

SHORT COMMUNICATION

*Neolimnophila alaskana* (Alexander, 1924) stat. nov.,  
a species new to the Palaearctic Region (Diptera: Limoniidae)

Jaroslav STARÝ

Neklanova 7, CZ-779 00 Olomouc-Nedvěži & Silesian Museum, Nádražní okruh 31, CZ-746 01 Opava, Czech Republic;  
e-mail: stary.cranefly@gmail.com

Accepted:  
23<sup>rd</sup> January 2019

Published online:  
1<sup>st</sup> February 2019

**Abstract.** The Nearctic *Neolimnophila ultima ultima* (Osten Sacken, 1860) is proposed as a new junior synonym for the Palaearctic *N. placida* (Meigen, 1830). *Neolimnophila ultima alaskana* (Alexander, 1924) is elevated to species rank and reported in the Palaearctic Region for the first time. Redescriptions of *N. carteri* (Tonnoir, 1921), *N. placida*, and *N. alaskana* stat. nov. are provided and their male terminalia and wing venations are illustrated.

**Key words.** Diptera, Limoniidae, *Neolimnophila*, new synonymy, elevation in rank, male terminalia, distribution, Palaearctic Region

**Zoobank:** <http://zoobank.org/urn:lsid:zoobank.org:pub:57A8EEF0-327E-4214-B853-A143BA9FC099>

© 2019 The Authors. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Licence.

### Introduction

The genus *Neolimnophila* Alexander, 1920, previously considered a subgenus of *Limnophila* Macquart, 1834, is a small group of chioneine Limoniidae comprising altogether 17 species and one subspecies (OOSTERBROEK 2017). There are seven Palaearctic, six Oriental, four Nearctic, and one Neotropical species. Zoogeographical regions of interest for this paper are the Nearctic, including *N. ultima* (Osten Sacken, 1860) subdivided into two subspecies, *N. ultima ultima* and *N. ultima alaskana* (Alexander, 1924), and the West Palaearctic, with three species, viz. *N. placida* (Meigen, 1830), *N. bergrothi* (Kuntze, 1919), and *N. carteri* (Tonnoir, 1921).

*Neolimnophila* is characterized, above all, by the structure of the antennae, in which the three/four basal flagellomeres are united into a compact conical fusion element (ALEXANDER 1920, EDWARDS 1938). Within the West Palaearctic, fusion of the basal flagellomeres is shared also by *Crypteria* Bergroth, 1913 and *Chionea* Dalman, 1816. *Crypteria*, however, differs from *Neolimnophila* in having  $R_3$  distinctly longer than  $R_{3+4}$  and, in *Chionea*, the wings are atrophied. By the presence of separate veins  $M_1$  and  $M_2$  and tibial spurs, *Neolimnophila* shows certain similarities with the subfamily Limnophilinae, otherwise, however, it clearly belongs to the Chioneinae (ALEXANDER 1924, SAVCHENKO 1982). The male terminalia of *Neolimnophila*

are distinctive by a medially interrupted tergite 9 and the gonocoxites with one or two pairs of peculiar spines at the inner base, sometimes referred to as interbases (SAVCHENKO 1982, DIENSKE 1987). Based on the latter characters, an affinity of the genus *Rhabdomastix* Skuse, 1890 to *Neolimnophila* was tentatively suggested (STARÝ 2003).

Although some notes appeared in the literature on a possible synonymy of the Palaearctic *N. placida* and the North American *N. ultima* (e.g. ALEXANDER 1941: 312, EDWARDS 1938: 99, SAVCHENKO & KRIVOLUTSKAYA 1976: 81), nobody established the synonymy formally. I have compared the two species based on specimens from the Czech Republic and U.S.A.: Indiana, respectively, and can confirm the synonymy. In addition, another species was discovered in the Palaearctic Region that turned out to be identical with the North American *N. ultima alaskana*.

As a result, I here place *N. ultima ultima* in synonymy with *N. placida*, raise *N. ultima alaskana* to species rank and give the first records of the latter species from the Palaearctic Region. Redescriptions are provided and the male terminalia and wing venations are illustrated for *N. carteri*, *N. placida*, and *N. alaskana*, the most closely related species. Another European species, *N. bergrothi*, is not treated here, because its male terminalia differ considerably in the structure of the gonostyli from its regional congeners (KUNTZE 1919: Fig. 2; SAVCHENKO 1982: Fig. 8/3).



## Material and methods

The morphological terminology adopted here essentially follows that of McALPINE (1981), except that the notation of the wing veins is in accordance with HENNIG (1954). The material under study is dry-mounted unless otherwise stated in the “Material examined” sections. For simplicity,  $R_2$  is omitted here from notations of the vein  $R_{2+3+4}$ , therefore the latter vein is referred to as  $R_{3+4}$  and  $R_{2+3}$  as  $R_3$  in the redescriptions. External characters, including colouration, are described from dry-mounted specimens. The male terminalia, if necessary, were prepared by boiling in a solution of 10% KOH and preserved in glycerine in a sealed plastic tube pinned with the appropriate specimen. The labels of type specimens are quoted verbatim, and individual lines of text are separated by a slash (/). Distributions for individual species as well as the subdivisions of Russia are given as summarized by OOSTERBROEK (2017).

The following acronyms of museums and collections are used in the text:

- JSOC Jaroslav Starý collection, Olomouc, Czech Republic;  
 USNM National Museum of Natural History, Smithsonian Institution, Washington (D.C.), U.S.A.;  
 ZISP Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;  
 ZMUM Zoological Museum of Moscow University, Moscow, Russia.

## Taxonomy

### *Neolimnophila carteri* (Tonnoir, 1921)

(Figs 1–3, 10)

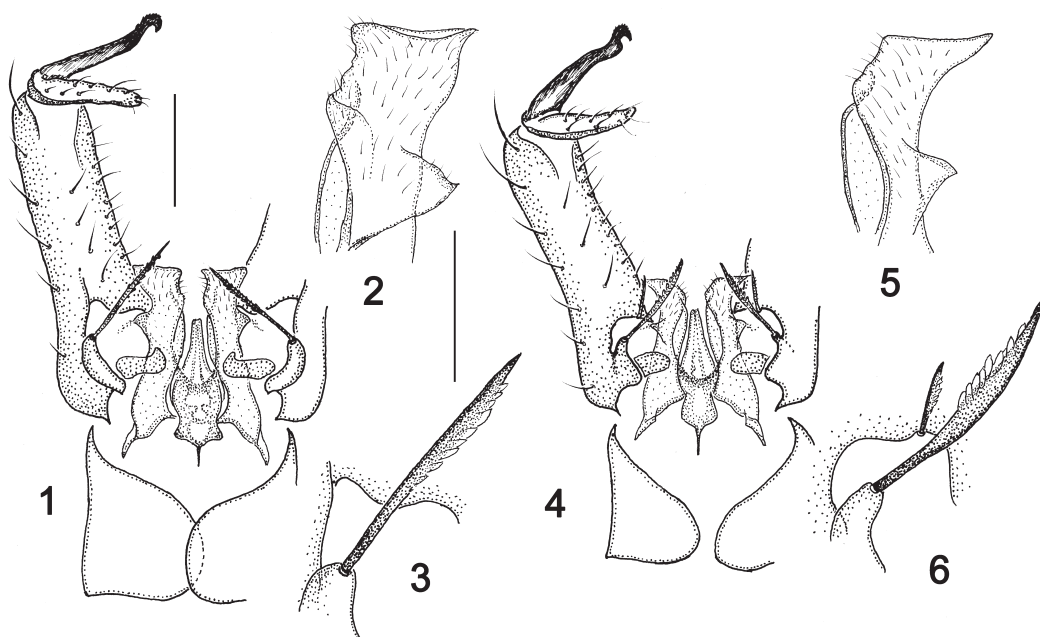
*Crypteria Carteri* Tonnoir, 1921 in GOETGHEBUER & TONNOIR (1921): 47 (description), Figs 33 (male terminalia), 34 (antenna).

*Limnophila placida* (misidentification): DE MEIJERE (1921): 70 (redescription), Text-Fig. 5 (wing), Taf. 5, Fig. 106 (male terminalia).

*Neolimnophila carteri*: EDWARDS (1938): 99 (diagnosis), Text-Fig. 18a (male terminalia), Pl. V, Fig. 3 (wing); SAVCHENKO (1982): 17 (redescription), Figs 6/1 (ovipositor), 7/1 (general view), 8/1 (male terminalia); PODENAS et al. (2006): 112, Fig. 29.4 (male terminalia) [copied from SAVCHENKO 1982].

**Material examined** (37 ♂♂ 22 ♀♀). **CZECH REPUBLIC: BOHEMIA:** Šumava Mts, Jezerní slať, 7.vii.1992, 2 ♂♂; Šumava Mts, Modrava, peat-bogs, 8.vii.1992, 1 ♀ (all J. Starý leg.) (all JSOC). **MORAVIA:** Hrubý Jeseník Mts [= Jeseníky Mts], Branná, “Dembauda” (900 m), 17.vii.1972, 1 ♂, 19.vii.1972, 1 ♂, 21.vii.1999, 1 ♂ 1 ♀ (at light); Hrubý Jeseník Mts, Rejvíz, 26.v.1969, 2 ♂♂; Hrubý Jeseník Mts, Malý Děd, 22.vi.1967, 1 ♂; Hrubý Jeseník Mts, Praděd, Bílá Opava valley (900–1050 m), 27.vi.1974, 1 ♀, 26.vii.1994, 1 ♂; Hrubý Jeseník Mts, Vidly, “Skalní potok” (700 m), 30.vii.2001, 1 ♀ (at light); Hrubý Jeseník Mts, Kouty nad Desnou, Divoká Desná valley, “Zámčisko” (970 m), 2.vi.2003, 1 ♂ (at light), 8.vii.2004, 1 ♂ 1 ♀ (at light); Libavá env., Nové Oldřávky, Odra valley, 22.vi.1993, 1 ♂; Kletné nr. Suchdol nad Odrou, 3.vi.1978, 1 ♂; Hrubá Voda nr. Olomouc, 15.v.1969, 4 ♂♂, 20.vi.1992, 1 ♂; Mladeč nr. Litovel, Třesín hill, 15.vi.1999, 1 ♀; Lazníky nr. Přerov, 9.vi.1991, 1 ♂, 1.vi.1992, 1 ♀, 7.vi.1993, 1 ♂; Moravskoslezské Beskydy Mts [= Beskydy Mts], Tanečnice (1000 m), 10.vii.1984, 1 ♂ 1 ♀; Moravskoslezské Beskydy Mts, Šance, “Vřesová stráň”, 25.vi.1996, 1 ♂; Moravskoslezské Beskydy Mts, Dolní Bečva, Horní Rozpitský valley (650 m), 29.vi.1994, 1 ♀; Moravskoslezské Beskydy Mts, Malinová (700–800 m), 24.vii.1990, 1 ♂; Moravskoslezské Beskydy Mts, Horní Bečva, “Kladnatá” 14.vi.1989, 1 ♀ (all J. Starý leg.) (all JSOC). **SLOVAKIA:** Západné Tatry Mts, Jamnicka valley, 11.vii.1967, 1 ♀ (J. Martinovský leg.) [listed by STARÝ & ROZKOŠNÝ (1969)]; Západné Tatry Mts, Baníkovské sedlo (1800 m), 26.vi.1998, 1 ♂ 1 ♀ (M. Vála leg.); Západné Tatry Mts, Spálená valley (1300–1400 m), 26.vi.1998, 1 ♂, 3 ♀♀, 22.vii.1998, 2 ♂♂ 1 ♀; Vysoké Tatry Mts, Mlynická valley, 2.viii.1973, 1 ♀; Vysoké Tatry Mts, Nové Štrbské pleso, 22.vii.1969, 1 ♀; Vysoké Tatry Mts, Velická pleso (1665 m), 16.vii.2001, 1 ♀; Velická valley (1500 m), 17.vii.2001, 1 ♂ 1 ♀; Vysoké Tatry Mts, Veľká Studená valley (1500 m), 23.vii.1969, 1 ♂; Poľana Mts, Čierny Potok (700 m), 6.vii.2000, 1 ♂ (at light) [listed by STARÝ (2009)]; Nová Sedlica env., 13.vi.1996, 1 ♂ 3 ♀♀; Nová Sedlica, Zbojský brook, 7.vii.1993, 1 ♀; Nová Sedlica, “Stužica”, 12.vi.1996, 1 ♀ [listed by STARÝ (1995)] (all J. Starý leg.) (all JSOC). **SWITZERLAND:** CANTON VALAIS: Aletschwald (2100 m), 2.vii.1996, 4 ♂♂ 1 ♀, 3.vii.1996, 1 ♂ (J. Starý leg.) (JSOC).

**Diagnosis.** Antenna moderately long, with verticils rather long, longest verticils subequal in length to their respective segments. Dorsum of thorax suffused with sparse, brownish light grey pruinosity, prescutum without distinct stripes. Wing rather broad, width-length ratio about 1 : 3. Male terminalia with single spine at base of gonocoxite, outer gonostylus slender and comparatively short, and paramere



Figs 1–6. 1–3 – *Neolimnophila carteri* (Tonnoir, 1921), male terminalia (Czech Republic: Moravia: Hrubá Voda nr. Olomouc): 1 – general view, dorsally; 2 – paramere, dorsal view; 3 – hypopygial spine, dorsal view. 4–6 – *N. placida* (Meigen, 1830), male terminalia (Czech Republic: Moravia: Lazníky nr. Přerov): 4 – general view, dorsally; 5 – paramere, dorsal view; 6 – hypopygial spines, dorsal view. Scale bars 0.25 mm.

broad, with very slight outer distal extension. Wing length 5.8–9.3 mm.

**Redescription. Male.** Head dark brown, suffused with brownish dark grey pruinosity on frons and vertex. Palpus dark brown, rostrum slightly paler. Antenna dark brown throughout, moderately long, reaching to about base of wing. Flagellum consisting of basal fusion element and subsequent 10 elongate flagellomeres, with verticils sparse, longest ones subequal in length to their respective segments.

Thorax generally dark brown, subshiny, restrictedly suffused with sparse, brownish light grey pruinosity, especially on dorsum, indistinctly paler on anterior paratergite and posterolaterally on scutal lobes. Prescutum without distinct stripes. Wing rather broad, width-length ratio about 1 : 3, stigma mostly indistinct. Venation usual for *Neolimnophila*. Sc<sub>1</sub> ending about opposite fork of Rs. R<sub>2</sub> (cross-vein r) its own length, or more, beyond fork of R<sub>3+4</sub>. R<sub>3</sub> subequal in length to R<sub>3+4</sub>. Latter vein simply arched. Cross-vein m-cu at from one fourth to one third length of discal cell (Fig. 10). Halter pale throughout. Legs brown, with setae on femora comparatively long and projecting, about twice diameter of femur.

Abdomen dark brown. Male terminalia (Figs 1–3). Tergite 9 interrupted medially. Gonocoxite with single spine at dorsal base, subequal in length to that of *N. placida* and *N. alaskana*, about one third length of gonocoxite. Spine with delicate membranous scales in distal half. Quite exceptionally, tiny second spine present in form of bristle, about one sixth length of first spine. Outer gonostylus slender as in *N. alaskana*, but not as long, about half length of gonocoxite, almost parallel-sided for about two thirds its length, with apical hook, microscopically serrate at outer margin. Paramere rather broad, as in *N. alaskana*, truncate at apex, distal outer extension barely apparent.

**Female** resembling male in general appearance, including length and structure of antenna and outline of wing. Female terminalia with cercus long, slender, generally straight, slightly upturned distally, subacute at tip. Hypogynial valve straight, reaching to about middle of cercus.

**Distribution.** Europe, including European Russia.

### *Neolimnophila placida* (Meigen, 1830)

(Figs 4–6, 11)

*Limnobia placida* Meigen, 1830: 275 (description).

*Limnobia hyalipennis* Zetterstedt, 1851: 3842 (description).

*Limnophila ultima* Osten Sacken, 1860: 238 (description), Fig. 26 (male terminalia) – **syn. nov.**

*Neolimnophila placida*: EDWARDS (1938): 99 (diagnosis), Text-Fig. 18b (male terminalia); SAVCHENKO (1982): 19 (redescription), Fig. 8/2 (male terminalia); PODENAS et al. (2006): 112, Fig. 29.5 (male terminalia) [copied from SAVCHENKO 1982]

*Neolimnophila ultima*: ALEXANDER (1966): 430 (diagnosis), Fig. 47B (wing).

**Material examined** (7 ♂♂ 17 ♀♀). **U.S.A.:** INDIANA: Jefferson Co., 15.ix.1934, 2 ♂♂ (J. S. Rogers leg.) (JSOC). **CZECH REPUBLIC:** MORAVIA: Moravskoslezské Beskydy Mts [= Beskydy Mts], Prostřední Bečva (600 m), 7.vi.1994, 1 ♂; Lazníky nr. Přerov, 30.v.1991, 1 ♀, 8.vi.1991, 3 ♂♂ 1 ♀, 9.vi.1991, 1 ♂ (all J. Starý leg.); Lešná nr. Zlín [= nr. Gottwaldov], 19.vii.1977, 3 ♀♀ (J. Starý leg., at light), 17.v.1979, 1 ♀ (V. Elsner leg., light trap), 6.vi.1980, 1 ♀ (J. Starý leg., at light) [listed by STARÝ (1986)], 4.ix.1985, 1 ♀ (V. Elsner, at light), 20.v.1987, 1 ♀ (V. Elsner leg., at light); Hrobice nr. Zlín, 19.viii.1980, 1 ♀ (V. Elsner leg., at

light), 24.viii.1981, 1 ♀ (J. Starý leg.), 14.vii.1982, 1 ♀ (J. Starý leg., at light) [listed by STARÝ (1986)]; Bílé Karpaty Mts, Javorník, “Machová”, 29.ix.1998, 1 ♀ (J. Starý leg., at light) (all JSOC). **POLAND:** Tuszyn nr. Łódź, 4.–6.vii.1980, 1 ♀, 7.vii.1980, 1 ♀, 3.viii.1980, 1 ♀ (B. Soszyński leg.) (JSOC). **SLOVAKIA:** Poľana Mts, Čierny Potok (700 m), 8.vi.1999, 1 ♀ (J. Starý leg., at light) [listed by STARÝ (2009)] (JSOC).

**Material not examined by the author** (3 ♂♂). Based on my drawings and diagnoses, D. I. Gavryushin (ZMUM) kindly identified some specimens, previously labelled mostly as *N. placida*. Those belonging to *N. placida* in the present concept are listed below, others, as *N. alaskana*, are listed under the latter species. – **RUSSIA:** NORTH EUROPEAN RUSSIA: Arkhangelsk env. (35 m), 64.525117°N, 40.719567°E, 5.viii.2011, 1 ♂ (D. I. Gavryushin leg.) (ZMUM); Leningrad Region [= oblast], Vsevolozhskiy District, Jukki village, 13.vii.1933, 1 ♂ (A. A. Stackelberg leg.) (ZISP). NORTHWEST EUROPEAN RUSSIA: Pskov Region, Plyusskiy District, Kharlamova Gora village, 9.viii.1891, 1 ♂ (F. D. Pleske leg.) (ZISP).

**Diagnosis.** Antenna rather short, with verticils short, longest ones shorter than their respective segments. Dorsum of thorax heavily suffused with bluish dark grey pruinosity, prescutum with four brown stripes. Wing comparatively narrow, width-length ratio about 1 : 3.8. Male terminalia with two spines at base of gonocoxite, ventral spine about one third length of dorsal one, outer gonostylus comparatively stout and short, and with paramere narrow, its distal outer extension conspicuous. Wing length 5.8–8.6 mm.

**Redescription. Male.** Head dark brown, suffused with bluish dark grey pruinosity on frons and vertex. Palpus and rostrum dark brown. Antenna dark brown throughout, comparatively short, shorter than that of *N. carteri* and *N. alaskana*, not reaching to base of wing, with scape greyish pruinose. Flagellum consisting of basal fusion element and subsequent 10 long-ovoid flagellomeres, with verticils sparse and short, longest ones shorter than their respective segments.

Thorax generally dark brown, heavily suffused with bluish dark grey pruinosity, especially on dorsum, sometimes indistinctly paler on anterior paratergite and posterolaterally on scutal lobes. Prescutum with four brown stripes. Wing comparatively narrow, width-length ratio about 1 : 3.8, sometimes with faintly indicated stigma. Venation usual for *Neolimnophila*. Sc<sub>1</sub> ending opposite or slightly before fork of Rs. R<sub>2</sub> (cross-vein r) at or at most its own length before or slightly beyond fork of R<sub>3+4</sub>. R<sub>3</sub> from shorter to subequal in length to R<sub>3+4</sub>. Latter vein slightly arched. Cross-vein m-cu at from one fourth to one third length of discal cell (Fig. 11). Halter pale on stem, weakly infuscated on knob. Legs brown, with setae on femora comparatively short, decumbent, less than diameter of femur.

Abdomen dark brown. Male terminalia (Figs 4–6). Tergite 9 interrupted medially. Gonocoxite with two spines at base: longer, positioned dorsally, subequal in length to corresponding spine in *N. carteri* and *N. alaskana*, about one third length of gonocoxite; shorter about one third length of dorsal spine, positioned more ventrally and medially. Both spines with delicate membranous scales distally. Outer gonostylus shorter than that in *N. alaskana* and stouter than in *N. carteri* and *N. alaskana*, from base evenly slightly narrowed distally for about two thirds its length, slightly concave before apical hook, hook microscopically serrate at outer margin. Paramere not as broad as in *N. carteri* and *N. alaskana*, truncate at apex, conspicuously extended disto-laterally into spinous point.

**Female** resembling male in general appearance, including length and structure of antenna and outline of wing. Female terminalia not essentially different externally from those of other species.

**Distribution.** Canada, U.S.A. (as far south as Mississippi and Georgia); Europe, including European Russia; West and East Siberia, Far East of Russia; Kazakhstan; Mongolia; Japan.

***Neolimnophila alaskana* (Alexander, 1924) stat. nov.**

(Figs 7–9, 12)

*Limnophila* (*Neolimnophila*) *ultima alaskana* Alexander, 1924: 10 (description).

? *Crypteriella Sverdrupi* Soot-Ryen, 1928: 6 (description), Figs 1 (wing), 2 (antenna), 3 (tibial spur), 4 (ovipositor).

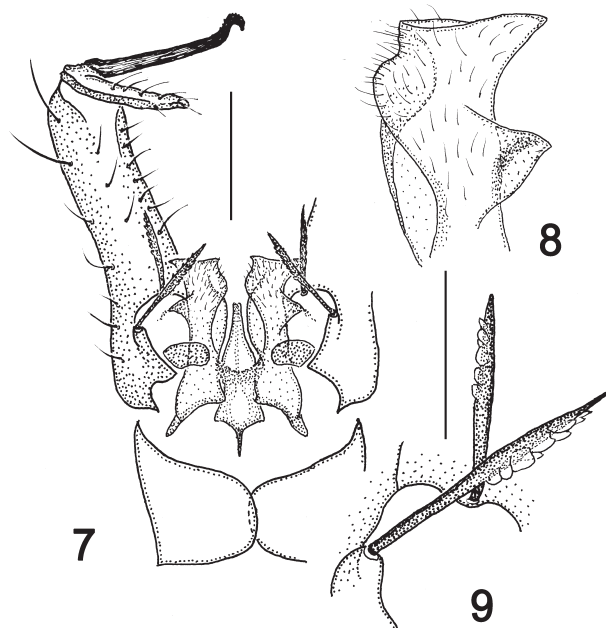
**Type material examined:** HOLOTYPE: ♂, U.S.A.: ALASKA: Healy, 24.vi.1921, specimen + slide (J. M. Aldrich leg.) (USNM) [the date given in the description (ALEXANDER 1924: 10) is “July 24, 1921“], labelled “Healy Alaska / VI-24-21” (partly printed, white label), “HOLOTYPE / *Limnophila* / *ultima* / *alaskana* / C.P. Alexander” (partly printed, red label). The specimen is pinned, without right wing, left fore and right hind legs, and apex of abdomen. The slide (Canada balsam) with wing (right) under one circular coverslip and male terminalia under another, labelled as for the specimen, with the inscription “HOLOTYPE 2287”. PARATYPE: U.S.A.: ALASKA: Flat, 5.viii.1919, 1 ♀ (+ slide) (A. H. Twitchell leg.) (USNM), labelled “Flat Alaska / Aug 5 1919” (printed, white label), “A H Twitchell / Collector” (printed, white label), “PARATYPE / *Limnophila* / *ultima* / *alaskana* / C.P. Alexander” (partly printed, blue label). The specimen is glued onto a triangular cardboard point, without antennae, right wing, and with only left mid femur + tibia, and left hind femur. The slide (Canada balsam) with wing (right) under a circular coverslip, labelled as for the specimen, with the inscription “PARATYPE 2287”.

**Other material examined** (3 ♂♂ 1 ♀): CANADA: NORTHWEST TERRITORIES: Aklavik, Mackenzie River, 4.ix.1929, 1 ♀ (+ slide), Aklavik, 27.viii.1931, 1 ♂ (+ slide) (both O. Bryant leg.) (both USNM). CZECH REPUBLIC: MORAVIA: Moravskoslezské Beskydy Mts, Dolní Bečva, “Kamenné” (650 m), 29.vi.1994, 1 ♂ (J. Starý leg., at light) (JSOC). RUSSIA: EAST SIBERIA: Yakutia, Srednekolymskiy District, Agrakhtakh, 20.vi.1971, 1 ♂ (P. Polyakova & Bobrova leg.) (JSOC).

**Material not examined by the author** (4 ♂♂; for explanation see under *N. placida*): KAZAKHSTAN: AKMOLA REGION: Atbasar, 30.viii.1936, 1 ♂ (P. D. Rezvoy leg.) (ZISP). RUSSIA: CENTRAL EUROPEAN RUSSIA: Moscow Region, Orekhovo-Zuyevo District, Smolevo village env., 55.5788°N, 38.6662°E, 16.–20.viii.2011, 1 ♂ (in ethanol) (K. Tomkovich leg.) (ZMUM). NORTH EUROPEAN RUSSIA: Murmansk Region, Khibiny Mts, basin of Vudyavr Lakes, 26.vii.1933, 1 ♂ (V. Y. Fridolin leg.) (ZISP). EAST SIBERIA: Zabaykalskiy Krai, Sretenskiy District, between Ivanovka and Kara Rivers (tributaries of Shilka River), 27.viii.1926, 1 ♂ (R. F. Hecker leg.) (ZISP).

**Diagnosis.** Antenna moderately long, with verticils rather long, longest ones subequal in length to their respective segments. Dorsum of thorax heavily suffused with bluish dark grey pruinosity, prescutum with four brown stripes. Wing rather broad, width-length ratio about 1 : 3. Male terminalia with two spines at base of gonocoxite, ventral spine about two thirds length of dorsal one, outer gonostylus slender and rather long, paramere broad, its distal outer extension smaller than that in *N. placida*. Wing length 7.8–8.7 mm.

**Redescription. Male.** Head dark brown, suffused with bluish dark grey pruinosity on frons and vertex. Palpus and rostrum dark brown. Antenna dark brown throughout, moderately long, reaching to about base of wing, scape greyish pruinose. Flagellum consisting of basal fusion



Figs 7–9. *Neolimnophila alaskana* (Alexander, 1925) stat. nov., male terminalia (Czech Republic: Moravia: Dolní Bečva): 7 – general view, dorsally; 8 – paramere, dorsal view; 9 – hypopygial spines, dorsal view. Scale bars 0.25 mm.

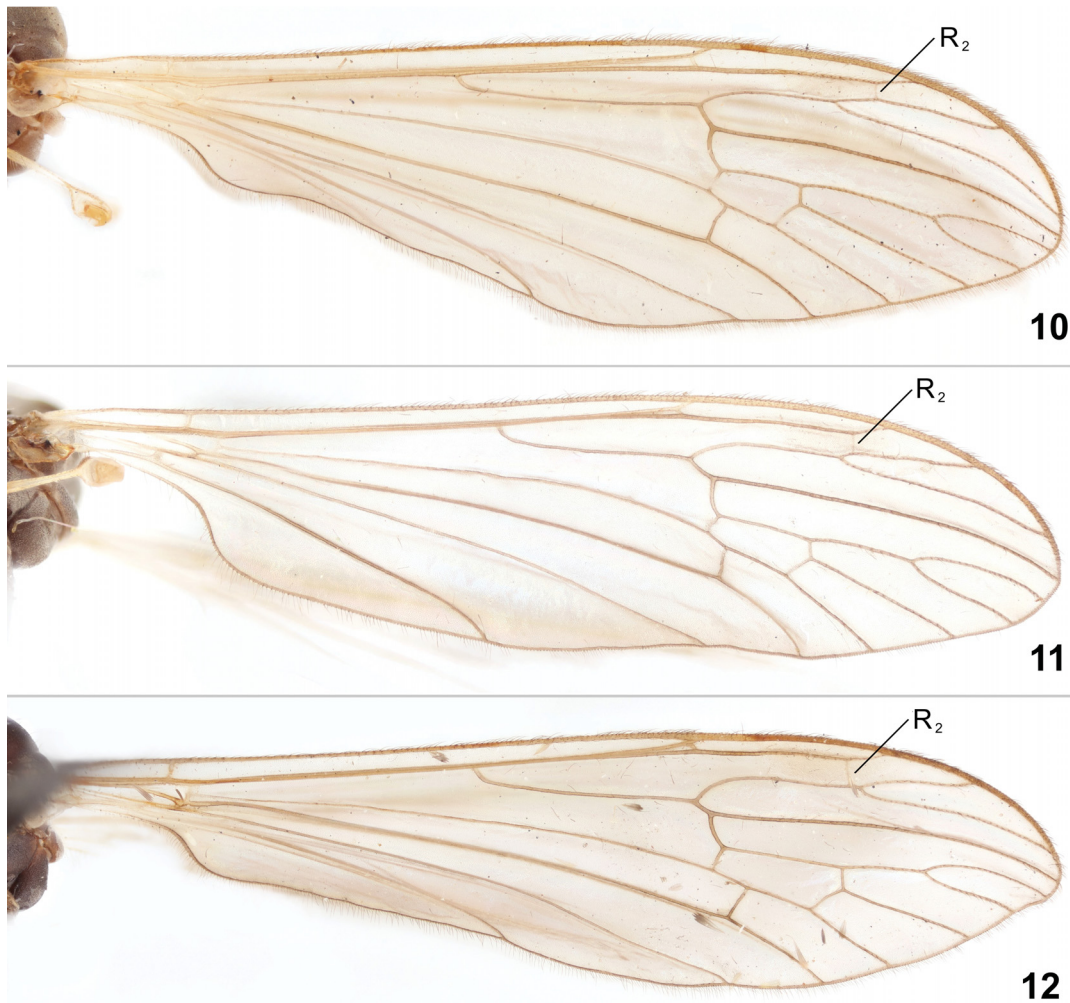
element and subsequent 10 elongate flagellomeres, with verticils sparse, longest ones subequal in length to their respective segments.

Thorax generally dark brown, heavily suffused with bluish dark grey pruinosity, especially on dorsum, indistinctly paler on anterior paratergite and postrerolaterally on scutal lobes. Prescutum with four brown stripes. Wing rather broad, width-length ratio about 1 : 3, sometimes with faintly indicated stigma. Venation usual for *Neolimnophila*.  $Sc_1$  ending about opposite fork of  $R_s$ .  $R_2$  (cross-vein r) at or slightly before fork of  $R_{3+4}$ .  $R_3$  slightly shorter than  $R_{3+4}$ . Latter vein sinuous, upturned distally. Cross-vein m-cu at from one fourth to one third length of discal cell (Fig. 12). Halter pale throughout. Legs brown, with setae on femora comparatively long and projecting, about twice diameter of femur.

Abdomen dark brown. Male terminalia (Figs 7–9). Tergite 9 interrupted medially. Gonocoxite with two spines at base: longer, positioned dorsally, subequal in length to corresponding spine in *N. carteri* and *N. placida*, about one third length of gonocoxite; shorter, about two thirds length of dorsal spine, positioned more ventrally and medially. Both spines with delicate membranous scales distally. Outer gonostylus long and slender, about three fifths length of gonocoxite, almost parallel-sided for about three fourths its length, with apical hook, microscopically serrate at outer margin. Paramere rather broad, truncate at apex, its distal outer corner less extended outwardly than in *N. placida*.

**Female** resembling male in general appearance, including length and structure of antenna and outline of wing. Female terminalia not essentially different externally from those of other species.

**Distribution.** So far only listed from Alaska, so probably new to Canada. First records from the Palaearctic Region.



Figs 10–12. Wing: 10 – *Neolimnophila carteri* (Tonnoir, 1921); 11 – *N. placida* (Meigen, 1830); 12 – *N. alaskana* (Alexander, 1925). Photos by M. Tkoč.

### Discussion

The three species treated here are very close to each other both in the structure of the male terminalia and the external characters (for more precise definitions of the characters, see redescriptions). Although the hypopygial character traits are slight, if considered as a complex, they provide reliable criteria for species identification. These are the following: the ventral spine of the gonocoxite (mostly none in *N. carteri* – Fig. 3, one third length of the dorsal spine in *N. placida* – Fig. 6, two thirds length of the dorsal spine in *N. alaskana* – Fig. 9), length and breadth of the outer gonostylus (moderately long and slender in *N. carteri* – Fig. 1, moderately long and stouter in *N. placida* – Fig. 4, long and slender in *N. alaskana* – Fig. 7), and the shape of parameres (distal outer corner moderately extended in *N. carteri* – Fig. 2, intermediately extended in *N. alaskana* – Fig. 8, conspicuously extended in *N. placida* Fig. 5). Wings are broader in *N. carteri* and *N. alaskana*, having width-length ratio about 1 : 3, and narrower in *N. placida*, with width-length ratio about 1 : 3.8. Wing venation is variable to a certain degree and may serve as an auxiliary character, yet a position of  $R_2$  (cross-vein r) its own length or more beyond fork of  $R_{3+4}$  indicates *N. carteri*, whereas,

in *N. placida* and *N. alaskana*,  $R_2$  is mostly at or before the fork. Similarly, a sinuous  $R_{3+4}$  points to *N. alaskana*, whereas, in *N. carteri* and *N. placida*,  $R_{3+4}$  is simply arched (Figs 10–12). Colour characters bring closer *N. placida* and *N. alaskana* by their bluish dark grey pruinosity on thorax and distinct, brown prescutal stripes, as compared to *N. carteri*, which shows rather a brownish light grey pruinosity on thorax without distinct prescutal stripes. Those characters, however, may not be visible in specimens preserved in ethanol. On the other hand, distinctly longer antennal verticils and setae on the legs, especially the femora, bring *N. carteri* and *N. alaskana* closer to each other, leaving *N. placida*, with shorter verticils and femoral setae, somewhat apart. Based on the wing venation (SOOT-RYEN 1928: Fig. 1) *Crypteriella sverdrupi*, described from the Chetyrekhstolbovoy Is. [= Firsøileø], Medvezhye Islands (Russia: East Siberia) and previously considered a junior synonym of *N. placida* (cf. OOSTERBROEK 2017), is probably identical with *N. alaskana*.

*Neolimnophila carteri*, a West Palearctic species, is the commonest species of the genus in Central Europe. Both *N. placida* and *N. alaskana* are Holarctic. Whereas *N. placida* is widely distributed throughout both the Nearctic (as *N. ultima*) and Palearctic, it is rather rare and local

in Europe. *Neolimnophila alaskana*, reported here for the first time in the Palaearctic, seems to be confined to the northern-most territories of North America and Eurasia. Its record from the Czech Republic, however, suggests that this may not be the case, as is also indicated by some of the Russian records. The *Neolimnophila* species treated here all show a significant affinity to light. It is necessary to say that, in Europe, *N. carteri* and *N. placida* have been distinguished chiefly on colouration of the thorax, therefore some records of *N. placida* might prove to belong to *N. alaskana*. A revision of other East Palaearctic and Nearctic *Neolimnophila* species might, apart from other things, add to the distribution of the three species treated here.

### Acknowledgements

For the loan of type and other specimens of *N. ultima alaskana* I thank the authorities of USNM, especially F. W. Shockley, and J. K. Gelhaus (Academy of Natural Sciences of Drexel University, Philadelphia, U.S.A.) who mediated the loan. I am indebted to D. I. Gavryushin (ZMUM) for examining some specimens of *N. placida* from Russian collections. M. Tkoč (National Museum, Prague, Czech Republic) is thanked for providing pictures of the wings. F. Brodo (Ottawa, Canada) kindly checked and improved the English of this article. The paper was financially supported by the Ministry of Culture of the Czech Republic by institutional financing of long-term conceptual development of the research institution (the Silesian Museum, MK000100595), internal grant of the Silesian Museum No. IGS201806/2018.

### References

- ALEXANDER C. P. 1920: Undescribed Tipulidae (Diptera) from western North America. *Proceedings of the California Academy of Sciences* **10**: 35–46.
- ALEXANDER C. P. 1924: New species of two-winged flies from western North America belonging to the family Tipulidae. *Proceedings of the United States National Museum* **64**: 1–16.
- ALEXANDER C. P. 1941: Records and Descriptions of North American crane-flies (Diptera). Part II. Tipuloidea of mountainous Western North Carolina. *American Midland Naturalist* **26**: 281–319.
- ALEXANDER C. P. 1966: Tipulidae. Pp. 196–486. In: CRAMPTON G. C., CURRAN C. H. & ALEXANDER C. P. (eds.): The Diptera or true flies of Connecticut. Part VI. First Fascicle. *State Geological and Natural History Survey of Connecticut, Bulletin* **64**: 1–509 (reprinted).
- DIENSKE J. W. 1987: An illustrated key to the genera and subgenera of the Western Palaearctic Limoniidae (Insecta: Diptera), including a description of the external morphology. *Stuttgarter Beiträge zur Naturkunde (A)* **409**: 1–52.
- EDWARDS F. W. 1938: British short-palped craneflies. Taxonomy of adults. *Transactions of the Society for British Entomology* **5**: 1–168.
- GOETGHEBUER M. & TONNOIR A. L. 1921: Catalogue raisonné des Tipulidae de Belgique (Suite). *Bulletin de la Société Entomologique de Belgique* **3**: 47–58.
- HENNIG W. 1954: Flügelgeäder und System der Dipteren unter Berücksichtigung der aus dem Mesozoikum beschriebenen Fossilien. *Beiträge zur Entomologie* **4**: 245–388.
- KUNTZE A. 1919: Eine neue Crypteria Bergroth. *Deutsche Entomologische Zeitschrift* **3–4**: 366–368.
- McALPINE J. F. 1981: Morphology and terminology – adults. Pp. 9–63. In: McALPINE J. F., PETERSON B. V., SHEWELL G. E., TESKEY H. J., VOCKEROTH J. R. & WOOD D. M. (eds.): *Manual of Nearctic Diptera I*. Monograph No. 27. Research Branch, Agriculture Canada, Ottawa, 674 pp.
- MEIGEN J. W. 1830: *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten*. Hamm, **6**: i–xiv+1–401.
- MEIJERE J. C. H. DE 1921: Studien über palaearktische, vorwiegend holländische, Limnobiiden, insbesondere über ihre Kopulationsorgane (Schluss). *Tijdschrift voor Entomologie* **64**: 54–118.
- OOSTERBROEK P. 2017: *Catalogue of the Craneflies of the World (Insecta, Diptera, Nematocera, Tipuloidea)*. Version 1. Nov 2017 [online]. Available from <http://ccw.naturalis.nl>
- OSTEN SACKEN C. R. 1860: New genera and species of North American Tipulidae with short palpi, with an attempt at a new classification of the tribe. *Proceedings of the Academy of Natural Sciences of Philadelphia* **1859**: 197–256.
- PODENAS S., GEIGER W., HAENNI J.-P. & GONSETH Y. 2006: *Limoniidae & Pediciidae de Suisse*. Fauna Helvetica, Vol. 14. Centre suisse de cartographie de la faune & Schweizerische Entomologische Gesellschaft, Neuchâtel, 375 pp.
- SAVCHENKO E. N. 1982: *Limoniidae: Eriopterinae*. Fauna Ukrainy **14(3)**. Naukova Dumka, Kiev, 335 pp (in Ukrainian).
- SAVCHENKO E. N. & KRIVOLUTSKAYA G. O. 1976: *Limoniidae of South Kuriles and South Sakhalin*. Akademia Nauk Ukrainskoi SSR, Naukova Dumka, Kiev, 160 pp (in Russian).
- SOOT-RYEN T. 1928: Diptera from arctic Siberia. *Meddelelser fra Det Zoologiske Museum (Oslo)* **14**: 2–7.
- STARÝ J. 1986: Nachträge und Berichtigungen zur Limoniiden-Fauna der Tschechoslowakei (Diptera), III. *Zborník Slovenského Národného Múzea, Prírodné Vedy* **32**: 91–111.
- STARÝ J. 1995: Limoniidae. Pp. 21–35. In: ROHÁČEK J., STARÝ J., MARTINOVSKÝ J. & VÁLA M. (eds.): *Diptera of the Bukovské Hills*. SAŽP – Správa CHKO a BR Východné Karpaty, Humenné, 232 pp (in Slovak, English abstract).
- STARÝ J. 2003: Revision of European species of the genus *Rhabdomastix* (Diptera: Limoniidae). Part 1: Introduction and subgenus *Lurdia* subgen. n. *European Journal of Entomology* **100**: 587–608.
- STARÝ J. 2009: Limoniidae. Pp. 23–39. In: ROHÁČEK J. & ŠEVČÍK J. (eds.): *Diptera of the Poľana Protected Landscape Area – Biosphere Reserve*. State Nature Conservancy of the Slovak Republic & Administration of the Protected Landscape Area – Biosphere Reserve, Zvolen, 340 pp.
- STARÝ J. & ROZKOŠNÝ R. 1970: Die slowakischen Arten der Unterfamilie Limoniinae (Tipulidae, Diptera). *Acta Rerum Naturalium Musei Nationalis Slovaci* **15** [1969]: 75–136.
- ZETTERSTEDT J. W. 1851: *Diptera Scandinaviae, deposita et descripta*. Lundae, **10**: 3711–4090.