyacophila arties* Sipahiler, 2000**

Material examined. **France**, Ariège, Vicdessos, Gardelle brook and several springs, 2260 m, 42.649N, 1.4246E, 12.XI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila eatoni* McLachlan, 1879**

Material examined. **France**, Pyrénées-Atlantiques, Iraty, nice resurgence, 1100 m, 43.0451N, 1.0546W, 17.11.2021, leg. G. Vinçon (1 male, OPC). **France**, Pyrénées-Atlantiques, below Sainte-Engrâce, torrent near the old mile, 610 m, 42.997N, 0.8238W, 17.XI.2021, leg. G. Vinçon (2 males, OPC). **France**, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, steep springs, 930 m, 42.7408N, 0.6146E and 42.7402 N, 0.616E, 19.XI.2021, leg. G. Vinçon (2 males, OPC). **France**, Pyrénées-Atlantiques, Osse-en-Aspe, Labays Pass, Gave d'Issaux, steep brooklet, 1160 m, 43.004N, 0.7201W, 17.XI.2021, leg. G. Vinçon (2 males, OPC). **France**, Pyrénées-Atlantiques, Sainte-Engrâce, very steep spring, 1040 m, 43.0006N, 0.7752W, 17.XI.2021, leg. G. Vinçon (2 males, 1 female; OPC). **Spain**, Navarra, Puerto de Ibañeta, Valcarlos, brook and spring, Luzaide tributary, 890 m, 43.0309N, 1.3435W, 16.11.2021, leg. G. Vinçon (4 males, 1 female; OPC).

***Rhyacophila evoluta* McLachlan, 1879**

Material examined. **France**, Pyrénées-Orientales, Puigmal Massif, «Rec de Vallosca», Ribera d'Err tributary, 1820 m, 42.421N, 2.038E, 11.XI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila foliacea* Moretti, 1981**

Material examined. **Italy**, Abruzzi: Maiella, spring and dripping rocks at the top of the Santo Spirito Valley, 1600 m, 42.1642N, 14.1136E, 25.V.2021, leg. G. Vinçon (6 males, OPC). **Italy**, Abruzzi, Val Fondillo, Sorgente Tornareccia, wonderful spring, 1100 m, 41.7713N, 13.857E, 13.VI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila glareosa* McLachlan, 1867**

Material examined. **France**, Hautes-Alpes, Queyras Massif, Aiguilles, brook and spring above ‘Grand Laus lake’, 2620 m, 44.8248N, 6.8697E 15.VIII.2021, leg. G. Vinçon (1 male, OPC). **France**, Savoie, Iseran Pass, springs, pasturages, 2630 m, 45.409N, 7.025E, 5.IX.2021, leg. G. Vinçon (1 male, OPC). **France**, Savoie, Iseran Pass, Mandettaz brook and springs, from 2720 m, 45.399N, 7.08E to 2770 m, 45.4N, 7.079 E, 5.IX.2021, leg. G. Vinçon (5 males, 4 females; OPC). **Italy**, Atesine Alps, N. Maranza, above Seefeldsee, brook, 2390 m and above, 46.8827N, 11.6597E, 25.IX.2021, leg. G. Vinçon (2 males, OPC). **Italy**, Atesine Alps, N. Maranza, above Seefeldsee, brook, 2330 m, 46.88N, 11.658 E, 25.IX.2021, leg. G. Vinçon (2 males, OPC).

***Rhyacophila hageni* McLachlan, 1879**

Material examined. **Slovenia**, Julian Alps, S. Vrsic Pass, Minarica trib., spring, 1480 m, 46.4279N, 13.743E, 27.IX.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila intermedia* McLachlan, 1868**

Material examined. **France**, Savoie, Iseran Pass, brooks and springs, Lenta trib. above Ouliette bridge, 2500 m, 45.4N, 7.045E, 5.IX.2021, leg. G. Vinçon (1 male, 3 females, OPC). **France**, Hautes Alpes, Orcières-Merlette, brook and spring, 2640 m, 44.7353N, 6.3412E, 11.IX.2021, leg. G. Vinçon (2 males, OPC). **France**, Drôme, Dévoluy massif, Jarjatte, Fontaine des Mougious, very nice spring, 1470 m, 44.6863N, 5.7964E, 30.X.2021, leg. G. Vinçon (6 males, 4 females; OPC). **Italy**, Rhaetian Alps, Passo di Gavia, N. slope, from 2640 m, 46.355N, 10.494E, to 2700 m, 46.356N, 10.4876E, 24.IX.2021, leg. G. Vinçon (6 males, 4 females; OPC). **Italy**, Rhaetian Alps, Passo di Gavia N. slope, Gavia trib., above Ponte dell’Alpe, brook, 2330m, 46.383N, 10.494E, 24.IX.2021, leg. G. Vinçon (3 males, 2 females; OPC). **Italy**, Carniche Pre-Alps, Dolomiti Friuli, S. Preone, Casali Chiampon, nice spring and brook, 760 m, 46.3416N, 12.8827E, 26.IX.2021, leg. G. Vinçon (1 male, OPC). **Italy**,

Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m, 45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (3 males, 2 females; OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (4 males, 2 females; OPC).

***Rhyacophila kelnerae* Schmid, 1971**

Material examined. **France**, Alpes-Maritimes, Bévéra Valley, nice spring and brooklet, 1420 m, 43.9807N, 7.4263E, 19.IX.2021, leg. G. Vinçon (5 males, OPC). **Italy**, Melogno Pass, road to Calizzano, nice springs + brooks, 1200 m, 44.24N, 8.1968E, 17.V.2021, leg. G. Vinçon (5 males, OPC). **Italy**, Toscana, below Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, 44.3175N, 10.238E, 18.V.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila laevis* Pictet, 1834**

Material examined. **Italy**, Lombardia, N. Salo, N. Eno hamlet, spring and brooklet, 980 m, 45.722N, 10.506E, 28.V.2021, leg. G. Vinçon (4 males, 1 female; OPC).

***Rhyacophila laufferi* Navas, 1918**

Material examined. **Spain**, Asturias, Puerto de Leitariegos, Brañas de Arriba, nice spring, 1400 m, 43.0128N, 6.4451W, 15.XI.2021, leg. G. Vinçon (5 males, 1 female; OPC).

Remarks. Association of the single female requires confirmation.

***Rhyacophila ligurica* Oláh & Vinçon, 2021**

Material examined. **Italy**, Liguria, Melogno Pass, road to Calizzano, spring and brook, 1040 m, 44.238N, 8.1875E, 10.VII.2021, leg. G. Vinçon (2 males, OPC).

***Rhyacophila lusitanica* McLachlan, 1884**

Material examined. **Spain**, Asturias, Puerto de Leitariegos, brook and spring, 1550 m, 43.001N,

6.4185W, 15.XI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila melpomene* Malicky, 1976**

Material examined. **Spain**, Asturias, Puerto del Palo Allande, brook and spring, 950 m, 43.2778N, 6.6681W up to 1000 m, 43.2764N, 6.6725W, 16.XI.2021, leg. G. Vinçon (3 males, 4 females; OPC).

***Rhyacophila martynovi* Mosely, 1930**

Material examined. **France**, Pyrénées-Atlantiques, Eaux-Bonnes, Iscoo spring, nice resurgence, 820 m, 42.969N, 0.3806W, 17.XI.2021, leg. G. Vinçon (3 male, OPC). **France**, Pyrénées-Atlantiques, Osse-en-Aspe, Labays Pass, Oueils d'Issaux, nice resurgence, 680 m, 43.00655N, 0.6913W, 17.XI.2021, leg. G. Vinçon (6 males, 1 female; OPC). **Spain**, Cantabria, Puerto del Ponton, Fuente del Infierno, brook and spring, 1260 m, 43.1023N, 5.0303W, 14.XI.2021, leg. G. Vinçon (8 males, 1 female; OPC). **Spain**, Burgos, Espinosa de los Monteros, Portillo de Las Estecas de Trueba, Fuente Cornejo, spring, 1030 m, 43.1115N, 3.6786W, 13.XI.2021, leg. G. Vinçon (10 males, 9 females; OPC). **Spain**, Asturias, Puerto de Tarna, E Tarna, brook and spring, 1130 m, 43.1096N, 5.2183W, 14.XI.2021, leg. G. Vinçon (2 males, OPC). **Spain**, Cantabria, Río Saja, Mina da Lapiz, 520 m, 43.1232N, 4.2961W, 14.XI.2021, leg. G. Vinçon (2 males, OPC). **Spain**, Cantabria, Puerto San Glorio, Río Vejo, torrent, 1240 m, 43.0725N, 4.7311W, 14.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC).

***Rhyacophila obliterated* McLachlan, 1863**

Material examined. **France**, Pyrénées-Orientales, Canigou Massif, Vernet-les-Bains, Cascade des Anglais, 1030 m, 42.539N, 2.4167E, 11.X.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila orobica* Moretti, 1991**

Material examined. **Italy**, Lombardia, N. Salò, N. Eno hamlet, spring and brooklet, 980 m,

45.722N, 10.506E, 28.V.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila pongensis* Sipahiler, 2000**

Material examined. **Spain**, Cantabria, Puerto del Ponton, Fuente del Infierno, brook and spring, 1260 m, 43.1023N, 5.0303W, 14.XI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila praemorsa* McLachlan, 1879**

Material examined. **France**, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1140 m, 46.7758N, 6.449E, 25.VIII.2021, leg. G. Vinçon (5 males, OPC). **France**, Hautes-Alpes, Queyras Massif, Vars, Crachet brook and spring, Ubaye trib., 2340 m, 44.5178N, 6.688E, 15.VIII.2021, leg. G. Vinçon (1 male, OPC). **Switzerland**, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1260 m, 46.7735N, 6.453E, 25.VIII.2021, leg. G. Vinçon (3 males, OPC).

***Rhyacophila producta* McLachlan, 1879**

Material examined. **Italy**, Trentino Alto Adige, Venetian Pre-Alps, Campogrosso Pass, below the water catchment, 1310 m, 45.745N, 11.161E, 27.V.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Trentino Alto Adige, Venetian Pre-Alps, above Camposilvano, spring and brook, 1000 – 1050 m, 45.754N, 11.149E, 27.V.2021, leg. G. Vinçon (19 males, 21 females; OPC).

***Rhyacophila pubescens* Pictet, 1834**

Material examined. **France**, Alpes-Maritimes, Clars Hamlet, nice spring and brook, 1090 m, 43.7473N, 6.74E, 15.V.2021, leg. G. Vinçon (4 males, OPC). **France**, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 15.V.2021, leg. G. Vinçon (1 male, OPC). **France**, Isère, Grande-Chartreuse, above Sarcenas, 1190 m, Fontfroide brook up to its spring, 45.28N, 5.7638E, 14.VIII.2021, leg. G. Vinçon (3 males, OPC). **France**, Drôme, Vercors, Tourtre, Adouin, 760 m, 45.0035N, 5.4563E, 14.VII.2021, leg. G. Vinçon (4 males, OPC).

France, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (2 males, 1 female; OPC). France, Isère, Bruyant torrent near its spring, 1000-1030 m, 45.147N, 5.617E, 29.X.2021, leg. G. Vinçon (4 males, 1 female; OPC). France, Alpes-de-Haute-Provence, Above Castellane, Lecques Pass, brook, 1220 m, 43.875N, 6.464E, 22.X.2021, leg. G. Vinçon (6 males, OPC). **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 24.VIII.2021, leg. G. Vinçon (1 male; OPC). Switzerland, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1260 m, 46.7735N, 6.453E, 25.VIII.2021, leg. G. Vinçon (6 males, 2 females; OPC).

***Rhyacophila ravizzai* Moretti, 1991**

Material examined. **France**, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Bévéra torrent, 1200 m, 43.976N, 7.412E, 19.IX.2021, leg. G. Vinçon (2 males, OPC). France, Alpes-Maritimes, N. Valdeblore, Vallon des Millefontes, spring and brook, 2120 m, 44.106N, 7.187E, 19.IX.2021, leg. G. Vinçon (2 males, 6 females; OPC). France, Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E, 23.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, Bévéra Valley, junction of two torrents, 1210 m, 43.977N, 7.4132E and 1210 m, 43.9763N, 7.4112E, 24.X.2021, leg. G. Vinçon (8 males, 3 females; OPC). France, Alpes-Maritimes, Caïros Valley, lateral spring, 1020 m, 44.011N, 7.4602E, 23.X.2021, leg. G. Vinçon (3 males, OPC).

***Rhyacophila rupta* McLachlan, 1879**

Material examined. **France**, Ariège, below Crouzette Pass, nice spring, 760 m, 42.9137N, 1.314E, 12.XI.2021, leg. G. Vinçon (5 males, 4 females; OPC). France, Ariège, below Crouzette Pass, brook, 840 m, 42.92N, 1.3287E, 12.XI.2021, leg. G. Vinçon (3 males, OPC). France,

Haute-Garonne, Arbas Massif, Fontaine de l'Ours, spring, 1190 m, 42.9647N, 0.8789E, 19.XI.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila stigmatica* (Kolenati, 1859)**

Material examined. **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (5 males, OPC). **Slovenia**, Julian Alps, N. Vrsic Pass, Pišnica trib., nice spring, 1390 m, 46.4399N, 13.7538E, 27.IX.2021, leg. G. Vinçon (5 males, 3 females; OPC). Slovenia, Julian Alps, S. Vrsic Pass, Minarica trib., brook, 1190 m, 46.4093N, 13.7505E, 27.IX.2021, leg. G. Vinçon (3 males, 2 females; OPC). Slovenia, Julian Alps, S. Vrsic Pass, Minarica trib., brook, 1030 m, 46.4068N, 13.7491E, 27.IX.2021, leg. G. Vinçon (2 males, 9 females; OPC).

***Rhyacophila tristis* Pictet, 1834**

Material examined. **France**, Alpes-Maritimes, Artuby River at «Relais de l'Artuby», 1020 m, 43.774N, 6.646E 15.V.2021, leg. G. Vinçon (5 males, 4 females; OPC). France, Alpes-Maritimes, bridge on the Loup River, below Cipières, 600 m, 43.789N, 6.949E, 15.V.2021, leg. G. Vinçon (4 males, 2 females; OPC). France, Hautes-Alpes, Queyras Massif, Aiguilles, torrent below 'Grand Laus lake', 2560 m, 44.82N, 6.872E, 15.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Isère, Vercors Massif, Bruyant River near its spring, 1000–1030 m, 45.147N, 5.617E, 1.VIII.2021, leg. G. Vinçon (1 male, 2 females; OPC). France, Hautes-Alpes, Queyras Massif, Aiguilles, brook and spring above 'Grand Laus lake', 2620 m, 44.8248N, 6.8697E 15.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-de-Haute-Provence, Jabron River at La Batie, 960 m, 43.81N, 6.6E, 15.V.2021, leg. G. Vinçon (17 males, 14 females; OPC). **Italy**, Dolomiti, S.E. Moso, near Biotop Patzenfeld-Moschermoos, spring and brook, 1530 m, 46.66875N, 12.3931E, 26.IX.2021, leg. G. Vinçon (1 male, OPC).

***Rhyacophila vandeli* Despax, 1933**

Material examined. **France**, Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, 2 brooks and 1 spring, 1630 m, 42.4348N, 2.394E, 21.XI.2021, leg. G. Vinçon (1 male, 4 females; OPC).

***Rhyacophila vulgaris* Pictet, 1834**

Material examined. **France**, Drôme, Vercors Massif, Adouin river, near its spring, Vernaison and Bourne tributary, Tourtre, Saint-Martin-en-Vercors (26420), 45°0.120928' N, 5°27.550379' E, 793m, 30.IV.2021, leg. G. Vinçon (1 male, 1 female; OPC). **France**, Isère, Grande-Chartreuse, Road to the 'Col de Porte', 1220 m, Ruisset brook up to its spring, 45.2757N, 5.77E, 14.VIII.2021, leg. G. Vinçon (1 male, OPC). **France**, Isère, Belledonne, St Murry-Monteymont, brook trib. of Vorz River, above Blanc Lake, 2180-2200 m, 45.18N, 5.9754E, 29.VIII.2021, leg. G. Vinçon (1 male, OPC). **France**, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (8 males, 2 females; OPC). **France**, Alpes-Maritimes, N. Valdeblore, Vallon des Millefontes, spring and brook, 2120 m, 44.106N, 7.187E, 19.IX.2021, leg. G. Vinçon (4 males, OPC). **France**, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66E, 30.X.2021, leg. G. Vinçon (8 males, 3 females; OPC). **France**, Drôme, South Vercors Massif, Archiane, nice big resurgence, 770 m, 44.7461N, 5.5064E, 30.X.2021, leg. G. Vinçon (6 males, 4 females; OPC). **Italy**, Toscana, Passo del Cerreto, 'La Nuda' glacial Circus, 1480 – 1500 m, springs and brooks, 44.285N, 10.2286E, 11.VII.2021, leg. G. Vinçon (3 males, OPC). **Italy**, Dolomiti, S.E. Moso, near Biotop Patzenfeld-Moschermoos, spring and brook, 1530 m, 46.66875N, 12.3931E, 26.IX.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook and springs below the first Lussant Lake, 2690 m, 45.6527N, 7.406E, 23.IX.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Julian Alps, E. Sella Nevea, brook below water capture, 1050 m, 46.3967N, 13.4995E, 26.IX.2021, leg. G.

Vinçon (3 males, 2 females; OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m, 45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (4 males, 2 females; OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (2 males, OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (4 males, OPC).

Hydroptilidae Stephens, 1836

Ptilocolepinae Martynov, 1913

***Ptilocolepus granulatus* (Pictet, 1834)**

Material examined. **France**, Alpes-Maritimes, spring on the road to Courmes, 570 m, 43.753N, 7.005E, 2.IV.2021, leg. Gilles Vinçon (7 males, 6 females; OPC). **France**, Alpes-Maritimes, Above Gréolières des neiges, springs and brooks, 760–1100 m, 43.794N, 6.971E and 43.801N, 6.971, 2.IV.2021, leg. Gilles Vinçon (4 males, 5 females; OPC). **France**, Alpes-Maritimes, Cairos Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 4.IV.2021, leg. G. Vinçon (8 males, 9 females; OPC). **France**, Alpes-Maritimes, Bevera Valley, brook and lateral spring, 1450–1500 m, 43.981N, 7.425E, 4.IV.2021, leg. Gilles Vinçon (4 males, 5 females; OPC). **France**, Alpes-Maritimes, Cairos Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 4.IV.2021, leg. Gilles Vinçon (9 males, 5 females; OPC). **France**, Alpes-Maritimes, Cairos Valley, spring, 1020 m, 44.011N, 7.460E, 16.V.2021, leg. Gilles Vinçon (18 males, 6 females; OPC). **Italy**, Ligurian Apennines, Beigua, nice spring, 960 m, 44.4233N, 8.5337E, 17.V.2021, leg. Gilles Vinçon (3 males, OPC).

***Ptilocolepus extensus* McLachlan, 1884**

Material examined. **Spain**, Asturias, Puerto del Palo Allande, brook and spring, 950 m, 43.2778N, 6.6681W up to 1000 m, 43.2764N, 6.6725W, 16.XI.2021, leg. G. Vinçon (8 males, 2

females; OPC). Spain, Cantabria, Vega de Pas, brook and spring, 1100 m, 43.1165N, 3.7172W, 13.XI.2021, leg. G. Vinçon (7 males, 3 females; OPC). Spain, Cantabria, Peñarrubia, E Linares, resurgence, 420 m, 43.2554N, 4.5741W, 14.XI.2021, leg. G. Vinçon (5 males, 4 females; OPC). Spain, Cantabria, Puerto de la Palombera, brook and 2 cascades, 1010 m, 43.0857N, 4.2589W, 14.XI.2021, leg. G. Vinçon (3 males, 2 females; OPC).

Lepidostomatidae Ulmer, 1903

***Crunoecia irrorata* (Curtis, 1834)**

Material examined. **France**, Isère, Vercors Massif, Bruyant River near its spring, 1000-1030 m, 45.147N, 5.617E, 1.VIII.2021, leg. G. Vinçon (1 male, OPC). **France**, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (1 male, OPC). **France**, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66E, 18.IX.2021, leg. G. Vinçon (3 males, OPC). **Italy**, Calabria: Sila grande, spring, 1320 m, 39.32N, 16.385E, 22.V.2021, leg. G. Vinçon (2 males; OPC).

Brachicentridae Ulmer, 1903

***Micrasema vestitum* Navas, 1918**

Material examined. **Spain**, Aragon, Ordesa, Faja Racon, spring trib. of Barranco Cotatuero, 1900 m, 42.6588N, 0.04377W, 14.X.2021, leg. G. Vinçon (1 male, OPC).

Goeridae Ulmer, 1903

***Lithax niger* (Hagen, 1859)**

Material examined. **France**, Isère, Taillefer Massif near Prevourey lake, spring Guiliman tributary, 1630 m, 45.0328N, 5.8715E, 18.VII.2021, leg. G. Vinçon (4 males, 3 females; OPC). **Italy**, Piedmont, Pennines Alps, W. Gravelona, Val Strona, > Campello Monti, 1430 m, spring and brooklet, 45.933N, 8.23E, 29.V.2021, leg. G. Vinçon (14 males, 8 females; OPC). **Italy**, Cogne, Gran Paradiso Massif, above Gimillan, spring and

brook above Corona Lake, 2780m, 45.6512N, 7.4172E, 16.V.2021, leg. G. Vinçon (15 males, 4 females; OPC).

Apataniidae Wallengren, 1886

***Apatania eatoniana* McLachlan, 1880**

Material examined. **France**, Ardèche, between Fayolle Pass and 4 Vios Pass, Auzène trib., 1150 m, 44.7785N, 4.401E, 15.IV.2004, leg. G. Vinçon (11 males, 2 females; OPC). **France**, Gard, below Espérou in direction of Valleraugue, big torrent, 800 m, 3.577N, 44.087E, 16.IV.2004, leg. G. Vinçon (2 males, 1 female; OPC). **France**, Gard, S. Aigoual Massif, 5 km S. Minier Pass, Parc des Cévennes House, 1000 m, 44.025N, 3.57E, 16.IV.2004, leg. G. Vinçon (7 males, 3 females; OPC). **France**, Gard, Aigoual Massif, between Cabrillac and Perjuret Pass, Spring + brook, 1100 m, 44.18N, 3.525E, 16.IV.2004, leg. G. Vinçon (4 males, OPC).

***Apatania fimbriata* (Pictet, 1834)**

Material examined. **France**, Isère, Ferrand V., lateral spr., Grand Sablat tor., 2380 m, 45.1199N, 6.1498E, 22.VIII.2021, leg. G. Vinçon (8 males, 1 female; OPC). **France**, Isère, Taillefer Massif near Prevourey lake, spring Guiliman tributary, 1630 m, 45.0328N, 5.8715E, 18.VII.2021, leg. G. Vinçon (11 males, 3 females; OPC). **France**, Isère, Belledonne, St Mury-Monteymont, brook trib. of Vorz River, above Blanc Lake, 2180-2200 m, 45.18N, 5.9754E, 29.VIII.2021, leg. G. Vinçon (11 male, 8 females; OPC).

Limnephilidae Kolenati, 1848

Drusinae Banks, 1916

***Drusus annulatus* species group**

***Drusus annulatus* species complex**

***Drusus annulatus* Stephens, 1837**

Material examined. **France**, Saône-et-Loire, Morvan, Haut-Folin, brook, 800 m, 47.007N, 4.0315E, 14.VII.1994, leg. G. Vinçon (1 male,

OPC). France, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1140 m, 46.7758N, 6.449E, 25.VIII.2021, leg. G. Vinçon (3 males, 3 females; OPC). **Switzerland**, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1260 m, 46.7735N, 6.453E, 25.VIII.2021, leg. G. Vinçon (16 males, 2 females; OPC). Switzerland, Jura Massif, Soubey, Bief de la Côte au Bouvier, 560–600 m, 47.302N, 7.059E, 27.X.2021, leg. G. Vinçon (4 males, 1 female; OPC). Switzerland, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 27.X.2021, leg. G. Vinçon (5 males, 3 females; OPC).

***Drusus aprutiensis* Moretti, 1981**

Material examined. **Italy**, Abruzzi, Val Fondillo, Tornareccia spring, 1120 m, 41.771N, 13.857E, 20.V.2021, leg. G. Vinçon (28 males, 9 females; OPC). Italy, Abruzzi, Sorgenti del Vera, 650 m, 42.372N, 13.4585E, 26.V.21, leg. G. Vinçon (18 males, 2 females; OPC). Italy, Abruzzi, Prati di Tivo, Arno spring, nice spring with cascade, 1450 – 1500 m, 42.486N, 13.542E, 26.V.21, leg. G. Vinçon (24 males, 6 females; OPC). Italy, Abruzzi, Val Fondillo, Sorgente Tornareccia, wonderful spring, 1100 m, 41.7713N, 13.857E, 13.VI.2021, leg. G. Vinçon (14 males, 5 females; OPC).

***Drusus trifidus* species complex**

***Drusus oblos* Oláh & Vinçon, 2021**

Material examined. **Italy**, Latium, Abruzzi Massif, Prati di Mezzo, brook below the first water catchment and lateral springs, 1560 m, 41.6524N, 13.9373E, 21.V.2021, leg. G. Vinçon (5 males, 5 females; OPC). Italy, Latium, Abruzzi Massif, Prati di Mezzo, brook below the second water catchment, 1580 m, 41.6535N, 13.94E, 21.V.2021, leg. G. Vinçon (7 males, 4 females; OPC). Italy, Latium, Abruzzi Massif, Prati di Mezzo, brook below the first water catchment and lateral springs, 1560–1580 m, 41.6524N, 13.9373 E, 12.VI.2021, leg. G. Vinçon (males, 4 females; OPC).

***Drusus bosnicus* species group**

***Drusus graecus* species complex**

***Drusus lepidopterus* species siblings**

***Drusus apuanensis* Oláh, 2017**

Material examined. **Italy**, Toscana, below Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, 44.3175N, 10.238E, 18.V.2021, leg. G. Vinçon (2 males, OPC).

Remarks. This species was only known from 1 male and 1 female collected in a single locality of the Apuane Alps (Oláh 2017), not far from the Cerreto Pass. In the surroundings of the Cerreto Pass occur both *D. apuanensis* and its sibling species *D. cerreto* Oláh & Vinçon, 2021.

***Drusus dudor* Oláh, 2017**

Material examined. Holotype: **Italy**, Pennines Alps, Gressoney Valley, below Pillaz, 1230 m, brook and spring, 45.6468N, 7.8735E, 30.V.2021, leg. G. Vinçon (1 male, OPC).

***Drusus lepidopterus* (Rambur, 1842)**

Material examined. **France**, Alpes-Maritimes, Cairas Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 4.IV.2021, leg. G. Vinçon (1 male, OPC). Alpes-Maritimes, Cairas Valley, spring in grass land, 1550 m, 44.021N, 7.432E, 16.V.2021, leg. G. Vinçon (1 male, 1 female; OPC).

***Drusus liguriensis* Oláh, 2017**

Material examined: **Italy**, Ligurian Apennines, Beigua, 1060 m, brook and spring, 44.427N, 8.543E, 17.V.2021, leg. G. Vinçon (1 male, 1 female; OPC).

***Drusus piemontensis* Oláh, 2017**

Material examined. **France**, Hautes-Alpes, Queyras Massif, Aiguilles, spring near ‘Bergerie des Soldats’, 2000 m, 44.8N, 6.8667E, 15.VIII.

2021, leg. G. Vinçon (17 males, 13 females; OPC). France, Hautes-Alpes, Queyras Massif, Aiguilles, brook and spring above 'Grand Laus lake', 2620 m, 44.8248N, 6.8697E 15.VIII.2021, leg. G. Vinçon (2 males, 2 females; OPC).

***Drusus improvisus* species complex**

***Drusus cianficconiae* Oláh, 2017**

Material examined. **Italy**, Abruzzi, Prati di Tivo, spring below a water captage, 1050 m, 42.5265N, 13.5648E, 26.V.21, leg. G. Vinçon (1 male, OPC). Italy, Latium, Abruzzi Massif, Prati di Mezzo, brook below the first water catchment and lateral springs, 1560–1580 m, 41.6524N, 13.9373E, 12.VI.2021, leg. G. Vinçon (4 males 3 females; OPC). Italy, Abruzzi, Val Fondillo, Sorgente Tornareccia, wonderful spring, 1100 m, 41.7713N, 13.857E, 13.VI.2021, leg. G. Vinçon (14 males 3 females; OPC).

***Drusus improvisus* (McLachlan, 1884**

Material examined. **Italy**, Toscana, Passo del Cerreto, 1420 – 1480 m, torrent, 44.288N, 10.227 E, 18.V.2021, leg. G. Vinçon (1 male, OPC). Italy, Toscana, Reggello, spring, slopy, with mosses and ferns, 920 m, 43.6906N, 11.582E, 19.V.2021, leg. G. Vinçon (4 males, OPC). Italy, Toscana, S.E. Abetone, 1270 m, spring and brook, 44.128N, 10.675E, 19.V.2021, leg. G. Vinçon (28 males, 3 females; OPC). Italy, Toscana, Reggello, spring, slopy, with mosses and ferns, 800 m, 43.693N, 11.58E, 19.V.2021, leg. G. Vinçon (6 males, 1 female; OPC). Italy, Toscana, Pratomagno, brook and spring, 1400–1450 m, 43.652 N, 11.649E, 20.V.2021, leg. G. Vinçon (28 males, OPC). Italy, Toscana, S. Abetone, 1340 m, spring and brook, 44.127N, 10.665E, 19.V.2021, leg. G. Vinçon (3 males, OPC). Italy, Toscana, Pratomagno, brook and spring very steep, 1180 m, 43.613N, 11.688E, 20.V.2021, leg. G. Vinçon (14 males, 3 females; OPC). Italy, Toscana, Reggello, spring, slopy, with mosses and ferns, 920 m, 43.6906N, 11.582E, 11.VI.2021, leg. G. Vinçon (2 males, OPC). Italy, Toscana, Passo del Cerreto, 'La Nuda' glacial Circus, 1480 - 1500 m, springs

and brooks, 44.285N, 10.2286E, 11.07.2021, leg. G. Vinçon (2 males, OPC).

Remarks. The four specimens from Reggello, 920m represent probably a contact population. One specimen has slightly modified head of the paraproct.

***Drusus discolor* species group**

***Drusus chapmani* species complex**

(Map 3)

*Taxonomic history of the *Drusus chapmani* complex.* This complex in the *Drusus discolor* species group was established with two species: *Drusus chapmani* McLachlan, 1901 and *Drusus letras* Oláh, 2017 (Oláh *et al.* 2017). Today this small complex of species is comprised of three known incipient sibling species: *Drusus chapmani* McLachlan, 1901, *Drusus katagelastos* Vitecek, 2020 in Vitecek *et al.* 2020 and *Drusus alethes* sp. nov. described here. One species, *Drusus letras* Oláh, 2017 in Oláh *et al.* 2017 was delineated and described without a detailed re-examination of the holotype of *Drusus chapmani* McLachlan, 1901. Based upon the detailed re-examination of the holotypes of both *Drusus chapmani* McLachlan, 1901 and *Drusus letras* Oláh, 2017 as well as the examination of four males and two female specimens collected in two new habitats at Val Strona of Piedmont, it was demonstrated that the holotypes of *chapmani* and *letras* and the newly collected four specimens represent the same species: *Drusus chapmani* McLachlan, 1901 characterized by a rather stable lateral profile of the dorsal branch of the paraproct as well as by the fine structure of the paramere of corrugated, ridged or wrinkled surfaces on the terminal region.

The single specimen collected in Italy, Bergamo, Averara, Alpe Cul versante sud, 1990m, 23.V.2003, leg. Bertuetti, and presented as well as drawn as *Drusus chapmani* was a Misidentification (Oláh *et al.* 2017). It is a new species described here as *Drusus alethes* sp. nov.

***Drusus alethes* Oláh & Vinçon sp. nov.**

(Figures 9–10, Map 3)

Drusus chapmani McLachlan, 1901. Oláh *et al.* 2017: 134. "Material examined: Italy, Bergamo, Averara, Alpe Cul versante sud, 1990m, 23.V.2003, leg. Bertuetti (1 male, MCSNBG)" Misidentification.

Material examined. Holotype: Italy, Bergamo, Averara, Alpe Cul versante sud, 1990m, 23.V.2003, leg. Bertuetti (1 male, MCSNBG)

Diagnosis and description. The rather robust fused dorsal branches of paraproct has rounded stair-like apical margin in lateral view; the stairs are less pronounced, rounded, not angled like at *D. chapmani*; The shape divergence of the speciation trait is accompanied by differences in the lateral profiles of the periphallic organs of cerci and gonopods being less elongated at *D. alethes* sp. nov. However, these traits are mostly neutral and exposed to the stochastic processes of the gene flow and genetic drift. The paramere structure is also diverged at the two species; the highly elongated subapical spine is regular spine shaped

at *D. alethes*, without any corrugated, ridged or wrinkled surfaces on the terminal region

Etymology. In Ancient Greek *aletheia* is translated as unclosedness, unconcealedness, disclosure or truth. It was revived by Heidegger as things appear as entities in the world. It is more than truth. It is state of not being hidden. It is state of being evident. Opposite of *lethe*, which means concealment. *Aletheia* is a noun; its adjective is *alethes* (male or female): loving the truth, speaking the truth, truthful.

***Drusus chapmani* McLachlan, 1901**

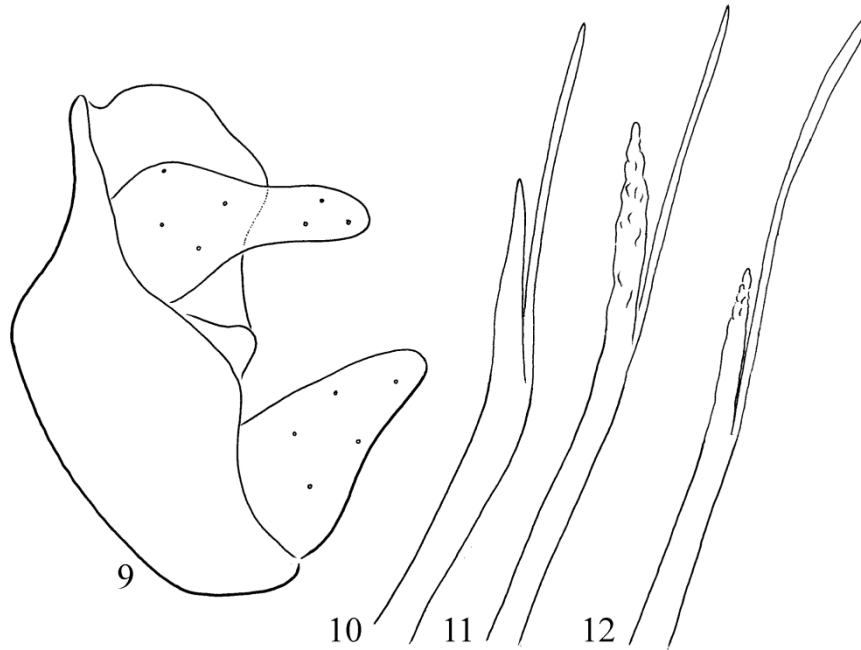
(Figures 11, 13–22, Map 3, Photo 4)

Drusus chapmani McLachlan, 1901:162–163. "Hab.: Switzerland (Locarno), April 6th, 1899, one ♂ (Dr. T. A. Chapman) in my collection."

Drusus chapmani McLachlan, 1901. Schmid 1956:28–29, "Je ne connais pas personnellement cette espèce; les dessins que je reproduis ci-dessous ont été aimablement effectués à mon intention par M. D. E. Kimmins." "Cette espèce n'est connue que par un ♂ capturé à Locarno (Suisse), le 6. IV. 1899 et déposé dans la collection de R. McLachlan."



Map 3. *Drusus chapmani* complex in the north-western Italian Alps (full circles represent the type localities).



Figures 9–12. *Drusus alethes* sp. nov. Holotype male: 9 = genitalia in left lateral view; 10 = apical part of left paramere in lateral view. 11 = *Drusus chapmani* McLachlan, 1901, apical part of left paramere in lateral view; 12 = *Drusus katagelastos* Vitecek, 2020, apical part of left paramere in lateral view.

Drusus chapmani McLachlan, 1901. Malicky 2005: 257, “Ich vermute, dass *chapmani* und *muelleri* die selbe Art sind. Der dorsale Dörnchenfleck des 8. Tergits variiert etwas, und die beiden Arten haben das gleiche endemische Verbreitungsgebiet in den Südalpen.”

Drusus chapmani McLachlan, 1901. Oláh *et al.* 2017, based on additional diagnosis its species status was reinstated.

Drusus letras Oláh, 2017 in Oláh *et al.* 2017:134–135. This species was described from a single specimen; “Holotype: Italy, Piemonte, Province Biella, 1000m, Ruscelli tributary Torr, Viona, 20.IV.1979, leg Ravizza (1 male, CC n°121).” It is deposited now in the Museo Civico di Scienze Naturali “E. Caffi”, Bergamo, Italy (MCSNBG). **Syn. nov.**

Material examined. Holotype: deposited in The Natural History Museum, London, England: McLachlan 1901:162–163: “Hab.: Switzerland (Locarno), April 6th, 1899, one ♂ (Dr. T. A. Chapman) in my collection.”

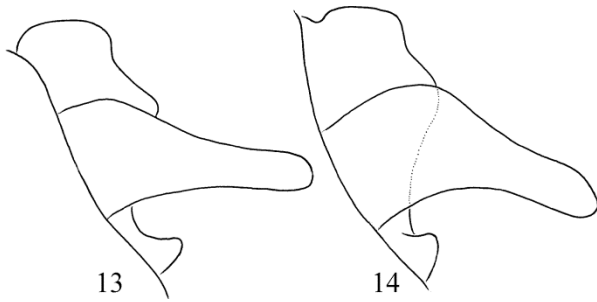
New collections: **Italy**, Piemont, Pennines Alps, W. Gravelona, Val Strona, > Campello Monti, 1700 m, spring and brooklet, 45.927N, 8.225E, 29.V.2021, leg. G. Vinçon (2 males, 1

female; OPC). Italy, Piemont, Pennines Alps, W. Gravelona, Val Strona, > Campello Monti, 1900 m, spring and brooklet, 45.926N, 8.2195E, 29.V.2021, leg. G. Vinçon (2 males, 1 female; OPC).

Original diagnosis. McLachlan 1901:162. “Belongs to the group of black species represented by *D. muelleri* McLachlan, *D. nigrescens* Meyer-Dür, and *D. melanchaetes* McLachlan; most allied to *D. muelleri*.” “It would be useless to draw a comparison with other black species (*nigrescens* and *melanchaetes*), because these differ widely in their anal structure, whereas with *muelleri* there is apparently real affinity and at the same time quite sufficient specific differences. Among other species there is slight analogy with *D. alpinus*.”

Diagnosis by Schmid 1956:28–29. “*Dr. chapmani* est très voisin de *transylvanicus* et de *romanicus*, il s’en distingue surtout par la grandeur de l’aire spinulifère du VIII^e segment et par la forme des appendices intermédiaires.”

Malicky 2005:257. *Drusus chapmani* is a synonym of *D. muelleri*.

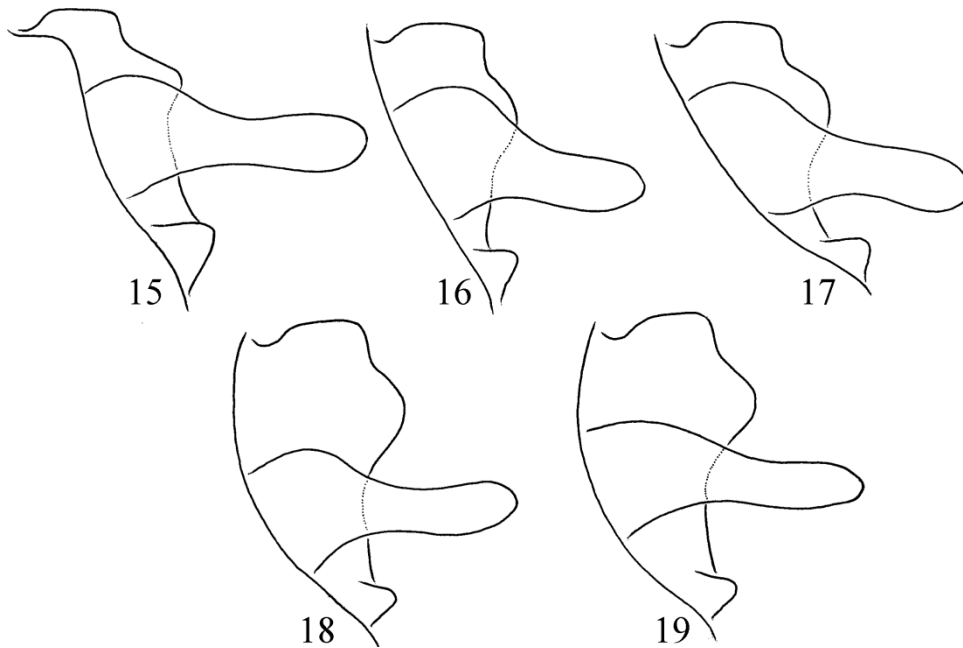


Figures 13–14. *Drusus chapmani* McLachlan, 1901. Holotype male: 13 = paraproct and cercus in left lateral view as redrawn from Schmid’s original drawing; 14 = paraproct and cercus in left lateral view as redrawn from the permanent prepate of the holotype.

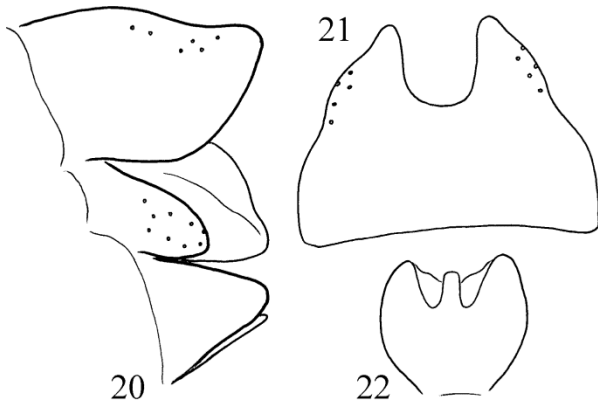
Taxonomic relation. According to the ancestral divergences of the paramere pattern *Drusus chapmani* represents a separate species complex with three known species, clearly differing from the *Drusus muelleri* species complex that is comprised of four known species. The members of *D. chapmani* species complex have very elongated and enlarged subapical spine on the paramere. The same structure is very short, reduced at

all members of the *D. muelleri* species complex. Already McLachlan (1901) has emphasized its real affinity to *D. muelleri*, but at the same time he has mentioned also quite sufficient differences between the two species. Malicky (2005) was unable to recognise any real differences between the two species, but he has not examined and not compared the two holotypes and particularly not examined the fine structure of their parameres. Based on the ancestral divergence of the paramere pattern *D. chapmani* cannot be a synonym of *D. muelleri*. Therefore, its species status was reinstated (Oláh *et al.* 2017).

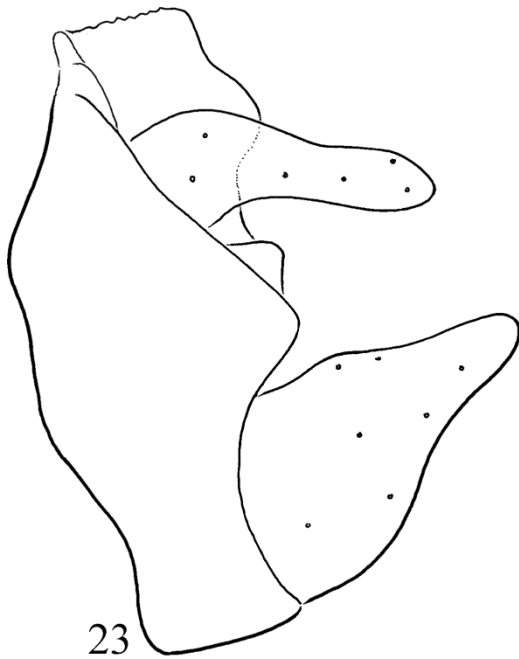
New diagnosis. The robust fused dorsal branches of paraproct has stair-like apical margin in lateral view; the stairs are pronounced, angled, similarly to *Drusus katagelastos* Vitecek, 2020 and not rounded like at *D. aethes* sp. nov. The shape divergence of the speciation trait is accompanied by differences in the lateral profiles of the periphallic organs of cerci and gonopods being more elongated at *D. chapmani*.



Figures 15–19. *Drusus chapmani* McLachlan, 1901. Newly collected specimens, male: 15–19 = paraproct and cercus in left lateral view, one specimen drawn twice to indicate the variability of drawing with possible slight modification of drawing angles.



Figures 20–22. *Drusus chapmani* McLachlan, 1901. Female. 20 = genitalia in lateral view; 21 = anal tube in dorsal view; 22 = vulvar scale (lower vaginal lip) in ventral view.



Figures 23. *Drusus katagelastos* Vitecek, 2020. Newly collected male: 23 = genitalia in lateral view.

However, these traits are mostly neutral and exposed to the stochastic processes of the gene flow and genetic drift. The paramere structure is also diverged at the three species; the highly elongated subapical spine is regular spine shaped at *D. alethes*, without any corrugated, ridged or wrinkled surfaces. *Drusus chapmani* has corrugated, ridged or wrinkled surfaces along the entire length

of the subapical elongated spine. *Drusus katagelastos* has corrugated, ridged or wrinkled surfaces at the terminal region of the subapical elongated spine.

Description of female. Tergite of segment IX and X with deep and wide U-shaped apicomeral excision; both in the dorsal and lateral views the lateral lobes bluntly rounded; the lateral setose lobe of sternite IX elongated triangular, heavily setose apically. Supragenital plate of segment X (upper vaginal lip) much developed and subquadrangular both in dorsal and ventral views. Median lobe of the vulvar scale (lower vaginal lip) present, shorter than the lateral lobes.

Drusus katagelastos Vitecek, 2020

(Figures 12, 23, Map 3)

Drusus katagelastos Vitecek, 2020 in Vitecek *et al.* 2020: 3. "Material examined. Holotype. 1 male: Italy, Piemonte, Fondo; 16.IV.2016; leg. Monika Hess, Ulrich Heckes; specimen identifier: Dem 0101M." „This holotype will be subsequently transferred to the Insecta Varia collection of the Natural History Museum of Vienna (NHMV Holotype Number NOaS-4/2020)."

Material examined. **Italy**, Lombardia, E. Vantone, spring and brooklet, 770 m, 45.7483N, 10.5287E, 28.V.2021, leg. G. Vinçon (1 male, OPC).

Remarks. The Old Greek name of the newly described species *Drusus katagelastos* has the meaning ridiculous, absurd referring to the odd, ridiculous, absurd situation having three beautiful, elegant caddisfly species, each represented only by a single specimen. Our new *Drusus katagelastos* specimen collected far from the locus typicus of the holotype plus the six new specimens of *Drusus chapmani* collected in two populations may give some more chance to understand the nature of organisation and distribution of this small species complex. However, it is really a ridiculous or absurd state of our present taxonomy that we are unable to carry out real and valid population level sampling in the most

beautiful heart of the Western Civilization covered by such rich countries as France, Italy, Switzerland, Germany and Austria.

***Drusus chrysotus* species complex**

***Drusus chrysotus* (Rambur, 1842)**

Material examined. France, Isère, Taillefer Massif, below Brouffier Lake, spring Guiliman tributary, 1850 m, 45.033N, 5.877E, 18.VII.2021, leg. G. Vinçon (1 male, OPC).

Remarks. This large-sized species with bright golden forewing was described from France, Department Haute-Savoie, Chamonix-Mont-Blanc, Barberine. Later, single specimens were recorded from Austria, Czech Republic, France, Germany, Italy, Slovenia, Switzerland and recently from Croatia (Previšić 2012). This nice, elegant species has typically an alpine distribution centre extending to adjacent mountain ranges in Croatia, Czech Republic, France and Germany.

Our comparative study, including historical pinned specimens from several museums has distinguished two separate distinct species hidden under the name of *Drusus chrysotus* (Oláh *et al.* 2017). *Drusus chrysotus* (Rambur, 1842) the western sibling species and *Drusus lapos* Oláh, 2017 in Oláh *et al.* 2017 the eastern sibling species! All the examined specimens from France, Western Switzerland, and Western Italy represent *Drusus chrysotus* and all the specimens from Eastern Switzerland, Eastern Italy, Austria and Czech Republic represent *Drusus lapos*.

The two distinct incipient sibling species are easily distinguished by the fine phenomics of their speciation traits, paraplect and paramere. In the lateral profile the dorsum of the fused dorsal branches of paraplect is sloping anterad at *D. chrysotus* and flat horizontal at *D. lapos*. Sub-apical spine on the paramere subdivided into two spines at *D. chrysotus* and impact, not divided, only a sole spine at *D. lapos*. The newly collected specimen from the Taillefer Massif, below Brouffier Lake, like any other examined specimens

from all the distributional area, has the character state combination of the typical *Drusus chrysotus*: anterad sloping paraplect as well as paramere with doubled, bifid subapical spines.

Due to traditional and strong devotion to gross morphology and neglecting the achievements of fine phenomics, as well as camouflaging with molecular DNA genetics, the lumpers' attitude lacking interest to recognise fine optical facts, makes progress in taxonomy hindering. They are simply unable to recover the fine structure of local genetic resources. Moreover, they are producing unjustified apophantic taxonomic acts without examining types or any other comparative materials. According to a recent publication (Vitecek *et al.* 2020) *Drusus lapos* Oláh, 2017 "is morphologically nearly indistinguishable from *D. chrysotus*. Its status as a distinct species is questionable." This statement was simply without testing the outstanding and clear morphological divergences between populations of the western and eastern species.

***Drusus discolor* species complex**

***Drusus discolor* (Rambur, 1842)**

Material examined. France, Isère, Ferrand V., lateral spr., Bruant tor., 2210 m, 45.1162N, 6.1618E, 22.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (1 male, 1 female; OPC).

***Drusus ferdes* Oláh & Coppa, 2016**

Material examined. France, Drôme, Vercors, Tourtre, Adouin, 760 m, 45.0035N, 5.4563E, 14.VII.2021, leg. G. Vinçon (3 males, OPC). France, Drôme, Dévoluy massif, Jarjatte, spring below the 'cabane du Fleyrard', crossing the path, 1510 m, 44.6955N, 5.803E, 14.VII.2021, leg. G. Vinçon (1 male, OPC). France, Hautes-Alpes, Queyras Massif, Vars, Crachet brook and spring, Ubaye trib., 2340 m, 44.5178N, 6.688E, 15.VIII.

2021, leg. G. Vinçon (3 males, 11 female; OPC). France, Hautes-Alpes, Queyras Massif, Aiguilles, brook and spring above 'Grand Laus lake', 2620 m, 44.8248N, 6.8697E 15.VIII.2021, leg. G. Vinçon (5 males, 2 females; OPC). France, Drôme, Vercors Massif, Adouin resurgence, Tourtre, 770–790 m, 45.002N, 5.459E, 1.VIII.2021, leg. G. Vinçon (1 male, 1 female; OPC). France, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, N. Valdeblore, Vallon des Millefontes, spring and brook, 2120 m, 44.106N, 7.187E, 19.IX.2021, leg. G. Vinçon (2 males, OPC).

***Drusus leker* Oláh, 2016**

Material examined. **France**, Alpes-Maritimes, N. Saint-Etienne-de-Tinée, above Refuge de Vens, Terre Rousse brook, 2410 m, 44.317N, 6.944E, 8.VIII.2021, leg. G. Vinçon (3 males, 14 females; OPC). France, Alpes-de-Haute-Provence, Bonnette Pass, north slope, nice spring and brook, 2570 m, 44.3434N, 6.7998E, 7.VIII.2021, leg. G. Vinçon (3 males, 2 females; OPC). France, Alpes-de-Haute-Provence, Bonnette Pass, north slope, nice springs and brooks, 2420 – 2450 m, 44.3359N, 6.7848E and 44.3353N, 6.7785E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Toscana, Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, very steep, 44.3175N, 10.238E, 11.VII.2021, leg. G. Vinçon (1 male, OPC). Italy, Toscana, Passo del Cerreto, 'La Nuda' glacial Circus, 1420 – 1480 m, torrent, 44.288N, 10.227E, 11.VII.2021, leg. G. Vinçon (1 male, OPC).

***Drusus muelleri* species complex**

***Drusus horgos* Oláh, 2017**

(Map 4)

Material examined. **Italy**, Piemont, Pennines Alps, W. Gravellona, Val Strona, > Campello Monti, 1900 m, spring and brooklet, 45.926N, 8.2195E, 29.V.2021, leg. G. Vinçon (1 male, OPC).

Remarks. This species was only known from a few specimens collected in the Valbondione Valley (Lombardian Prealps, near Bergamo). Our new location is rather far from this place, widely extending its distribution area in the Italian Alps.

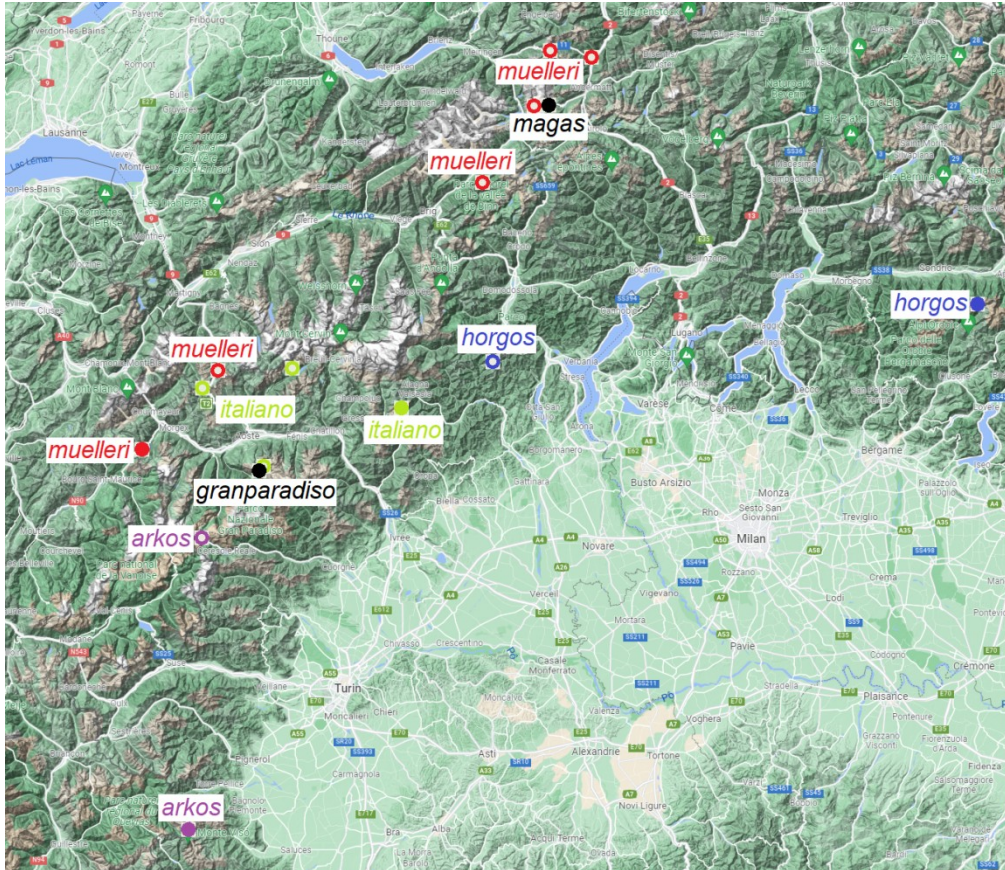
***Drusus italiano* Oláh & Vinçon sp. nov.**

(Figures 24–25, Map 4, Photos 5–6)

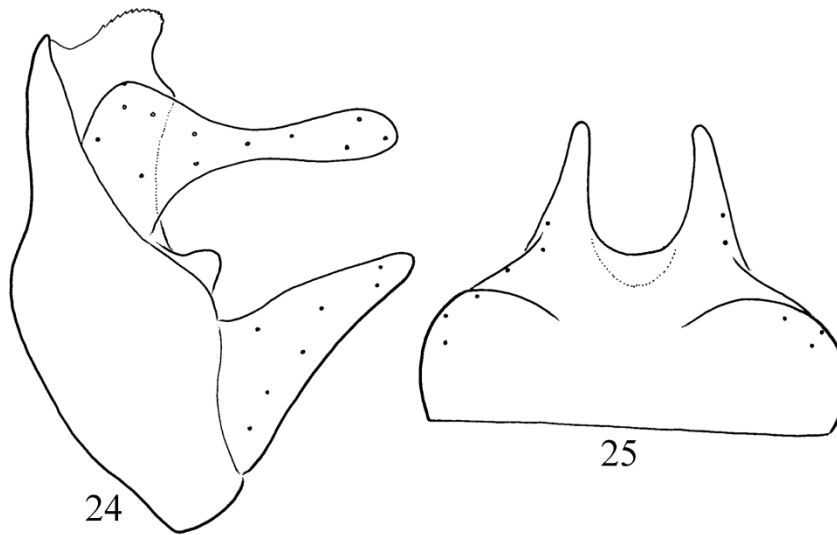
Drusus magas Oláh, 2017, in Oláh *et al.* 2017:147. "Material examined: Paratypes: Italy, Valle d'Aosta, Valpelline (AO), 1850 m, Torrente affl. Dora di Valpelline, 8.VIII.1969, leg. Ravizza (1 male, MCSNBG; 1 male, CM; 1 male, OPC)." Misidentification.

Drusus magas Oláh, 2017, in Oláh *et al.* 2021:42–43. "Italy, Piemonte, Grand St Bernard, springs, 2450m, 45.872N, 7.158E and 2560m, 45.873N, 7.179E, 6.VII.2020, leg. Gilles Vinçon (1 male, OPC). Italy, Piemonte, Grand St Bernard, torrent, 45.86N, 7.134E, 2370m, 6.VII.2020, leg. Gilles Vinçon (5 males, 1 female; OPC). Italy, Piemonte, > Cogne, Gran Paradiso Massif, Gimillan, spring, 45.649N, 7.415E, 2740m, 5.VII.2020, leg. Gilles Vinçon (6 males, OPC). Italy, Piemonte, Grand St Bernard, torrent, 45.859N, 7.145E, 2230m, 6.VII.2020, leg. Gilles Vinçon (1 male, 2 females; OPC)." Misidentification.

Material examined. Holotype: **Italy**, Piemont, Pennines Alps, high Sesia Valley, above Sant'Antonio, spring below Lago Nero, 45.814N, 7.88E, 2630 m, 12.VII.2021, leg. G. Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (12 males, 1 female; OPC). Italy, Piemont, Pennines Alps, high Sesia Valley, above Sant'Antonio, between Lago Bianco and Lago Nero, dripping cliffs and springs, 2480 m, 45.81N, 7.875E, 12.VII.2021, leg. G. Vinçon (1 male, OPC). Italy, Valle d'Aosta, Valpelline (AO), 1850 m, Torrente affl. Dora di Valpelline, 8.VIII.1969, leg. Ravizza (1 male, MCSNBG; 1 male, CM; 1 male, OPC). Italy, Piemonte, Grand St Bernard, springs, 2450 m, 45.872N, 7.158E and 2560m, 45.873N, 7.179 E, 6.VII.2020, leg. Gilles Vinçon (1 male, OPC). Italy, Piemonte, Grand St Bernard, torrent, 45.86 N, 7.134E, 2370m, 6.VII.2020, leg. Gilles Vinçon (5 males, 1 female; OPC). Italy, Piemonte, >



Map 4. *Drusus muelleri* complex in the western Italian Alps and Swiss Alps (full circles represent the type localities).



Figures 24–25. *Drusus italiano* sp. nov. Holotype male: 24 = genitalia in left lateral view; Allotype: 25 = anal tube in dorsal view.

Cogne, Gran Paradiso Massif, Gimillan, spring, 45.649N, 7.415E, 2740m, 5.VII.2020, leg. G. Vinçon (6 males, OPC). Italy, Piemonte, Grand St Bernard, torrent, 45.859N, 7.145E, 2230m, 6.VII.2020, leg. Gilles Vinçon (1 male, 2 females; OPC).

Diagnosis. This new species is close to *D. magas* Oláh, 2017. Several populations collected from Italian Alps have been misidentified as *Drusus magas* Oláh, 2017 (Oláh *et al.* 2017, Oláh *et al.* 2021). New collection of a large population sample from below Lake Nero offers a study with fine phenomics on the variability of the paraprot, the speciation trait of this species complex. Similarly to the species complex, this new species has the fused dorsal branches of paraprot rather robust with variously undulating vertical apical margin in lateral view. The dorsum of the fused dorsal branches of the paraprot is directed obliquely upward, not straight and not with deep basal ditch like at *D. arkos*; not with posterad turning or directed tip like at *D. horgos*; not with upward directed head and straight vertical apical margin like at *D. magas*; not with rounded head and without pronounced vertical undulation like at *D. muelleri* and not with rounded head like at *D. granparadiso*. The most stable diverged speciation trait character of *D. italiano* sp. nov. is the small triangular elevation in lateral view subapical on the vertical margin of the paraprot present in each examined Italian populations and lacking on the holotype of *Drusus magas* and on the Swiss specimen drawn by Schmid (1956). It seems that all the known Italian specimens belong to the new species *D. italiano* and *D. magas* Oláh, 2017 is represented only by Swiss specimens, by the holotype and by the drawings of Schmid (1956) from Swiss specimen under the name *D. muelleri*.

Description. Dark coloured species like all the other members of the species complex. The speciation trait of the paraprot dorsal branches that is the lateral profile of the obliquely upward directed dorsoapical tip and the subapical small,

triangular elevation on the apical margin in lateral view is very stable in all of the sampled populations. Cerci are long, with very thin shaft with strong middle constriction and extremely broad basement. This unique shape of the cerci distinguishes *Drusus italiano* sp. nov. from *D. magas* Oláh, 2017. Gonopods with slender, narrowing apical portion and a small basomesal lobe visible in ventral view. The subapical spine on the paramere is small without small tertiary spines.

Female genitalia. Tergite of segment IX and X with deep U-shaped apicomeresal excision in dorsal view; both in the dorsal and lateral views the lateral lobes narrowing; the lateral setose lobe of sternite IX rounded elongated triangular, heavily setose. Supragenital plate of segment X (upper vaginal lip) much developed and subquadrangular both in lateral and ventral views with small lateral lobes visible in ventroapical view. Median lobe of the vulvar scale (lower vaginal lip) present and slightly shorter than the lateral lobes.

Etymology. Name coined from the region of the type locality as a noun in apposition.

***Drusus siveci* species complex**

(Map 5)

The *Drusus siveci* species complex having the dorsoapical fused dorsal branches of paraprot produced into an elongated digitiform slender process in lateral view, was described recently in the *Drusus discolor* species group (Oláh *et al.* 2017) with the nominate known species and with four new sibling species: *Drusus siveci* Malicky, 1981, Montenegro; *D. fabbrii* Oláh, 2017, Italy, Emilia Romagna; *D. fortos*, Oláh & Ibrahim, 2017, Kosovo; *D. puskasi* Oláh & Ibrahim, 2017, Bosnia & Herzegovina; *D. vekon* Oláh & Ibrahim, 2017, Kosovo. Surprisingly in France (Vercors) we have collected specimens of *Drusus spelaeus* with paramere structure similar to *Drusus siveci* species complex; therefore we present a distributional map of this complex in order to visualize their distribution making comparable to the *Drusus spelaeus* siblings (see below).



Map 5. *Drusus siveci* complex in southern Europe (full circles represent the type localities).

***Drusus monticola* species group**
***Drusus destitutus* species complex**
***Drusus kronion* Malicky, 2002**

Material examined. **France**, Isère, Vercors Massif, above Engins, Bruyant brook and spring, Furon trib., 1050 m, 45.1471°N 5.6160°E, 16.IV.2021, leg. G. Vinçon (3 males, OPC).

***Drusus melanchaetes* McLachlan, 1876**

Material examined. **Italy**, Lombardia, Passo di Gavia S. slope, above Lago Nero, nice brook, 2480m, 46.3386N, 10.4784E, 15.VI.2021, leg. G. Vinçon (4 males, 1 female, OPC). Italy, Lombardia, Passo di Gavia S. slope, Rio di Gaviola, brook, 2420m, 46.337N, 10.4875E, 15.VI.2021, leg. G. Vinçon (1 male, OPC).

***Drusus mixtus* species group**

This species group in the *Drusus* genus was established by the ancestral integration of parameres having subapical spine bunch with at least one large primary spine upward arching and the apical shaft is stout and abbreviated. This was the speciation trait in ancestral sexual integration and still retaining its sensitivity by responding in contemporary speciation processes sometimes with significant standing variations (Oláh *et al.* 2017).

***Drusus flavipennis* species complex**
***Drusus apados* Oláh & Coppa, 2017**
 (Map 6)

Material examined. **France**, Drôme, Dévoluy massif, Jarjatte, Fontaine des Mougious, very nice spring, 1470 m, 44.6863N, 5.7964E, 18.IX.2021, leg. G. Vinçon (21 males, 11 females; OPC).

***Drusus flavipennis* (Pictet, 1834)**

(Map 6)

Material examined. **France**, Drôme, Dévoluy massif, Jarjatte, outlet of Lauzon lake, spring, 1920 m, 44.7017N, 5.8065E, 14.VII.2021, leg. G. Vinçon (1 male, OPC). France, Isère, Ferrand V., lateral spr., Grand Sablat tor., 2380 m, 45.1199N, 6.1498E, 22.VIII.2021, leg. G. Vinçon (1 male, OPC). France, Hautes-Alpes, Queyras Massif, Vars, Crachet brook and spring, 2510 m, Ubaye trib., 44.5136N, 6.6829E, 15.VIII.2021, leg. G. Vinçon (2 males, 4 females; OPC). France, Alpes-Maritimes, N. Saint-Etienne-de-Tinée, above Refuge de Vens, Terre Rousse brook, 2440–2450 m, 44.314N, 6.948E, 8.VIII.2021, leg. G. Vinçon (2 males, OPC). France, Hautes Alpes, Orcières-Merlette, brook and spring, from 2330 m, 44.723 N, 6.329E, to 2450 m, 44.7269N, 6.3293E, 11.IX.2021, leg. G. Vinçon (1 male, 14 females; OPC).



Map 6. *Drusus flavipennis* species complex in the French and Italian Alps (full circles represent the type localities).

***Drusus malickyi* (Sipahiler, 1992)**

(Map 6)

Material examined. **France**, Isère, Lalley le Jocou, spring Rif Bruyant tributary, 1440 m, 44.729N, 5.66E, 14.V.21, leg. G. Vinçon (3 males, OPC). France, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66E, 14.VII.2021, leg. G. Vinçon (1 male, OPC). France, Drôme, Dévoluy massif, Jarjatte, Fontaine des Mougious, very nice spring, 1470 m, 44.6863N, 5.7964E, 14.VII.2021, leg. G. Vinçon (9 males, 14 females; OPC). France, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66E, 18.IX.2021, leg. G. Vinçon (15 males, 8 females; OPC). France, Isère, Alpe du Jocou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66 E, 30.X.2021, leg. G. Vinçon (2 males, 2 females; OPC). France, Drôme, South Vercors Massif, Archiane, nice big resurgence, 770 m, 44.7461N, 5.5064E, 30.X.2021, leg. G. Vinçon (1 male, 4 females; OPC).

***Drusus rhaeticus* (Schmid, 1956)**

(Map 6)

Material examined. **Italy**, Carniche Pre-Alps, Dolomiti Friuli, S. Preone, Casali Chiampon, nice spring and brook, 760 m, 46.3416N, 12.8827E, 26.IX.2021, leg. G. Vinçon (1 male, OPC). Italy, Carniche Pre-Alps, Dolomiti Friuli, S. Preone, Casali Chiampon, spring and brook below water capture, 780 m, 46.3445N, 12.8785E, 26.IX.2021, leg. G. Vinçon (1 male, 6 females; OPC). Italy, Julian Alps, W. Sella Nevea, brook, 1040 m, 46.3897N, 13.4693, E 26.IX.2021, leg. G. Vinçon (1 male, 2 females; OPC).

***Drusus mixtus* species complex**

***Drusus mixtus* (Pictet, 1834)**

Material examined. **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, springs near the bridge, 1900 m, 45.625N, 7.376E, 23.IX.2021, leg. G. Vinçon (5 males, OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m,

45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (7 females; OPC). **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 14.IX.2021, leg. G. Vinçon (2 females; OPC). Jura Massif, Soubey, Bief de la Côte au Bouvier, 560 – 600 m, 47.302N, 7.059E, 27.X.2021, leg. G. Vinçon (2 males, 3 females; OPC). Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 27.10X.2021, leg. G. Vinçon (1 male, 5 females; OPC).

***Drusus spelaeus* species complex**

There is a separate species complex in the *Drusus mixtus* species group with three species: the *Drusus spelaeus* siblings (*D. spelaeus*, *D. valserinensis*) as well as the *Drusus buscatensis* species of a rather incongruent relation. The basic species group character, the subapical spine bunch with primary upward arching spine is less pronounced in this complex. Based on paraproct structure the siblings of *Drusus spelaeus* have close relation to the *Drusus siveci* species complex in the *Drusus discolor* species group. *Drusus buscatensis* has a more plesiomorphic paramere of the *Drusus annulatus* species group as well as the *Drusus spelaeus* siblings have subapical spine bunch without definite upward arching primary spine. Therefore their placement into the *Drusus mixtus* species group was incongruent (Oláh et al. 2017). The present discovery of a unique population of *Drusus spelaeus* in the Vercors Mountain of Drôme Department with paramere structure of a single more produced spine of modified seta typical for the paramere in the *Drusus discolor* species group confirms the chimeric state of this species complex.

***Drusus spelaeus* (Ulmer, 1920)**

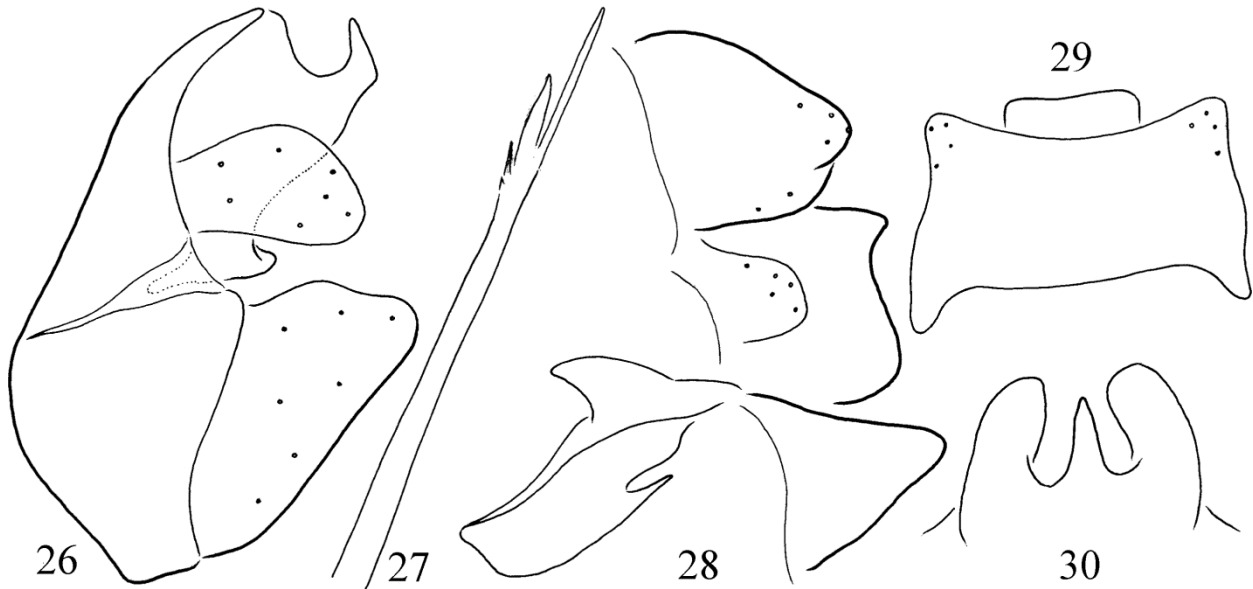
(Figures 26–30)

Material examined. **France**, Isère, Grande-Chartreuse, above Sarcenas, 1190 m, Fontfroide brook up to its spring, 45.28N, 5.7638E, 14.VIII.2021, leg. G. Vinçon (3 males, OPC). **France**, Isère, Grande-Chartreuse, Road to the ‘Col de Porte’, 1220 m, Ruisset brook up to its spring,

45.2757N, 5.77E, 14.VIII.2021, leg. G. Vinçon (1 male, OPC). Isère, Vercors Massif, Bruyant River near its spring, 1000–1030 m, 45.147 N, 5.617E, 1.VIII.2021, leg. G. Vinçon (2 males, OPC). Drôme, Vercors Massif, Adouin resurgence, Tourtre, 770–790 m, 45.002N, 5.459 E, 1.VIII.2021, leg. G. Vinçon (1 male, 1 female; OPC). Isère, Vercors Massif, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 29.X.2021, leg. G. Vinçon (1 male, 1 female; OPC). Isère, Vercors Massif, Bruyant torrent near its spring, 1000–1030 m, 45.147N, 5.617E, 29.X.2021, leg. G. Vinçon (1 male, 6 females; OPC). Drôme, Vercors, Tourtre, Adouin, 760 m, 45.0035N, 5.4563E, 29.X.2021, leg. G. Vinçon (6 males, 17 females; OPC).

Incongruent traits. The paraproct of *Drusus spelaeus* siblings is related to that of the *Drusus siveci* species complex in the *Drusus discolor* species group. The present discovery of a population of *Drusus spelaeus* with paramere structure similar to the parameres in the *Drusus discolor* species group indicates again the importance of chimeric processes in species integrative organisation. However, the sensitivity of parameres to contemporary speciation as indicated by the detected significant standing variations in the *Drusus spelaeus* siblings suggest a more comprehensive study on the taxonomic position of the Vercors population.

Revised female genitalia. Malicky has published two different drawings for the *Drusus spelaeus* female (Malicky 1983, 2004) and we have examined females from Isère and Drôme department with completely different genital structure. Here we redescribe the female of *Drusus spelaeus*. Tergite of fused segments IX and X subquadrangular in dorsal view with very shallow and wide apical excision; the lateral setose lobe of sternite IX rounded elongated, heavily setose. Supragenital plate of segment X (upper vaginal lip) much developed and subquadrangular both in lateral and ventral views with small dorsal lobes visible in lateral view. Median lobe of the vulvar scale (lower vaginal lip) present and slightly shorter than the lateral lobes and pointed apicad.



Figures 26–30. *Drusus spelaeus* (Ulmer, 1920). Male: 26 = genitalia in left lateral view; 27 = left paramere in lateral view; Female: 28 = genitalia in left lateral view; 29 = anal tube in dorsal view; 30 = vulvar scale (lower vaginal lip) in ventral view.

***Drusus alpinus* species group**

***Drusus alpinus* species complex**

***Drusus alpinus* Meyer-Dür, 1875**

Material examined. **Italy**, Piemont, Pennines Alps, W. Gravelona, Val Strona, > Campello Monti, 1430 m, spring and brooklet, 45.933N, 8.23E, 29.V.2021, leg. G. Vinçon (10 males, OPC). Italy, Pennines Alps, Gressoney Valley, below Pillaz, 1230 m, brook and spring, 45.6468 N, 7.8735E, 30.V.2021, leg. G. Vinçon (9 males, 7 females; OPC). Italy, Cogne, Gran Paradiso Massif, above Gimillan, spring near the bridge, 1900m, 45.625N, 7.375E, 16.V.2021, leg. G. Vinçon (6 males, 2 females; OPC). Italy, Piemont, Pennines Alps, high Sesia Valley, above Sant' Antonio, between Lago Bianco and Lago Nero, dripping cliffs and springs, 2480 m, 45.81N, 7.875E, 12.VII.2021, leg. G. Vinçon (14 males, 5 females; OPC).

***Drusus nebulicola* species complex**

***Drusus euphorion* (Malicky, 2002)**

Material examined. **France**, Alpes-Maritimes, Bevera Valley, nice spring and brooklet, 1700 m,

43.9856N, 7.4323E, 16.V.2021, leg. G. Vinçon (9 males, 1 female; OPC).

***Drusus nebulicola* (McLachlan, 1867)**

Material examined. **France**, Isère, Ferrand V., lateral spr., Bruant tor., 2210 m, 45.1162N, 6.1618E, 22.VIII.2021, leg. G. Vinçon (36 males, 19 females; OPC). France, Isère, Ferrand V., lateral spr., Grand Sablat tor., 2380 m, 45.1199N, 6.1498E, 22.VIII.2021, leg. G. Vinçon (2 males, OPC). France, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (7 males, 8 females, OPC).

***Ecclisopteryx asterix* Malicky, 1979**

Material examined. **Slovenia**, Julian Alps, N. Vrsic Pass, Pišnica trib., nice spring, 1390 m, 46.4399N, 13.7538E, 27.IX.2021, leg. G. Vinçon (1 male, 4 females; OPC). Slovenia, Julian Alps, S. Vrsic Pass, Minarica trib., brook, 1190 m, 46.4093N, 13.7505E, 27.IX.2021, leg. G. Vinçon (2 females, OPC). Slovenia, Julian Alps, S. Vrsic Pass, Minarica trib., spring, 1480 m, 46.4279N,

13.743E, 27.IX.2021, leg. G. Vinçon (1 male, OPC). Slovenia, near Italian border, Julian Pre-Alps, below Livek, spring and brook, 600 m, 46.2123N, 13.5939E, 28.IX.2021, leg. G. Vinçon (1 male, OPC).

***Ecclisopteryx kunkor* Oláh, 2017**

Material examined. **Italy**, Abruzzi, Val Fondillo, Sorgente Tornareccia, wonderful spring, 1100 m, 41.7713N, 13.857E, 13.VI.2021, leg. G. Vinçon (6 males, 2 females; OPC).

***Ecclisopteryx malickyi* Moretti, 1991**

Drusus camposilvano Oláh & Vinçon, 2021:45–46. “*Drusus camposilvano* sp. nov. has two remarkable incongruent character states of the gonopods, unique in the genus *Drusus*. (1) The gonopods are completely fused to segment IX without any discernible vestigial suture; this differentiates the new species from all the known species of the genus. (2) The completely fused gonopods has undergone an other architectural modification; its dorsoapical region has produced a secondary or additional lobe-like unite with serrated apex. Such an additional lobe of serrated head is a character state of the gonopods in the *Ecclisopteryx* genus. However, the *Ecclisopteryx* genus has lost the sclerotized paraprot entirely, present and well-developed in *Drusus camposilvano* sp. nov.” **Syn. nov.**

Material examined. **Italy**, Trentino Alto Adige, Venetian Pre-Alps, above Camposilvano, spring, 45.754N, 11.148E, 1010 m, 10.IX.2020, leg. G. Vinçon (1 male, 2 females; OPC). **Italy**, Trentino Alto Adige, Venetian Pre-Alps, above Camposilvano, spring and brook, 1000 – 1050 m, 45.754N, 11.149E, 27.V.2021, leg. G. Vinçon (2 males, OPC).

Remarks. The recovery of this rare species is a great luck! Our misidentification and the description of this chimeric species as a new species was not an accident. During the revision of the Drusinae subfamily we have no specimen of *Ecclisopteryx malickyi* to examine, a unique incongruent species with mixed character states of the *Drusus* and *Ecclisopteryx* genera (Oláh *et al.*

2017). The only known specimens, the male holotype and the female allotype are deposited in the Museum of Natural Sciences, Verona and were not available for study. The examination of the three males and two females collected recently in the Venetian Pre-Alps made it possible to reveal in more details its chimeric nature composed of *Drusus* paraprot and *Ecclisopteryx* gonopods and paramere.

Limnephilinae Kolenati, 1848

Limnephilini Kolenati, 1848

***Limnephilus ignavus* McLachlan, 1865**

Material examined. **France**, Hautes Alpes, Orcières-Merlette, brook and spring, 2250 m, 44.713 N, 6.334E, 11.IX.2021, leg. G. Vinçon (1 male, OPC).

***Limnephilus sparsus* Curtis, 1834**

Material examined. **France**, Hautes Alpes, Orcières-Merlette, brook and spring, 2250 m, 44.713 N, 6.334E, 11.IX.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Rhaetian Alps, Livigno, S. slope of Passo del Foscagno, brook and spring, 2180 m, 46.483N, 10.222E, 24.IX.2021, leg. G. Vinçon (1 male, OPC).

***Limnephilus vittatus* (Fabricius, 1798)**

Material examined. **France**, Alpes-Maritimes, N. Valdeblore, Vallon des Millefontes, brook, 2270 m, 44.114N, 7.1903E, 8.VIII.2021, leg. G. Vinçon (1 male, OPC). **Alpes-Maritimes**, Valdeblore, Vallon des Mille Fonts, torrent, 2110 m, 44.1065 N, 7.1853E, 24.X.2021, leg. G. Vinçon (1 male, OPC).

Chaetopterygini Hagen, 1858

***Annitella pyrenaica* (Navas, 1930)**

Material examined. **Andorra**, Inclès torrent above Baladosa bridge, 1840 m, 42.602N, 1.688E, 11.11.2021, leg. G. Vinçon (2 males, OPC). **France**, Pyrénées-Orientales, Canigou Massif,

Vernet-les-Bains, Cascade des Anglais, 1030 m, 42.539N, 2.4167E, 11.X.2021, leg. G. Vinçon (1 male, OPC). Haute-Garonne, Bagnère-de-Luchon, Port-de-Vénasque brook, Pique tributary, from 1550 m, 42.7118N, 0.649E to 1610 m, 42.7108N, 0.6485E, 19.11.2021, leg. G. Vinçon (14 males, 3 females; OPC). Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, 2 brooks and 1 spring, 1630 m, 42.4348N, 2.394E, 21.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC). Ariège, Vicdessos, above Soulcem Lake, Gardelle brook, 1820 m, 42.657N, 1.439E, 12.XI.2021, leg. G. Vinçon (1 male, 2 females; OPC). Pyrénées-Orientales, below Pas de la Case, rec del Baladrar torrent, 1900 m, 42.556N, 1.768E, 11.XI.2021, leg. G. Vinçon (9 males, 6 females; OPC). Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 1880 m, 42.6664N, 2.2276E, 20.XI.2021, leg. G. Vinçon (1 male, OPC). Pyrénées-Atlantiques, Arriou brook, from 1580 m, 42.839N, 0.3753W to 1800 m, on the snow, 42.842N, 0.363W, 17.XI.2021, leg. G. Vinçon (2 males, 2 females; OPC). Pyrénées-Orientales, below Pas de la Case, rec del Baladrar, lateral spring, 1960 m, 42.552N, 1.764E, 11.XI.2021, leg. G. Vinçon (6 males, 4 females; OPC). Pyrénées-Orientales, Puigmal Massif, «Rec de Vallosca», Ribera d'Err tributary, 1820 m, 42.421 N, 2.038E, 11.XI.2021, leg. G. Vinçon (2 males, 4 females; OPC). Ariège, Vicdessos, East Soulcem Lake, brook, 1600 m, 42.672N, 1.452E, 12.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC). France, Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 2040 m, 42.6608N, 2.2141E, 20.XI.2021, leg. G. Vinçon (22 males, 14 females; OPC). France, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, torrent, 1400 m, 42.7196N, 0.657E, 19.XI.2021, leg. G. Vinçon (21 males, 9 females; OPC). **Spain**, Catalogne, above Espot, between Estany del Bars and Estany della Muniydera, 2350 m, 42.6002N, 0.9808E, 12.X.2021, leg. G. Vinçon (3 males, 1 female; OPC). Huesca, Bielsa, Pineta Valley, brook and spring, 2250 m, 42.7026N, 0.1015E, 18.XI.2021, leg. G. Vinçon (3 males, 1 female; OPC). Huesca, Bielsa, Pineta Valley, brook, 1620 m, 42.6913N, 0.0897E, 18.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC).

Chaetopterygopsis maclachlani Stein, 1874

Material examined. **France**, Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 1880 m, 42.6664N, 2.2276E, 20.XI.2021, leg. G. Vinçon (2 males, 1 female; OPC). Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 2040 m, 42.6608N, 2.2141E, 20.XI.2021, leg. G. Vinçon (9 males, 5 females; OPC).

Chaetopteryx atlantica Malicky, 1975

Material examined. **Spain**, Asturias, Puerto de Leitariegos, brook and spring, 1550 m, 43.001N, 6.4185W, 15.XI.2021, leg. G. Vinçon (2 males, 2 females; OPC).

Chaetopteryx lusitanica Malicky, 1974

Material examined. **Spain**, Asturias, Puerto de Leitariegos, Brañas de Arriba, nice spring, 1400 m, 43.0128N, 6.4451W, 15.XI.2021, leg. G. Vinçon (13 males, 11 females; OPC). Léon, Aralla de Luna, brook and spring, 1360 m, 42.9088N, 5.8274W, 15.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC).

Chaetopteryx villosa (Fabricius, 1798)

Material examined. **France**, Pyrénées-Orientales, Canigou Massif, Vernet-les-Bains, Cascade des Anglais, 1030 m, 42.539N, 2.4167E, 11.X.2021, leg. G. Vinçon (1 male, OPC). Hautes-Pyrénées, Néouvielle Massif, below Aumar lake, springs, 2150 m, 42.8417N, 0.1446E, 13.X.2021, leg. G. Vinçon (1 male, 1 female; OPC). Pyrénées-Orientales, below Pas de la Case, rec del Baladrar, lateral spring, 1960 m, 42.552N, 1.764 E, 11.XI.2021, leg. G. Vinçon (1 male, OPC). France, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, steep springs, 930 m, 42.7408N, 0.6146E and 42.7402N, 0.616E, 19.XI.2021, leg. G. Vinçon (1 male, OPC). Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 1880 m, 42.6664N, 2.2276E, 20.XI.2021, leg. G. Vinçon (1 male, OPC). France, Haute-Garonne, Bagnère-de-Luchon, Port-de-Vénasque

brook, Pique tributary, from 1550 m, 42.7118N, 0.649E to 1610 m, 42.7108N, 0.6485E, 19.XI.2021, leg. G. Vinçon (1 male, OPC). Haute-Garonne, Bagnère-de-Luchon, Pique spring, nice resurgence, 1450 m, 42.7168N, 0.6536E, 19.XI.2021, leg. G. Vinçon (10 males, OPC). Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, 2 brooks and 1 spring, 1630 m, 42.4348N, 2.394E, 21.XI.2021, leg. G. Vinçon (4 males, OPC). Isère, above Laval-en-Belledonne, SE Prabert, brook and spring, 1260 m, 45.232N, 5.991E, 6.XI.2021, leg. G. Vinçon (1 male, OPC). Haute-Garonne, Arbas Massif, resurgence, Rosignol spring, 1400 m, 42.9592N, 0.8511E, 19.XI.2021, leg. G. Vinçon (12 males, 5 females; OPC). Pyrénées-Orientales, Puigmal Massif, Ribera d'Err tributary, «La Ballousque» spring, 1480m, 42.4321N, 2.0372E, 11.XI.2021, leg. G. Vinçon (1 female, OPC). Pyrénées-Orientales, Canigou Massif, between Valmanya and Paloumère Pass, steep brooklet, 1020 m, 42.5335N, 2.5601E, 20.XI.2021, leg. G. Vinçon (1 male, 1 female; OPC). Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, Jourdana brook and spring, 1740 m, 42.4459N, 2.4155E, 21.XI.2021, leg. G. Vinçon (1 male, OPC). Pyrénées-Orientales, Madres Massif, tributary of Castellane, brook and spring, 2040 m, 42.6608N, 2.2141E, 20.XI.2021, leg. G. Vinçon (1 male, OPC). Pyrénées-Atlantiques, below Sainte-Engrâce, torrent near the old mile, 610 m, 42.997N, 0.8238W, 17.XI.2021, leg. G. Vinçon (2 males, OPC). Drôme, Vercors, Tourtre, Adouin, 760 m, 45.0035N, 5.4563E, 29.X.2021, leg. G. Vinçon (1 female, OPC). Ariège, Vicdessos, Las Rougos, Pla de l'Izard, Mounicou tributary, spring and brook, 1220 m, 42.6949N, 1.4497E, 12.XI.2021, leg. G. Vinçon (14 males, 10 females; OPC). **Spain**, Cantabria, Branavieja, Hermandad de Campoo de Suso, Hajar tributaries, from 1740 m, 43.0385N, 4.3826W to 1870 m, 43.0432N, 4.382W, 13.XI.2021, leg. G. Vinçon (3 males, OPC). Léon, Vega de Viejos, Rio Sil, 1270 m, 42.9763N, 6.2104W, 15.XI.2021, leg. G. Vinçon (2 males, 1 female; OPC).

Chaetopteryx gessneri new species complex

(Map 7)

This new species complex is characterized by the divergence of the periphallid organ, the gonopods being extremely elongated and accompanied by the speciation trait of the aedeagus exhibiting specific apically truncated ending with or without various tooth-like processes. *Chaetopteryx polonica* has elongated gonopod, but without truncated aedeagus apex; *Chaetopteryx sahlbergi* has truncated aedeagus apex, but with short, not elongated gonopods. The following species belong to this species complex: *Chaetopteryx gessneri* McLachlan, 1876 *C. tomaszewski* Moretti, 1991 *C. tompula* sp. nov., *C. trinacriae* Botosaneanui, Cianficconi & Moretti, 1986 and *Chaetopteryx vulture* Malicky, 1971.

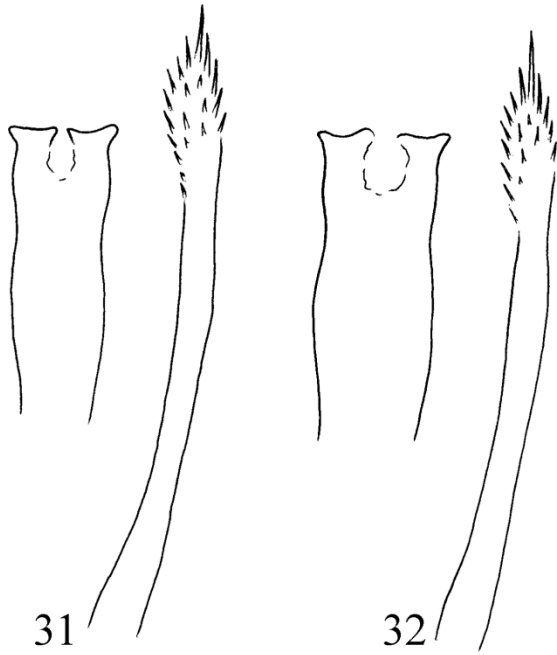
Chaetopteryx gessneri McLachlan, 1857

(Figures 31–32, Map 7)

Chaetopteryx gessneri McLachlan, 1876: 198. “I have one ♂ from Airolo, Gotthard, 9th October (Frey Gessner).” “A very distinct species.”

Material examined. **Italy**, Pennines Alps, Gressoney Valley, near Ronc de Grangia, spring and br., 45.607N, 7.812E, 600 m, 17.X.2020, leg. Gilles Vinçon (1 male, OPC). Cottian Alps, Fenestre Pass, Chisonne trib., nice spring, 45.0515N, 7.079E, 1780 m, 19.X.2020, leg. G. Vinçon (14 males, 9 females; OPC). Cottian Alps, Fenestre Pass, Chisonne trib., nice spring, 45.053 N, 7.079E, 1820–1950 m, 19.X.2020, leg. Gilles Vinçon (1 male, OPC).

Remarks. This species was described from Switzerland (Tessino). A large light brown animal characterized by elongated gonopods and the dorsal profile of the apical ending of the aedeagus without a pair of mesal tooth-like processes as well as by clavate parameres wholly armed with spine-like modified setae. In the orinial 19th cen-



Figures 31–32. *Chaetopteryx gessneri* McLachlan, 1857. Male: 31 = apical part of the aedeagus and the paramere in dorsal view from Cottian Apls; 32 = apical part of the aedeagus and the paramere in dorsal view from Pennines Apls.

ture drawings the holotype from Switzerland as well as Schmid's drawings from the middle of the 20th century of Swiss specimen exhibit aedeagus head without mesal pair of tooth-like processes. All the specimens examined both from the Cottian Alps and Pennines Alps have typical head of the aedeagus without mesal pair of tooth-like processes and clavate paramere fully packed with variously sized spines. In a detailed examination of the 14 males from the Fenestra Pass spring of Cottian Alps the traits of aedeagus and paramere are rather stable with only minute individual variations.

***Chaetopteryx tomaszewski* Moretti, 1991 stat. nov.**

(Figures 33–35, Map 7)

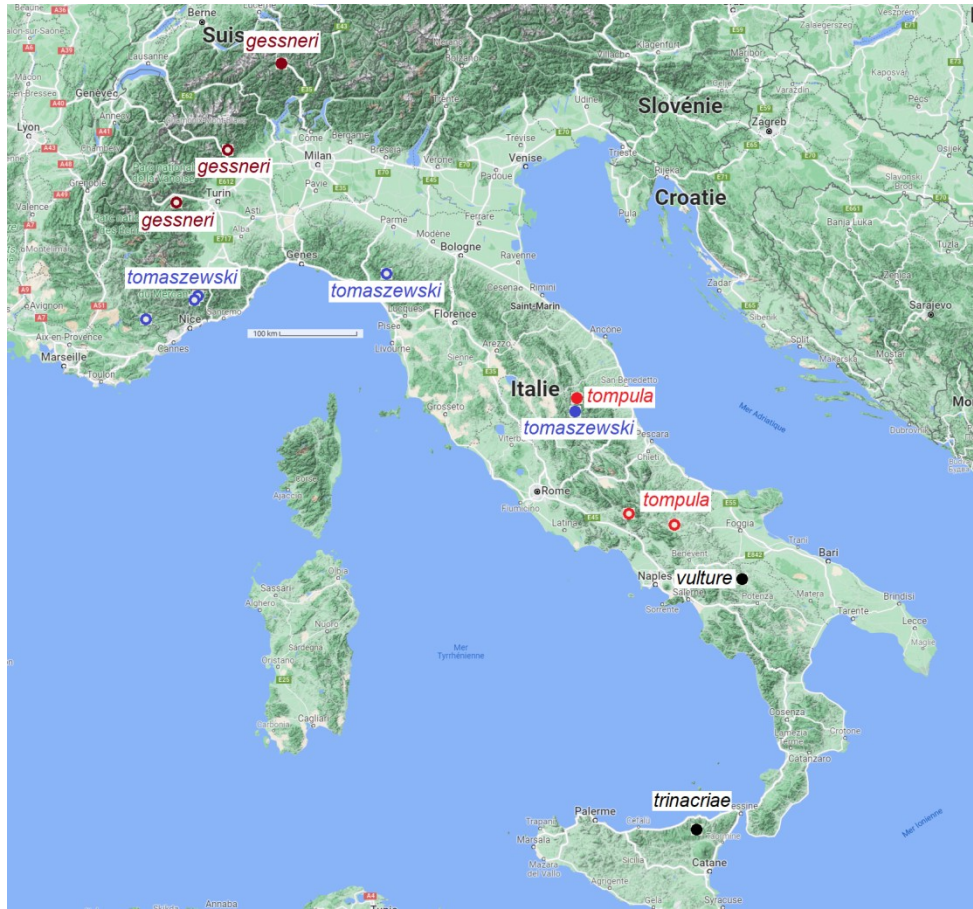
Chaetopteryx gessneri tomaszewski n. ssp. Moretti, 1991: 402. "Holotype ♂, allotype ♀, Umbria, Marcite di Norcia, Perugia, 500 m, 25.X.1984, leg. Chiappafreddo. Nombreux paratypes ♂, ♀ provenant d'Italie centrale de 1953 à 1988." "Le pénis est très semblable à celui de *C. gessneri*, mais l'échancrure

apicale porte 2 dents larges et chitineuses très évidentes et toujours présentes."

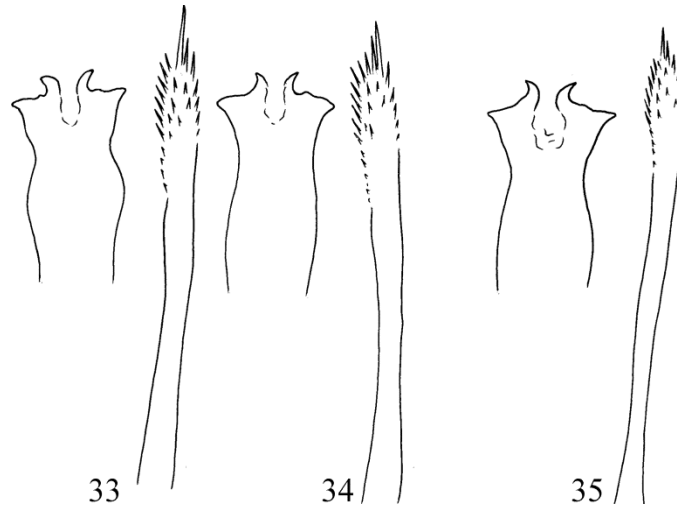
Chaetopteryx gessneri McLachlan, 1857. Malicky, 2005:573 (= *tomaszewski* Moretti, 1991). "Diese fällt in die Variationsbreite; man findet beide "Formen" innerhalb der selben Populationen: nov. syn.).

Material examined. **France**, Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E, 23.X.2021, leg. G. Vinçon (2 males, 1 female; OPC). Alpes-Maritimes, Caïros Valley, lateral spring, 1260 m, 44.0168N, 7.4425 E, 23.X.2021, leg. G. Vinçon (1 male, 1 female+1 uncertain female); OPC). Alpes-Maritimes, Bévéra Valley, Vallon des Cabanes Vieilles, lateral spring, 1700 m, 43.9856N, 7.4323E, 24.X.2021, leg. G. Vinçon (1 male, 1 female; OPC). Alpes-Maritimes, Caïros Valley, lateral spring, 1020 m, 44.011N, 7.4602E, 23.X.2021, leg. G. Vinçon (2 females, OPC). Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E, 23.X.2021, leg. G. Vinçon (1 male, 2 females; OPC). Alpes-de-Haute-Provence, N.W. La Bâtie, Couissine brook and lateral spring, 1000 m, 43.8172N, 6.5943E, 23.X.2021, leg. G. Vinçon (1 male, OPC). **Italy**, Toscana, Passo di Cerreto, 1500m scc + ruis., 44.286N, 10.228E, 2.XII.2019, leg. G. Vinçon (3 males, 1 female; OPC). Toscana, Cerreto Pass, spring, brook and torrent, 44.291N, 10.229E, 1400 m, 18.X.2020, leg. G. Vinçon (4 males, 1 female; OPC). Toscana, Cerreto Pass, 44.286N, 10.228E, 1460 m, 18.X.2020, leg. G. Vinçon (1 male, OPC).

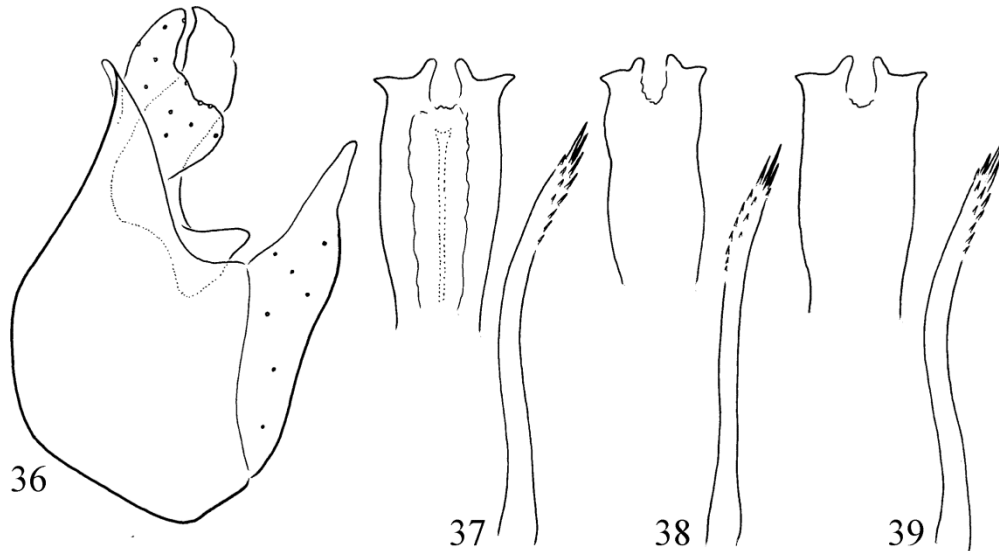
Remarks. All the examined specimens from Alpes-Maritimes and Alpes-de-Haute-Provence of France and Toscana, Italy have well developed mesal pair of teeth on the apical margin of the aedeagus head. This is the main speciation trait of *Chaetopteryx tomaszewski* diverging and splitting from *C. gessneri* as recognised already by Moretti in his description (1991). This character state of aedeagus seems rather stable in the entire distributional area from Alpes-Maritimes to Toscana or perhaps from Jura mountains to Toscana as was recorded by Schmid (1952). This recorded character state stability on such a large distributional area supports our taxonomic act to reinstate the independent status as well as to elevate to species rank of its taxonomic status.



Map 7. *Chaetopteryx gessneri* species complex in the French and Italian Alps and in the Italian Apennines (full circles represent the type localities).



Figures 33–35. *Chaetopteryx tomaszewski* Moretti, 1991 stat. nov. Male: 33 = apical part of the aedeagus and the paramere in dorsal view from Alpes-de-Haute-Provence; 34 = apical part of the aedeagus and the paramere in dorsal view from Alpes Maritimes; 35 = apical part of the aedeagus and the paramere in dorsal view from Toscana.



Figures 36–39. *Chaetopteryx tompula* sp. nov. Holotype male: 36 = genitalia in lateral view; 37 = apical part of the aedeagus and the paramere in dorsal view from Marche; 38 = apical part of the aedeagus and the paramere in dorsal view from Abruzzi; 39 = apical part of the aedeagus and the paramere in dorsal view from Molise.

***Chaetopteryx tompula* Oláh & Vinçon sp. nov.**

(Figures 36–39, Map 7, Photos 7–8)

Material examined. Holotype: **Italy**, Marche, Visso, 17. X.1987, leg. H. Malicky (1 male, OPC). Paratypes: Same as Holotype (1 female, OPC). Italy, Abruzzi, Prati di Mezzo, >Fontitune, springs near the top, 41.651N, 13.94E and 41.651 N, 13.959E, 29.XI.2019, 1650–1700 m, leg. G. Vinçon (1 male, 4 females; OPC). Molise-Bojano (CB), Torr Calderone aff. Biferno, 41.482N 14.659E, 24.X.1995, leg. M. Baccaro (1 male, OPC).

Diagnosis. This new species is recorded from Marche, Abruzzi and Molise provinces, contacting the southern population of *Chaetopteryx tomaszewski* sibling species, but differs by the mesal pair on the truncated apical margin of the aedeagus as well as by the paramere with more slender, not clavate apex with spine-like modified setae dominating on the lateral apical margin.

Description. This is a light brown coloured medium-sized species with forewing length of 15 mm. Posterodorsal setate/spinate surface of segment VIII very prominent separated with setaless midline. Segment IX rounded convex anterad, its

dorsum is reduced to a short, narrow strap; ventrum longer. Cerci short foliform. Paraproct heavily sclerotized, its dorsal arm with slightly anterad turning apices. Gonopods elongated and strongly tapering with almost pointed apex. Aedeagus truncated but armed with pronounced blunt mesal pair of lobes.

Etymology. *tompula*, coined form “tompul” getting blunt or obtuse in Hungarian, refers to the mesal pair of processes on the truncated apical margin of aedeagus with blunt apices.

***Chaetopteryx trinacriae* Botosaneanu, Cianficconi & Moretti, 1986**

(Figure 40, Map 7)

Chaetopteryx trinacriae Botosaneanu, Cianficconi & Moretti, 1986: 148. “Locality, material. – Sorgenti del Fiume Morello, in the Serra del Re, part of the Monti Nebrodi, in north-east Sicily, (Prov. Messina). These spring brooks feed the Fiume Morello, a tributary of the F. Simeto; they are at about 15 km from the small town of Floresta, at some 1500–1600 m above sea level.”

Remarks. We have examined and drawn the type specimen. A typical member of the *Chaetopteryx gessneri* species complex distributed in the

southernmost region of the complex. It has elongated gonopods, bilobed cerci and typical truncated apical margin of the aedeagus head with specific mesal pair of tooth-like processes. Compared to other members of the complex, except *C. vulture*, the lateral profile of the paraproct is even less slender, almost stout, stumpy.

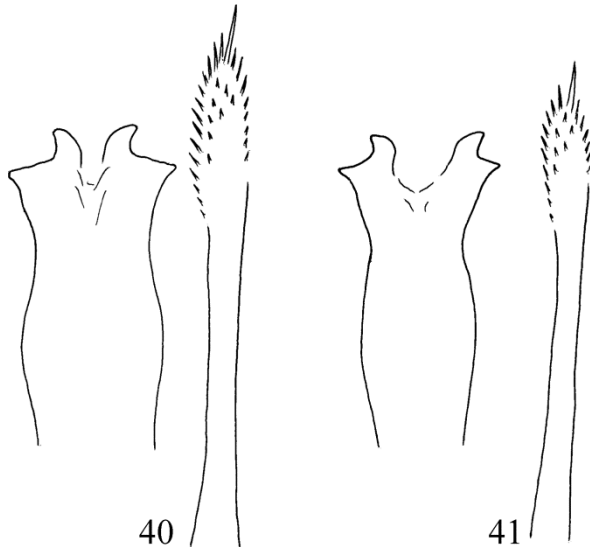


Figure 40. *Chaetopteryx trinacriae* Botosaneanu, Cianficoni & Moretti, 1986. Male: apical part of the aedeagus and the paramere in dorsal view;

Figure 41. *Chaetopteryx vulture* Malicky, 1971. Male: apical part of the aedeagus and the paramere in dorsal view.

***Chaetopteryx vulture* Malicky, 1971**

(Figure 41, Map 7)

Chaetopteryx vulture Malicky, 1971: 264. "Holotypus ♂: Lucania, Mte. Vulture, dint. Laghi di Monticchio 750 m, 10.XI.1966, leg. et coll. Hartig. Die Art gehört in die *villosa*-Gruppe und steht *Ch. gessneri* am nächsten."

Remarks. We have examined and drawn the type specimen. A typical member of the *Chaetopteryx gessneri* species complex distributed in the southernmost region of the complex. It has bilobed cerci, but the gonopod is not elongated, rather abbreviated. However, it has typical truncated apical margin of the aedeagus head with specific mesal pair of tooth-like processes. Compared to other members of the complex, except *C.*

trinacriae, the lateral profile of the paraproct is almost stout, stumpy. Moreover, the gonopod is not elongated indicating that it is a chimeric member of the complex however, the speciation trait, the apical pattern of the aedeagus is typical for the complex. This is why both Malicky (1971) and Botosaneanu *et al.* (1986) have related this species to *C. gessneri*.

***Chaetopteryx major* species group**

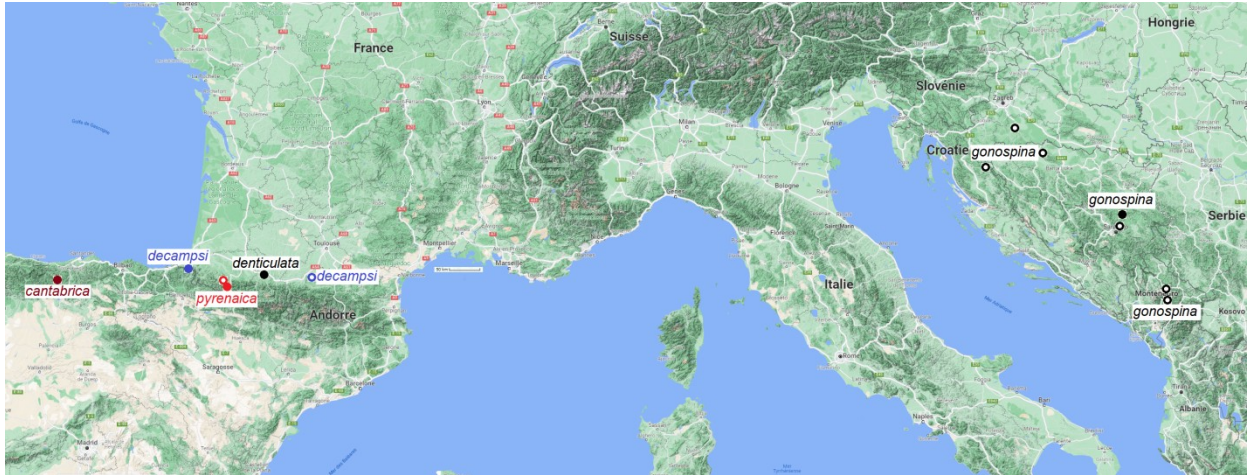
***Chaetopteryx gonospina* new species complex**

(Map 8)

Chaetopteryx gonospina Marinković, 1966 was recorded as a new species by Schmid (Marinković 1966b), but its description was presented by Marinković (1966a). It was described from Bosnia-Herzegovina based on 3 males; the female was unknown. In the next years it was recorded from the French Pyrenees (Décamps 1967) and later from Spain (Gonzalez & Menéndez 2011). *Chaetopteryx gonospina* female was described and drawn from French specimen (Décamps 1971) and accepted and included into both the first and into the second edition of the Atlas of European Trichoptera (Malicky 1983, 2004).

Based on male and female specimens collected from Bosnia-Herzegovina, Croatia and Montenegro we have found distinctly different female genital structure compared to the Pyrenean female described and drawn by Décamps (1971) and also published as *Chaetopteryx gonospina* Marinković, 1966 in the European Trichoptera Atlas (Malicky 1983, 2004). The distinguishing character states of the female genitalia were stable in all of the examined populations from Bosnia-Herzegovina, Croatia and Montenegro. Similarly, we have found subtle, but stable divergences in the modified setal structure of the male parameres in the examined population from the Balkan countries.

Distinct combination of character states for distinguishing females in the *Chaetopteryx gonospina* species complex is composed of the (1) development of the dorsoapical mesal process on the anal tube, reduced or elongated; (2) lateral



Map 8. *Chaetopteryx gonospina* species complex in the Balkan countries and in the Pyreneo-Cantabrian mountain range (France and Spain) (full circles represent the type localities).

profile of the anal tube with or without basolateral lobes; (3) the extension of the apical excision, the gap between the lateral lobes of the anal tube in dorsal profile being as wide as the lateral lobe or double wide than the lateral lobes; (4) perpendicular, slightly ventroapical view of the mesal excision, the distance between the setose lobes of sternite IX surrounding the supragenital plate of segment X (upper vaginal lip). This distinct combination of character states offers a stable practical procedure to differentiate the closely related sibling species in the *Chaetopteryx gonospina* species complex. It seems that the subtle and stable divergences in the modified setal pattern in the male support the female divergences. However, we have no males coupled to our female specimens from the Pyrenean region and from Cantabria. This is why we describe the sibling species based on combination of character states in female genitalia. We hope these descriptions based on the presented and listed combination of character states give some impetus to collect more specimens of this still badly known species complex.

***Chaetopteryx cantabrica* Oláh & Vinçon sp. nov.**

(Figures 42–44, Map 8, Photos 9–10)

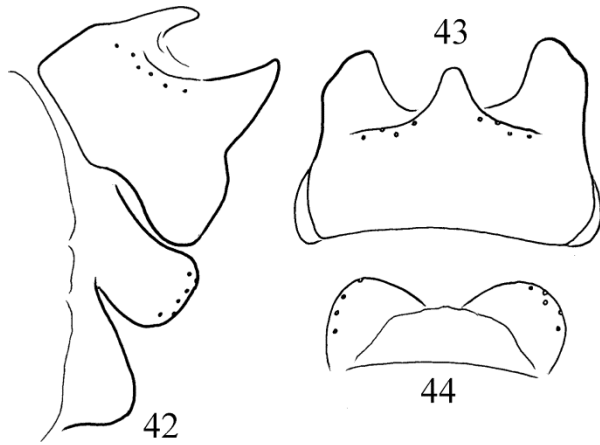
Chaetopteryx gonospina Marinković, 1966: Gonzalez & Menéndez 2011:124. Included in the checklist of

the caddisflies of the Iberian Peninsula as recorded from continental Spain. Misidentification.

Material examined. Holotype: **Spain**, Cantabria, Rio Saja, Mina da Lapiz, lateral spring, 520 m, 43.1232N, 4.2961W, 14.11.2021, leg. G. Vinçon (1 female, OPC).

Diagnosis. The single female was collected and selected as holotype having resemblance to *Chaetopteryx pyrenaica* sp. nov. but differs by the distinct combination of character states of the female genitalia, (1) development of the dorsoapical mesal process on the anal tube, elongated; (2) lateral profile of the anal tube with strongly developed, very produced basolateral lobes; (3) the extension of the apical excision, the gap between the lateral lobes of the anal tube in dorsal profile is double wide than the lateral lobes; (4) perpendicular, slightly ventroapical view of the mesal excision, the distance between the setose lobes of sternite IX surrounding the supragenital plate of segment X is very narrow, short.

Female description. Tergite of segment IX and X forming together the anal tube with deep and wide U-shaped apicomesal excision in dorsal view; the lateral lobes slightly narrowing apicad; the dorsoapical mesal process well developed, elongated, narrowing apicad; in lateral view the lateral setose lobe of sternite IX with rounded



Figures 42–44. *Chaetopteryx cantabrica* sp. nov. Holotype: female: 42 = genitalia in left lateral view; 43 = anal tube in dorsal view; 44 = supragenital plate of segment X (upper vaginal lip) with the setose sternite IX in ventrocaudal view.

apical margin, slightly upward turning, heavily setose apically; in ventroapical, perpendicular view the setose sternites of segment IX close to each other, the mesal excision is very narrow. Supragenital plate of segment X (upper vaginal lip) much developed and trapesoid in ventral views. Median lobe of the vulvar scale (lower vaginal lip) present, very short, tiny.

Etymology. Named from the region of the type locality.

***Chaetopteryx decampsi* Oláh & Vinçon sp. nov.**

(Map 8)

Chaetopteryx gonospina Marinković-Gospodnetić, 1966: Décamps 1967:145. "Nivelle, 100 m. XII." Cette espèce, du groupe de *Chaetopteryx major*, est très voisine de *Chaetopteryx gonospina* décrite de Yougoslavie (Marinković, 1966). Le statut de la forme pyrénéenne (1♂), ne pourra être défini que par l'étude d'autres exemplaires et par leur comparaison avec l'un des types de *Chaetopteryx gonospina*."

Chaetopteryx sp. groupe de *major*. Décamps 1967:145. "Volp, 280–340 m. IX, XI." "Espèce dont je ne possède que 3 ♀. La forme des pièces génitales permet de ranger ces trois exemplaires dans le groupe de *Ch. major* et rend possible leur appartenance à la forme précédente, *Ch. gonospina* ssp."

Chaetopteryx gonospina Marinković-Gospodnetić, 1966: Décamps 1971:121. "*Chaetopteryx gonospina*

na est une espèce tardive. Les récoltes faites sur le ruisseau Lissuraga (leg Max Thibault), dans les Pyrénées occidentales, s'échelonnent du 21 octobre au 23 décembre. Les trois exemplaires des Pyrénées centrales ont été obtenus par l'élevage de larves au laboratoire en fin septembre et en novembre. L'espèce ne paraît pas très abondante."

Material. Syntypes: specimen presented in the cited two publications by Decamps (1967:145, 1971:121).

Diagnosis. The female drawn by Decamps (1971) has resemblance to *Chaetopteryx cantabrica* sp. nov. but differs by the combination of character states of the female genitalia. (1) Development of the dorsoapical mesal process on the anal tube, less elongated; (2) lateral profile of the anal tube with strongly developed, very produced basolateral lobes; (3) the extension of the apical excision, the gap between the lateral lobes of the anal tube in dorsal profile is double wide than the lateral lobes; (4) perpendicular, ventroapical view of the mesal excision, the distance between the setose lobes of sternite IX surrounding the supragenital plate of segment X is indistinct. More female specimens both from Cantabria and from the Pyrenees are required to study the details of the divergences. To establish the final taxonomic status of both species needs also associated male specimens.

Female description. Female (Decamps 1971: 122, Figures 5–7). Tergite of segment IX and X forming together the anal tube with deep and wide U-shaped apicommesal excision in dorsal view; the lateral lobes slightly narrowing apicad; the dorsoapical mesal process slightly elongated, narrowing apicad; in lateral view the lateral setose lobe of sternite IX with ventral elongation and slightly downward directed, heavily setose apically; in ventroapical, perpendicular view the setose sternites of segment IX close to each other, the mesal excision indistinct. Supragenital plate of segment X (upper vaginal lip) much developed and semi-circular in ventral views. Median lobe of the vulvar scale (lower vaginal lip) present, very short, tiny.

Etymology. Named in honour of H. Decamps who has recorded this species in the Pyrenees.

***Chaetopteryx denticulata* Décamps, 1971**

(Map 8)

Chaetopteryx denticulata Décamps, 1971:123. "Chaetopteryx denticulata n'est connu que par un exemplaire capturé aux environs de Tarbes en 1907. L'Holotype ♂ est déposé dans la collection Pandellé au Museum d'Histoire naturelle de Paris." "Les appendices supérieurs sont finement dentelés, moins nettement bilobés que ceux de *Ch. gonospina*. Les appendices intermédiaires sont plus redressés. Les prolongements des appendices inférieurs sont nettement plus allongés vers le haut."

***Chaetopteryx gonospina* Marinković, 1966**

(Figures 45–48, Map 8)

Chaetopteryx gonospina Marinković, 1966a:111–112. "Holotype ♂, Bosnia, Olovo, 7.X.1964. in author's collection; 2 paratypes ♂, Bosnia, Sarajevo, Crepoljsko, one in collection of Zemaljski muzej, Sarajevo, the other in Schmid's collection, Ottawa." "Male genitalia resembling that of *Chaetopteryx major* McL. but the process of the inferior appendages is much longer. There are some differences in the intermediate appendages, superior appendages and aedeagus, too."

Chaetopteryx gonospina Marinković 1966b:209. "There were two specimens of this species in collection of the museum in Sarajevo; they were determined as *Ch. major*. F. Schmid had taken them in order to describe them as a new species, but he ceded kindly its description to me, because I have already had a specimen of this species in my collection. Female unknown. Crepoljsko, 2♂, Olovo, 1♂, 7.X.1964. Fojnica, 1♂, 8.IX.1966."

Material examined. **Bosnia-Herzegovina**, Banja Luka region, Kozara Mts, forest brook below the Vrbaška – Kozarac road, N45°02.480', E16°54.266', 560 m, 7.XI.2012, leg. T. Kovács, & G. Magos, (1♀, OPC). **Croatia**, Banovina region, Petrinja, Kriz spring, N45.424233°, E 16.228267°, 124m, 30.X.2009, leg. M. Kucinic (1♀, OPC). Plitvice NP, Srednji tok Crne rijeke, P4/Crna rijeka middle reach, N44°50.10' E15° 36.30', IX. 2008, leg. Ivkovic & Mihaljevic (5♂, OPC). Plitvice NP, Izvor Crne rijeke, P5/Crna rijeka spring, N44°50.14' E15°36.28', IX. 2008, leg. Ivkovic & Mihaljevic (1♀, OPC). **Monteneg-**

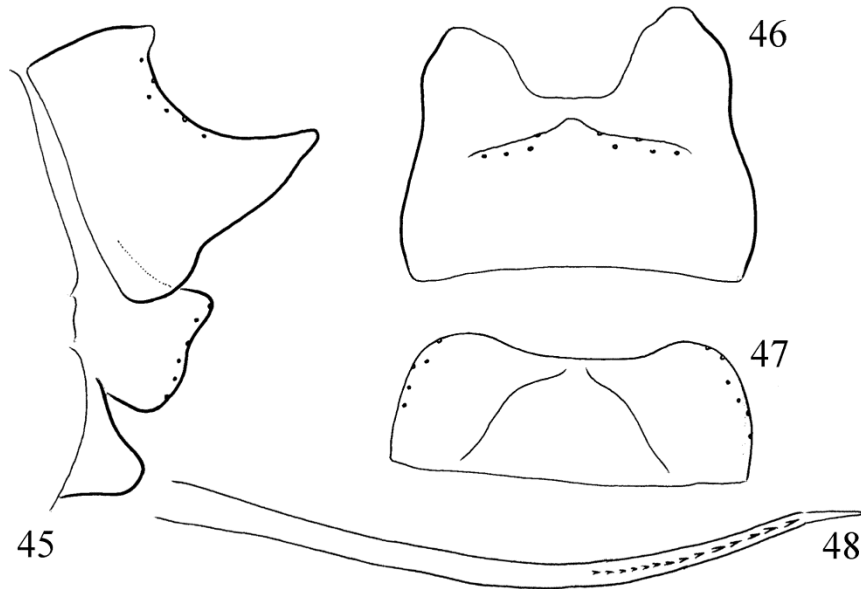
ro, Sinjajevina Mts, Gornji Štitarica, right side springs of Štitarička reka, N42°55'14.9", E19°29' 59.4", 1040 m, 04.11.2011, Kovács, T. & Magos, G. (1♂, OPC). Komovi Mts, Mateševo-Bare Kraljske, Nesirenski potok, N42°45'04.6", E19° 34'23.2", 1030 m, 08.11.2011, Kovács, T. & Magos, G. (2♂, 1♀, OPC).

***Chaetopteryx pyrenaica* Oláh & Vinçon sp. nov.**

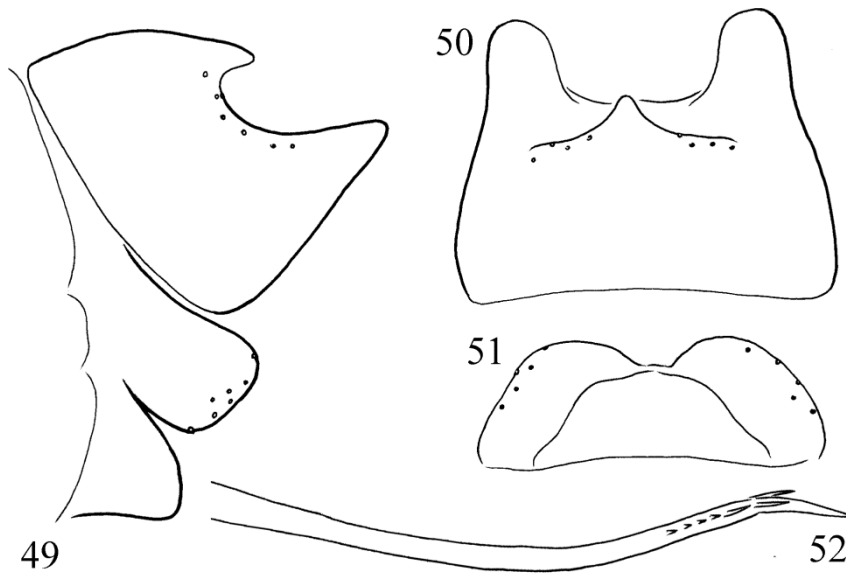
(Figures 49–52, Map 8, Photo 11)

Material examined. Holotype: **France**, Pyrénées-Atlantiques, Osse-en-Aspe, Labays Pass, Oueils d'Issaux, nice resurgence, 680 m, N 43.00655°, W0.6913°, 17.XI.2021, leg. G. Vinçon (1 female, OPC). Paratypes: Pyrénées-Atlantiques, Lanne-en-Baretous, spring, 28. X. 2009, leg. G. Coppa (2♂, OPC).

Diagnosis. This new species has resemblance to *Chaetopteryx cantabrica* sp. nov. but differs by the distinct combination of character states of the female genitalia. The single female was collected and selected as holotype with distinct combination of following character states. (1) Development of the dorsoapical mesal process on the anal tube, slightly elongated; (2) lateral profile of the anal tube without any basolateral lobes; (3) the extension of the apical excision, the gap between the lateral lobes of the anal tube in dorsal profile is double wide than the lateral lobes; (4) perpendicular, slightly ventroapical view of the mesal excision, the distance between the setose lobes of sternite IX surrounding the supragenital plate of segment X is very narrow, short. We have two males collected however, from different habitat than the female holotype. The association of these males with the female of *Chaetopteryx pyrenaica* sp. nov. is uncertain. By fine phenomics the pattern of the spine-like modified setae differs from the parameres of all the examined male specimens of *Ch. gonospina*. The terminal spine more developed accompanied with a few of long penultimate spines as well as the row of the small spine is short not as long as on the parameres of *Ch. gonospina* specimens.



Figures 45–48. *Chaetopteryx gonospina* Marinković, 1966 female: 45 = genitalia in left lateral view; 46 = anal tube in dorsal view; 47 = supragenital plate of segment X (upper vaginal lip) with the setose sternite IX in ventrocaudal view; male: 48 = paramere in lateral view.



Figures 49–52. *Chaetopteryx pyrenaica* sp. nov. Holotype, female: 49 = genitalia in left lateral view; 50 = anal tube in dorsal view; 51 = supragenital plate of segment X (upper vaginal lip) with the setose sternite IX in ventrocaudal view; male: 52 = paramere in lateral view.

Female description. Tergite of segment IX and X forming together the anal tube with deep and wide U-shaped apicomesal excision in dorsal view; the lateral lobes rounded apicad; in lateral profile there is no basolateral lobe; the dorso-

apical mesal process slightly elongated, narrowing apicad; in lateral view the lateral setose lobe of sternite IX with rounded apical margin, slightly upward turning, heavily setose apically; in ventro-apical, perpendicular view the setose sternites of

segment IX close to each other, the mesal excision is very narrow. Supragenital plate of segment X (upper vaginal lip) much developed and trapesoid in ventral views. Median lobe of the vulvar scale (lower vaginal lip) present, very short, tiny.

Etymology. Named after the region of the type locality.

***Pseudopsilopteryx zimmeri* (McLachlan, 1876)**

Material examined. **France**, Isère, Taillefer Massif near Prévourey lake, spring Guiliman tributary, 1630 m, 45.0328N, 5.8715E, 17.X.2021, leg. G. Vinçon (7 males, 4 females; OPC). Isère, above Laval-en-Belledonne, SE Prabert, brook and spring, 1260 m, 45.232N, 5.991E, 6.XI. 2021, leg. G. Vinçon (1 male, 2 females; OPC). Isère, above Laval-en-Belledonne, Crop torrent, 1430 m, 45.2174N, 5.991E, 6.11.2021, leg. G. Vinçon (4 males, 2 females; OPC). **Italy**, Rhaetian Alps, Livigno, S. slope of Passo del Foscagno, brook and spring, 2180 m, 46.483N, 10.222E, 24.IX. 2021, leg. G. Vinçon (4 males, 7 females; OPC).

Stenophylacini Schmid, 1955

***Allogamus* Schmid, 1955**

***Allogamus auricollis* species group**

***Allogamus auricollis* species subgroup**

(Map 9)

During our revision of the *Allogamus* genus (Oláh *et al.* 2014) at the time when we have started to generalise and develop further as well as apply the principles and procedures of our fine phenomics we have faced a special problem with the history of type specimens in the *Allogamus auricollis* species complex. See below the taxonomic history of species of *Allogamus auricollis* (Pictet, 1834) and *Allogamus brauerii* (Kolenati, 1859).

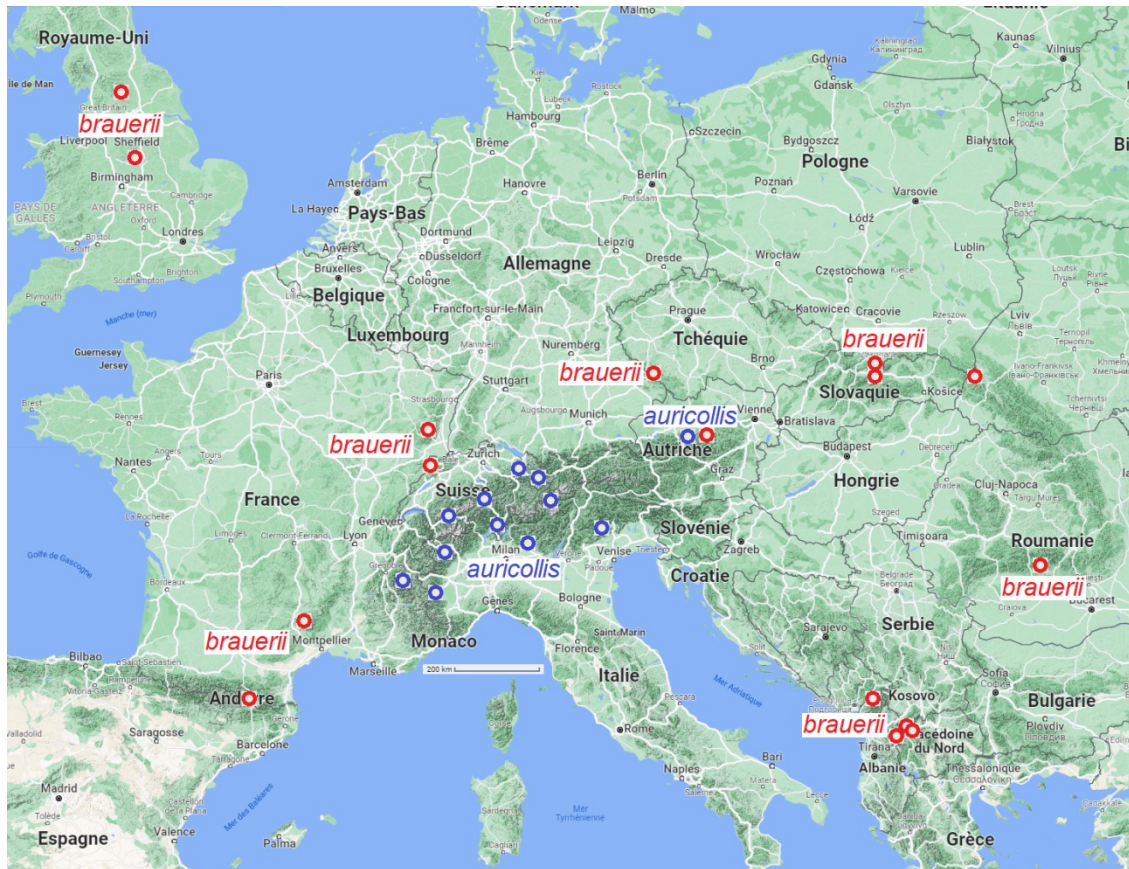
Until our discovery of speciation trait, *Allogamus auricollis* was treated as a species with wide distribution and with high variability that is the typical excuse theory and practice of the lumpers.

Even the geographic races of *Allogamus auricollis* briefly outlined by Schmid (1951) were considered by Malicky (2004) just as variations of a single widely distributed species.

Applying the fine phenomics we have discovered and clearly distinguished two subtly and stably diverged incipient sibling species by the very pronounced differentiations in the shape of speciation traits of sclerites on the aedeagus and of the spine pattern that is the modified setal structure of the paramere (Oláh *et al.* 2014). The structure of these speciation traits were very stable in all of the examined populations on the entire distributional area of the widely distributed species from Spain to England and from France to Albania through Austria, Germany, Czech Republic, Poland, Slovakia, Ukraine, Romania as well as from Slovenia through Macedonia, Montenegro to Serbia. The second incipient sibling species was restricted to the habitats of the western and central Alps. We have selected the widely distributed species with apicad-pointed sclerites on the aedeagus as well as with the single spined paramere as *Allogamus auricollis* (Pictet, 1834) and specimens having laterad-pointed sclerites on the aedeagus and paramere with spine bunch were described as a new species *Allogamus alpenis*, because its distribution was restricted to the Alps.

Due to the lack of proper type material we were unable to decide reliably which incipient sibling species actually represents the genuine *Allogamus auricollis* species described by Pictet in 1834 (Oláh *et al.* 2014). Pictet has carried out his collection and research on caddisflies during the years of 1830–1833. His famous comprehensive monograph on Trichoptera has been published in 1834. His study was based mostly on specimens of his personal collecting activity in the Lemman Basin of Savoie, particularly in the vicinity of Geneva and in the nearby Jura Mountains (Botosaneanu & Schmid 1973).

Pictet has not designated any type specimen for his *Allogamus auricollis* and not given any collecting details. Simply he has mentioned that “I was collecting this species only in the Arve”. Un-



Map 9. *Allogamus auricollis* - *A. brauerii* species complex in Europe (full circles represent the type localities).

fortunately, large part of the original collection of Pictet was dispersed to several museums (Botosaneanu & Schmid 1973). In their detailed study on the Pictet's collection remained in the Natural History Museum of Geneva, Botosaneanu & Schmid (1973) have found and recorded only two specimens as possible syntypes. They have found one specimen without abdomen and one female specimen without diagnostic value in the potential syntype series collected along the River Arve in Geneva that is in the type locality of *A. auricollis*.

Malicky (2016) has selected a neotype with the following three labels: "Genève/Crêts de/Champel/3.10.48" + "extremement abundant" + "*Allogamus/auricollis* Pict.♂/L. Botosaneanu/det.1971". However, neotype selection is not valid if the two syntypes, the intact female and the specimen without abdomen, are still available. Moreover, the selected "neotype" was collected in 3.X.1948

after the description of *Allogamus auricollis* (Pictet, 1834). In 2017 we have re-examined all the specimens of River Arve origin remained in the Natural History Museum of Geneva and unfortunately the abdomen of the selected "neotype" was already lost, the 2 cm plastic tube attached to the pin was full of black debris. Fortunately two other male specimens collected along the River Arve at Châtelaine 46°12'0"N, 6°7'0"E in 10.IX.1924 with number 9846 and 9847 and identified by L. Botosaneanu in 1971 as *Allogamus auricollis* Pict. were available for study. Their genital structure are typical for the *Allogamus alpinensis*, now *Allogamus auricollis* as drawn earlier by ourselves (Oláh *et al.* 2014) as well as confirmed later by Malicky (2016).

Malicky (2016)'s drawings from the holotype of *Halesus brauerii* Kolenati, 1859 with apicad-pointed sclerites on the aedeagus as well as with

single spined paramere, collected in Altvater and recovered in the Natural History Museum of Vienna has solved our problem. We realise with a tribute to Kolenati, Brauer as well as to Malicky that the widely distributed incipient sibling is *Allogamus brauerii* (Kolenati, 1859) and the other incipient sibling species we have delineated by the speciation traits with laterad-pointed sclerite on the aedeagus as well as with a bunch of spines on the paramere is the genuine *Allogamus auricollis* (Pictet, 1834) including its synonym *Allogamus alpensis*. However, they are not the geographic races of Schmid and neither the morphotypes of Malicky. They are phylogenetic incipient sibling species with speciation traits, very stable on the entire distributional area covering either most of Europe by *Allogamus brauerii* or the Alps by *Allogamus auricollis* (Oláh *et al.* 2014).

***Allogamus auricollis* (Pictet, 1834)**

(Map 9)

Phryganea auricollis Pictet, 1834:141–142. “Je n’ai trouvé cette espèce que dans l’Arve, la larve se fixe aux pierres, recherche les places où le courant est fort et éclot dans le commencement d’Octobre.”

Halesus auricollis (Pictet, 1834): Schmid 1951:51–55. “Les races géographiques que l’on peut distinguer chez cette espèce ne se différencient que par la coloration et la forme des titillateurs.” Schmid has distinguished two distinct geographic races: (1) specimens from Jura Mountains and South Germany with apicad pointed sclerites on the aedeagus and with single spined paramere; (2) specimens with laterad pointed sclerites on the aedeagus and with small bunch of spines on the paramere from Central and East Europe. Today it is well documented that the distribution of this species, the genuine *Allogamus auricollis*, is restricted to the western and central Alps.

Allogamus Schmid, 1955:194–196. *Allogamus* gen. nov. split from *Halesus* genus and established with the two species group of *auricollis* and *uncatus*.

Allogamus auricollis (Pictet, 1834): Botosaneanu & Schmid 1973:247–248. “une longue série de spécimens, surtout de Suisse, mais l’un d’entre eux provient de Chamonix et plusieurs d’ “Eur. Centrale”. Dans la description originale, Pictet affirme avoir trouvé cette espèce “seulement dans l’Arve”. Deux exemplaires seulement pourraient être des syntypes. Un exemplaire sans abdomen étiquette “Geneve” et une ♀ de la même localité. Il serait éventuellement possible de désigner cette ♀ comme lectotype, mais nous nous en sommes abstenus, la chose étant inutile, l’espèce étant bien caractérisée

et connue et le sexe ♀ peu représentatif dans ce genre. Quelques exemplaires étiquettes “Chataine” appellant quelques commentaires. Certains détails de l’armature génitale du ♂ font penser à *antennatus* McL. Il y a une zone nettement plus foncée que le reste, mais pas de tubercules sur le VIII^e tergite. Les appendices inférieurs apparaissent nettement émarginés en vue latérale. L’édéage ressemble plutôt à celui d’*antennatus* tel que l’a figuré Schmid (1951). Mais par la taille et la coloration ces exemplaires se rattachent évidemment à *auricollis*.”

Allogamus auricollis (Pictet, 1834): Malicky 2004:271. Schmid’s geographic races were treated simply as variations.

Allogamus alpensis Oláh, Lodovici & Valle, 2014:50–52. Specimens distributed in the western and central Alps having laterally pointed sclerites on the aedeagus and with a bunch of ventral spines on the middle region of the paramere are separated and described as *Allogamus alpensis* sp. nov.

Allogamus alpensis Oláh, Lodovici & Valle, 2014 in Oláh *et al.* 2014: Malicky 2016: 29. “*Allogamus auricollis* Pictet 1834 = *Allogamus alpensis*, syn. nov.

Allogamus auricollis auricollis (Pictet, 1834): Malicky 2016: 30

Material examined. **Austria**, superior, Reichraming, 9. X. 1983, leg. H. Malicky (10 males, 6 females; OPC). Voralberg, Ferwall, Zeinisjoch, 1850m, 4. IX.1975, leg. Aistleitner (7 males, OPC). **France**, Isère Department, Saint Christophe en Oisans, D 530 les Pièces du Clot la Berande, 13. IX. 2007 leg. G. Coppa (1 male, CPC). **Italy**, Lombardia-Bergamo, Gazzaniga, valle Platz, 850 m, light trap, 2.X.1993, leg. Gusmini (38 males, 3 females; CNSMB). Trentino-Alto Adige-Bolzano, Glorenza, IX.1978, leg. Osella (4 males, 2 females; CNHNV). Piemonte – Cuneo, Crisolino, Pian della Regina, fiume Po, light trap, N44,7000° E7,1163°, 2.IX. 1997 (51 males, 1 female; CSNMB). Veneto-Belluno, Cesiomaggiore, Val Canzoi, torrente Caorame, N46.1167° E11.9376°, 590 m, 14.X.2002, light trap leg. O. Lodovici, P. Pantini (2 males, 29 females; CNS MB). **Liechtenstein**, Schellenberg, 26. IX. 1988, leg. Aistleitner (9 males, 7 females; present from MPC, OPC). **Switzerland**, Wallis, 2.5 km nördlich Salgesch, N46°19’34” E7° 35’24”, 1390 m, 12.X. 2001, leg. A. Bischof & G. Bischof, (6 males, present from MPC, OPC). Ticino, Gudo, Mitte Oktober 1982, leg. L. Rézbányai (7 males, 2 females; present from MPC, NMPC). Uri, Hospental, 1500 m, Ende IX. 1982, leg. L. Rézbányai (6 males, 4 females; present from MPC, OPC).

New material: **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, springs near the bridge, 1900 m, 45.625N, 7.376E, 23.IX. 2021, leg. G. Vinçon (3 males, 34 females; OPC).

Remarks. The character state divergences, that is the speciation traits of the laterad pointed sclerites on the aedeagus as well as of the paramere with small spine bunch are remarkably stable in all of the examined populations in the western and central Alps (Oláh *et al.* 2014). Based on the unified phylogenetic species concept taking subspecies and races out of science (Oláh *et al.* 2018) these specimens represent an incipient sibling species of *Allogamus brauerii* (Kolenati, 1859), **stat.nov.**

***Allogamus brauerii* (Kolenati, 1859) stat. nov.**

(Map 9)

Halesus brauerii Kolenati, 1859:36. Collected in Altvater = Pradĕd Mountains.

Halesus brauerii Kolenati 1860:385–386. “Diese Art könnte auf den ersten Blick mit *Anobolia paludum* Kolenati verwechselt werden, sie stehet zwischen *Halesus auricollis* Pictet und *uncatus* Brauer.” “Vorkommen. An Ursprung der Tess oberhalb der letzten Dämme bis 4000’ Seehöhe, am Altvater, ziemlich häufig im Juli, August bis in den September.”

Allogamus auricollis (Pictet, 1834): Fischer 1969:281. *Allogamus brauerii* (Kolenati, 1859) is a synonym of *Allogamus auricollis* (Pictet, 1935).

Allogamus auricollis (Pictet, 1834): Oláh *et al.* 2014:50–52. Specimens with apically pointed sclerites of the aedeagus and with single spined paramere are misidentified as *A. auricollis* widely distributed in Europe from Spain to England, from Jura Mountains to Czech Republic and south to Ukraine and through the Balkan to Albania. Misidentification.

Allogamus auricollis brauerii (Kolenati, 1859): Malicky 2016: 29.

Material examined. **Albania**, Dibër district, Korab Mts, Radomirë, brook E (above) of the village, N41°49.152’ E20°30.111’, 1495 m, 7.X. 2012, leg. P. Juhász, T. Kovács, D. Murányi, G. Puskás (3 males, 3 females; OPC). **Austria:** Inferior, Lunz, Ybbs bei Weissenbach, 20. VIII. 1969 leg. H. Malicky, (12 males, 7 females; present from MPC, OPC). **Czech Republic**, Southern Bohemia, Šumava Mts, Modrava,

Weitfallerské slatě, N49°01’ E13°25’, 3.VIII. 2011, leg. A. Pavlicko (4 males, 4 females; present from MPC, OPC). **England**, River Dove, Derbysire, 4. X. 1913, leg M. E. Mosely, Mosely Bequest. B.M. 1948-589, Ex. NHM-London (6 males, 4 femal; OPC). R. Wharfë, Grass Wood, Grassington, North Yorks, 17. IX. 1925, leg A. Brindle (6 males, 6 females; OPC). **France**, Massif Central, Losère Department, Meyrueis, La Breze, 27. X. 2010 leg. G. Coppa (1 male, 3 females; CPC). Vosges Department, Le Valtin, La Meurthe en Amont de l’Etang, 4. X. 2012 leg. G. Coppa (1 male, OPC). Pyrénées, Pyrénées-Orientales Department, Porte Puymorens, Ru de l’Orris, 21. VIII. 2011, leg. G. Coppa (6 males, 6 females; OPC). **Kosovo**, Brod River, 6. X. 2013, leg H. Ibrahimji (7 males, 4 females; OPC). **Macedonia**, Polog region, Šar Planina, Vešala (Veshallë), open, rocky stream at the village, N42°03.865’ E20°50.866’, 1290m, 1.X.2013, leg. T. Kovács, D. Murányi, (2 males, 5 females; OPC). **Montenegro**, Plav municipality, Gusinje, Alipašini Springs, 935 m, N42°33.014’, E19°49.486’, 4.X. 2005, leg. T. Deli, Z. Eröss, Z. Fehér & D. Murányi (2 males, 1 female). **Poland**, High Tatras, Chochołowska valley 22.VIII.1986, leg J. Oláh, (6 males, 2 females, OPC). **Romania**, Arges County, Fagaras Mts. Capatanenii Ungureni, small springlake by the Capra stream along road No. 7C, N45°34.605’ E45°34.605’, 1405m, 29.VIII.2012, leg. T. Kovács, D. Murányi & J. Oláh (4 males, 1 female, OPC). **Slovakia**, Low Tatras, Východná, 17.IX.1999, leg. J. Ortner (4 males, 4 females; OPC). **Ukraine**, Bieszczady Mts (Besszádok), Ung National Park, above Lubnya (Kiesvölgy), N49°02’13,90”, E22°42’59,75”, 579 m, singled, 20. IX. 2013, leg. J. Oláh, Cs. Balogh, Cs. Deák & I. Meszesán (1 male, OPC).

New material. **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600 – 650 m, 47.3N, 7.06E, 14.IX.2021, leg. G. Vinçon (1 male, 2 females; OPC).

Remarks. The character state divergences, that are the speciation traits of the apicad-pointed sclerites on the aedeagus as well as the single spined paramere are remarkably stable in all of the examined populations including the newly collected male specimen from the Jura Mountains (Oláh *et*

al. 2014). Based on the unified phylogenetic species concept taking subspecies and races out of science (Oláh *et al.* 2018) these specimens represent an incipient sibling species of *Allogamus auricollis* (Pictet, 1834). Here we elevate *Allogamus brauerii* (Kolenati, 1859) to species rank.

***Allogamus hilaris* species subgroup**

***Allogamus hilaris* (McLachlan, 1876)**

(Map 10)

Material examined. **France**, Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 1850 m, 45.033N, 5.877E, 17.X.2021, leg. G. Vinçon (1 male, OPC). France, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787N, 6.9534E, 19.IX.2021, leg. G. Vinçon (1 female, OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, springs near the bridge, 1900 m, 45.625N, 7.376E, 23.IX.2021, leg. G. Vinçon (1 male, 3 females; OPC). Italy, Lombardian Pre-Alps, Bergamo, Passo San Marco, N. slope, brooks and springs, 1820 m, 46.058N, 9.63E and 1600m, 46.0696N, 9.6288E, 24.09.2021, leg. G. Vinçon (4 males, 3 females; OPC). **Switzerland**, Lombardian Pre-Alps, Bernina Pass, brook and spring, 2050 m, 46.4093N, 10.0496E, 24.IX.2021, leg. G. Vinçon (1 male, 2 females; OPC).

***Allogamus ligonifer* species subgroup**

***Allogamus laureatus* (Navas, 1918)**

(Map 10)

Material examined. **Spain**, Asturias, Puerto de Tarna, E Tarna, brook and spring, 1130 m, 43.1096N, 5.2183W, 14.XI.2021, leg. G. Vinçon (1 female, OPC). Spain, León, Aralla de Luna, brook and spring, 1360 m, 42.9088N, 5.8274W, 15.XI.2021, leg. G. Vinçon (3 females; OPC).

***Allogamus uncatius* species group**

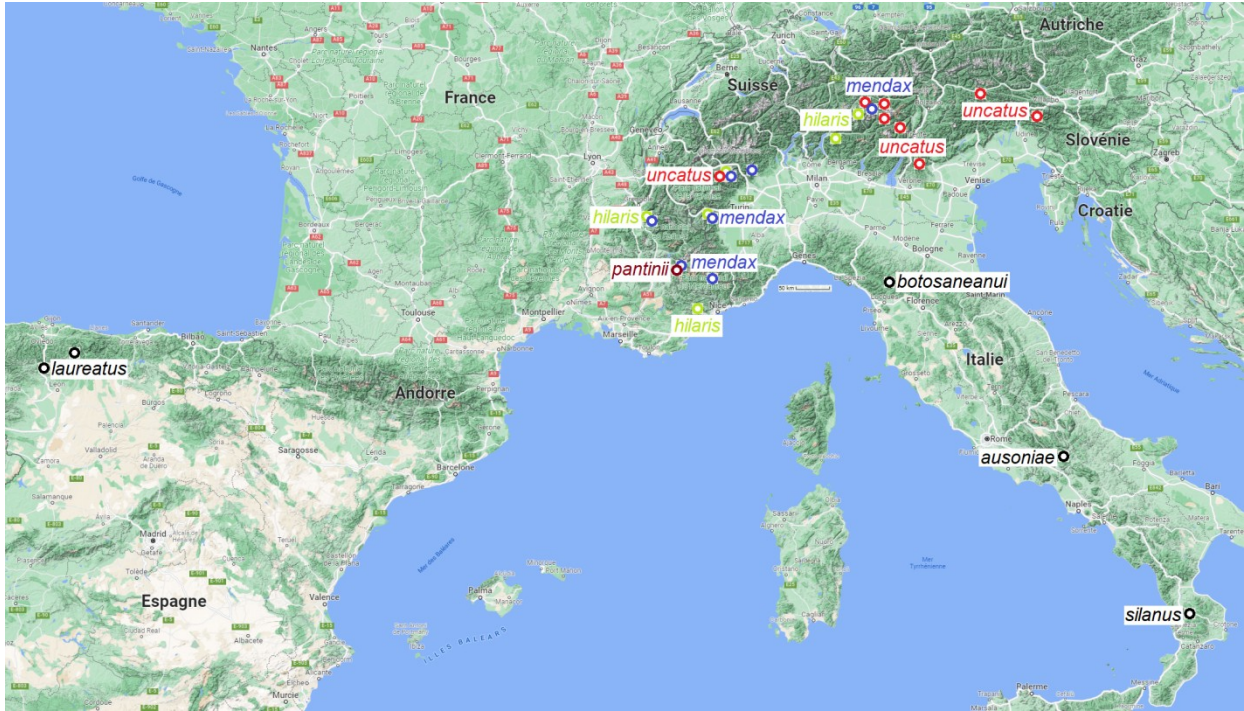
***Allogamus mendax* (McLachlan, 1876)**

(Map 10)

Material examined. **France**, Isère, Taillefer Massif, below Brouffier lake, spring Guiliman

tributary, 1850 m, 45.033N, 5.877E, 17.X.2021, leg. G. Vinçon (4 females; OPC). Isère, Taillefer Massif near Prévourey lake, spring Guiliman tributary, 1630 m, 45.0328N, 5.8715E, 17.X.2021, leg. G. Vinçon (4 males, 7 females; OPC). Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 2060 m, 45.0357N, 5.8865E, 17.X.2021, leg. G. Vinçon (1 male, 6 females; OPC). Alpes-Maritimes, N. Valdebloure, Vallon des Millefontes, spring and brook, 2120 m, 44.106N, 7.187E, 19.IX.2021, leg. G. Vinçon (2 males, OPC). Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (3 males, 2 females; OPC). Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, S. Thuiles Pass, Séolane brook and spring, 2320 m, 44.3406N, 6.56E, 12.IX.2021, leg. G. Vinçon (2 males, 1 female; OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook and springs below the first Lussant Lake, 2690 m, 45.6527N, 7.406E, 23.IX.2021, leg. G. Vinçon (4 males, 6 females; OPC). Rhaetian Alps, Livigno, S. slope of Passo del Foscagno, brook and spring, 2180 m, 46.483N, 10.222E, 24.IX.2021, leg. G. Vinçon (5 males, 8 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m, 45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (10 males, 2 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (5 males, 3 females; OPC).

Remarks. Paramere fusion is a pronounced speciation process in the *Allogamus uncatius* species group. The probably ancestral and nominate *A. uncatius* has the most plesiomorphic parameres fused only on its basal third and the apical two thirds is split, but adhering along its entire length. The length of splitting seems to separates sibling species. *Allogamus mendax* has the shortest apical split among the known species. However, we have detected some infra and interpopulational variations in the length of the apical split among the examined *A. mendax* populations. In the population at Gimillan, between 2300 and 2370



Map 10. *Allogamus hilaris* and *A. ligonifer* species subgroups and *A. uncatus* species group in South West Europe.

meters sampled by 10 males, the apical split is almost completely fused and reduced to the very tip, almost indiscernible, but two specimens have the typical split length present and well discernible.

***Allogamus pantinii* Oláh, Lodovici & Valle, 2014**

(Map 10)

Material examined. France, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (1 male, OPC).

Remarks. This species with almost unicolour light brown forewing without any distinct pattern was described from Italy (Piemonte-Cuneo) as most close to *A. mendax*, but differs by having the fused paramere with different arching and longer separated apical portion; paired dorsal branches of the aedeagus shorter and with distinctly laterad arching pattern; aedeagus apex turning slightly

upward, not straight. The same fine structural divergences in the speciation trait of the phallic organ are present at the specimen collected in France. This again demonstrates how stable are these fine shape modifications organised in the adaptive, non-neutral speciation traits. This species is new to France.

***Allogamus uncatus* (Brauer, 1857)**

(Map 10)

Material examined. Italy, Rhaetian Alps, Passo di Gavia, N. slope, from 2640 m, 46.355N, 10.494E, to 2700 m, 46.356N, 10.4876E, 24.IX.2021, leg. G. Vinçon (8 males, 6 females; OPC). Rhaetian Alps, Passo di Gavia N. slope, Gavia trib., above Ponte dell'Alpe, brook, 2330m, 46.383N, 10.494E, 24.IX.2021, leg. G. Vinçon (6 males, OPC). Dolomiti, S.E. Moso, near Biotop Patzenfeld-Moschermoos, spring and brook, 1530 m, 46.66875N, 12.3931E, 26.IX.2021, leg. G. Vinçon (6 males, 3 females; OPC). Julian Alps, E. Sella Nevea, brook below water capture, 1050 m, 46.3967N, 13.4995E, 26.IX.2021, leg. G. Vinçon

(3 males, 6 females; OPC). Rhaetian Alps, S.W. Passo dello Stelvio, springs and brooks, 2630 m, 46.5314N, 10.4435E, 25.IX.2021, leg. G. Vinçon (5 males, 4 females; OPC). Rhaetian Alps, above Livigno, N. slope of Passo del Foscagno, brook and spring, 2250 m, 46.5N, 10.205E, 24.IX.2021, leg. G. Vinçon (2 males, 8 females; OPC). Dolomiti, S.E. Moso, many springs below water captures, trib. Rio Bianco, 1650 m, 46.6552N, 12.4063E, 26.09.2021, leg. G. Vinçon (2 males, 3 females; OPC). Rhaetian Alps, Livigno, S. slope of Passo del Foscagno, brook and spring, 2350 m, 46.4757N, 10.214E, 24.IX.2021, leg. G. Vinçon (2 males, 1 female; OPC).

***Anisogamus difformis* (McLachlan, 1867)**

Material examined. **France**, Savoie, Iseran Pass, brooks and springs, Lenta trib. above Ouliette bridge, 2500 m, 45.4N, 7.045E, 5.IX.2021, leg. G. Vinçon (2 males, 5 females; OPC). Hautes-Alpes, Queyras Massif, Aiguilles, spring near 'Bergerie des Soldats', 2000 m, 44.8N, 6.8667E, 15.VIII.2021, leg. G. Vinçon (12 males, OPC). Hautes-Alpes, Queyras Massif, Aiguilles, brook and spring above 'Grand Laus lake', 2620 m, 44.8248N, 6.8697E 15.VIII.2021, leg. G. Vinçon (5 males, 4 females; OPC). Alpes-de-Haute-Provence, Bonnette Pass, north slope, nice spring and brook, 2570 m, 44.3434N, 6.7998E, 7.VIII.2021, leg. G. Vinçon (1 female, OPC). **Italy**, Toscana, Passo del Cerreto, 1400 – 1500 m, springs and brooks, 44.285N, 10.2286E, 11.VI.2021, leg. G. Vinçon (4 males, 5 females; OPC).

***Conсорophylax cairos* Oláh & Vinçon sp. nov.**

(Figures 53–57, Map 11, Photo 12)

Material examined. Holotype: **France**, Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E, 23.X.2021, leg. G. Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (5 males, 1 female; OPC).

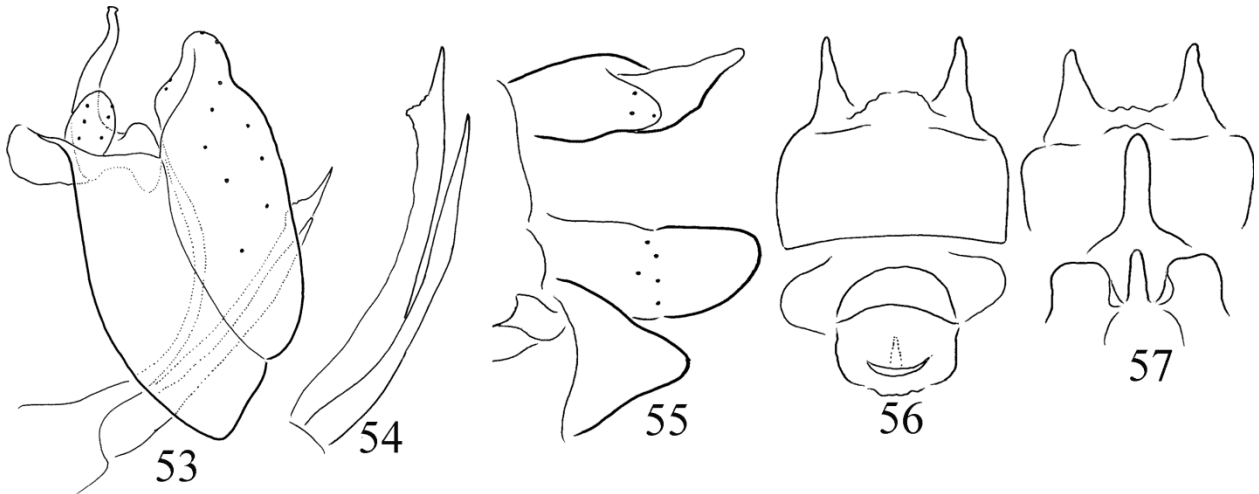
Diagnosis. This new species in the *Conсорophylax* genus is characterized by the unusually elongated unique gonopods as compared to

the low and long gonopod shape of the genus. This character state differentiates this new species from all the known species. The paramere is also apomorphic having lost all the setae. The female genital structure is very close to nominate species of the genus *Conсорophylax consors*, but its colour is light not dark and the longitudinal veins are not armed with strong setae.

Description. Male and female (in alcohol). This is a brown, less pigmented animal with brown cephalic and thoracic sclerites with variously lighter appendages. Forewing without strong, erect spine-like setae on the longitudinal veins of males, and with less pronounced spine-like setae on the longitudinal veins of females; membrane densely covered with tiny recumbent setae; forewing length 17 mm, female forewing length 12 mm. Tibial spur number 134 both at male and at female.

Male genitalia. Posterodorsal spinate area of vestitural noncellular microtrichia pronounced on tergite VIII, densely covered with tiny peg-like structures on light background. Segment IX long ventrally, very short strap or bridle-like dorsally; its lateral length is almost equally developed, parallel-sided. Segment X partly fused to tergite IX forming together the short dorsal bridle and partly present as less sclerotized membranous vestigium connecting mesad the invaginated basal part of the cerci. Cerci are ovoid in lateral view. Dorsal branch of paraproct elongated slender, slightly S-forming in lateral view, directed upward; well-produced ventral branch forming a closed train-gular shape. Gonopods narrowing apicad into an apical lobe extended mesad. Phallic organ composed of the slender aedeagus and of the pair of spine-like, upward curving paramere without any additional setae.

Female genitalia. Female genitalia is characterized with elongated two partited anal tube, formed by the complex of the fused tergite IX and segment X, basal part almost quadrangular in dorsal view and the apical part composed of two slender lateral lobes. Sternite IX without true setal surface like at other member of this genus, but this new species retained a short setal surface located vertical on the middle; the mesal plate



Figures 53–57. *Consorophylax cairos* sp. nov. Holotype male: 53 = genitalia in lateral view; 54 = phallic organ in lateral view. Allotype: female: 55 = genitalia in lateral view; 56 = anal tube with vaginal sclerite complex in dorsal view; 57 = genitalia in ventral view.

with sharp median ridge, semicircular in lateral view, digitiform narrow plate in ventral view; this usually glabrous ventral surface of sternite IX functions like the upper vaginal lip present as a free supragenital plate. The lower vaginal lip, the vulvar scale is visible somewhat separated from sternite VIII by its more sclerotized structure; the mesal lobe is longer than the lateral lobes. Vaginal sclerite complex short with characteristic apicolateral sclerotized lobes.

Etymology. Coined after the name of the Locus Typicus, a noun in apposition.

***Consorophylax consors* (McLachlan, 1880)**

(Map 11)

Material examined. **France**, Isère, Taillefer Massif, above Lac de l’Emay, springs and brooks, Bonne tributary, from 2550 m, 45.0348N, 5.9129 E to 2560 m, 45.0337N, 5.9139E, 17.X. 2021, leg. G. Vinçon (18 males, 13 females; OPC). Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 1850 m, 45.033N, 5.877E, 17.X.2021, leg. G. Vinçon (14 males, 12 females; OPC). Isère, Taillefer Massif near Prévourey lake, spring Guiliman tributary, 1630 m, 45.0328N, 5.8715E, 17.X.2021, leg. G. Vinçon (1 male,

OPC). Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 2060 m, 45.0357N, 5.8865E, 17.X.2021, leg. G. Vinçon (1 male, OPC). Alpes-Maritimes, below Moutière Pass, spring tributary of Clapouse torrent, 2420 m, 44.3359N, 6.7848E, 24.X.2021, leg. G. Vinçon (3 males, 4 females; OPC). Alpes-Maritimes, Valdeblore, Vallon des Mille Fonts, spring and brook, 2120 m, 44.1061N, 7.1869E, 24.X.2021, leg. G. Vinçon (3 males, OPC). **Italy**, Cogne, Gran Paradiso Massif, Gimillan, below upper Lussert Lake, 45.6583N, 7.396E, 2900m, 12.IX.2020 leg. Gilles Vinçon (2 males, OPC). Madonna di Campiglio, brook below Serodoli lake and above Serodoli lake, 46.246N, 10.78E, 2350–2380 m, 11.IX. 2020, leg. Gilles Vinçon (2 males, OPC). Toscana, Cerreto Pass, La Nuda glacial circus, 44.286N, 10.228E, 1460 m, 18.X.2020, leg. Gilles Vinçon (2 males, OPC). Rhaetian Alps, Passo di Gavia, N. slope, from 2640 m, 46.355N, 10.494E, to 2700 m, 46.356N, 10.4876E, 24.IX.2021, leg. G. Vinçon (19 males, 12 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook and springs below the first Lussant Lake, 2690 m, 45.6527N, 7.406E, 23.IX.2021, leg. G. Vinçon (6 males, 3 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook and springs below the second Lussant Lake, 2810 m, 45.6552N, 7.4007E and the third



Map 11. *Consorophylax* species occurring in the Italian Alps and Apennines (full circles represent the type localities).

Lussant Lake, 2910 m, 45.6584N, 7.3963E, 23.IX.2021, leg. G. Vinçon (5 males, OPC). Italy, Pennines Alps, High Sesia Valley, S.W. Sant'Antonio, Lago Verde outlet, 2850 m, 45.8215N, 7.8713E, 29.IX.2021, leg. G. Vinçon (2 males, 2 females; OPC). Rhaetian Alps, S.W. Passo dello Stelvio, springs and brooks, 2630 m, 46.5314N, 10.4435E, 25.IX.2021, leg. G. Vinçon (5 males, 4 females; OPC). Dolomiti, S.E. Moso, many springs below water captures, trib. Rio Bianco, 1650 m, 46.6552N, 12.4063E, 26.IX.2021, leg. G. Vinçon (4 males, 2 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m, 45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (6 males, 2 females; OPC). Rhaetian Alps, Passo di Gavia, S. slope, Rio di Gaviola, brook, 2420m, 46.337N, 10.4875E, 24.IX.2021, leg. G. Vinçon (9 males, 5 females; OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, spring, above Corona lake, 2750 m, 45.651N, 7.417E, 23.IX.2021, leg. G. Vinçon (5 males, 3 females; OPC). Italy, Pennines Alps, High Sesia Valley, S.W. Sant'Antonio,

below Lago Nero, nice spring and brook, 2640 m, 45.8142N, 7.88E, 29.IX.2021, leg. G. Vinçon (5 males, 3 females; OPC). Rhaetian Alps, Livigno, S. slope of Passo del Foscagno, brook and spring, 2350 m, 46.4757N, 10.214E, 24.IX.2021, leg. G. Vinçon (2 males, 1 female; OPC). Rhaetian Alps, Passo di Gavia, N. slope, below Lago Bianco, river, 2610m, 46.346N, 10.495E, 24.IX.2021, leg. G. Vinçon (4 males, 2 females; OPC). Rhaetian Alps, S.W. Passo dello Stelvio, spring, 2030 m, 46.5152N, 10.4057E, 25.IX.2021, leg. G. Vinçon (7 males, OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook and springs above the third Lussant Lake, 3020–3030 m, 45.6603N, 7.3907E, 23.09.2021, leg. G. Vinçon (3 males, 1 female; OPC). Pennines Alps, High Sesia Valley, S.W. Sant'Antonio, Lago Bianco outlet, torrent, 2330 m, 45.8075N, 7.8814E, 29.IX.2021, leg. G. Vinçon (1 male, OPC). **Switzerland**, Furkapass, 13.X.2006, leg. W. Graf (1 male, 1 female; OPC).

Remark. *C. consors* is the only one species occurring in our highest locality in the whole

Alpes, indeed it reaches 3020–3030 m in the Gran Paradiso Massif above the highest Lussant Lake (see details in the previous list). In this site, there is no vegetation at all, only stones where the spring appears. Probably it could be the highest mention of Trichoptera in Europe.

***Conсорophylax kimera* (Oláh & Vinçon, 2021)
comb. nov.**

(Map 11)

Chaetopteryx kimera Oláh & Vinçon, 2021: 51. “A rather unique chimeric species having several character states of different origin”

Material examined. **Italy**, Cogne, Gran Paradiso Massif, Lago Lussant n° 3, 2910 m, 45.6585 N, 7.3968E, 16.VI.2021, leg. G. Vinçon (1 male, 10 larvae, 2 larval cases; OPC). Cogne, Gran Paradiso Massif, Lago Lussant n° 2, 2810 m, 45.6555N, 7.4003E, 16.VI.2021, leg. G. Vinçon (3 males, 2 females, 3 larvae, OPC). Cogne, Gran Paradiso Massif, above Gimillan, spring and brook above Corona Lake, 2780 m, 45.6512N, 7.4172E, 16.VI.2021, leg. G. Vinçon (8 larvae? OPC). Cogne, Gran Paradiso Massif, Lago Lussant n° 1, 2710m, 45.655N, 7.407E, 16.VI.2021, leg. G. Vinçon (1 male, OPC). Lombardia, Passo di Gavia N. slope, Gavia River, 2560m, 46.35N, 10.496E, 15.VI.2021, leg. G. Vinçon (28 males, 4 females, 1 copula, 1 larva?; OPC). Italy, Lombardia, Passo di Gavia S. slope, Rio di Gaviola, brook, 2420m, 46.337N, 10.4875E, 15.VI.2021, leg. G. Vinçon (3 males, OPC). Lombardia, Passo di Gavia N. slope, below Lago Bianco, river, 2610 m, 46.346N, 10.495E, 14.VI.2021, leg. G. Vinçon (39 males, 8 females; OPC). Lombardia, Passo di Gavia N. slope, Gavia trib., above Ponte dell’Alpe, brook, 2330m, 46.383N, 10.494E, 15.VI.2021, leg. G. Vinçon (15 males, 1 female; OPC). Trentino Alto Adige, above Madonna di Campiglio, between Nero and Serotoli lakes, torrent, 2350 m, 46.246N, 10.780E, 14.VI.2021, leg. G. Vinçon (1 male, 1 female; OPC). Trentino Alto Adige, above Madonna di Campiglio, above Nambino lake, brook and spring, 2150 m, 46.247N, 10.79E, 14.06.2021, leg. G. Vinçon (1 female, OPC).

Remarks. The general habitus, the reduced body size, the brachypterous, highly spiny forewings and the enlarged female abdomen are typical character states of several *Chaetopteryx* species. The genital structure as well as the structure of the phallic organ has relations to several stenophylacini and chaetopterygini genera. The highly developed erect setae on the forewing of both male and female or only on female were already known to occur in several species in the *Potamophylax winneguthi* species group as well as in the autumnal flying *Allogamus* and *Simaphylax* genera. There is also species in the *Conсорophylax* genus with females armed with erect setae on the longitudinal veins. The development and dominance of erect spines have been considered as a cold-adaptation. The genital structure of the *Chaetopteryx kimera* species has most resemblance to the *Conсорophylax* genus and the massive development of the erect spines both on male and female forewing could be a cold-adaptation at the very high elevation of the species habitat. Therefore we move it to the genus *Conсорophylax*.

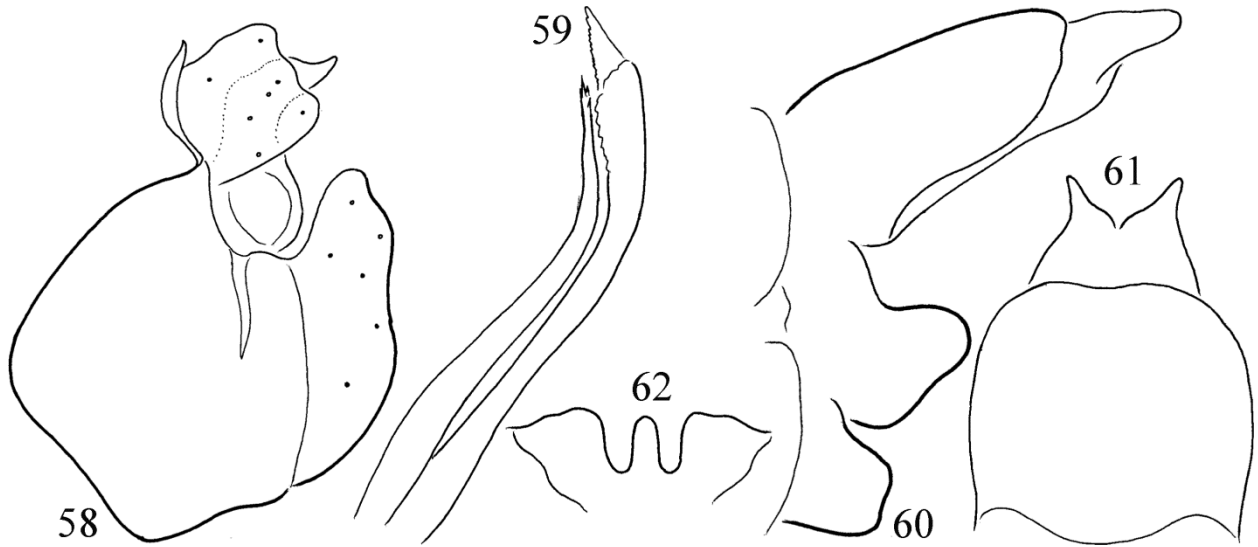
C. kimera was only known from the Gran-Paradiso Massif (Oláh & Vinçon 2021). In fact it has a wide distribution area on the southern slope of the Alps from the Dolomitti up to the Graian Alps (Gran-Paradiso Massif).

***Conсорophylax lagoverde* Oláh & Vinçon sp. nov.**

(Figures 58–62, Map 11, Photo 13)

Material examined. Holotype: **Italy**, Pennines Alps, High Sesia Valley, S.W. Sant’Antonio, Lago Verde outlet, 2850 m, 45.8215N, 7.8713E, 29.IX.2021, leg. G. Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (1 female, OPC). Associated larvae (15 specimens, OPC). These larvae could also belong to *C. consors* that occurred the same day in the same place.

Diagnosis. This new species in the *Conсорophylax* genus is close to *Conсорophylax lepon-tiorum* from lower elevation. However, this particularly small-sized species in the genus differs



Figures 58–62. *Consorophylax lagoverde* sp. nov. Holotype male: 58 = genitalia in lateral view; 59 = phallic organ in lateral view. Allotype: female: 60 = genitalia in lateral view; 61 = anal tube in dorsal view; 62 = vulvar scale (lower vaginal lip) in ventral view.

from its sibling species *lepontiorum* by having small size, very spiny forewing, gonopod narrowing, not truncated in lateral view as well as the apical region of aedeagus not setose.

Description. Male and female (in alcohol). This is a dark, highly pigmented animal with fuscous castaneous brown cephalic and thoracic sclerites with variously lighter appendages. Forewing with strong, erect spine-like setae present on the longitudinal veins, almost as pronounced like at Chaetopterygini tribe; membrane between veins densely covered with tiny recumbent setae; male forewing length 10 mm, female forewing length 9 mm. Tibial spur number 134 both at male and at female.

Male genitalia. Posterodorsal spinate area of vestitural noncellular microtrichia less pronounced on tergite VIII, scattered only with tiny peg-like structures on light background. Segment IX long ventrally, very short strap or bridle-like dorsally; its lateral length elongated by rounded convexity anterad, its posterior margin slightly concave. Segment X partly fused to tergite IX forming together the short dorsal bridle and partly

present as less sclerotized membranous vestigium connecting mesad the invaginated basal part of the cerci. Cerci are subquadrangular in lateral view fused partially to the dorsal branch of the paraproct. Dorsal branch of paraproct short, directed laterad; well-produced ventral branch forming a closed almost circular shape. Gonopods narrowing apicad in lateral view. Phallic organ composed of the slender aedeagus and of the pair of spine-like, upward curving paramere with apical spine-like setae.

Female genitalia. Female genitalia is characterized with an unusually elongated anal tube, diverging laterad in dorsal view forming a closed “anal tube” by the complex of the fused tergite IX and segment X. Sternite IX without any setal surface and almost indiscernible; the mesal plate with sharp median ridge; this glabrous ventral surface of sternite IX functions like the upper vaginal lip present as a free supragenital plate. The lower vaginal lip, the vulvar scale visible somewhat separated from sternite VIII by its more sclerotized structure; the mesal lobe as long as the lateral lobes. Vaginal sclerite complex short with characteristic apicolateral sclerotized process.

Etymology. Coined after the name of the Locus Typicus, a noun in apposition.

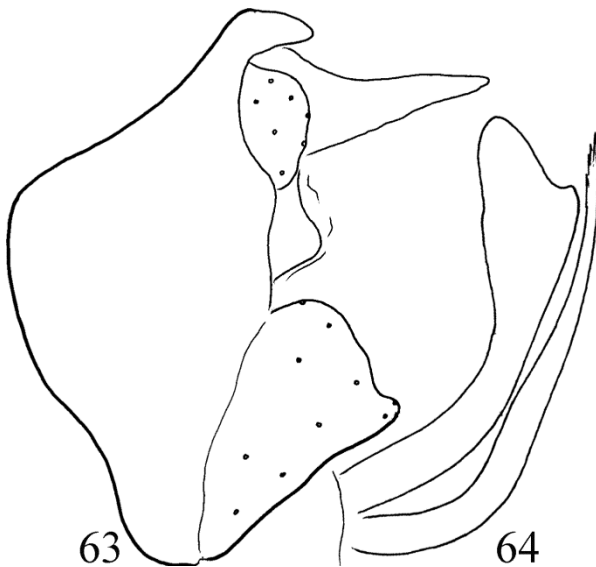
Remark. The collecting site is the outlet of one of the highest lakes in the close surroundings of the famous Mont Rose Massif (Monte Rosa), (4634 m) in the heart of the Valaisanne and Pennines Alps.

***Conсорophylax livek* Oláh & Vinçon sp. nov.**

(Figures 63–64, Map 11, Photo 14)

Material examined. Holotype: **Slovenia**, near Italian border, Julian Pre-Alps, below Livek, spring and brook, 600 m, 46.2123N, 13.5939E, 28.IX. 2021, leg. G. Vinçon (1 male, OPC).

Diagnosis. This is a unique new species in the *Conсорophylax* genus having extremely small body size as well as highly reduced spur number, 022. Spur number of 134 is more or less present at all of the known species however, we have found intrapopulational variation in several species as well as asymmetry is rather abundant. Has some resemblance to *Conсорophylax piemontanus*, but the lateral profile of the gonopods blunt, not narrowing apicad, paraproct much more developed, dominating on the entire genitalia as well as the aedeagus head is differently formed.



Figures 63–64. *Conсорophylax livek* sp. nov. Holotype male: 63 = genitalia in lateral view; 64 = phallic organ in lateral view.

Description. Male and female (in alcohol). This is an extremely small sized, light coloured species, with cephalic and thoracic sclerites brown centrally and fade on periphery; appendages lighter. Forewing without any erect spine-like setae of 7 mm length. Tibial spur number highly reduced, 022.

Male genitalia. Posterodorsal spinate area of vestitural noncellular microtrichia less pronounced on tergite VIII, scattered with tiny peg-like structures. Segment IX short ventrally, very short strap or bridle-like dorsally; its lateral length elongated by rounded triangular convexity anterad, its posterior margin slightly concave. Segment X partly fused to tergite IX forming together the short dorsal bridle and partly present as less sclerotized membranous vestigium connecting mesad the invaginated basal part of the circular cup-like cerci. Cerci semicircular in lateral view fused partially to the dorsal branch of the paraproct. Dorsal branch of paraproct slender, dominating the genital structure; tapering straight and directed posterad; well-produced ventral branch forming a closed almost circular shape. Gonopods short and blunt in lateral view with a small ventroapical lobe. Phallic organ composed of the robust aedeagus with bilobed apex in dorsal view and of the pair of spine-like, upward curving paramere with a few spine-like apical setae.

Etymology. Coined after the name of the Locus Typicus, a noun in apposition.

Remark. *C. livek* occurs in the Julian Pre-Alps, rather isolated from the Julian Alps since they are separated from them by the wide Isonzo Valley also named Soča Valley. The collecting locality is just 2.5 km from the Italian border, in a humid region close to the Adriatic sea shore.

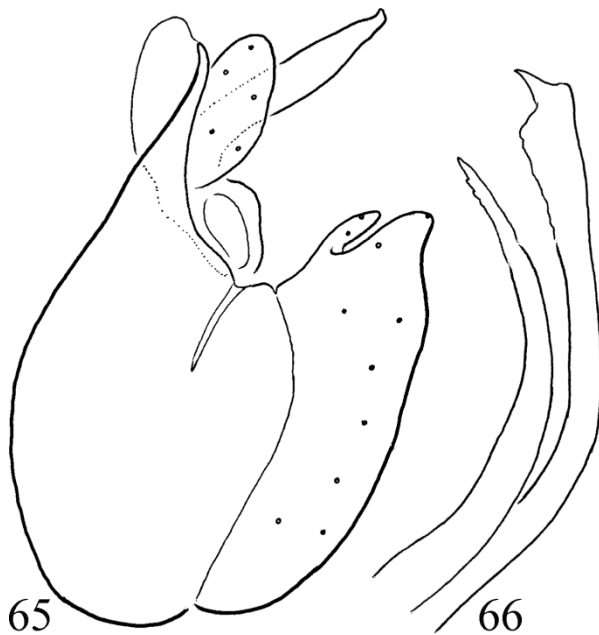
***Conсорophylax seolan* Oláh & Vinçon sp. nov.**

(Figures 65–66, Map 11, Photos 15–16)

Material examined. Holotype: **France**, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (1 male,

OPC). Allotype: same as holotype (1 female, OPC). Paratype: same as holotype (1 male, OPC).

Diagnosis. This is a new species in the *Conсорophylax* genus, an endemic alpine genus occurring only in the Alps and recently reported in the central part of the northern Apennines (Oláh *et al.* 2021). Very close to *Conсорophylax consors* the most distributed and the putative ancestral species of the genus, but differs by character state of the speciation trait that is the paramere. The gonopods with bilobed apex, somewhat more pointed and slender, than at *C. consors*, however the stability of this neutral, non-adaptive organ is uncertain, probably variable. The real divergence is organised in the spine pattern of the paramere head. *Conсорophylax consors* has the paramere head armed with well produced set of spine-like setae composed of three dorsoapical and single ventroapical spines. The spine pattern is stable in all the examined population including population from Switzerland and Toscana, Italy. *Conсорophylax seolan* sp. nov. has lost entirely the modified spine-like setae on the paramere head. This new species of the genus is an incipient sibling species, recently split by the speciation trait of paramere from *Conсорophylax consors*.



Figures 65–66. *Conсорophylax seolan* sp. nov. Holotype male: 65 = genitalia in lateral view; 66 = phallic organ in lateral view.

Description. Male and female (in alcohol). This is a dark, highly pigmented animal with fuscous castanean brown cephalic and thoracic sclerites with variously lighter appendages. Forewing with a few erect spine-like setae present on the longitudinal veins, mostly on anal and cubital veins; membrane between veins densely covered with tiny recumbent setae; male and female forewing length 15 mm Tibial spur number 134 both at male and at female.

Male genitalia. Posterodorsal spinate area of vestitural noncellular microtrichia less pronounced on tergite VIII, scattered only with tiny peg-like structures. Segment IX long ventrally, very short strap or bridle-like dorsally; its lateral length elongated by rounded convexity anterad, its posterior margin slightly concave. Segment X partly fused to tergite IX forming together the short dorsal bridle and partly present as less sclerotized membranous vestigium connecting mesad the invaginated basal part of the circular cup-like cerci. Cerci are ovoid in lateral view fused partially to the dorsal branch of the paraproct. Dorsal branch of paraproct slender, tapering straight and directed posterad; well-produced ventral branch forming a closed almost circular shape. Gonopods bilobed. Phallic organ composed of the slender aedeagus and of the pair of spine-like, upward curving paramere without any spine-like setae.

Female genitalia. Female genital structure is identical with its sibling species *Conсорophylax consors*.

Etymology. Coined after the name of the Locus Typicus, a noun in apposition.

Remarks. The Grande Séolane (2909 m) is one of the highest mounts at the western extremity of the wide Mercantour Massif (Southern French Alps). It is calcareous with karstic relief. The Mercantour Massif harbors a rich biodiversity.

***Conсорophylax styriacus* Botosaneanu, 1967**

(Map 11)

Material examined. Italy, Atesine Alps, N. Maranza, above Seefeldsee, brook, 2390 m and

above, 46.8827N, 11.6597E, 25.IX.2021, leg. G. Vinçon (2 males, OPC). Atesine Alps, N. Maranza, above Seefeldsee, brook, 2330 m, 46.88N, 11.658E, 25.IX.2021, leg. G. Vinçon (4 males, OPC).

Remark. This species is new to Italy.

***Enoicyla pusilla* (Burmeister, 1839)**

Material examined. **France**, Pyrénées-Atlantiques, below Sainte-Engrâce, nice torrent near the old mill, 610 m, 42.997N, 0.8238W, 17.XI.2021, leg. G. Vinçon (1 male, OPC). **Spain**, Asturias, Puerto de Leitariegos, brook and spring, 1550 m, 43.001N, 6.4185W, 15.XI.2021, leg. G. Vinçon (1 male, OPC). Asturias, Puerto de Tarna, E Tarna, brook and spring, 1130 m, 43.1096N, 5.2183W, 14.XI.2021, leg. G. Vinçon (1 male, OPC).

***Halesus rubricollis* (Pictet, 1834)**

Material examined. **France**, Isère, Ferrand V., lateral spr., Bruant tor., 2210 m, 45.1162N, 6.1618E, 22.VIII.2021, leg. G. Vinçon (1 male, OPC). Isère, Ferrand V., lateral spr., Grand Sablat tor., 2380 m, 45.1199N, 6.1498E, 22.VIII.2021, leg. G. Vinçon (1 male, 1 female; OPC). Drôme, Dévoluy massif, Jarjatte, Fontaine des Mougious, very nice spring, 1470 m, 44.6863N, 5.7964E, 18.IX.2021, leg. G. Vinçon (1 male, 3 females; OPC). Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, from 2140 m, 44.35N, 6.555E to 2220 m, 44.348N, 6.552E, 12.IX.2021, leg. G. Vinçon (5 females, OPC). Isère, Vercors, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 29.X.2021, leg. G. Vinçon (6 females, OPC). **Italy**, Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, springs near the bridge, 1900 m, 45.625N, 7.376E, 23.IX.2021, leg. G. Vinçon (1 male, 3 females; OPC). Lombardian Pre-Alps, Bergamo, Passo San Marco, N. slope, brooks and springs, 1820 m, 46.058 N, 9.63E and 1600m, 46.0696N, 9.6288E, 24.IX.2021, leg. G. Vinçon (2 females, OPC). Graian Alps, above Cogne, Gran Paradiso Massif, Gimillan, brook in open grass land, from 2300 m,

45.64N, 7.4E to 2370 m, 45.642N, 7.403E, 23.IX.2021, leg. G. Vinçon (2 males, 2 females; OPC).

***Melampophylax melampus* (McLachlan, 1876)**

Material examined. **France**, Isère, Alpe du Jocu, spring below a water catchment, and lateral springs, 1380–1420 m, 44.729N, 5.66E, 30.X.2021, leg. G. Vinçon (2 males, 2 females; OPC). **Italy**, Lombardian Pre-Alps, Bergamo, Passo San Marco, N. slope, brooks and springs, 1820 m, 46.058N, 9.63E and 1600 m, 46.0696N, 9.6288E, 24.09.2021, leg. G. Vinçon (3 males, 2 females; OPC).

***Platyphylax* McLachlan, 1871**

(Map 12)

Platyphylax g. n. McLachlan, 1871:109–110. “I form this genus for the reception of some insects that have been placed in *Enoicyla* genus on account of their spur-formula being identical (i.e. so far as the winged male of *Enoicyla* is concerned) but which are evidently very closely allied to *Stenophylax*.” In *Platyphylax* should be placed the European *E. frauenfeldi*, Brauer and *E. kolenatii* Kol (*frauenfeldi* ♂?), the North American *E. subfasciata*, Say, *E. designata*, Walker, and *E. lepida*, Hagen, and the Chinese species described below as *P. lanuginosus*.

Platyphylax McLachlan, 1875: 143–144. “I consider the European *P. frauenfeldi* to be typical of this genus; the Siberian *P. nigro-vittatus* diverges in many respects, and especially in its short stout palpi. The Chinese *P. lanuginosus*, and numerous North American species, are widely divergent, and in a general work on the species of the world it would be necessary to place them in several genera, unless *Platyphylax* be rendered as heterogeneous as *Limnephilus* and *Stenophylax* are at present.”

Platyphylax McLachlan, 1875: Schmid 1955:181–182. “*Platyphylax* a été un grand genre dans lequel fut classé toute une faune très hétéroclite. Actuellement, il ne contient plus que quatre espèces. J’en transporte deux, *lanuginosus* McL. et *rufescens* Mart. dans le genre *Nothopsyche* Bks et une, *fulvipennis* Mart. dans *Stenophyliella* Mos. Le genre devient donc monobasique. *Platyphylax* est très voisin de *Halesus* par les grandes lignes de l’armature génitale des deux sexes et surtout par la structure de l’appareil vaginal. *Platyphylax* ne contient qu’une seule espèce automnale, spora



Map 12. *Platyphylax* genus in southern Europe (full circles represent the type localities).

dique, très rare, et dont l'aire de répartition est probablement discontinue. Génératype désigné par McLachlan (1875): *Platyphylax frauenfeldi* Brau.”

Remarks. This genus originally contained four known species, but Schmid (1955) has removed three species to another genus with reasonable justification and *Platyphylax* became monotypic with the sole species *Platyphylax frauenfeldi* (Brauer, 1857). We have found the second species of the genus in the Balkan Mountains, *Platyphylax beshkovi* Oláh, 2019 (Oláh *et al.* 2019). Like many other limnephiline taxa the *Platyphylax* genus has the neutral periphallitic structures and their character combination very similar to many other limnephiline genera and distinguished only by the specific structure of the phallic organ and the paraproc. Here we describe the third species of this monotypic genus from France: *Platyphylax vinconi* sp. nov.

***Platyphylax beshkovi* Oláh, 2019**

(Map 12)

Platyphylax beshkovi Oláh, 2019:82–83. “This new species is close to *Platyphylax frauenfeldi*, but

differs by having apices of gonopods bilobed, not pointed, cerci elongated, not subtriangular, paraproc elongated, not short. The paramere tip bifid, not multifid.”

Material examined. Holotype: **Albania**, Delvina Region, Syri i Kalter near Bistrice Village, 155 m, N39°55'23" ; E20°11'30" 23.X.2017, leg. S. Beshkov & A. Nahirnic (1 male, OPC). Allotype: Albania, Gjirokastrë county, Finiq municipality, Syri i Kaltër spring, N39°55'23", E20°11'30", 155 m, 3.XI.2018, leg. S. Beshkov & A. Nahirnic (1 female, OPC). Paratype: same as holotype (1 male, OPC). Albania, Gjirokastrë county, Finiq municipality, Syri i Kaltër spring, N39°55'23", E20°11'30", 155 m, 3.XI.2018, leg. S. Beshkov & A. Nahirnic (17 males, 23 females; OPC).

Remarks. Large sized animal with forewing of 25 mm. It is known only from its locus typicus on low elevation, a unique aquatic habitat. The Blue Eye “bottomless” spring in Albania, a rare nature monument of an outstanding, unique value. Its clear blue water is more than fifty meters deep, reaching unknown depth. Divers were unable to descend to the bottom of the karst hole due to the

extremely strong upward directed water current. Water temperature is 11–12 C°, average water discharge 7 m³/sec.

***Platyphylax frauenfeldi* (Brauer, 1857)**

(Map 12)

Enoicyla frauenfeldi Brauer, 1857:45–46. Coloration and wing venation briefly described. “An der steirischen Grenze. Oktober. Selten. (Frauenfeld).” According to the published drawings the species was described from a female specimen.

Material examined. Hungary, River Dráva, Szentborbás, 25.X.1981, light leg. Á. Uherkovich (3 males, 1 female; OPC). River Dráva, Órtilos, 22.X.1991, light leg. Á. Uherkovich (2 males, OPC). River Dráva, Órtilos, 21.X.1996, light leg. Á. Uherkovich (2 females, OPC). River Dráva, Vízvár, N46°05'13" E17°13'24", 5.XI.1996, leg. S. Nógrádi & Á. Uherkovich (1 male, OPC).

Remarks. An almost extinct species that was represented only by a few singular historical specimens and afterwards hardly any data were published by European authors, so it could be supposed that the species is disappearing. However, it was rediscovered in Hungary along the Drava River and 119 specimens were collected between 1975 and 1996 (Uherkovich & Nógrádi, 1997). At the end of October, 2000, 51 more specimens were collected at the Drava River, at Vízvár and Órtilos, Hungary and the larvae were bred by the *ex ovo* breeding method and described by Malicky *et al.* (2002).

***Platyphylax vinconi* Oláh sp. nov.**

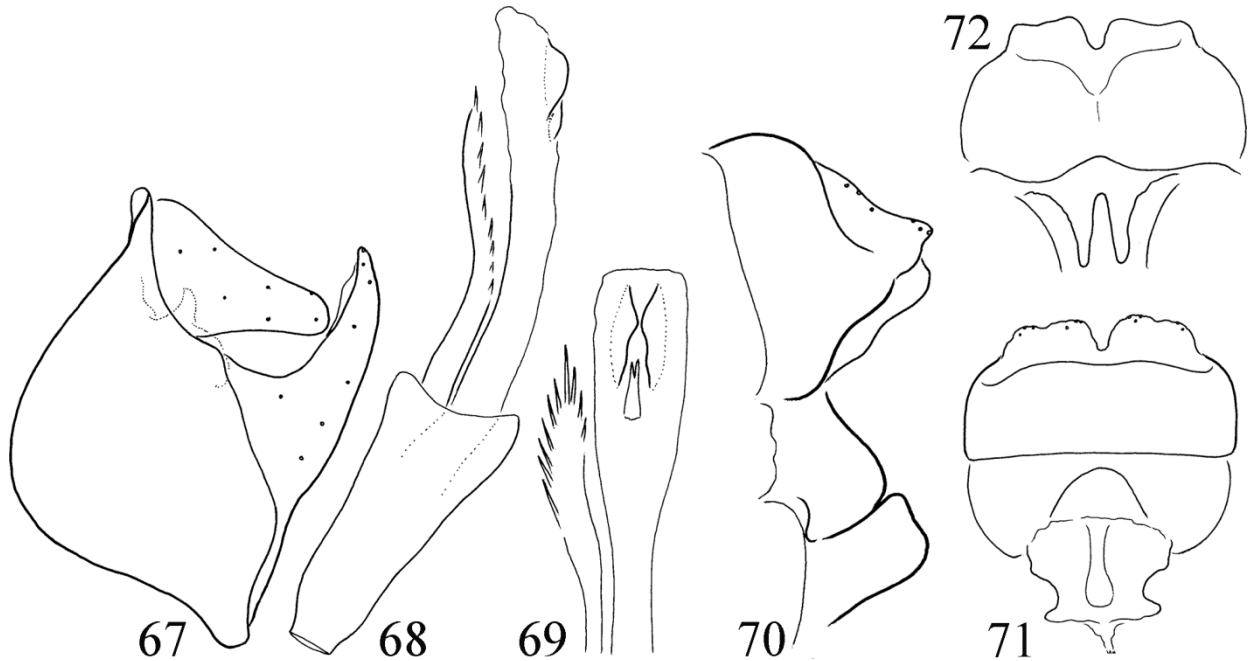
(Figures 67–72, Map 12, Photos 17–18)

Material examined. Holotype: France, Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 2050 m, 45.0355N, 5.8861E, 18.VII.2021, leg. G. Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (5 males, OPC).

Diagnosis. This new stenophylacini species is organised by rather large perturbations. It was a

trouble to relate it to any genera in the Stenophylacini tribe. Even its relation to the tribe was not easy to establish. One more trivial example of the reticulation, the basic chimeric nature of any speciation! The stenophylacini character states of body habitus, wing habitus, and basic structure of periphallic organs are combined with a similarity to the apomorphic limnephilid character state of the paramere on the phallic organ. The plesiomorphic bilobed apical setose lobes of the limnephiline tribe are modified in several genera, like in the derived *Anabolia* lineage with apomorphic monolobous paramere, by simplification, into an enlarged monolobous setose apical portion. *Platyphylax vinconi* sp. nov. has this type of enlarged apical portion of paramere, however the setae modified into rather strong spines typical for the stenophylacini tribe instead of the unmodified, fine sensory structures, typical for the limnephilini tribes and only seldom with stronger setae.

The structural organisation of the paraproct and of the phallic organ relates this new species to the *Platyphylax* genus. The reduced almost vestigial paraproct is the synapomorphic character state of the genus; no any other genera in the Stenophylacini tribe have vestigial paraproct. Even, in the Limnephilini tribe there is only a single genus *Sakala* described recently (Oláh *et al.* 2020) having vestigial paraproct. The reduction of paraproct is a rare, large perturbation in the entire Limnephilidae family. There is vestigial paraproct present also in the *Ecclisopteryx* genus of the Drusinae subfamily inside the Limnephilidae family. However, the synapomorphic character state of the reduced paraproct in the *Platyphylax* genus is not a stable condition. It is complicated by incongruences. *Platyphylax beshkovi* Oláh, 2019 having typical *Platyphylax* type of phallic organ with anterad pointed apicoventral sclerites on the aedeagus has fully produced and well developed paraproct. It seems it is rather a rule than exception that majority of lineage formation is highly incongruence laden with sheer random complexity. Due to external and internal environmental factors created by mutations and substitution of stochastic quantum clouds there are 10⁴–10⁶ molecular lesions per cell



Figures 67–72. *Platyphylax vinconi* sp. nov. Holotype male: 67 = genitalia in left lateral view; 68 = phallic organ in lateral view; 69 = phallic organ in ventral view. Allotype female: 70 = genitalia in left lateral view; 71 = anal tube and vaginal sclerite complex in dorsal view; 72 = genitalia in ventral view.

per day affecting genetic mechanisms and producing permanently various chromosomal rearrangements by insertion, deletion, inversion, translocation, duplication, including *cis*-regulatory elements and dormant pseudogene resurrections (Hoeijmakers, 2009).

Platyphylax vinconi sp. nov. has vestigial paraproct like the type species of the genus *P. frauenfeldi* Brauer, 1857, but the phallic organ is highly modified by rather large perturbations. The pair of apicoventral sclerites is present, but without anterad turning pointed hook formation as well as the paramere has an enlarged apical region with numerous spine like setae.

Description. Male (in alcohol). Medium-sized animal. Yellowish light brown-coloured animal; forewing light-brown-coloured without discernible speckled darker brown spots. Male and female spurs: 134. Forewing length 15 mm.

Male genitalia. Tergite VIII with spinulose protuberance, with anchoring strong setae, short spines or pegs, that is with setate or spinate area.

Segment IX long almost subovoid in lateral view with short dorsal and ventral regions. Cavity of segment X lined by cerci and subdivided by a dorsomesal inner ridge is less pronounced. Cerci robust, elongated, downward directed. Paraproct reduced, especially its ventral branch that almost indiscernible. Gonopod narrowing, pointed. Phallic organ with aedeagus supplied with a pair of apicoventral sclerites without anterad curving pointed apex and with paramere of enlarged apical half armed with numerous spine-like modified setae, more on lateral and less on mesal margin.

Female genitalia. There is a closed “anal tube” formed by the complex of the fused tergite IX and segment X; this tube that is more or less closed at many limnephilid females. Tergite IX with narrowing, almost pointed apicolateral processes in lateral view and with a narrow and deep apicommesal excision in dorsal view. Sternite IX is without any setal surface and almost indiscernible; the mesal plate with median ridge; this glabrous ventral surface of sternite IX functions like the upper vaginal lip present as a free supra-genital plate. Segment X represented by a closed

ring heavily setose laterad and with a small pointed process dorsoapicad. The lower vaginal lip, the vulvar scale is visible somewhat separated from sternite VIII by its more sclerotized structure; the mesal lobe is as long as the lateral lobes. Vaginal sclerite complex short with characteristic apico-lateral sclerotized process.

Etymology. Named after the collector, Gilles Vinçon, very sophisticated and efficient field collector of caddisflies.

***Potamophylax albergaria* Malicky, 1975**

Material examined. **Spain**, Asturias, Puerto del Palo Allande, brook and spring, 950 m, 43.2778N, 6.6681W up to 1000 m, 43.2764N, 6.6725W, 16.XI.2021, leg. G. Vinçon (2 males, OPC).

***Potamophylax inermis* Moretti & Cianficconi, 1994**

Material examined. **Italy**, Abruzzi, Sorgenti del Vera, 650 m, 42.372N, 13.4585E, 26.V.21, leg. G. Vinçon (1 male, OPC).

***Potamophylax spinulifer* Moretti, 1994**

Material examined. **France**, Alpes-Maritimes, below Cipières, spring and brook, 660 m, 43.787 N, 6.9534E, 19.IX.2021, leg. G. Vinçon (2 males, 1 female; OPC).

Remarks: This species is new for the French Fauna. Its subspecies status was raised recently to species rank (Oláh *et al.* 2018).

***Simaphylax* genus**

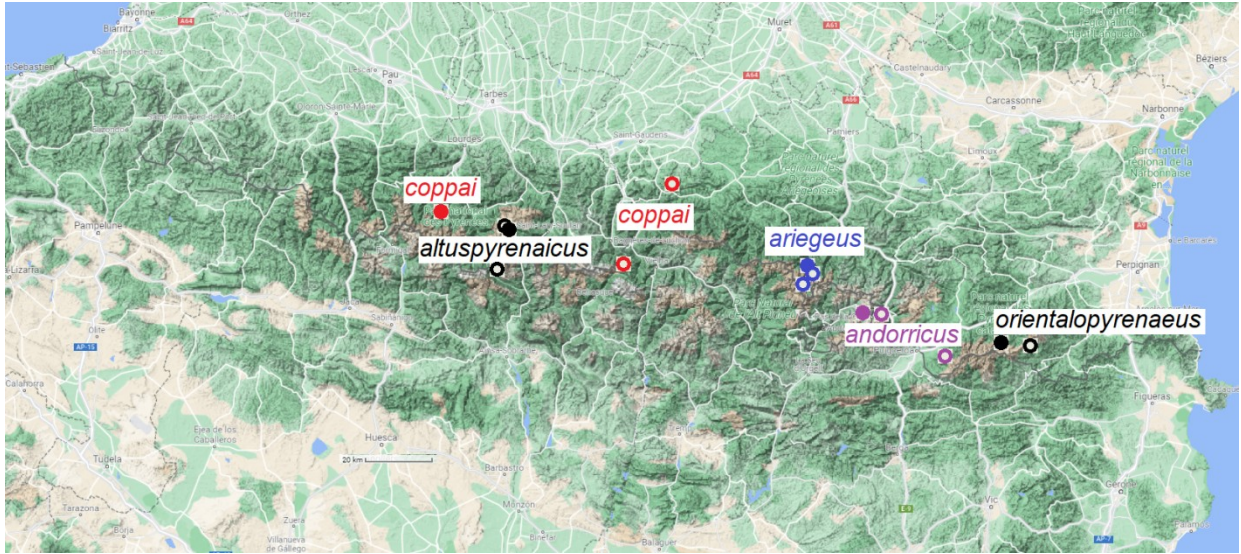
(Maps 13, 14)

Simaphylax Oláh, 2019:78–79: *Simaphylax* gen nov. was split from the *Melampophylax* genus based upon the entirely different genitalic character state and paramere organisation including the highly apomorphic character state of the elongated vaginal dorsal sclerite complex in the female genitalia.

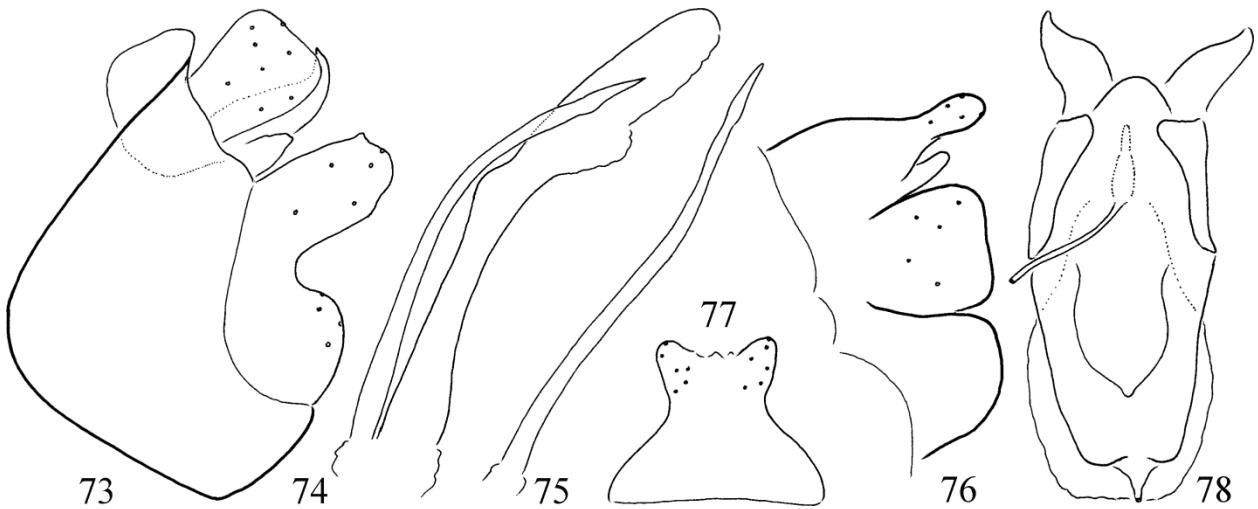
We have carried out a detailed lineage sorting of tribes and genera by parameres in the Limnephilinae subfamily applying the principles and procedures of fine phenomics in order to establish transformation series of the polarized plesiomorphy-apomorphy character states for each limnephiline genera (Oláh *et al.* 2019). The character state combination of the basic structural units of both the male and female genitalia demonstrated genuine generic level divergences in the *Melampophylax* genus established by Schmid (1955). Based upon these generic level divergences we have split and described a new genus *Simaphylax* from the *Melampophylax* genus:

Melampophylax genus. Segment IX and gonopods fused; gonopods separated, without ventromesal plate; paraproct composed of several spine-like processes; position of cerci rather transversal, aedeagus with spine-shaped processes, parameres with several spine-like modified setae. Vaginal dorsal sclerite complex is not elongated, but accompanied with a unique ventral vaginal sclerite giving ventral support to the membranous and flexible vaginal chamber. The highly specialized male and female genitalia suggest and confirm an earlier divergence of this small group supporting an independent generic taxonomic rank, differentiated from the *Simaphylax* genus.

Simaphylax genus. Segment IX and gonopods not fused; gonopods not separated, touching mesad with well-produced ventromesal plate; paraprocts form a simple pair of hook-shaped dorsal branches; position of cerci rather sagittal; aedeagus simple without any spine-like process, only lateral flange present to house the parameres; parameres simple elongated spine-like rod, without any spine-like modified setae. Very characteristic and species specific terminal blade evolved on the speciation trait of paramere in each species. This peculiar terminal configuration is a product of sexual coevolution. The pair of the internal tubes inside the elongated vaginal sclerite complex receives the elongated rod-shaped parameres during copulation. The terminal blade has crucial function to introduce the paramere shafts into the



Map 13. *Simaphylax* genus in the Pyrenees (full circles represent the type localities).



Figures 73–78. *Simaphylax altuspyrenaicus* (Botosaneanu, 1994). Male: 73 = genitalia in left lateral view; 74 = phallic organ in lateral view; 75 = paramere in dorsal view. Female: 76 = genitalia in left lateral view; 77 = anal tube in dorsal view; 78 = vaginal sclerite complex in dorsal view.

long internal tubes inside the elongated vaginal sclerite complex during copulation. Vaginal dorsal sclerite complex is very much elongated to receive the parameres and the vaginal chamber is without any ventral sclerite.

Simaphylax genus presently consists of 15 species. Their locus typicus: *altuspyrenaicus* (Botosaneanu, 1994), France: Pyrenees; *andorricus*

sp. nov., France: Pyrenees; *ariegeus* sp. nov., France: Pyrenees; *austriacus* (Malicky, 1990), Austria; *banaticus* (Botosaneanu, 1995), Romania: Southern Carpathians; *cantalicus* (Botosaneanu, 1994), France: Massif Central; *coppai* sp. nov. France: Pyrenees; *gutinicus* (Botosaneanu, 1995), Romania, Eastern Carpathians; *keses* (Coppa & Oláh, 2015), France: Alpes-de-Haute-Provence; *mucoreus* (Hagen, 1861), Switzerland;

nepos (McLachlan, 1880), Germany, Altwater Mountains; *orientalopyrenaicus* (Coppa, 2016), France, Pyrenees; *polonicus* (Malicky, 1990), Poland; *szczesnyorum* (Oláh & Chvojka, 2015), Ukraine; *triangulifera* (Botosaneanu, 1957), Romania, Eastern Carpathians.

***Simaphylax altuspyrenaicus* (Botosaneanu, 1994)**

(Figures 73–78, Map 13, Photos 19–20)

Melampophylax altuspyrenaicus Botosaneanu, 1994: 363. “Holotype: ♂, 8.X.1961, France, Pyrénées: River Neste d’Aure in the neighbourhood of the lake of Oredon, ca. 1810–1880 m.a.s.l.; leg. H. Decamps - det. as *M. mucoreus* (Hagen). In the Z.M.A.”

Simaphylax altuspyrenaicus (Botosaneanu, 1994): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. **France**, Hautes-Pyrénées, Néouvielle Massif, below Aumar lake, springs, 2150 m, 42.8417N, 0.1446E, 13.X.2021, leg. G. Vinçon (5 males, OPC). Aumar Lake and Oredon Lake, the locus typicus are very close one from the other; the water of the Aumar lake flows down in the Oredon lake, both belonging to the Natural National Reserve of the Néouvielle Mount. Hautes-Pyrénées, Aragnouet, Estaragne brook, 2100 m, 42.8136N, 0.1466E, 18.XI.2021, leg. G. Vinçon (5 males, 1 female; OPC). **Spain**, Huesca, Bielsa, Pineta Valley, brook and spring, 2250 m, 42.7026N, 0.1015E, 18.XI.2021, leg. G. Vinçon (18 males, 1 female; OPC). Huesca, Bielsa, Pineta Valley, brook, 1620 m, 42.6913N, 0.0897E, 18. XI. 2021, leg. G. Vinçon (4 males, 4 females; OPC).

Remarks. We have examined the type material of this interesting species described from the High Pyrenees (Oláh *et al.* 2015). However, the genital structure of the holotype as well as the allotype was almost totally damaged by over-clearing and the originally published drawings were uncertain. We were lucky to collect 5 males from the locus typicus and a detailed examination of all the five genitalia clearly confirmed the reliability of

Botosaneanu’s original drawings, especially the diagnostic, downward curving apical third of the paramere is real, not deformed.

A new drawing of the *Simaphylax altuspyrenaicus* (Botosaneanu, 1994) collected in Aragnouet Department of Hautes Pyrénées published by Coppa (2016) is completely different from the original female drawings of Botosaneanu. The dorsal profile of the vaginal sclerite complex is long and narrow slender, not short and broad fat of the original drawings. We were lucky to collect a female together with 18 males of *Simaphylax altuspyrenaicus* and its genital structure is entirely identical with the original drawings. Therefore, we confirm the female identity as drawn in the original species description. The female collected in Aragnouet Department of Hautes-Pyrénées and described and drawn by Coppa (2016) as *Simaphylax altuspyrenaicus* (Botosaneanu, 1994) represents probably the female of *Simaphylax coppai* sp. nov. This species is new for the Spanish Fauna.

***Simaphylax cantalicus* (Botosaneanu, 1994)**

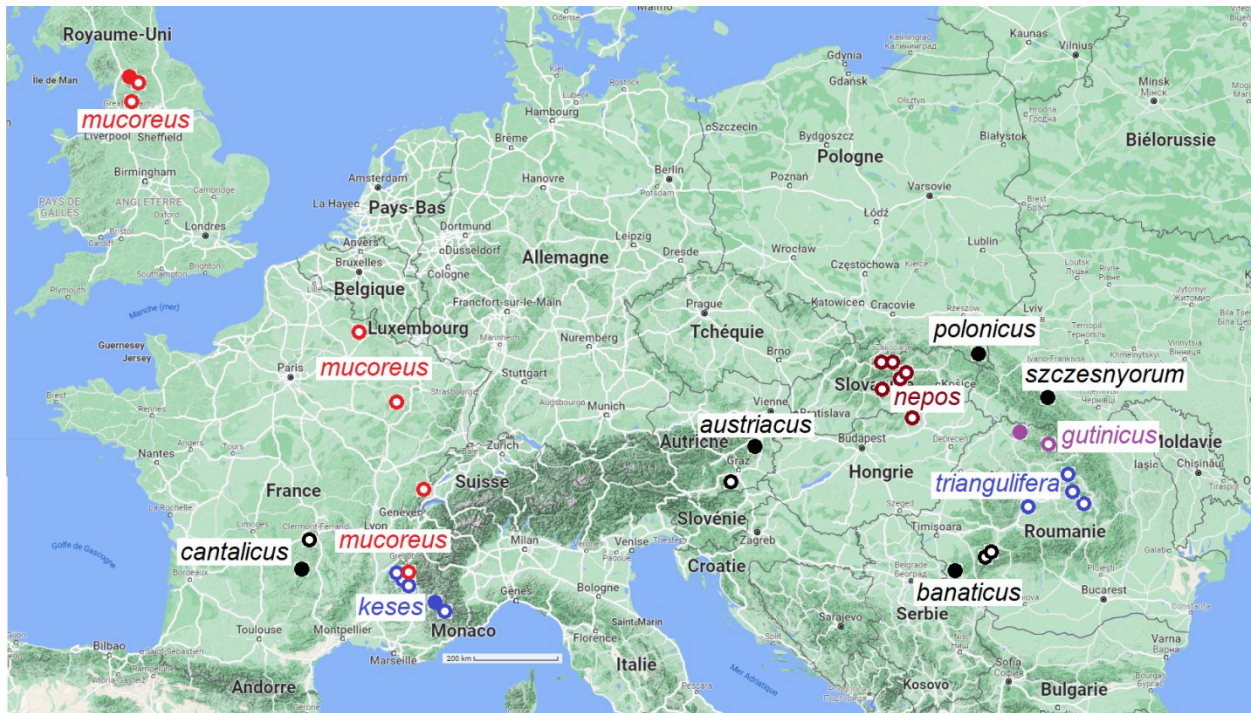
(Map 14)

Melampophylax cantalicus Botosaneanu 1994: 364–365. “Holotype: ♂, 10.XI.1982, France, Cantal (Massif Central): tributary of Ruisseau des Cros, ca. 1300 m.a.s.l.; leg. A. Thomas. In the Z.M.A. Paratypes: 2♂; same date and locality as the holotype.”

Simaphylax cantalicus (Botosaneanu, 1994): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. France: Puy de Dome, Chambon, Ru en Amont de la Croix Morand, 11.X.2007, leg. G. Coppa, (2 males, 2 females; OPC).

Remarks. This unique species easily distinguished from all the other species by its paramere covered with numerous spicules and by the shape of the elongation of the vaginal sclerite complex.



Map 14. *Simphylax* genus in the rest of Europe (full circles represent the type localities).

***Simphylax coppai* Oláh & Vinçon sp. nov.**

(Figures 79–83, Map 13)

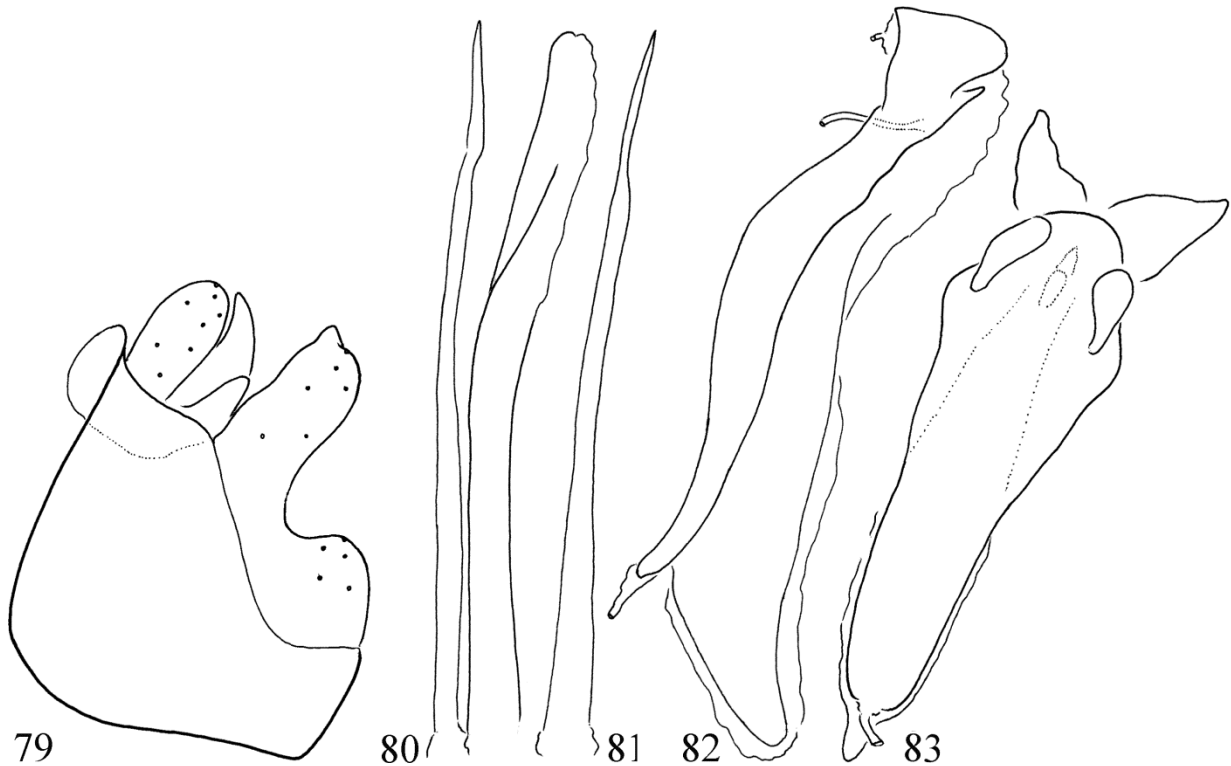
Melampophylax altuspyrenaicus Botosaneanu, 1994: Oláh *et al.* 2015: 49–50. Due to the damaged over-cleared genitalia of the holotype a single male collected at Estaing, Ilheou, nearby the locus typicus was drawn and designated erroneously as lectotype of *M. altuspyrenaicus*. Misdesignation.

Material examined. Holotype: **France**, Hautes-Pyrénées, Estaing, Ilheou, 3.XI.2010, leg. G. Coppa, (1 male, OPC). Allotype: France, Haute-Garonne, Bagnère-de-Luchon, Port-de-Vénasque brook, Pique tributary, from 1550 m, 42.7118N, 0.649E to 1610 m, 42.7108N, 0.6485E, 19.XI.2021, leg. G. Vinçon, (1 female, OPC). Paratypes: same as allotype: (17 males, 4 females; OPC). France, Haute-Garonne, Bagnère-de-Luchon, Pique spring, nice resurgence, 1450 m, 42.7168N, 0.6536E, 19.XI.2021, leg. G. Vinçon, (6 males, OPC). France, Haute-Garonne, Arbas Massif, nice resurgence, Rossignol spring, 1400 m, 42.9592N, 0.8511E, 19.XI.2021, leg. G. Vinçon, (2 females,

OPC). France, Haute-Garonne, Bagnère-de-Luchon, Pique tributary, torrent, 1400 m, 42.7196N, 0.657E, 19.XI.2021, leg. G. Vinçon, (3 males, 1 female; OPC).

Diagnosis. Most close to *Simphylax altuspyrenaicus*, but differs by shape divergences in the peripheral organs: cerci elongated ovoid, not truncated; gonopod with very pronounced dorso-apical corner. there are clear divergence in the structure of the speciation trait: paramere shaft straight, not downward curving as well as phallosome is a simple tube, not supplied with a pronounced dorsal hump. Moreover, the vaginal sclerite complex of the female is long narrowing, not short and broad.

Description. Dark medium-sized species with dark brown thoracic sclerites and slightly lighter appendages. Spurs 133. Forewing dark without discernible pattern in alcohol; length 13 mm. Male genitalia. Segment IX with subtriangular lateral profile; convex anterad, shallow concave posterad. Cerci elongated with rounded apical



Figures 79–83. *Simaphylax coppai* sp. nov. Holotype: male: 79 = genitalia in left lateral view; 80 = phallic organ in lateral view; 81 = paramere in dorsal view. Allotype: female: 82 = vaginal sclerite complex in lateral view; 83 = vaginal sclerite complex in dorsal view.

margin in lateral view, almost ovoid. Paraproct hook-shaped in lateral view with produced accessory process laterad on the ventral branch. Gonopods with mesal plate, but without mesal elongation. Paramere straight elongated spine-like rod with long terminal blade, dorsoventrally flat. Aedeagus supplied with well developed lateral flanges.

Female description. The female genitalia of this new species is distinguished by the dorsal profile of the vaginal sclerite complex exhibiting elongated and gradually tapering shape of the basal plate. The partially membranous vaginal chamber having somehow slightly sclerotized dorsum has a specific unique lateral profile with downward directed anterior ending.

Etymology. This species was dedicated to the first collector Gennaro Coppa

Simaphylax keses (Coppa & Oláh, 2015)

(Map 14)

Melampophylax keses Coppa & Oláh, 2015: 52. “Holotype: France, Alpes-de-Haute-Provence, Uvernets Fours, Braissette zone humide, contrebas du sentier, 20.X.2009, leg. G. Coppa (1 male, CPC). Allotype: same as holotype (1 female, CPC).”
Simaphylax keses (Coppa & Oláh, 2015): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. **France**, Isère, Alpe du Joccou, spring below a water catchment, and lateral springs, 1380 – 1420 m, 44.729N, 5.66E, 30.X.2021, leg. G. Vinçon (1 male, OPC). Alpes-Maritimes, below Moutière Pass, spring tributary of Clapouse torrent, 2420 m, 44.3359N, 6.7848E, 24.X.2021, leg. G. Vinçon (2 males, 1 female; OPC). Drôme, South Vercors Massif, Archiane, nice big resurgence, 770 m, 44.7461N, 5.5064E,

30.X.2021, leg. G. Vinçon (1 male, 4 females; OPC). Drôme, Vercors, Tourtre, Adouin, 760 m, 45.0035N, 5.4563E, 29.X.2021, leg. G. Vinçon (8 females; OPC). Drôme, Dévoluy massif, Jarjatte, Fontaine des Mougious, very nice spring, 1470 m, 44.6863N, 5.7964E, 30.X.2021, leg. G. Vinçon (17 males, 17 females; OPC).

Remarks. This species is close to and diverged from *S. mucoreus*, but differs by having paramere more developed, the terminal blade is flattened coronally, not sagittally and differs also by the more elongated vaginal sclerite complex.

***Simaphylax mucoreus* (Hagen, 1861)**

(Map 14)

Halesus mucoreus Hagen, 1861:115. "Ich habe diese Art aus Basel von Imhoff als *Phr. mucorea* erhalten."

Melampophylax mucoreus (Hagen, 1861): Schmid, 1955:182–183. *Melampophylax* gen. nov. was split from the *Halesus* genus.

Simaphylax mucoreus (Hagen, 1861): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. **England**, Horton in Ribblesdale, SD8072, North Yorkshire 12.X.1973, leg. A. Brindle, (5 male, 1 female; 34/814724, F3298.3311, MMUE). River Wharfe, Grass Woods, Grassington, SE0064, North Yorkshire, 7.X.1975, leg. A. Brindle, (1 female; 34/981662, F3298.3309, MMUE). Ings Beck, near River Ribble, Downham, SD7844, Lancashire, 5.X.1975, leg. A. Brindle, (1 female; 34/775455, F3298.3310, MMUE). **France**, Doubs, Mouthe, Doubs Aval Resurgence, 24.IX.2009, leg. G. Coppa, (3 males, 2 females; OPC). Haute Marne, Orquevaux, Cul du Cerf/Etg du Moulin, 27.IX.2009, leg. G. Coppa, (1 male OPC). Ardennes, Signy l'Abbaye, Source Gibergon, 9.X. 2006, leg. G. Coppa, (2 male, 3 female OPC, 1 male, 1 female CNSMB). Ardennes, Signy l'Abbaye, Fosse Bleue a Librecy Resurgence, 25.X.2008, leg. G. Coppa, (3 males, 4 females OPC). Drôme, Vercors Massif, Adouin river, near its spring, Vernaison and Bourne tributary, Tourtre, Saint-Martin-en-Vercors (26420), 45°0.120928'N, 5°27.550379'E, 793 m, 16.XII.2020, leg. G. Vinçon (1 male, 5 female OPC).

Remarks. Easily distinguished from all the other species by having trait combination of most short vaginal sclerite elongation and the most slim and highly arching paramere with very long, but tiny terminal blade.

***Simaphylax nepos* species complex**

This species complex is characterized by mesal elongation of the ventromesal plate with straight, mesad or laterad curving pointed or blunt apex, absent in other species of the *Simaphylax* genus. The parameres are specific and differ in the robustness, curvature and in the formation of the terminal blade. The basal architecture and gross morphology of paramere is identical, but the divergences in its fine structure are very consistent and stable between populations on large distributional area. This species complex is composed of four species: *Simaphylax austriacus* (Malicky, 1990), *Simaphylax nepos* (McLachlan, 1880), *Simaphylax szczesnyorum* (Oláh & Chvojka, 2015), *Simaphylax triangulifera* (Botosaneanu 1957).

***Simaphylax austriacus* (Malicky, 1990)**

(Map 14)

Melampophylax austriacus Malicky, 1990:8. "Wechsel oberhalb von Mariensee (Niederösterreich), 900 m, 24.X.1985 – 1 ♂ (Holotypus)."

Simaphylax austriacus (Malicky, 1990): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. **Austria**, Schwarze Sulm, 20.X.2013, leg. W. Graf (1 male, 1 female; OPC).

Remarks. Auxilliary mesal elongation of the gonopods blunt broad triangular. Terminal blade on paramere sagittally flattened. Elongated vaginal sclerite complex broad basad and narrowing distad.

***Simaphylax nepos* (McLachlan, 1880)**

(Map 14)

Halesus nepos McLachlan, 1880:40. "This remains known to me by Stein's examples from the Altvater Mountains."

Melampophylax nepos (McLachlan, 1880): Schmid 1955:182–183. *Melampophylax* gen. nov. was split from the *Halesus* genus.

Simaphylax nepos (McLachlan, 1880): Oláh *et al.* 2019:78–79. Transferred to *Simaphylax*

Material examined. **Hungary**, Bükk Mts. Sebes Stream (Sebes Víz), 7.X.1964, singled leg. J. Oláh (20 males, OPC). **Slovakia**, Svermovo, Hron Spring, 12.X.1989, leg. S. Nógrádi & Á. Uherkovich (2 males, 1 female; OPC). West Tatra, River Bela, VII. 1978, light trap (1 male, OPC). Strbské Pleso, 14.X.1989, leg. S. Nógrádi & Á. Uherkovich (1 female; OPC). Pribilina, Hrdovo, 14.X.1989, leg. S. Nógrádi & Á. Uherkovich (1 male; OPC). Vernar, Kopanec, 9.X.1987, leg. Á. Uherkovich (2 males, 1 female; OPC). Stratená, Dobsinská Ladova Jaskyna, 26. IX.1984, leg. S. Nógrádi (3 males, 1 female; OPC). Stratená, Pálenica, 9.X.1987, leg. Á. Uherkovich (2 males, 2 females; OPC). Dobsiná, Dankova, 13.X.1989, leg. Á. Uherkovich (1 male, 1 female; OPC). Stratená, valley toward Hrabusice, 26.IX.1984, leg. Á. Uherkovich (1 male, 1 female; OPC). Rejdova (Sajóréde), Slana (Sajó) stream, below spring, N48°47'6'', E20°12'18'', 1120 m, 3. X. 2013, singled leg. J. Oláh & J. Kecskés (2 males, 2 females; OPC). Rejdova (Sajóréde), right tributary of Slana (Sajó) stream, lower reach, N48°48'53'', E20°15'51'' 680 m, 3. X. 2013, singled leg. J. Oláh & J. Kecskés J. (2 males, 1 female; OPC). Rejdova (Sajóréde), right tributary of Slana (Sajó) stream, lower reach, N48°48'53', E20°15'51'' 680 m, 3. X. 2013, singled leg. J. Oláh & J. Kecskés (2 females, OPC). Rejdova (Sajóréde), Mlynná stream, below spring, at bridge, N48°46'16'', E20°13'31'' 1250 m, 3.X. 2013, singled leg. J. Oláh & J. Kecskés J. (8 males, 31 females, OPC). Rejdova (Sajóréde), right tributary of Mlynná stream, at bridge, N48°46'16'' E20°13'31'' 1250 m, 3. X. 2013, singled leg. J. Oláh & J. Kecskés (1 male, 5 females; OPC). Banskobystrický region, Poľana Mts, Hriňová, Bystré, spring brook of Bystrý Stream, N48°37.569' E19°29.261', 1025 m 8.X.2013, singled leg. J. Oláh & L. Szél (8 males, 4 female; OPC).

Remarks. Paramere with most shallow curvature in the complex; the terminal blade of the paramere rounded and slender, not flattened like at *M. szczesnyorum* and not robust like at *M. triangulifera*. Elongated vaginal sclerite complex is rather stable, narrowing distad.

***Simaphylax szczesnyorum* (Oláh & Chvojka, 2015)**

(Map 14)

Melampophylax nepos triangulifera Botosaneanu, 1957: Szczesny 1980:465–466. Misidentification.

Melampophylax szczesnyorum Oláh & Chvojka, 2015: 56–57. “Holotype: Ukraine: original label: “Chomiak, (pot. podziemny), 6.X.1905, leg. Dziedzielewicz (1 male, Klapálek’s Collection in NMPC: No. 50).” “Mesal elongation of gonopods with straight apex, mesad turning at *M. nepos* and laterad turning at *M. triangulifera*.”

Simaphylax szczesnyorum (Oláh & Chvojka, 2015): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. Holotype: **Ukraine**, original label: “Chomiak, (pot. podziemny), 6.X. 1905, leg. Dziedzielewicz (1 male, Klapálek’s Collection in NMPC: No. 50). Allotype: Ukraine: original label: “Chomiak. p. Weredyk, 1.-10.-1907, leg Dz.” (1 female, Dziedzielewicz’s collection in NHM-ISEA). Paratypes: Ukraine: original label: “Tatarow (Prutec), 7.-10.-1905 Dz” (1 male, Dziedzielewicz’s collection in NHM-ISEA). Ukraine: original label: “Chomiak, p. Weredik, 1.-10.-1907 Dz” (1 male, Dziedzielewicz’s collection in NHM-ISEA).

***Simaphylax triangulifera* (Botosaneanu, 1957)**

(Map 14)

Melampophylax nepos triangulifera Botosaneanu, 1957:400–401.

Melampophylax nepos ssp. *triangulifera* Botosaneanu, 1957: Malicky 1990:2.

Melampophylax nepos (McL.) ssp. *triangulifera* Botosaneanu, 1957: Botosaneanu, 1995:74–75. Female described.

Melampophylax nepos ssp. *triangulifera* Botosaneanu, 1957: Malicky 2005:576.

Melampophylax triangulifera Botosaneanu, 1957: Oláh *et al.* 2015: 57. Subspecies status was raised to species rank.

Simaphylax triangulifera (Botosaneanu 1957): Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined. **Romania**, Eastern Carpathians, Harghita Mts., springs and streamlets between Baile Harghita and Cabana Madaras, 1650–1700 m, 14. X. 1970 leg. L. Botosaneanu (6 males, OPC). Gurghiu Mts. near Bucin Pass, Tárnava Mica springs and stream, N46°39'16.63", E25°16'42.46", 1290 m, 30.X.2014, leg. Z. Baczó, Cs. Balogh, J. Kecskés & J. Oláh. (49 males, 6 females; OPC). Gurghiu Mts. near Bucin Pass, Gainasa springs and stream, N46°40'11.35", E25°17'39.06", 1400 m, 30.X.2014, leg. Z. Baczó, Cs. Balogh, J. Kecskés & J. Oláh (1 male, 1 female; OPC). Harghita Mts. Filio stream side spring, N46°27'03.90", E25°33'29.29", 1350 m, 31.X.2014 leg. Z. Baczó, Cs. Balogh, J. Kecskés & J. Oláh. (1 male, 3 females; OPC). Caliman Mts. Fantanele stream, N46°59'4", E25°05'52.56", 776 m, 1.XI.2014, leg. Z. Baczó, Cs. Balogh, J. Kecskés & J. Oláh. (3 females; OPC).

Remarks. This is a sibling species of *M. nepos* and *M. szczesnyorum*. Auxilliary mesal elongation of the gonopods laterad curving. Terminal blade of the paramere robust and rounded. Elongated vaginal sclerite complex is rather variable inside populations.

Simaphylax orientalopyrenaeus species complex

Simaphylax andorricus Oláh & Vinçon sp. nov.

(Figures 84–86, Map 13, Photos 23–24)

Material examined. Holotype: **Andorra**, Port d'Envalira, 2290 m, brook and spring, on the snow, 42.547N, 1.707E, 11.XI.2021, leg. G. Vinçon (1 male; OPC). Allotype: **France**, Pyrénées-Orientales, below Pas de la Case, rec del Baladrar, torrent, 1900 m, 42.556N, 1.768E, 11.XI.2021, leg. G. Vinçon (1 female, OPC). Paratypes: same as holotype (1 male, OPC). same as allotype (2 males, OPC). Pyrénées-Orientales, below Pas de la Case, rec del Baladrar, lateral spring, 1960 m,

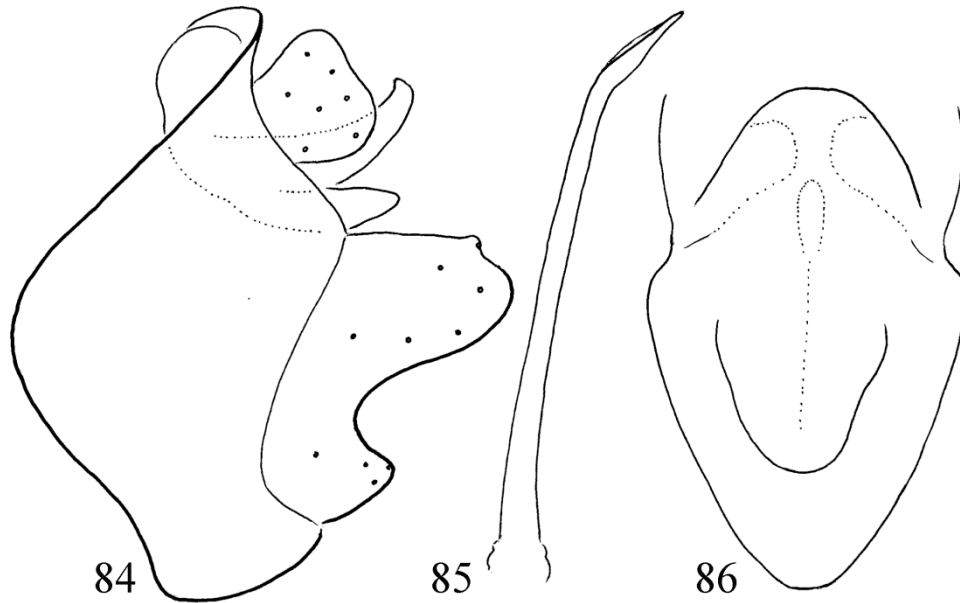
42.552N, 1.764E, 11.XI.2021, leg. G. Vinçon (4 males, OPC). Pyrénées-Orientales, below Pas de la Case, rec del Baladrar, lateral spring, 1960 m, 42.552N, 1.764E, 11.XI.2021, leg. G. Vinçon (7 females, OPC). Pyrénées-Orientales, Puigmal Massif, «Rec de Vall Pouada», Ribera d'Err tributary, 1880 m, 42.4135N, 2.045E, 11.XI.2021, leg. G. Vinçon (1 male, 3 females; OPC). Pyrénées-Orientales, Puigmal Massif, Ribera d'Err tributary, «La Ballousque» spring, 1480 m, 42.4321N, 2.0372E, 11.XI.2021, leg. G. Vinçon (1 male, OPC). Pyrénées-Orientales, Puigmal Massif, «Rec de Vallosca», Ribera d'Err tributary, 1820 m, 42.421N, 2.038E, 11.XI.2021, leg. G. Vinçon (13 males, 22 females; OPC).

Diagnosis. Most close to *Simaphylax ariegeus* sp. nov. but differs by shape divergences in the periphallic organs: cerci broad and truncated, not narrow and elongated; gonopod with less pronounced dorsoapical corner. However, these periphallic organs are neutral, non-adaptive traits with more variability and less shape stability. There is clear divergence in the structure of the speciation trait: paramere shaft straight with downward directed apical blade. Moreover the vaginal sclerite complex of the female is differently shaped, in dorsal profile more heart-shaped.

Description. Dark medium-sized species with dark brown thoracic sclerites and slightly lighter appendages. Spurs 133. Forewing dark without discernible pattern in alcohol; length 12 mm.

Male genitalia. Segment IX with subtriangular lateral profile; convex anterad, shallow concave posterad. Cerci broad with truncated apical margin in lateral view. Paraproct hook-shaped in lateral view with produced accessory process laterad on the ventral branch. Gonopods with mesal plate, but without mesal elongation. Paramere straight elongated spine-like rod with slightly downward turning terminal blade. Aedeagus supplied with well developed lateral flanges.

Female description. The female genitalia of this new species are distinguished by the dorsal profile of the vaginal sclerite complex exhibiting heart-shaped and gradually tapering basal plate.



Figures 84–86. *Simaphylax andorricus* sp. nov. Holotype: male: 84 = genitalia in left lateral view; 85 = paramere in lateral view; 86 = vaginal sclerite complex in dorsal view.

Etymology. This species was named after the locus typicus.

***Simaphylax ariegeus* sp. nov.**

(Figures 87–90, Map 13, Photos 25–26)

Material examined. Holotype: **France**, Ariège, Videssos, Las Rougos, Pla de l'Izard, Mounicou tributary, spring and brook, 1220 m, 42.6949N, 1.4497E, 12.XI.2021, leg. G. Vinçon (1 male, OPC). Allotype: same as holotype (1 female, OPC). Paratypes: same as holotype (6 males, 8 females; OPC). Ariège, Videssos, above Soulcem Lake, Gardelle brook, 1820 m, 42.657N, 1.439E, 12.XI.2021, leg. G. Vinçon (1 female, OPC). Ariège, Videssos, East Soulcem Lake, brook, 1600 m, 42.672N, 1.452E, 12.XI.2021, leg. G. Vinçon (25 males, 19 females; OPC).

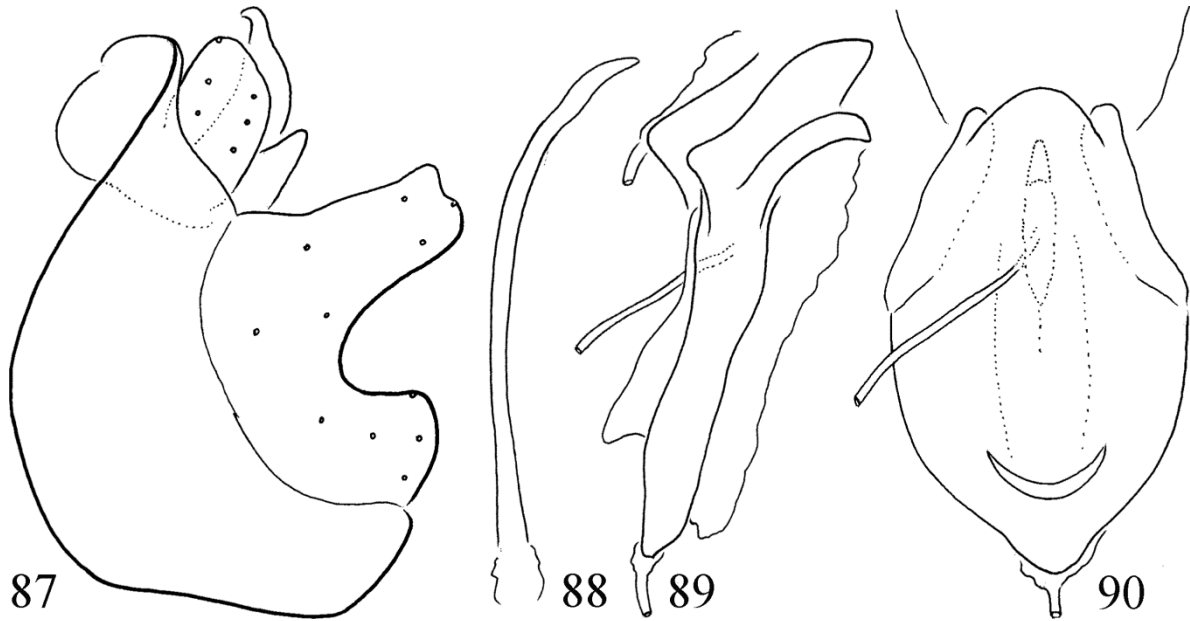
Diagnosis. Most close to *Simaphylax andorricus* sp. nov. but differs by shape divergences in the periphallic organs: cerci narrow and elongated, not broad and truncated; gonopod with pronounced dorsoapical corner. However, these periphallic organs are neutral, non-adaptive traits with more variability and less shape stability.

There is clear divergence in the structure of the speciation trait: paramere shaft downward curving with broad apical blade. Moreover the vaginal sclerite complex of the female is differently shaped, in dorsal profile less heart-shaped.

Description. Dark medium-sized species with dark brown thoracic sclerites and slightly lighter appendages. Spurs 133. Forewing dark without discernible pattern in alcohol; length 11 mm. Male genitalia. Segment IX with circular lateral profile; convex anterad, concave posterad. Cerci narrow with tapering apical margin in lateral view. Paraproct hook-shaped in lateral view with produced accessory process laterad on the ventral branch. Gonopods with mesal plate, but without mesal elongation. Paramere downward curving elongated spine-like rod with broad terminal blade. Aedeagus supplied with well developed lateral flanges.

Female description. The female genitalia of this new species have the dorsal profile of the vaginal sclerite complex exhibiting less heart-shape and less gradually tapering basal plate.

Etymology. This species was named after the locus typicus of the holotype.



Figures 87–90. *Simaphylax ariegeus* sp. nov. Holotype: male: 87 = genitalia in left lateral view; 88 = paramere in lateral view. Allotype: female: 89 = vaginal sclerite complex in lateral view; 90 = vaginal sclerite complex in dorsal view.

***Simaphylax orientalopyrenaeus* (Coppa, 2017)**

(Map 13)

Melampophylax orientalopyrenaeus Coppa, 2017:34–35. “Holotype: 1 mâle, le 30.08.2001, département des Pyrénées, commune de Mantet, Ruisseau d’Alemany, vers 2000 m. 13 autres mâles et 2 femelles ont été collectés le même jour à cet endroit; leg. Joël Moubayed; Holotype déposé au Hungarian Natural History Museum, Budapest. Paratypes: 5 mâles et 1 femelle, 30.10.2001, département des Pyrénées Orientales, commune de Mantet, Mouillera de Callau, Ruisseau de Callau entre 2000 et 2200 m; leg. Joël Moubayed; déposé au Hungarian Natural History Museum, Budapest. 2 mâles, commune de Porté-Puymorens, département des Pyrénées-Orientales, ruisseau de l’Estorredor, 1700 m, 27.11.2014; leg. Jacques Le Doaré, collection Genaro Coppa. Autre matériel. Département des Pyrénées-Orientales, commune de Mantet, Ruisseau d’Alemany, 2000 m, le 5.7.2008: 1 femelle; le 14.7.2008: 28 mâles; le Font des Soques vers 2000 m; le 1.7.2005: 3 mâles; le 3.8.2008: 28 mâles; le 9.8.2008: 35 mâles et 3 femelles; le 28.8.2008: 6 mâles et 1 femelle; leg. Joël Moubayed, collection Genaro Coppa.”

Simaphylax orientalopyrenaeus (Coppa, 2017): Oláh *et al.* 2019: 78–79. based upon the apomorphy of the very simple (sima in Hungarian) spine-like para-

mere without any modified setae as well as on the apomorphy of the elongated female vaginal sclerite *Simaphylax* new genus was splitted from the *Melampophylax* genus.

Material examined. France, Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, Jourdana brook and spring, 1740 m, 42.4459N, 2.4155E, 21.XI.2021, leg. G. Vinçon (2 males, 2 females; OPC). Pyrénées-Orientales, Canigou Massif, Prats-de-Mollo-la-Preste, brook and springs, from 1910 m, 42.4603N, 2.4161E to 2040 m, 42.4615N, 2.4126E, 21.XI.2021, leg. G. Vinçon (8 males, 9 females; contact population, OPC).

***Simaphylax polonicus* new species complex**

This new species complex is characterized by denticulate margin of gonopods without any mesal elongation of the ventromesal plate. Three species belong to this complex: *Simaphylax banaticus* (Botosaneanu, 1995), *Simaphylax gutinicus* (Botosaneanu, 1995), *Simaphylax polonicus* (Malicky, 1990),

***Simaphylax banaticus* (Botosaneanu 1995)**

(Map 14)

Melampophylax polonicus ssp. *banaticus* Botosaneanu 1995:76. “♂ holotype, ♀ allotype: 14.XI.1961, Romania, Banat mountains: Pârâul Buhui (near Anina), L. Botosaneanu leg. In the Grigore Antipa Museum, Bucharest.

Melampophylax polonicus ssp. *banaticus* Botosaneanu, 1995: Malicky 2005:577.

Simaphylax banaticus (Botosaneanu, 1995). Oláh *et al.* 2019: 78–79. Transferred to *Simaphylax*.

Material examined . Romania, Caraş-Severin county, Ţarcu Mts., open brook on the W slope of Mt. Ţarcu, N45°17'30.9", E22°30'59.9", 1770 m, 14.X.2011, Á. Ecsedi, T. Kovács & G. Puskás (4 males, 2 females; OPC). Retezat Mts. Gura Apelor, N45.33 E22.88, 1500 m, 20.X. 2007 leg. M. Bálint, E. Magyarai & M. Braun (1 male, OPC).

Remarks. This is an incipient sibling species closely related to *M. polonicus* and *M. gutinicus*, but differs from both by having female with differently shaped vaginal sclerite elongation and males with pointed mesal corner on the mesal plate of the gonopods. Also differs by having the speciation trait, the paramere very stout with shallow curvature and with pronounced mace-like terminal blade.

***Simaphylax gutinicus* (Botosaneanu, 1995)**

(Map 14)

Melampophylax polonicus ssp. *gutinicus* Botosaneanu, 1995:75–76. “♂ holotype: 14.XI.1962, Romania, Maramureş, Gutin mountains: streamlet tributary of Valea Săsarului, L. Botosaneanu le. In the Grigore Antipa Museum, Bucharest.”

Melampophylax polonicus ssp. *gutinicus* Botosaneanu, 1995: Malicky 2005:577.

Simaphylax gutinicus (Botosaneanu, 1995). Oláh *et al.* 2019:78–79: Transferred to *Simaphylax*.

Material examined. Romania, Maramureş county, Muntii Ignis, Deseşti-Staţiunea Izvoare, open brook on the Valhani Plateau, 1020m, N47°43.015', E23°44.547', 07.X.2010, leg. P. Barcán-

falvi, D. Murányi & J. Oláh, (5 males, 2 females, OPC). Maramureş county, Muntii Ignis, Deseşti-Staţiunea Izvoare, open stream on the Valhani Plateau, 940 m, N47°43.945' E23°44.661', 08.X. 2010, leg. P. Barcánfalvi, D. Murányi & J. Oláh, (1 male, OPC). Maramureş county, Muntii Ignis, Deseşti-Staţiunea Izvoare, spring brook on the Valhani Plateau, 955 m, N47°44.177' E23°43.971', 08.X.2010, leg. P. Barcánfalvi, D. Murányi & J. Oláh, (4 males, OPC). Radnei Mts. Rodnei Mts. small tributary just below Iza Spring, Albastru al Izei, 1020 m, 27. IX. 2014, leg. J. Oláh & Cs. Balogh (1 male, OPC).

Remarks. Incipient sibling species closely related to *M. banaticus* and *M. polonicus*, but differs from both by having female with differently shaped vaginal sclerite elongation, that is short and narrowing distad and the male has the most rounded mesal corner on the mesal plate of the gonopods as well as very slender paramere that has minute terminal blade.

***Simaphylax polonicus* (Malicky, 1990)**

(Map 14)

Melampophylax polonicus Malicky, 1990:8–9. “Polen, Bieszczady-Gebirge, Polaniec, 600–1000 m, 22.X. 1976, 1♂ (Holotypus).

Simaphylax polonicus (Malicky, 1990). Oláh *et al.* 2019:78–79. Transferred to *Simaphylax*.

Material examined. Poland, Bieszczady Mts. X. (October, without day and year), leg. det. B. Szczesny (2 males, 1 female; OPC).

Remarks. Incipient sibling species closely related to *M. banaticus* and *M. gutinicus*. Differs from both by having female with differently shaped vaginal sclerite elongation with produced subapical constriction; males with straight truncate apical margin on the mesal plate of the gonopods as well as long and strong paramere that has strong terminal blade.

***Stenophylax lavandieri* (Décamps, 1972)**

Material examined. France, Ariège, Vicdesos, Gardelle brook and several springs, 2260 m,

42.649N, 1.4246E, 12.XI.2021, leg. G. Vinçon (5 males; OPC).

Remark: this species was only known from the Hautes-Pyrénées department (Décamps 1972). We mention it for the first time in the eastern part of the Pyrenees.

***Stenophylax nycterobius* (McLachlan, 1875)**

Material examined. **France**, Alpes-Maritimes, Bévéra Valley, Vallon des Cabanes Vieilles, lateral spring, 1700 m, 43.9856N, 7.4323E, 24.X.2021, leg. G. Vinçon (1 male, 1 female; OPC).

***Stenophylax sequax* (McLachlan, 1875)**

Material examined. **Switzerland**, Jura Massif, Soubey, Bief de la Côte au Bouvier, 600–650 m, 47.3N, 7.06E, 24.VIII.2021, leg. G. Vinçon (1 male; OPC).

***Stenophylax wagneri* (Malicky, 1971)**

Material examined. **Italy**, Toscana, Reggello, brook and lateral springs, slopy, 920–1170 m, 43.689N, 11.594E, 11.VI.2021, leg. G. Vinçon (2 males, 2 females; OPC). Liguria, Melogno Pass, spring and brook, 1180 m, 44.2384N, 8.2E, 10.VI.2021, leg. G. Vinçon (4 males, 3 females; OPC). Italy, Toscana, Passo del Cerreto, „La Nuda” glacial Circus, 1480–1500 m, springs and brooks, 44.285N, 10.2286E, 11.07.2021, leg. G. Vinçon (2 males, OPC).

Integripalpia

Brevitentoria

Leptoceroidea superfamily

Odontoceridae Wallengren, 1891

***Odontocerum albicorne* Scopoli, 1763**

Material examined. **France**, Alpes-Maritimes, N. Saint-Etienne-de-Tinée, above one of the Vens Lakes, Vens brook, resurgence from another Vens lake, 2310 m, 44.3116N, 6.9332E, 8.VIII.2021, leg. Gilles Vinçon (6 males, 12 females; OPC).

Beraeidae Wallengren, 1891

***Beraea maura* (Curtis, 1834)**

Material examined. **France**, Jura Massif, Jougne, N.E. Entre les fourgs, Petit Nerveau brook, 1140 m, 46.7758N, 6.449E, 25.VIII.2021, leg. G. Vinçon (2 males, OPC). France, Isère, Vercors Massif, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 1.VIII.2021, leg. G. Vinçon (4 males, 3 females; OPC).

***Beraemyia gudrunae* Malicky, 2002**

Material examined. **France**, Alpes-Maritimes, Bevera Valley, junction of 2 torrents, 1200–1250 m, 43.976N, 7.412E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC). **Italy**: Liguria, Melogno Pass, road to Calizzano, spring and brook, 1040 m, 44.238N, 8.1875E, 10.VII.2021, leg. G. Vinçon (4 males, 1 female; OPC).

Remark. This species was only known from a single locality in Liguria (Italy). It is new for the French Fauna.

***Ernodes romaniulus* Moretti, Cianficconi, Campadelli & Crudele, 1999**

Material examined. **Italy**, Campania, N Curticelle, N Giffoni Valle Piana, spring and brooklet, 720–820 m, 40.781N, 14.924E, 21.V.2021 leg. G. Vinçon (7 males, 2 females; OPC). Toscana, Apuane Alps, below Vinca, brook, 470–520 m, 44.14N, 10.146E, 11.VI.2021, leg. G. Vinçon (1 male, 1 female; OPC). Toscana, Passo del Cerreto, „La Gabellina”, 950 m, spring and brook, very steep, 44.3175N, 10.238E, 11.VII.2021, leg. G. Vinçon (1 male, OPC).

***Ernodes articularis* (Pictet, 1834)**

Material examined. **France**, Isère, Vercors Massif, springs and brooks below Cascade de Moulin Marquis, 450 m, 45.0563N, 5.4343E, 1.VIII.2021, leg. G. Vinçon (3 males, 2 females; OPC).

***Ernodes botosaneanui* Vaillant, 1982**

Material examined. **France:** Alpes-Maritimes, Bevera Valley, junction of 2 torrents, 1200–1250 m, 43.976N, 7.412E, 7.VIII.2021, leg. G. Vinçon (1 male, OPC).

Sericostomatidae Stephens, 1836

***Sericostoma personatum* (Kirby & Spence, 1826)**

Material examined. **France,** Hautes-Alpes, Queyras Massif, Aiguilles, torrent below ‘Grand Laus lake’, 2560 m, 44.82N, 6.872E, 15.VIII.2021, leg. G. Vinçon (1 male, OPC). **France,** Alpes-de-Haute-Provence, Ravin de St Barnabé, Verdon trib., road to Stade de neige de Vauplane, spring, 1400 m, 43.867N, 6.632E, 19.IX.2021, leg. G. Vinçon (1 male, OPC).

***Sericostoma romanicum* Navas, 1930**

Material examined. **Italy,** Campania, N Curticelle, N Giffoni Valle Piana, spring and brooklet, 720–820 m, 40.781N, 14.924E, 21.V. 2021 leg. G. Vinçon (1 male, OPC).

***Sericostoma subaequale* McLachlan, 1898**

Material examined. **Italy,** Trentino Alto Adige, Venetian Pre-Alps, Raossi, Speccheri, brook below the dam, low current, 670 m, 45.7648N, 11.1301E, 27.V.2021, leg. G. Vinçon (4 males, OPC).

REFERENCES

- BERTHÉLEMY, C. (1969): Les *Capnioneura* des Pyrénées (Plecoptera). *Annales de Limnologie*, 5(1): 25–47. doi: [10.1051/limn/1969005](https://doi.org/10.1051/limn/1969005)
- BOTOSANEANU, L. (1994): Two new species of *Melampophylax* Schmid 1955 from France (Trichoptera: Limnephilidae). *Entomologische Zeitschrift*, 104(18): 363–366
- BOTOSANEANU, L. & SCHMID, F. (1973): Les Trichoptères du Muséum d’Histoire naturelle de Genève. *Revue Suisse Zoologie*, 80(1): 221–256. doi: [10.5962/bhl.part.75942](https://doi.org/10.5962/bhl.part.75942)
- BOTOSANEANU, L., CIANFICCONI, F. & MORETTI, G.P. (1986): Autumnal aspects of the caddisfly fauna (Trichoptera) of Sicily, with the description of a remarkable relict species. *Mitteilungen der Entomologische Gesellschaft Basel*, 36(4): 145–154.
- BRAUER, F. (1857): *Neuroptera Austriaca: Die im Erzherzogthum Oesterreich bis Jetzt Aufgefundenen Neuropteren nach der Analytischen Methode Zusammengestellt, nebst Einer Kurzen Charakteristik aller Europäischen Neuropteren-Gattungen.* C. Gerold’s Sohn, Wien, 80 pp. doi: [10.5962/bhl.title.60612](https://doi.org/10.5962/bhl.title.60612).
- COPPA, G. (2017): *Melampophylax orientalopyrenaicus* n. sp. des Pyrénées Orientales (France) et description de la femelle de *M. altuspyrenaicus* Botosaneanu, 1994 (Trichoptera, Limnephilidae). *Ephemera*, 18(1): 3–9.
- DÉCAMPS, H. (1962): Trichoptères nouveaux des Pyrénées. *Nouvelle Revue d’Entomologie*, 2: 261–265.
- DÉCAMPS, H. (1967): Introduction à l’Étude écologique des Trichoptères des Pyrénées. *Annales de Limnologie*, 3(1): 101–176. doi: [10.1051/limn/1967013](https://doi.org/10.1051/limn/1967013)
- DÉCAMPS, H. (1971): Taxonomie des *Chaetopteryx* Pyrénéens du Groupe *major* (Trichoptera, Limnephilidae). *Annales de Limnologie*, 7(1): 121–124. doi: [10.1051/limn/1971009](https://doi.org/10.1051/limn/1971009)
- FISCHER, F.C.J. (1969): *Trichopterorum Catalogus. Volume X, Limnephilidae Pars 3.* Nederlandse Entomologische Vereeniging, Amsterdam, 332 pp.
- GONZALEZ, M.A.G. & MENÉNDEZ J.M. (2011): Checklist of the caddisflies of the Iberian Peninsula and Balearic Islands (Trichoptera). In: MAJECKA, K., MAJECKI, J. & MORSE, J. (Eds.) Proceedings of the 13th International Symposium on Trichoptera. *Zoosymposia*, 5: 115–135.
- HOEIJMAKERS, J. H. (2009): DNA damage, aging, and cancer. *New England Journal of Medicine*, 361: 1475–1485. doi: [10.1056/NEJMra0804615](https://doi.org/10.1056/NEJMra0804615)
- KOLENATI, F.A. (1859): Systematisches Verzeichnis der am Altvater bis gegenwärtig beobachteten der gesammelten Insekten, von 3700 bis 4680’ Meereshöhe. *Jahresheft der Naturwissenschaftlichen Section der K.K. Mährisch-Schellischen Gesellschaft für Ackerbau, Natur- und Landeskunde für das Jahr 1858*, 1: 1–83.
- KOLENATI, F.A. (1860): Einige neue Insekten-Arten vom Altvater. *Wiener Entomologische Monatschrift*, 4(12): 381–394.

- MALICKY, H. (1971): Trichopteren aus Italien. *Entomologische Zeitschrift*, 81(23): 257–265.
- MALICKY, H. (1983): *Atlas of European Trichoptera*. Junk, The Hague, 298 pp.
- MALICKY, H. (1990): Revision der Gattung *Melampophylax* Schmid, 1955 (Trichoptera, Limnephilidae). *Nachrichtenblatt der Bayerischen Entomologen*, 39(1): 1–12.
- MALICKY, H. (2004): *Atlas of European Trichoptera. Second Edition*. Springer, Dordrecht, 359 pp.
- MALICKY, H. (2005): Ein kommentiertes Verzeichnis der Köcherfliegen (Trichoptera) Europas und des Mittelmeergebietes. *Linzer biologische Beiträge*, 37(1): 533–596.
- MALICKY, H., WARINGEN, J. & UHERKOVICH, Á. (2002): Ein Beitrag zur Bionomie und Ökologie von *Platyphylax frauenfeldi* Brauer, 1857 (Trichoptera, Limnephilidae). *Entomologische Nachrichten und Berichte*, 46(2): 73–80.
- MARINKOVIĆ–GOSPODNETIĆ, M. (1966a): New species of Trichoptera from Yugoslavia. *Bulletin scientifique, Conseil des Académies des Sciences et des Arts de la RSF de Yougoslavie. Sect. A. Zagreb*, 11(4–6): 110–112.
- MARINKOVIĆ–GOSPODNETIĆ, M. (1966b): Grupa *Chaetopteryx* (Limnephilidae, Trichoptera) u Bosni. *Godišnjak Biološkog Instituta Univerziteta u Sarajevu*, 1966: 204–210.
- MCLACHLAN, R. (1871): On new forms, etc., of extra-European Trichopterous insects. *Journal of the Linnean Society London Zoology*, 11: 98–141, pls. 2–4. doi: [10.1111/j.1096-3642.1870.tb02011.x](https://doi.org/10.1111/j.1096-3642.1870.tb02011.x)
- MCLACHLAN, R. (1874–1880): *A monographic revision and synopsis of the Trichoptera of the European fauna*. Reprinted 1968. E.W. Classey Ltd. Hampton, Middlesex. doi: [10.5962/bhl.title.28556](https://doi.org/10.5962/bhl.title.28556)
- MORETTI, G.P. (1991): *Nouvelles espèces et sous-espèces de Trichoptères italiens et exemples de variabilité des populations des Alpes méridionales et des Apennins*. In: TOMASZEWSKI, C. (Ed.) Proceedings of the 6th International Symposium on Trichoptera, AMU Press, Poznan, p. 385–402.
- OLÁH, J., CHVOJKA, T.P., COPPA, G., GRAF, W., IBRAHIMI, H., LODOVICI, O., RUIZ GARCIA, A., SÁINZ-BARIÁIN, M., VALLE, M. & ZAMORA-MUÑOZ, C. (2014): The genus *Allogamus* Schmid, 1955 (Trichoptera, Limnephilidae): revised by sexual selection-driven adaptive, non-neutral traits of the phallic organ. *Opuscula Zoologica, Budapest*, 45(1): 33–82.
- OLÁH, J., CHVOJKA, T.P., COPPA, G., GODUNKO, R.J., LODOVICI, O., MAJECKA, K., MAJECKI, J., SZCZESNY, B., URBANIC, G. & VALLE, M. (2015): Limnephilid taxa revised by speciation traits: *Rhadiocoleptus*, *Isogamus*, *Melampophylax* genera, *Chaetopteryx rugulosa*, *Psilopteryx psorosa* species groups, *Drusus bolivari*, *Annitella kosciuskii* species complexes (Trichoptera, Limnephilidae). *Opuscula Zoologica, Budapest*, 46(1): 3–117. doi: [10.18348/opzool.2015.1.3](https://doi.org/10.18348/opzool.2015.1.3)
- OLÁH, J., BESHKOV, S., CHVOJKA, T.P., CIUBUC, C., COPPA, G., IBRAHIMI, H., KOVÁCS, T., MEY, W. & OLÁH, J. jr. (2017): Revision of Drusinae subfamily (Trichoptera, Limnephilidae): divergence by paraproct and paramere, speciation in isolation by integration. *Opuscula Zoologica, Budapest*, 48(Suppl. 1): 3–228. doi: [10.18348/opzool.2017.S1.3](https://doi.org/10.18348/opzool.2017.S1.3)
- OLÁH, J., ANDERSEN, T., BESHKOV, S., CIUBUC, C., COPPA, G., IBRAHIMI, H., KOVÁCS, T., OLÁH, J. Jr. & SZCZESNY, B. (2018): Unified phylogenetic species concept: taking subspecies and race out of science: postmodern theory applied to the *Potamophylax cingulatus* group (Trichoptera, Limnephilidae). *Opuscula Zoologica, Budapest*, 49(1): 33–70. doi: [10.18348/opzool.2018.1.33](https://doi.org/10.18348/opzool.2018.1.33)
- OLÁH, J., ANDERSEN, T., BESHKOV, S., BILLALI, A., COPPA, G., IBRAHIMI, H., JOHANSON, K.A., KOVÁCS, T., MEY, W., MUSLIU, M., OLÁH, J. Jr. & RUIZ-GARCIA, A. (2019): Lineage sorting by paramere in Limnephilinae subfamily (Trichoptera): with description of a new tribe, new genera and new species. *Opuscula Zoologica, Budapest*, 50(Suppl. 1): 3–98. doi: [10.18348/opzool.2019.S1.3](https://doi.org/10.18348/opzool.2019.S1.3)
- OLÁH, J., VINÇON, G., KERIMOVA, I., KOVÁCS, T. & MANKO, P. (2020): On the Trichoptera of the Caucasus with western and eastern relatives. *Opuscula Zoologica, Budapest*, 51(Supplementum 1): 3–174. doi: [10.18348/opzool.2020.S3.3](https://doi.org/10.18348/opzool.2020.S3.3)
- OLÁH, J., VINÇON, G. & COPPA, G. (2021): On the Trichoptera of Italy with delineation of incipient sibling species. *Opuscula Zoologica, Budapest*, 52(1): 3–67. doi: [10.18348/opzool.2021.1.3](https://doi.org/10.18348/opzool.2021.1.3)
- Pictet, F.J. (1834): *Recherches pour servir à l'histoire et l'anatomie des Phryganides*. Genève 228 pp. 19 pl.
- PREVIŠIĆ, A., CERJANEC, D., GRAF, W. & KUČINIĆ, M. (2012): *Drusus chrysotus* (Rambur, 1842) (Tricho-

- ptera: Limnephilidae: Drusinae): A new caddisfly species in the Croatian fauna. *Natura Croatica*, 21(2): 419–425.
- SCHMID, F. (1951): Monographie du genre *Halesus* (Trich.). *Trabajos del Museo de Ciencias Naturales de Barcelona. Nueva Serie Zoologica*, 1(3): 1–72.
- SCHMID, F. (1955): Contribution à l'étude des Limnophilidae (Trichoptera). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft*, 28: 1–245.
- SIPAHILER, F. (1999): Five new species of Trichoptera from France, Spain and Turkey (Philopotamidae, Psychomyiidae, Polycentropodidae). *Braueria*, 26: 41–43.
- SZCZESNY, B. (1980): Caddis-flies (Trichoptera) in the collection of the Institute of Systematic and Experimental Zoology, Polish Academy of Sciences in Cracow. *Acta Zoologica Cracoviensia*, 24(10): 449–486.
- Uherkovich Á. & Nógrádi, S. (1997): *Platyphylax frauenfeldi* Brauer, 1857 (Trichoptera, Limnephilidae) in Hungary. *Braueria*, 24: 13–14.
- VITECEK, S., GRAF, W., MARTINI, J., ZITRA, C., HANDSCHUH, S., KUHLMANN, H.C., VIEIRA, A., HESS, M., HECKES, U., ERZINGER, F., PAULS, S.P. & WARINGER, J. (2020): A new Drusinae species from the western Alps with comments on the subfamily and an updated key to filtering carnivore larvae of Drusinae species (Insecta: Trichoptera: Limnephilidae). *Zootaxa*, 4790(3): 491–504. doi: [10.11646/zootaxa.4790.3.4](https://doi.org/10.11646/zootaxa.4790.3.4)
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Appendix 1. Habitat photos of the collection localities



Photo 1. Italy, Melogno Pass, road to Calizzano, 1200 m, 44.24N, 8.1968E (*Wormaldia ligurica* sp. nov.) (G. Vinçon).



Photo 2. France, Alpes-Maritimes, Clars Hamlet, spring, 1090 m, 43.7473N, 6.74E (*Wormaldia maritima* sp. nov.) (G. Vinçon).



Photo 3. France, Alpes-Maritimes, mountains surrounding Clars Hamlet (G. Vinçon).



Photo 4. Italy, Piemonte, Pennines Alps, W. Gravelona, Val Strona, > Campello Monti, 1900 m, spring and brooklet, 45.926 N, 8.2195E (*Drusus chapmani* McLachlan, 1901) (G. Vinçon).



Photo 5. Italy, Piemonte, Pennines Alps, high Sesia Valley, above Sant'Antonio, big spring below Lago Nero, 45.814N, 7.88E, 2630 m, (*Drusus italiano* sp. nov.) (G. Vinçon).



Photo 6. Italy, Piemonte, Pennines Alps, high Sesia Valley, above Sant'Antonio, Lago Nero (G. Vinçon).



Photo 7. Italy, Abruzzi, Prati di Mezzo, above Fontitune, spring, 41.651N, 13.94E, 1650 m (*Chaetopteryx tompula* sp. nov.) (G. Vinçon).



Photo 8. Italy, Abruzzi, Prati di Mezzo, above Fontitune, landscape view (G. Vinçon).



Photo 9. Spain, Cantabria, Rio Saja, Mina da Lapiz, lateral spring, 520 m, 43.1232N, 4.2961W
(*Chaetopteryx cantabrica* sp. nov.) (G. Vinçon).



Photo 10. Spain, Cantabria, landscape view of Saja Valley (G. Vinçon).



Photo 11. France, Pyrénées-Atlantiques, Osse-en-Aspe, Labays Pass, Oueils d'Issaux, spring, 680 m, 43.00655N, 0.6913W
(*Chaetopteryx pyrenaica* sp. nov.) (G. Vinçon).



Photo 12. France, Alpes-Maritimes, Caïros Valley, Fromagine spring, 1500 m, 44.0208N, 7.4317E
(*Consorophyllax cairos* sp. nov.) (G. Vinçon).



Photo 13. Italy, Pennines Alps, High Sesia Valley, S.W. Sant'Antonio, Lago Verde outlet, 2850 m, 45.8215N, 7.8713E
(*Consorophylax lagoverde* sp. nov.) (G. Vinçon).



Photo 14. Slovenia, near Italian border, Julian Pre-Alps, below Livek, spring, 600 m, 46.2123N, 13.5939E
(*Consorophylax livek* sp. nov.) (G. Vinçon).



Photo 15. France, Alpes-de-Haute-Provence, Above les Thuiles, Grande Séolane Massif, Gimette brook and spring, 2140 m, 44.35N, 6.555E (*Consorophylax seolan* sp. nov.) (G. Vinçon).



Photo 16. France, Alpes-de-Haute-Provence, above les Thuiles, Grande Séolane Massif, landscape view of Gimette Valley (G. Vinçon).



Photo 17. France, Isère, Taillefer Massif, below Brouffier lake, spring Guiliman tributary, 2050 m, 45.0355N, 5.8861E (*Platyphylax vinconi* sp. nov.) (G. Vinçon).



Photo 18. France, Isère, Taillefer Massif, landscape view of Brouffier Valley (G. Vinçon).



Photo 19. Spain, Huesca, Bielsa, Pineta Valley, brook and spring, 2250 m, 42.7026N, 0.1015E
(*Simaphylax altuspyrenaicus* (Botosaneanu, 1994)) (G. Vinçon).



Photo 20. Spain, Huesca, Bielsa, Pineta Valley, landscape view, 2250 m (G. Vinçon).



Photo 21. France, Haute-Garonne, Bagnère-de-Luchon, Port-de-Vénasque brook, Pique spring, 1450 m, 42.7168N, 0.6536E
(*Simaphylax coppai* sp. nov.) (G. Vinçon).



Photo 22. France, Haute-Garonne, Bagnère-de-Luchon, Port-de-Vénasque brook, Pique tributary,
landscape view above 1600 m (G. Vinçon).



Photo 23. France, Pyrénées-Orientales, Puigmal Massif, Ribera d'Err tributary, "La Ballousque,, spring, 1480m, 42.4321N, 2.0372E (*Simaphylax andorricus* sp. nov.) (G. Vinçon).



Photo 24. France, Pyrénées-Orientales, Puigmal Massif, "Rec de Vallosca,, Ribera d'Err tributary, 1820 m, landscape view (*Simaphylax andorricus* sp. nov.) (G. Vinçon).



Photo 25. France, Ariège, Vicdessos, Las Rougos, Pla de l'Isard, Mounicou tributary, spring and brook, 1220 m, 42.6949 N, 1.4497E (*Simaphylax ariegeus* sp. nov.) (G. Vinçon).

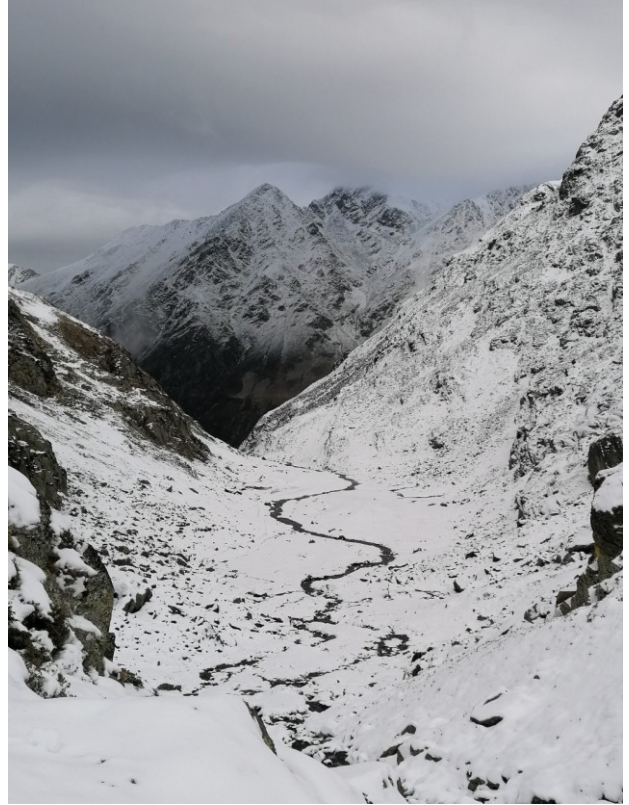


Photo 26. France, Ariège, Vicdessos, above Soulcem Lake, Gardelle Valley, above 1820 m, landscape view (*Simaphylax ariegeus* sp. nov.) (G. Vinçon).