

***Limnephilus morsei* sp. n., a new species of the genus
Limnephilus LEACH (Trichoptera: Limnephilidae) from India**

MALKIAT S. SAINI, SAJAD H. PAREY¹

Department of Zoology & Environment Science, Punjabi University, Patiala, 147002, India,
¹e-mail: sajadzoo@gmail.com

ABSTRACT. *Limnephilus morsei* sp. n. from Apharwat (Jammu and Kashmir) is described and illustrated. With this new addition this genus is now represented by three valid species from India.

KEY WORDS: Limnephilidae, *Limnephilus morsei* sp. n., India, Jammu and Kashmir.

INTRODUCTION

Limnephilus LEACH is one of the most species-diverse genera, with nearly 200 described widely distributed across the Holarctic region and as far as Central America (NOZAKI 1996, SCHMID 1998, HOLZENTHAL et al. 2007). In the Oriental region this genus is represented by the following ten species: *L. asiaticus* MCLACHLAN, 1874, *L. distinctus* TIAN & YANG, 1993, *L. externus* HAGEN, 1861, *L. fuscovittatus* MATSUMURA, 1904, *L. kaumarajiva* SCHMID, 1961, *L. lakshaman* OLAH, 1994, *L. samoedus* MCLACHLAN, 1880, *L. tibeticus* SCHMID, 1966, *L. horstaspoecki* MALICKY, 2004, *L. zhejiangensis* LENG & YANG, 2004. In India *L. tibeticus* SCHMID and *L. fuscovittatus* MATSUMURA are present. The latter was originally described from Japan but SCHMID (1966) also reported this species from Sikkim (India). The genus has a broad ecological tolerance and a strong affinity for lentic habitats, lakes, permanent or temporary ponds, marshes, but some species also inhabit rivers and springs. It is partially well reported at low altitudes, with many subarctic species. Some species are found in high altitudes (SCHMID 1998).

Acknowledgements

The authors are grateful to Dr J. C. Morse Clemson University (USA) for providing the relevant literature. The material provided by Rifat H. Raina is invaluable. The financial

assistance provided by the University Grants commission (UGC) New Delhi and the Indian Agricultural Institute (IARI) New Delhi is acknowledged. The laboratory facilities provided by the Punjabi University, Patiala, are put on record. We also extend our gratitude to Muzamil Ahmad, Manpreet Singh, Vikram Singh Rathore and Lakwinder Kaur for their assistance.

MATERIAL AND METHODS

The specimens examined in this study were collected primarily using a mercury-vapour bulb (150 W). The traps were placed on a high-altitude mountain for 1-3 hours beginning at dusk. The caddisflies so collected were killed and preserved in 70% ethyl alcohol with a drop of glycerine. To make detailed studies, the male genitalia were removed with the help of fine-tipped forceps and were treated using the lactic acid procedure described by BLAHNIK et al. (2007). The type specimens are deposited in the Museum of the Department of Zoology & Environmental Sciences, Punjabi University, Patiala, India.

DESCRIPTION

Genus: *Limnephilus* LEACH, 1815

Type species: *Phryganea rhombicus* LINNAEUS, 1758

Limnephilus morsei sp. n.

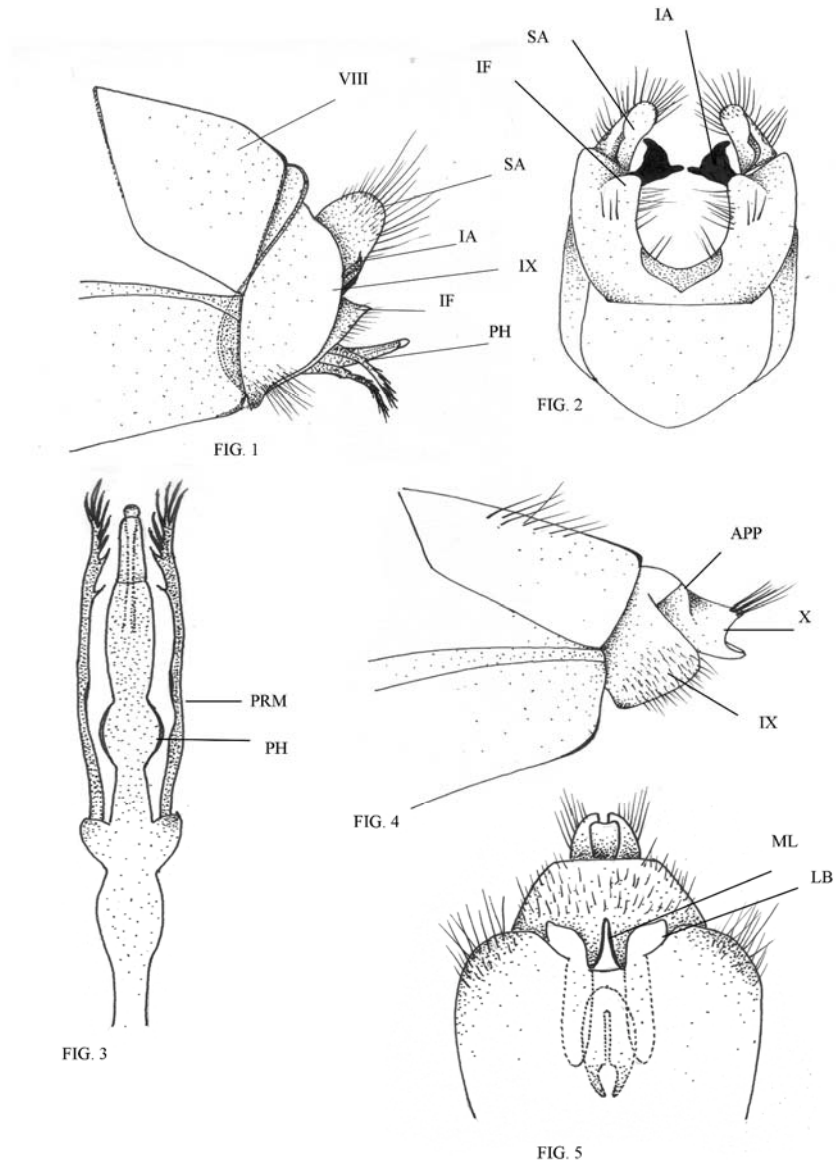
(Figs 1-6)

Description

Male. Adult male brown. Length of antennae 7.76 mm. Forewing light brown but with dark spots throughout the costal region, hindwing transparent without any dark brown spots in both male and female. Length of forewing 9.7 mm.

Male genitalia (Figs 1-3). Segment IX broad, apically rounded, pointed near bottom, base of this segment covered by segment VIII in lateral view; superior appendages rounded, bulging slightly near base, with long setae on its surface, ventrally nearly rectangular, with a spine-like process at its centre; intermediate appendages almost hidden behind superior appendage, only base of its appendage visible in lateral view; ventrally intermediate appendage sclerotized, apically bifid, just like a cock's comb. Inferior appendages each triangular apically, narrowed near base, reaching to base of segment IX. Phallus elongate, 2 segmented, basal segment much longer, with wing like projection near base, centrally rounded, apical segment short and rounded. Parameres placed nearly parallel to one another, apically with a tuft of spines.

Female. Adult female brownish. Length of antennae 10 mm. Length of forewing 9.7 mm.



Figs 1-5. *Limnephilus morsei* sp. n.: 1 – male genitalia, lateral view, 2 – male genitalia, ventral view, 3 – phallic apparatus, left lateral view, 4 – female genitalia, lateral view, 5 – female genitalia, ventral view.

APP = appendage, IA = intermediate appendage, IF = inferior appendage, IX = segment IX, LB = lateral lobe, ML = median lobe, SA = superior appendage, PH = phallus, PRM = parameres, VIII = segment VIII, X = segment X.



Fig. 6. Collection site of *Limnephilus morsei* sp. n.

Female genitalia (Figs 4-5). Segment IX apically rounded in lateral view. Segment X with appendage, bifid apically, one apical lobe finger-like and second upper lobe pointed. Subgenital plate median lobe pointed apically, lateral lobe nearly triangular.

Diagnosis

The new species resembles *Limnephilus fuscovittatus* MATSUMURA. It differs from the latter by having the superior appendage much rounded; inferior appendages each apically triangular, narrowed near base (in *L. fuscovittatus* rounded apically and broadened near base). The female of the new species differs from the latter by having the lower lobe of segment X longer than the apical lobe (in *L. fuscovittatus* upper lobe longer than lower lobe); segment IX truncate laterally (rounded laterally in *L. fuscovittatus*). The female of the new species also differs from *Limnephilus tibeticus* by having segment X bifid apically (truncate in the case of *L. tibeticus*); appendage of segment X reduced in the new species (elongated in *L. tibeticus*). Median lobe of subgenital plate pointed apically (in *L. tibeticus* rounded apically).

Distribution

India (Jammu and Kashmir).

Etymology

The species is named after Dr J.C. Morse (USA) for his outstanding contribution to the systematics of Trichoptera.

Material examined

Holotype male. India: Jammu & Kashmir, Apharwat 4000 m, 05.08.2008. Paratype female from the same date and locality as the holotype. Material deposited in the Museum of the Department of Zoology, Punjabi University, Patiala, India.

REFERENCES

- BLAHNIK J. HOLZENTHAL R.W., PRATHER. L. 2007. The lactic acid method for clearing Trichoptera genitalia. [In:] BUENO-SORIA J., BARBA-ALVAREZ R., ARMITAGE B.J. (eds). Proceedings of the 12th International Symposium on Trichoptera. The Caddis Press, Columbus, Ohio, pp.: 9-14.
- HAGEN H.A. 1861. Synopsis of the Neuroptera of North America with a list of the South American species. Smithsonian Miscellaneous Collections.
- HOLZENTHAL R.W., BLAHNIK R.J., PRATHER A.L., KJER K.M. 2007. Order Trichoptera KIRBY, 1813, (Insecta), caddisflies. Zootaxa **1668**: 639-698.
- LEACH W.E. 1815. Entomology. Brewster's Edinburgh Encyclopedia **9**: 52-172.
- LENG K., YANG L. 2004. Five new species of Limnephilidae (Insecta, Trichoptera) from China. Acta Zootaxonomica Sinica **29**: 516-522.
- LINNAEUS C. 1758. Systema naturae per regna tria naturae: secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. 10th Edition Volume, 1, Ragnum Animalia. Holmiae [Stockholm], Laurentii Salvii.
- MALICKY H. 2004. Neue Köcherfliegen (Trichoptera) aus dem Bardia Nationalpark, Nepal. Denisia **13**: 291-300.
- MATSUMURA S. 1904. Thousand insects of Japan, Vol. 1. Keiseisha, Tokyo, 213 pp.
- MCLACHLAN R. 1874. A monographic revision and synopsis of the Trichoptera of the European fauna. Part 1, London, John van Voorst, pp. 1-46, plates 1-5.
- MCLACHLAN R. 1880. A monographic revision and synopsis of the Trichoptera of the European fauna. Part 9, London, John van Voorst, pp. 501-523 (with supplement, pp. xiii-lxxxiv), plates 52-59.
- NOZAKI T. 1996. The genus *Limnephilus* LEACH (Trichoptera, Limnephilidae) in Japan. Japanese Journal of Entomology **64**: 810-824.
- OLAH J. 1994. Three new Trichoptera from the Kopet-Dagh and Karakoram Mountains. Folia Entomologica Hungarica **55**: 281-286.
- SCHMID F. 1966. A propos des limites de la zone Paléarctique dans L'Himalaya ou les Limnophilines en Inde (Trichoptera). Acta Zoologica Academiae Scientiarum Hungaricae 363-369.
- SCHMID F. 1988. The insects and arachnids of Canada, part 7. Genera of the Trichoptera of Canada and adjoining or adjacent United States. Ottawa, NRC Research Press.
- SCHMID F. 1961. Trichoptères du Pakistan, 4me parti (fin). Tijdschrift voor Entomologie **104**: 187-230.
- TIAN L., YANG L. 1993. Trichoptera. [In:] CHEN SHIXIANG (ed.). Insects of the Hengduan Mountains region. Volume 2. Beijing, Science Press, pp.: 867-892.

Received: October 10, 2011

Accepted: February 27, 2012