

Description of *Metalimnobia (Metalimnobia) charlesi* sp. n. from Europe (Diptera, Limoniidae)

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The crane-fly species *Metalimnobia (Metalimnobia) charlesi* sp. n. is described from Europe, and a photograph of the wing and illustrations of the male terminalia are provided. This new species is closely related to *M. (M.) quadrimaculata* (Linnaeus), but it can be distinguished by differences in some external and genital characters. The larva of the new species is most probably saproxylic, being associated with polyporous fungi on decaying deciduous trees. *M. (M.) charlesi* sp. n. is known from Finland, Slovakia and Sweden.

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1. Introduction

The nominotypical subgenus of the genus *Metalimnobia* Matsumura, 1911 (Diptera, Limoniidae, Limoniinae) is Holarctic and Oriental in its distribution, with 30 currently recognized species and subspecies (Oosterbroek 2008). The other two subgenera of the genus, *Tricholimonia* Alexander, 1965 and *Lasiolimonia* Alexander, 1976, are Afrotropical and limited in the number of species. Adults of *Metalimnobia* s. str. are large flies within European Limoniidae. The gonostyli of the male terminalia are considerably modified, consisting of four appendages. Whereas the smooth, arched, darkly pigmented and sclerotized spine may well be interpreted as the dorsal (outer) gonostylus, the two fleshy, setose lobes seem to be parts of the body of the ventral (inner) gonostylus, as in e.g. *Dicranomyia* Stephens, 1829 and others, and the innermost long process most probably represents the so-called rostrum of

the same (cf. Fig. 2a,c). Adults of *Metalimnobia* s. str. may be characterized by the following morphological characters (modified after Dienske 1987): antenna with 12 flagellomeres; Sc1 ending nearly opposite fork of Rs; wing length more than 12 mm; wings mostly conspicuously patterned with dark brown patches; male ventral (inner) gonostylus deeply divided into three lobes. Larvae of European species are associated with fruiting bodies of both fleshy (i.e. Agaricales and Ascomycotina) and woody (i.e. Aphyllophorales) fungi (e.g. Coe 1941, Hackman & Meinander 1979, Yakovlev 1994, Ševčík 2001).

Bo Tjeder, a Swedish entomologist and outstanding student of European craneflies, discovered an undescribed *Metalimnobia* s. str. in northern Sweden in 1970's. In a letter sent to Hans Mendl (written in German, a copy of this letter is deposited in the correspondence archives of J. Starý), Tjeder stated that his two specimens, a male and a female, both collected at Messaure

(Lule Lappmark), had been seen by Charles P. Alexander, who considered them distinct from the closely related *M. (M.) quadrimaculata* (Linnaeus, 1760). Tjeder used a “manuscript name” *Metalimnobia charlesi* for this species and illustrated the male hypopygium. Unfortunately, he never submitted a formal description, and, thus, the new *Metalimnobia* remained undescribed. The authors of this article have recently succeeded in collecting this species in Finland and Slovakia. It has probably been overlooked rather than being extremely rare.

Acronyms of museums and collections used in the text are as follows: JSJ (collection of J. Salmela, Jyväskylä, Finland), JSO (collection of J. Starý, Olomouc, Czech Republic), MZHF (Zoological Museum, Helsinki, Finland), MZLU (Museum of Zoology, Lund, Sweden), NHMJ (Natural History Museum of Jyväskylä University, Jyväskylä, Finland). The morphological terminology essentially follows McAlpine (1981), except for notation of the wing veins, which is in accordance with Hennig (1954). Finnish biogeographical provinces (e.g. Ta [=Tavastia australis] and Sb [=Savonia borealis]) precede the locality data and site coordinates following the localities are given in the Uniform Finnish grid system (EPSG code 2393).

2. *Metalimnobia charlesi* sp. n. (Figs 1a, 2a–b)

Type material. Holotype: Finland, Sb: Karttula, Suojärvenpuro 6960564:3508034, 16.VII.2008, 1♂, J. Salmela leg. (pinned specimen) (MZHF).

Paratypes: Finland. Ta: Korpilahti, Vaarunvuoret, 12.VI.2007, 1♂, K. Kulmala leg. (NHMJ); Ta: Lammi, Untulanharju 6777227:3392591, 15.VIII.–18.X.2007, 2♂♂, J. Jakovlev & J. Penttinen leg. (JSJ, JSO); Tb: Petäjavesi, Kintaus, Kortelahti 6913:3417, 4.VI.2007, 1♂, K. Kulmala leg. (NHMJ); Tb: Muurame, Kuusimäki 6902262:3421848, 27.VII.–31.VIII.2007, 1♂, N. Vartija leg. (JSJ); Tb: Muurame, Kuusimäki 6901863:3421764, 6.–27.VI.2007, 5♀♀, 27.VII.–31.VIII.2007, 2♂♂, N. Vartija leg. (JSJ, JSO); Tb: Muurame, Kuusimäki 6902012: 3421794, 27.VII.–31.VIII.2007, 2♂♂, 3♀♀, N. Vartija leg. (JSJ); Tb: Muurame, Kuusimäki 6902399: 3421798,

6.–27.VI.2007, 1♂, N. Vartija leg. (JSJ); Tb: Muurame, Kuusimäki 6902760: 3421940, 27.VII.–31.VIII.2007, 2♀♀, N. Vartija leg. (JSJ); Tb: Jyväskylän mlk, Iilivuori E 6887500:3443850, 10.VII.2008, 1♀, J. Salmela leg. (ZMHF); Sa: Leivonmäki, Hakosjärvi W 6880479:3457185, 10.VII.2008, 1♂, J. Salmela leg. (ZMHF); Sb: Vieremä, Puolinpuro 7098858: 3494801, 13.VII.2008, 1♂, J. Salmela leg. (ZMHF); Sb: Vieremä, Joutensuo N 7088628: 3490990, 18.VI.2008, 1♂, J. Salmela leg. (JSJ); Sb: Kiuruvesi, Jynkänjärven lehto 7046684: 3484818 13.VII.2008, 1♂, J. Salmela leg. (JSJ). Slovakia. Poľana Mts, Detva, Detvianský brook (800 m a.s.l.), 19.VI.2003, 1♂, J. Starý leg. (JSO); Poľana Mts, “Hrončecký grúň” (800–900 m a.s.l.), 4.VII.2006, 1♂, J. Starý leg. (JSO).

Diagnosis. Large species. Body length in male 11.0–16.0 mm, in female 12.0–15.0 mm; wing length in male 14.0–18.5 mm, in female 12.0–16.0 mm. General coloration yellowish brown. Prescutum and scutum with four stripes. Femora with two dark rings. Wing patterned with dark brown patches, generally less extensive than those in *M. (M.) quadrimaculata*; dark seam along base of Cu barely evident. Abdominal tergites generally yellow, their posterior margins dark brown. Parameres of male terminalia broad and generally straight, not sinuous as in *M. (M.) quadrimaculata*. Female cercus shorter than that of *M. (M.) quadrimaculata*.

Description. Male. Head dark brown dorsally, laterally with yellowish brown pruinosity. Eye purple, with metallic hue. Palpus dark brown. Antenna 14-segmented, moderate in length, not reaching to base of wing, scape and pedicel paler than flagellomeres. Scape cylindrical, pedicel globular. Flagellomeres ovoid, decreasing in breadth towards apex of antenna, covered with dense and short semierect pubescence. Longest verticils about 2.5 times as long as respective segment. Last segment longest, vermiculate, broadest subbasally, about twice as long as penultimate segment.

Thorax generally brown, somewhat shiny and variously covered with yellowish brown or golden brown pruinosity. Prescutum and scutum with two dark median stripes and two dark lateral stripes, latter broader than former. Sparse light hairs present in two longitudinal rows in yellow-

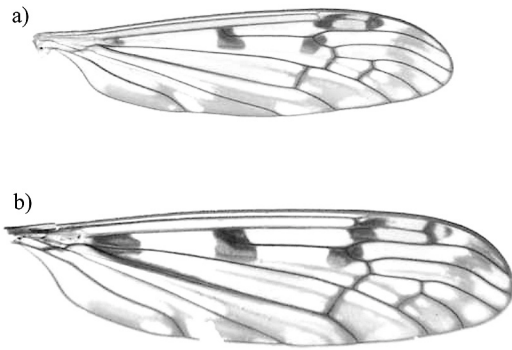


Fig. 1. Male wings. – a. *Metalimnobia (Metalimnobia) charlesi* sp. n. (Finland). – b. *M. (M.) quadrimaculata* (Linnaeus) (Finland).

ish brown interspaces between median and lateral stripes. Scutal lobes mainly dark brown, yellowish brown at anterior and posterior corners and with two narrow light stripes in median part. Sparse dark hairs on scutal lobes. Scutellum and postscutellum predominantly brown. Pleuron dark brown, restrictedly patterned with paler areas. Fore coxa dark brown, mid and hind coxae paler, yellowish brown. Trochanters yellowish brown. Legs relatively long. Femora light brown with dark subapical and apical rings. Tibiae brownish, darkened at tips. Tarsi dark brown.

Tarsomere 1 longer than tarsomeres 2–5 combined; tarsomere 2 about as long as tarsomeres 3+4; tarsomere 5 somewhat longer than, or subequal in length to, tarsomere 4. Claws slender, rather short, much shorter than tarsomere 5. Three teeth present near base of claw, distal one longest, median tooth shorter and proximal one minute. All legs similar in above-mentioned characters. Halter pale, knob slightly infuscated in basal part.

Wing (Fig. 1a) tinged yellowish, with dark brown patches present at bases of R, Rs and R2+3+4; pterostigma yellowish, bordered by dark patch on each side. Patch at base of R very small, that at base of Rs not reaching to M. Seams along cross-veins r-m, m-m and m-cu and basal sections of M1+2 and M3. Base of Cu only indistinctly seamed. Obscure brownish irregular clouds in all marginal cells, arranged in transverse band before apex of wing. Wing venation as in other *Metalimnobia* s. str.

Abdomen with tergites 1, 7 & 8 predominantly brown, other tergites generally yellow, their posterior margins brown; ill-defined median stripe sometimes present on posterior tergites. Sternites with similar coloration, but sternite 1 yellow.

Male terminalia (Fig. 2a–b) yellowish. Ter-

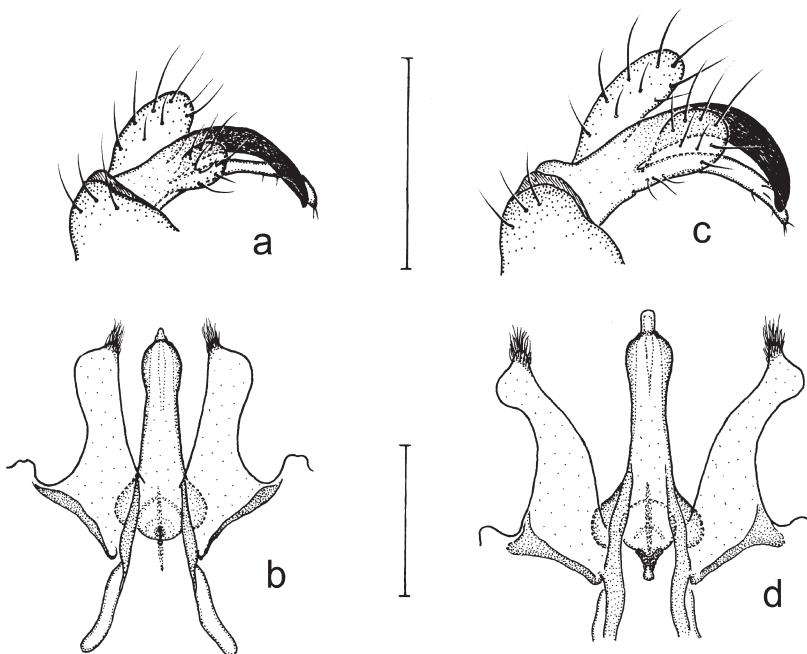


Fig. 2. Male terminalia of *Metalimnobia (Metalimnobia) charlesi* sp. n. (Finland) (a–b) and *M. (M.) quadrimaculata* (Linnaeus) (Finland) (c–d). – a and c. Gonostyli, dorsal. – b and d. Aedeagal complex, dorsal. Scale bars 0.5 mm.

gite 9 with two groups of dense setae at posterior margin. Gonocoxite stout, with broad and blunt ventromesal lobe. Dorsal gonostylus darkly pigmented, moderately arched. Ventral gonostylus divided into three lobes; for details, see Fig. 2a and Introduction. Aedeagus rather short (cf. Fig. 2b and d). Paramere flattened, relatively broad and short, not sinuous, inner lateral edge almost straight. Tip of paramere obtuse, with dense tuft of hairs (Fig. 2b).

Female. Resembling male in general appearance. Female terminalia with cercus distinctly shorter than tergite 10.

Etymology. Tjeder's original manuscript name, *charlesi*, is used for this species, dedicating it to Charles P. Alexander. A noun in genitive singular.

3. Discussion

3.1. Taxonomic remarks

Metalimnobia (M.) charlesi sp. n. is a large species even within European *Metalimnobia* s. str. Along with *M. (M.) quadrimaculata*, the most closely related species, it is among the largest European Limoniidae. On average, *M. (M.) quadrimaculata* seems to be somewhat larger than *M. (M.) charlesi* sp. n., but there is considerable variation in size in both species. The wing pattern in *M. (M.) charlesi* sp. n. is somewhat less pronounced than that in *M. (M.) quadrimaculata*, with the patches at base of R and Rs distinctly smaller, the latter not reaching posteriorly to M, and the seam at the base of Cu only weakly indicated or lacking entirely (cf. Fig. 1a–b).

The most distinctive differences between the two species are in the structure of the male terminalia. The dorsal gonostylus is distinctly less arched in *M. (M.) charlesi* sp. n. (more strongly in *quadrimaculata*), and the two fleshy divisions of the ventral gonostylus are shorter, more rounded (cf. Fig. 2a and c). The aedeagus and the parameres are shorter in the new species, the latter rather straight along inner margin, not strongly curved as in *M. (M.) quadrimaculata* (cf. Fig. 2b and d).

The female terminalia of *M. (M.) charlesi* sp. n. have the cerci distinctly shorter than tergite 10

(longer in *quadrimaculata*, subequal in length to tergite 10).

3.2. Biology and distribution of *Metalimnobia (M.) charlesi* sp. n.

Based on specimen data, and knowledge of other species within the subgenus, the larvae of *Metalimnobia (M.) charlesi* sp. n. are most probably fungivorous, perhaps confined to wood-decomposing polyporous fungi. A large part of the type material (16 specimens) was obtained from trunk-emergence traps (for a description of the trap, see Penttinen *et al.* 2007) set on decaying logs in the forest floor. A total of 14 specimens emerged from birch trees (*Betula* sp., most probably *B. pubescens* Ehrh.) decayed by *Fomitopsis pinicola* (Sw.: Fr.) P. Karst., and two specimens from a birch log decayed by *Fomes fomentarius* (L.: Fr.) Fr.; several fruiting bodies of the respective polyporous fungi were enclosed in each trap. All these logs were lying in the Kuusimäki old-growth forest. Traps were also set on spruce (*Picea abies* (L.) H. Karst.) logs and on birch logs in the surrounding commercial forests, but no specimens of *M. (M.) charlesi* sp. n. were recorded from spruce nor from outside the old-growth forest. Additional Finnish localities are Nature Conservation Areas (Untulanharju, Vaarunvuoret, Jynkänjärvi) or forest sites with notable amounts of coarse deciduous woody debris. In the trunk-emergence trap material the new species was found together with saproxylic and fungivorous limoniids viz. *Achyrolimonia decemmaculata* (Loew, 1873), *Discobola annulata* (Linnaeus, 1758), *D. caesarea* (Osten Sacken, 1854), *Elephantomyia (Elephantomyia) krivosheinae* Savchenko, 1976 and *Metalimnobia (M.) quadrimaculata*. *Metalimnobia (M.) charlesi* sp. n. is a summer species, its flying season extends from the mid June to the end of August.

The new species is known from Finland, Slovakia and Sweden. The Swedish material could not be traced in MZLU (pers. comm. by R. Danielsson), but, without doubt, the specimens studied by B. Tjeder (Lule Lappmark, Messaure) are conspecific with the type material examined here, based on Tjeder's drawings. In Fennoscandia, the species was recorded from southern, middle and

northern boreal vegetation zones, between latitudes of 61°5'N and 66°40'N. The Slovak specimens come from the mountains (Poľana Mts) in the central part of the country.

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