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Micropsectra arduinna sp.n. (Diptera: Chironomidae, Tanytarsini), a new brachypterous species inhabiting acid peat bogs located in NE-France

Micropsectra arduinna sp.n. (Diptera: Chironomidae, Tanytarsini), новый брахиптерный вид из кислотных торфяных болот северо-востока Франции

J. Moubayed-Breil*, G. Coppa**
Дж. Мобайед-Брейл*, Г. Коппа**

* 10 Rue des Fenouils, Montpellier F-34070 France. E-mail: mvp5133@gmail.com.
* 10-я ул. Фенуи, Монтпелье, Франция.

** 1 rue du Courlis, Villers-sur-Bar F-08350 France. E-mail: gennaro.coppa@wanadoo.fr.
** ул. Керлью, Вилле-сюр-Бар, Франция.

Key words: Chironomidae, *Micropsectra arduinna*, brachypterous, acid peat bogs, NE-France, new species.
Ключевые слова: Chironomidae, *Micropsectra arduinna*, брахиптерный вид, кислотные торфяные болота, северо-восток Франции, новый вид.

Abstract. The male adult of *Micropsectra arduinna* Moubayed-Breil, **sp.n.** is described, the diagnosis based on material recently collected in low land acid peat bogs (alt. 250–300 m) located in the department of Ardennes (NE-France). Taxonomic notes provided include some comparative characters found in the male adult of *M. uliginosa* (Reiss, 1969), which is considered to be a sister species of *M. arduinna* Moubayed-Breil, sp.n. The distribution of *M. arduinna* Moubayed-Breil sp.n. is currently restricted to its type locality. Remarks on taxonomic position, and ecology of the new described species are given.

Резюме. Приведено иллюстрированное описание имаго самца *Micropsectra arduinna* Moubayed-Breil **sp.n.** по материалу, собранному у торфяного болота с кислой pH среды на высоте 250–300 м н.у.м. в провинции Арденн (северо-восток Франции). Брахиптерные самцы *M. arduinna* Moubayed-Breil, sp.n. и *M. uliginosa* (Reiss, 1969) имеют много общих морфологических признаков, и поэтому их можно считать близкородственными видами. Географическое распространение *M. arduinna* Moubayed-Breil sp.n. ограничено типовым местообитанием. Также даны замечания, таксономическое положение и экология нового вида.

Introduction

In this paper a new brachypterous *Micropsectra arduinna* sp.n. is described and diagnosed as male adult based on material recently collected in low land acid peat bogs (altitude 250–300 m) located in the department of Ardennes (NE-France). On the basis of some relevant characters found in the male adult of both *M. arduinna* sp. n. and *M. uliginosa* (Reiss, 1969) these two brachypterous species appear to be closely related and therefore are both considered as sister species. According to Shilova [1976], Reiss [1969, 1971, 1982, 1983], Langton and Ruse [2006], Murray and Baars [2006], Giłka [2009, 2011], Ekrem et al. [2010], Giłka and Jazdzewska [2010] currently there is six known species of the genus *Parapsectra* Reiss, 1969 which are actually included in the genus *Micropscetra* Kieffer, 1909: *M. bumasta* (Giłka et Jazdzewska, 2010), *M. chionophila* (Edwards, 1933), *M. nana* (Meigen, 1818), *M. styriaca* (Reiss, 1969), *M. uliginosa* (Reiss, 1969), *M. wagneri* (Siebert, 1979). Consequently the description of *M. arduinna* sp.n. increases to seven the total number of the latter group of *Micropsectra* species. The recent updated list of 767 species previously provided for continental France in Moubayed-Breil et Ashe [2016, 2018a, b], Moubayed-Breil [2017] and Moubayed-Breil and Dia [2017] was upgraded to 768 valid known Chironomid species in Moubayed-Breil [2018]. Consequently, the description of *M. arduinna* sp. n. currently increases the total number to 769 known Chironomid species from this country. Morphological terminology and measurements follow that of Saether [1980] for the imagines. Remarks and discussion on the nearest related *Micropsectra* species and comments on the ecology and geographical distribution of the new species are given. Holotype (on 1 slide) is deposited in the collections of the Zoologische Staatssammlung (ZSM), Munich, Germany. Type material was preserved in 80–90 % alcohol, and later mounted in polyvinyl lactophenol. For each adult, the head, thorax and abdomen were cleared in 90 % lactic acid then washed in 60–70 % ethanol before mounting on slides.

Micropsectra arduinna Moubayed-Breil, **sp.n.**
Figs 1–3, 6; 8–11; 15–21.

Type material. Holotype: 1 male adult, France, Acid peat bogs, Signy-Le-Petit wetland area (Department of Ardennes, NE-France), upper basin of the River La Gland, altitude 250–

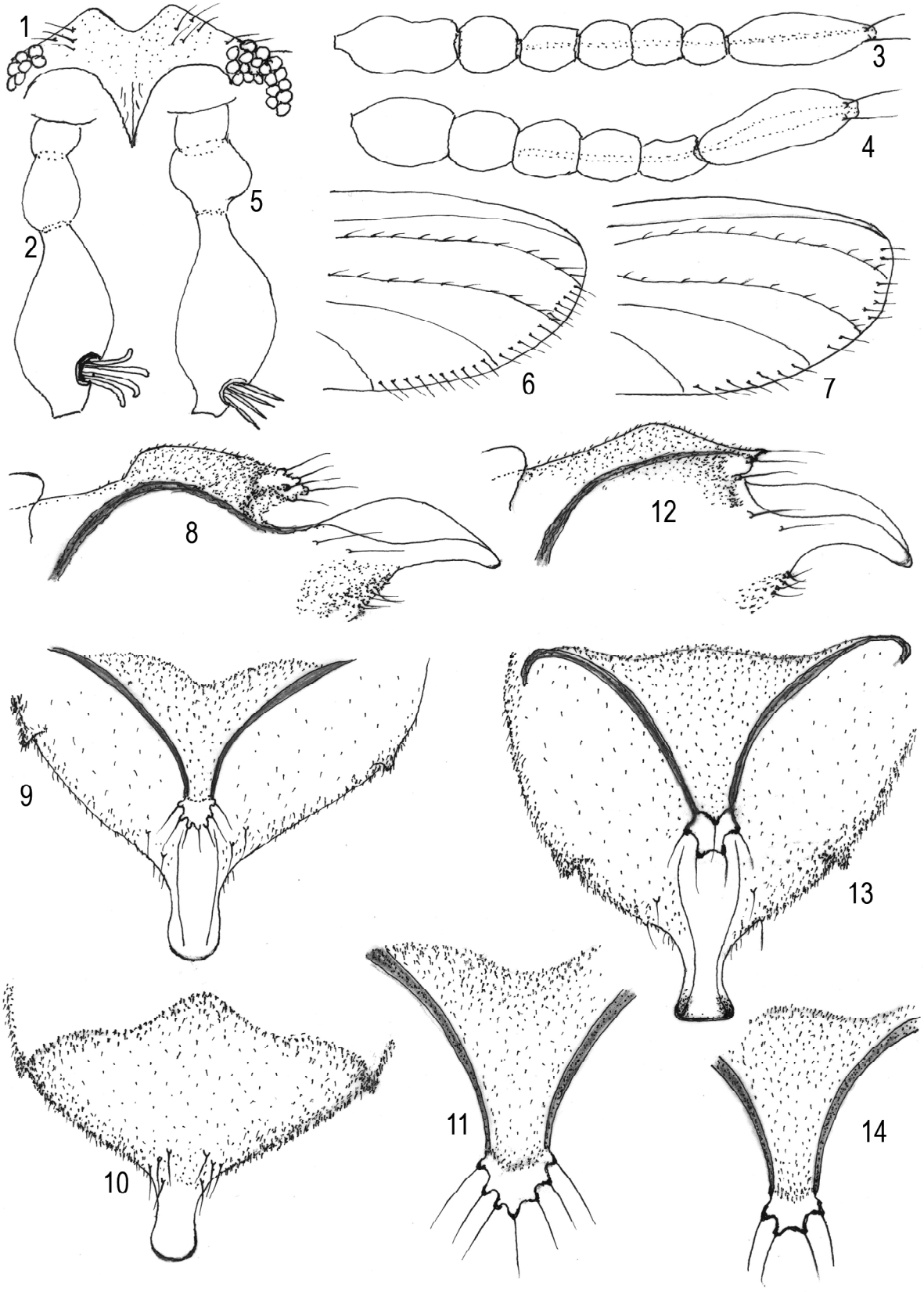
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Table 1. *Micropsectra arduinna* sp.n.: length (μm) and proportions of legs
Таблица 1. *Micropsectra arduinna* sp.n.: длина (μm) и пропорции ног

P	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
PI	595	460	510	215	175	130	90	0.90	2.40	2.60	1.31
PII	490	440	150	85	65	55	60	0.34	4.00	6.20	0.71
PIII	605	555	230	145	130	80	65	0.41	3.31	5.04	1.70

300 m; leg. Gennaro Coppa, 17.IV.2016 (Fig. 26). Environmental data of water are: moderately crystalline water, conductivity about 20−30 μS/cm; temperature 6−15 °C.

Etymology. The species name '*arduinna*' belongs to the known religious Goddess '*Arduinna*', which is one of the many Celtic Goddesses who is associated with a particular territory or body of water. *Arduinna* is derived from the Gaulish '*arduo*' (meaning height) and refers to the eponymous tutelary goddess of the Ardennes Forest and Regions delimited by the current day Belgium and Luxembourg with small portions found in France and Germany.

Diagnosis. *M. arduinna* sp.n. represents a sister species of *M. uliginosa* based on close resemblance of some features found in the male adult. However, the new described species can be separated from other European members of the genus in having: palpomere 3 much longer than fourth; sensilla coeloconica on palpomere 3 tubule-like; number and location of setae on cells of wing differently figured; elevated hump and dorsal tubercles on tergite IX markedly projecting; anal point drop-like with rounded apex; median volsella with short stem, bent downwards, bearing often fusiforme setae; inferior volsella markedly wider at base than in median part, setiferous ventral lobe consists of 5 setae (placed: 1 medially, 2 on outer margin, 2 posteriorly; gonostylus slender, swollen medially, distal half distinctly tapering to a pointed apex.

Description. *Male imago* (n = 1, brachypterous male adult; Figs 1–3, 6, 8–11, 15–21). A very small sized *Micropsectra* species. Total length 1.75 mm. Wing length 0.70 mm. TL/WL 2.5. Colouration pale to brown with contrasting brown to dark brown head, thorax, abdominal segments and anal segment. Tergites I–VI with two lateral brownish bands, which are markedly converging towards the posteromedian area.

Head (frontal and temporal parts, Fig. 1). Eyes bare; hairs present on distal half of inner margin of eyes; frontal margin markedly gaping medially, with two distinct semi-circular projections placed on each side of the coronal suture; coronal triangle well represented; frontal tubercles absent. Temporal setae 8 including 5 inner and 3 outer verticals. Clypeus rectangular with 16 setae in 5 rows. Palp (Fig. 2) 5-segmented; length (in μm) of segments 1–5: 20, 28, 83, 67, 89; palpomere 4 strongly shorter than third; palpomere 3 with tubule-like sensilla coeloconica. Antenna (Fig. 3) 7-segmented, 261 μm long; length (μm) of segments: 55, 35, 32, 32, 32, 20, 75; ultimate flagellomere clubbed and bearing 2 pre-apical setae; antennal groove reaching segments 3; AR 0.40.

Thorax. Lobes of antepronotum widely gaping; antepronotals, acrostichals and prealars absent; dorsocentrals 11 including 8 grouped proximally and 3 placed distally; humeral pit oval and small sized. Scutellum (Fig. 20) with 6 setae placed laterally in 1 row (3 on each side), the mostly located lateral seta is much smaller; median area bare.

Wing. General form as in *M. uliginosa*, markedly reduced, linear and spatulate; maximum width 110 μm; brachiolum with 2 setae; distribution pattern of setae on veins and cells as shown in Fig. 6); number of setae on veins: R 11–12; R_1 11–13; R_{2+3} 0; R_{4+5} 9–10; remaining veins bare; number of setae on cells: r_{2+3}, 0; r_{4+5}, 5–6; m_{1+2}, 5; m_{3+4}, 9–10; an, 1–2. Squama bare.

Legs. Length (in μm) of tibial spurs: PI, 10; PII, 65 and 10; PIII, 75 and 50. Tibial combs of PII and PIII vestigial with about 10 short teeth (5–10 μm long), separated by about 60 μm. Tarsomeres ta_1–ta_4 of PII much shorter than those of PI and PIII; the ratio (length of tarsomeres ta_1–ta_5 of PI divided by that of ta_1–ta_5 of PII) is as follows: 3.4, 2.5, 2.5, 2.4, 1.5; maximum value of BR (1.31–1.70) is recorded on PI and PIII, lowest value (0.71) belongs to PII; highest values of SV are those of PII (6.20) and PIII (5.04); sensilla chaetica present on tarsomeres ta_1 to ta_5 of PI, PII and PIII. Length (μm) and proportions of legs as in Table 1.

Hypopygium (Figs 15–19) as illustrated in dorsal (Fig. 15) and ventral view (Fig. 16, with anal point and tergite IX removed). Tergite IX 180 μm maximum width at base, subrectangular and narrowing distally; presence of a dorsal projecting elevated hump on median area (clearly visible in lateral view, Fig. 8), is bearing seven small tubercles with 1 seta each (clearly visible in dorsal view, Figs 9, 11, 15); setae on apical part of the dorsal hump as shown in Figs 9, 11 and 15; teeth on median part of lateral margin present; anal tergite bands (Figs 9, 11, 15) converging towards base of the median tubercles; posteromedian area delimited by the anal tergites bands gaping medially at base and covered with dense microtrichia. Anal point (Fig. 8, lateral; Figs 9, 15, dorsal; Fig. 10, ventral) about 60 μm long and 20 μm maximum width at distal part; distinctly drop-like shaped, constricted medially and ending with rounded apex; a long crest (Figs 8, 9, 15) is extending from base to distal part; base with 4–5 dorsal setae and about 8 setae inserted ventrally. Sternapodeme orally directed medially, bear-

Figs 1−14. Imago males of *Micropsectra arduinna* (1−3, 6, 8−11), and *M. uliginosa* (2−5, 7, 12−14): 1 — head, frontal and temporal areas, 2 — palpomeres 1−3, 3 — antenna, 4 — antenna, 5 — palpomeres 1−3. 6−7 — distal half of wing of *M. arduinna* sp.n. (6), and *M. uliginosa* (7). 8−10 — tergite IX and anal point in lateral (8), dorsal (9) and ventral view (10); 11 — dorsal tubercle of tergite IX; 12 — tergite IX and anal point, lateral view; 13 — tergite IX and anal point, dorsal view; 14 — dorsal tubercle of tergite IX.

Рис. 1−14. Имаго самцы *Micropsectra arduinna* (1−3, 6, 8−11) и *M. uliginosa* (2−5, 7, 12−14): 1 — голова, фронтальная и темпоральная области; 2 — 1−3 членики максиллярного щупика; 3, 4 — антенна; 5 — 1−3 членики максиллярного щупика. 6−7 — дистальная половина крыла *M. arduinna* sp.n. (6) и *M. uliginosa* (7). *M. arduinna* sp.n. (8−10): тергит IX и анальный отросток, вид сбоку (8), то же, вид сверху (9) и снизу (10); 11 — дорсальный бугорок на тергите IX; 12 — тергит IX и анальный отросток, вид сбоку; 13 — тергит IX и анальный отросток, вид сверху; 14 − дорсальный бугорок на тергите IX.

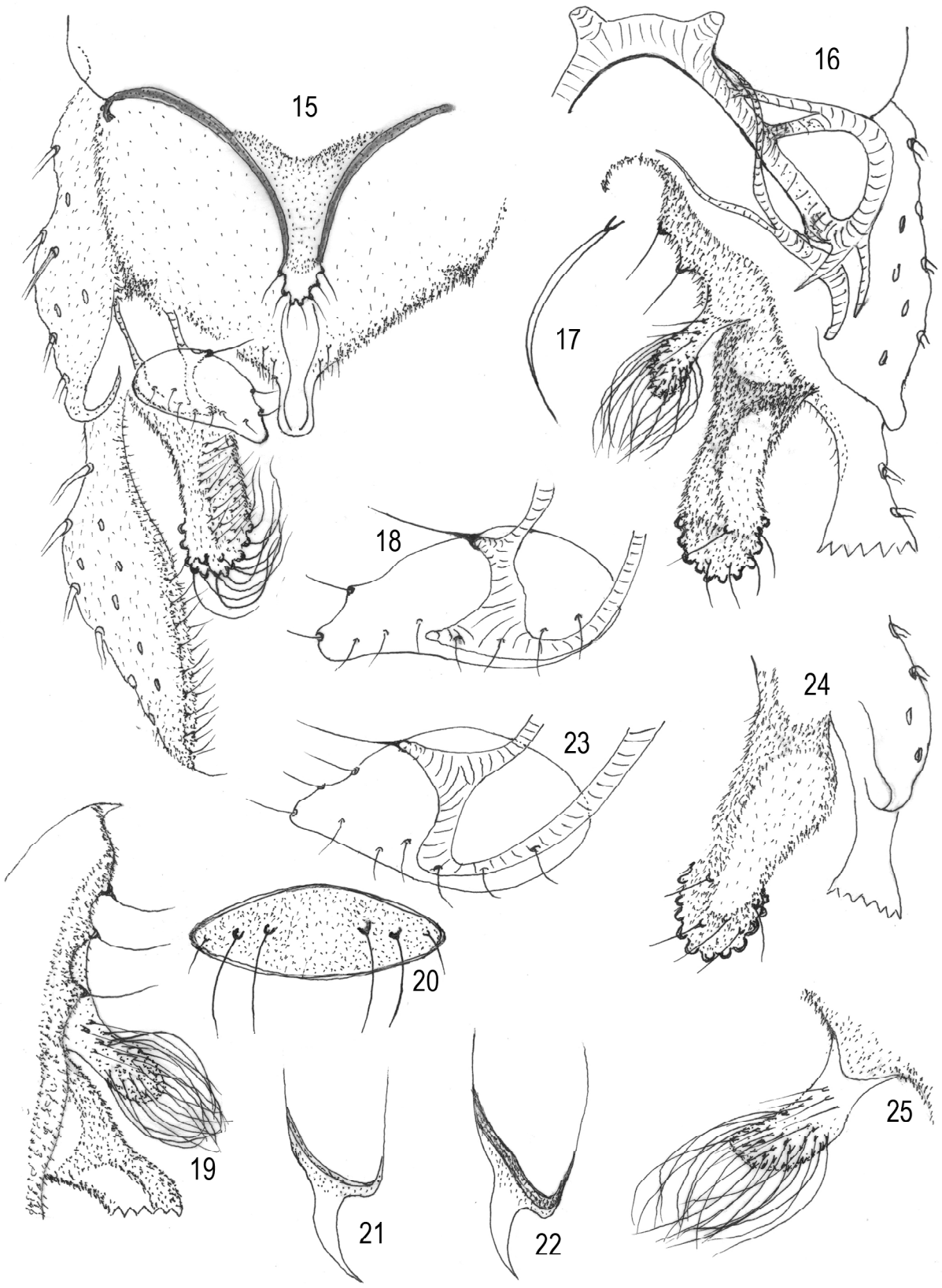
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Fig. 26. Acid peat bogs at Signy-le-Petit (type locality, NE-France), upper basin of the River La Gland, altitude 250–300 m (Photo of Gennaro Coppa, 17.IV.2016).

Fig. 26. Кислотные торфяные болота у Сигни-Ле-Петит (типовое местообитание, северо-восток Франции), верхний бассейн р. Ла Гланд, высота над уровнем моря 250–300м (Фото Геннаро Коппа, 17.IV.2016).

ing two characteristic lateral horn-like projections; coxapodeme composed of a linear elongate inner part which turns over at base to join the upper outer part; phallapodeme crescent-like at base and bifurcate apically, outer branch projecting upwards to join the upper part of coxapodeme. Superior volsella (Figs 15, 18), 75 µm long and 30 µm maximum width; microtrichia absent; swollen proximally and narrowing distally; anterior margin convex in its proximal part, sinuous distally with setal protuberances; digitus stout and short, overreaching half length of superior volsella, *Micropsectra*-seta placed on a distinct short tubercle; surface with 2 setae on inner anterior margin and 7 smaller setae on posterodorsal area. Median volsella (Figs 16, 19) about 60 µm long and 45 µm maximum width, distinctly bent downwards, consists of a short stem spherical to bulbous distally, bearing about 17–20 setae which are parallel-sided basally and fusiforme distally (Fig. 17). Inferior volsella (Figs 15–16) about 120 µm long and 40 µm maximum width; base markedly wider than median part; dorsal side (Fig. 15) with 29–32 setae including 19–21 relatively short (located medially in 2–3 longitudinal rows) and 10–11 longest (inserted close to the posterior margin); setiferous ventral lobe (Fig. 16) is composed of 5 setae (placed: 1 medially, 2 on outer margin, 2 posteriorly). Gonocoxite 150 µm long, with 8–9 setae. Gonostylus (Fig. 15) 190 µm long and about 40 µm maximum width, slender, moderately swollen medially, tapering in its distal half to a pointed apex; median and distal inner margin bearing 1–2 row of 8–10 fine long setae. HR 0.79.

Pupal and larva unknown.

Taxonomic remarks. *M. arduinna* sp.n. and *M. uliginosa* belong to two closely related species: both are brachypterous, small sized *Micropsectra* species and characterized by some similar morphological features found in the male adult. Therefore, these two species can be considered as sister species. However, *M. arduinna* sp.n. can be separated from *M. uliginosa* based on comparative taxonomic data from the literature [Reiss 1969, Figs 1–6; Giłka and Jazdzewska 2010, Figs 6, 25–28] or, on the following summarized distinguishing relevant characters provided in Table 2.

Ecology and geographical distribution. The male adult of *M. arduinna* sp.n. is collected in the acid peat bog of Sevigny-Le-Petit (type locality, North Eastern France, altitude 250–300 m). Emergence is recorded in April.

Figs 15–25. Imago males of *Micropsectra arduinna* (15–21), and *M. uliginosa* (22–25): 15–16 — hypopygium in dorsal (15) and ventral view; 16 — tergite IX and anal point removed; 17 — seta of median volsella; 18 — superior volsella; 19 — median volsella and base of inferior volsella; 20 — scutellum; 21 — femoral claw of PII; 22 — femoral claw of PII; 23 — superior volsella; 24 — inferior volsella, ventral view; 25 — median volsella.

Рис. 15–25. Имаго самцы *Micropsectra arduinna* (15–21) и *M. uliginosa* (22–25): 15–16 — гипопигий, вид сверху (15) и вид снизу; 16 — тергит IX и анальный отросток удалены; 17 — щетинка медиального придатка; 18 — верхний придаток; 19 — медиальный придаток и основание нижнего придатка; 20 — скутеллюм; 21 — крючок бедра на средней ноге; 22 — femoral claw of PII; 23 — верхний придаток; 24 — нижний придаток, вентральный вид; 25 — медиальный придаток.

Table 2. Main differentiating characters in the male adults of *Micropsectra arduinna* sp.n. and *M. uliginosa*
Таблица 2. Сравнительная характеристика основных морфологических признаков самцов *Micropsectra arduinna* sp.n. и *M. uliginosa*

Main distinguishing characters	*M. arduinna* sp.n.	*M. uliginosa* (Reiss, 1969)
Sensilla coeloconica on palpomere 3	Tubule-like with rounded apex	Tubule-like with pointed apex
Distribution of setae on cells: Figs 6–7	r_{2+3}, 0 / r_{4+5}, 5–6 / m_{1+2}, 5 / m_{3+4}, 10 / an, 1–2	r_{2+3}, 2 / r_{4+5}, 5 / m_{1+2}, 2 / m_{3+4}, 7–8 / an, 0
Tergite IX	Sub-rectangular	Semi-circular
Hump of tergite IX	Well elevated and projecting	Low and not projecting
Dorsal tubercles of tergite IX	Number, 7	Number, 4–5
Dorsal area between tergite bands	Distinctly gaping medially ad base	Convex medially at base
Anal point	Drop-like with rounded apex	Not drop-like, with truncate apex
Median volsella	Bent downwards	Slightly projecting upwards
Setae on median volsella	Parallel-sided basally, fusiforme apically	Falciform (basally), fusiforme (apically)
Inferior volsella	Base wider than median part	Median part wider than base
Gonostylus	Slender and tapering; apex pointed	Bulbous, not tapering; apex not pointed

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