Zootaxa 3904 (4): 553–562
www.mapress.com/zootaxa/
Copyright © 2015 Magnolia Press

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3904.4.4
http://zoobank.org/urn:lsid:zoobank.org:pub:D8D15BFD-4954-4976-B17C-31DDDE20BE66

A new species of *Megaperlodes* Yokoyama *et al.* 1990 (Plecoptera, Perlodidae) from the South of the Russian Far East

VALENTINA A. TESLENKO
Institute of Biology and Soil Science, Far Eastern Branch, Russian Academy of Sciences, Vladivostok, 690022, Russia.
E-mail: teslenko@ibss.dvo.ru

Abstract

A new species of Plecoptera *Megaperlodes tiunovi* **sp. n.**, from the South of the Russian Far East is described and illustrated. The relationships with its close relatives are discussed. Newly discovered features are added to the diagnosis of the genus *Megaperlodes*, especially previously overlooked eversible lobes within the paraprocts, egg structure, and wing venation.

Key words: Plecoptera, Perlodini, *Megaperlodes*, eversible paraproct lobes, eggs, South Russian Far East, Japan

Introduction

The original Japanese description of the new genus *Megaperlodes* Yokoyama, Isobe & Yamamoto, 1990 and its type species, *M. niger* Yokoyama, Isobe, & Yamamoto, 1990 was relatively brief. This species was found in Yamagata Prefecture (central Japan, Honshu) and recorded from 11 streams flowing through the foothills of the Sekiryo, Gassan, Agatsuma and Iide Mountains. *Megaperlodes* was included in the tribe Perlodini and distinguished from other genera by tergum 10 of male entire, male paraprocts divided into two apices, abdominal segments 1–6 clearly divided into terga and sterna, triangular egg, and lacinia unidentate in the larva (Yokoyama et al. 1990). The original description was incomplete, types were not designated, but the name *M. niger* is nevertheless available (ICZN 2014). The male, female, and larvae are however, well-illustrated (Yokoyama et al. 1990, Inada et al. 1998, Shimizu et al. 2005). Additional localities for *M. niger* were found in the streams and rivers in Okayama (Inada et al. 1998) and Ibaraki (Yoshinari 2001) Japanese Prefectures.

This paper is provides descriptions and illustrations of all life stages of a second species of the *Megaperlodes, M. tiunovi* **sp. n.** discovered in a small salmonid foothill stream flowing out of the East Manchurian Mountains (south of the Russian Far East) into the Sea of Japan. Notes and illustrations of the related *M. niger*, especially of the previously overlooked eversible paraproct lobes (EPL) of the male, the structure of the egg, and wing venation are also provided.

Methods and material

Nymphs were associated with adults by common occurrence. Two mature nymphs were collected from the Brus'ya River in April 2013. Adult and larval exuviae were collected from supports of a bridge crossing the Brus'ya River on 12 May 2014. Additional live males, females, and larval exuviae were collected on 18 May at the same site. Adults were kept in the laboratory in plastic containers covered by cotton. The paraproctal lobes of male were everted on a freshly preserved specimen following the procedure outlined by Zwick (1982). A few egg masses were produced 2–3 days later. The last female survived until 1 of June. Some egg masses were incubated in vial with river water kept in a refrigerator. The other egg masses were fixed in 75% ethanol, transferred stepwise to 95% ETOH, and then fixed on specimen stubs with double-sided tape and air dried for detailed study. Specimens

Accepted by B. Kondratieff: 12 Nov. 2014; published: 8 Jan. 2015

spot on tergum 10. In everted condition, the posterior margin of tergum 10 of *M. niger* appears like a long transversal slightly sclerotized sclerite with rounded lateral margins (Fig. 23). The paraproct sclerite of *M. niger* is larger than in *M. tiunovi* and completely heavily sclerotized, with the base hemispherical, the sclerite long, medially narrowed, and then widened and distally bluntly rounded (Figs. 23, 25). The rectangular base of the EPL of *M. niger* has a long fingerlike projection, narrowed from base to the pointed tip (Figs. 23, 25), and densely covered by short setae (Fig. 24). The female subgenital plate of *M. niger* is caudally rounded and covered by short setae (Fig. 26). The egg of *M. niger* has a wider anterior pole with an entire collar (Figs. 27, 28). Each egg face has medially an additional hemispherical swelling (Fig. 27); the micropyles are shorter than in *M. tiunovi*, slightly elevated above the chorion surface, openings with rounded margins (Figs. 29, 30). The larvae differ in color, shape of submentum and pronotum (Fig. 3E in Inada et al. 1998).

Acknowledgments

The author thanks Dr. I. Tiunov for collecting larvae and for images of the type locality. The help of Prof. T. Tiunova, Drs. N. Naryshkina, and V. Loctionov, Vladivostok, Russia during slide preparation is very much appreciated. T. Eroshenko, Vladivostok, Russia, is sincerely thanked for the illustrations. Dr. T. Shimizu (Gifu, Japan) is thanked for the translating the Japanese references and for sending material of *M. niger* from the type locality. The author is very grateful to Prof. P. Zwick (Schlitz, Germany) and Dr. D. Murányi (Budapest, Hungary) for valuable comments, suggestions, linguistic revision that greatly improved the original manuscript, and also to Prof. Boris Kondratieff (Fort Collins Colorado, USA) for linguistic suggestions. The present work was supported in part by FEB RAS, Grant No 12-1-P30-01.

References

ICZN (International Code of Zoological Nomenclature) (2014) *The International Trust of Zoological Nomenclature, Fourth edition.* Online Version. Available from: http://www.nhm.ac.uk/hosted-sites/iczn/code (accessed 1 September 2014)

Inada, K., Ueno, T. & Tomita, K. (1998) *Megaperlodes niger* in Okayama Prefecture (I). *Hyogo Freshwater Biology*, 49, 39–45.

Shimizu, T., Inada, R. & Uchda, S. (2005) Plecoptera. *In*: Kawai, T. & Tanida, K. (Eds.), *Aquatic Insects of Japan Manual with Keys and Illustrations*. Tokai Univ. Press, Kanagawa, 236–290. [in Japanese]

Stark, B.P. & Szczytko, S.W. (1984) Egg morphology and classification of Perlodinae (Plecoptera: Perlodidae). *Annales de Limnologie*, 20, 99–104.
http://dx.doi.org/10.1051/limn/1984029

Teslenko, V.A., Zwick, P. & Bazova, N.V. (2010) Redescription of *Filchneria mongolica* (Klapalek, 1901) (Plecoptera, Perlodidae) based on type eggs and fresh material from Selenga and Amur River Basins of Russia and Mongolia. *Zootaxa*, 2693, 49–59.

Yokoyama, N., Isobe, Y. & Yamamoto, S. (1990) Distribution of *Megaperlodes niger* gen. et sp. nov. (Perlodidae) in Yamagata Prefecture. Abstract of Papers from the 55th Annual Meeting of the Limnological Society of Japan, Yamagata, 65 pp. [in Japanese]

Yoshinari, G. (2001) *Megapelodes niger* in Ibaraki Prefecture. *Hyogo Freshwater Biology*, 53, 97–99.

Zwick, P. (1997) *Rauserella*, a new genus of Plecoptera (Perlodidae), with notes on related genera. *In*: Landolt, P. & Sartori, M. (Eds.), *Ephemeroptera & Plecoptera. Biology-Ecology-Systematics*. MTL-Mauron+Tinguely & Lachat, S.A. Fribourg/ Switzerland, pp. 489–496.

Zwick, P. (1982) A revision of the Oriental stonefly genus *Phanoperla* (Plecoptera: Perlidae). *Systematic Entomology*, 7, 87–126.
http://dx.doi.org/10.1111/j.1365-3113.1982.tb00128.x