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Magnitude and Structure of *Lymantria dispar asiatica* Infestations of Common Forest Steppe Tree Species in Northern Mongolia

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Some taxonomic records of aquatic insects in the Eroo river basin (West Khentii, northern Mongolia)

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Abstract

In the Eroo basin of Mongolia, many species of aquatic insects have been recorded including 5 species of Diptera in the families Psychodidae, Dixidae, and Blephaceraeidae and 25 species across 8 families of stoneflies. One species of Psychodidae, *Bazarella baikalensis* Wagner is reported for the first time in Mongolia while the other families are discussed and a species list is provided for the country.

Key words: Plecoptera, Diptera, Psychodidae, Dixidae, Blephaceraeidae, new record, species list, West Khentii, Mongolia

Introduction

Currently about 2000 species of the subfamily Psychodinae belonging to 100 genera are known in the world with a predicted eventual increase of species number. Most species of Psychodinae are aquatic inhabitants and almost all are water dependent (WAGNER et al. 2008). The geographic distributions of Central Asian Psychodinae are relatively large compared to those of European species (WAGNER 2003).

Only a few taxa of the family Psychodidae have been recorded in Mongolia (VAILLANT 1973, LEWIS 1982, ARTEMIEV 1984, WAGNER & JOOST 1986A) with as few as five or six species of this family reported from Mongolia by Dr. Z. Kaszab's expedition conducted in 1968 (VAILLANT 1973). Additional specimens in this family were collected by Artemiev in 1980 and 1982, and by Joost in 1983. Later, WAGNER & JOOST (1986a) registered two more species in Mongolia, and ARTEMIEV (1984) found one more taxon. Two of these species were discovered as new to science.

As for stoneflies, some investigations were performed during last decade in the upper reaches of Eroo river and its tributaries by PUREVDORJ (2001), PUREVDORJ *et al.* (2003) and SAULYEGUL (2006), summarized by ZWICK & SURENKHORLOO (2005) and SURENKHORLOO (2009). Here we summarize recent data on both discussed groups of the Eroo river basin.

Materials and methods

This research was conducted at the Field Station "Khonin Nuga" between 1998 and 2003. Imagines were collected with a sweep net and identified to species in the laboratory. Specimens from selected Dipteran families were carried to the laboratory of the Limnological River Station Schlitz (Germany) and provided to Drs. P. Zwick and R. Wagner separately. All studied specimens were preserved in 70 % ethanol, and retained in the author's collection.

The Eroo is one of the largest rivers in northern Mongolia. It flows via the Orkhon river into the river Selenge. While the upper part of the Eroo has had little human impact, there is a gold mining on its tributary Bar-Chuluut river. The open-cast mining stretches over approximately 17 km in the lower reaches to the Bar-Chuluut river valley. As with many other mountain rivers, the main channel of the Eroo river and its tributaries have very distinct habitats e.g. in the upper reaches of Bar-Chuluut river, there are riffles (runs), reaches (raceways), and pools. Hydrological parameters of the Eroo and its tributaries can be found in SAULYEGUL (2006) and KRAETZ (2009).

Results

Seventy insect genera (9 orders, 42 families) were collected in the upper reaches of the river Eroo (PUREVDORJ 2001). Nowadays the details of data determinations clarify a few Dipteran species (families Psychodidae, Dixidae, Blephariceridae) and a species list of stoneflies in the Eroo river basin. The new record of species is to find detailed in WAGNER (2003); the other records are summarized as a species list below.

Taxonomic records:

Order Diptera

Family Dixidae:

Dixa nebulosa Meigen, 1830: Selenge aimag, Mandal sum, Khonin Nuga area, Eroo river (N 49°05' N/ 107°17' E), 1♂, 11.08.2003 (coll. P. Surenkhorloo).

Family Blephariceridae

Bibiocephala maxima Brodsky, 1954: Selenge aimag, Mandal sum, Khonin Nuga area, Eroo river: 1♀, 8 exuvia; 21.04.2003 (coll. P. Surenkhorloo).

Agathon eoasiaticus Brodsky, 1954: Mongolia, Selenge aimag, Mandal sum, Bar-Chuluut river: 3♂♂, 6 pupae; 13.07.2003; 2♂♂, 2♀♀ 04.08.2003. Tsagaan-Chuluut river: 1 larva, 48 pupae; 30.06.2003. Small tributary of Eroo river near confluence of Khongi and Sharlan rivers: 2 larvae; 01.07.2003. Ataa river: 2♂♂, 56 pupae, 4 larvae, 3 exuvia; 18.07.2003 (coll. P. Surenkhorloo).

Neohapalothrix manschukuensis (Mannheims, 1938): Mongolia, Selenge aimag, Mandal sum, Khonin Nuga, Eroo river: 28 pupae, 44 larva, 21.06.2003; 35♀♀ 25.06.2003; 2♀♀ 26.06.2003; 2♀♀ 13.07.2003. Eroo hot spring, Ar-Ichlekh river: 8 pupae, 16 larva, 28.06.2003. Bar-Chuluut river: 2♀♀, 13.07.2003. Ataa river: 1 larva, 18.07.2003 (coll. P. Surenkhorloo).

Species list of Mongolian Psychodidae

Paramormia ustulata (Walker, 1856)

Phlebotomus mongolensis, Sinton, 1928

Phlebotomus andrejevi Shakirzyanova, 1953

Psychoda alternate Say, 1824

Psychoda moravica Vaillant, 1966

Psychoda uniformata Hasaeman, 1907

Saraiella bulganica Vaillant, 1973

Sergentomyia gobica Artemiev, 1984

Telmatoscopus mongolianus Vaillant, 1973

Tinearia alternata (Say, 1824)

Thornburghiella weidneri Wagner & Joost, 1985

Ulomyia kaszabi Vaillant, 1973

Bazarella baikalensis Wagner, 2003 (new record for Mongolia, Figs. 1a-d)

Description. Head: Eye-bridge consisted of four rows of facets, distance between eyes equal to 4-5 facet diameters. Antennal scape approximately 2.5 times longer than wide, straight. Pedicel spherical, postpedicel elongate cylindrical with three strong setae, one basal and two distal; distal seta twice as long as basal setae. Antennal segments 4 to 13 barrel-shaped, segments 14 and 15 short. Segment 16 with blunt apiculus. Segments 5 to 13 each with one pair of finger-shaped ascoids. Relative length of antennal segments: 75-27-32-14-13-15-15-15-15-14-14-13-12-11-11-19. Relative length of palpus segments: 36-50-50-55.

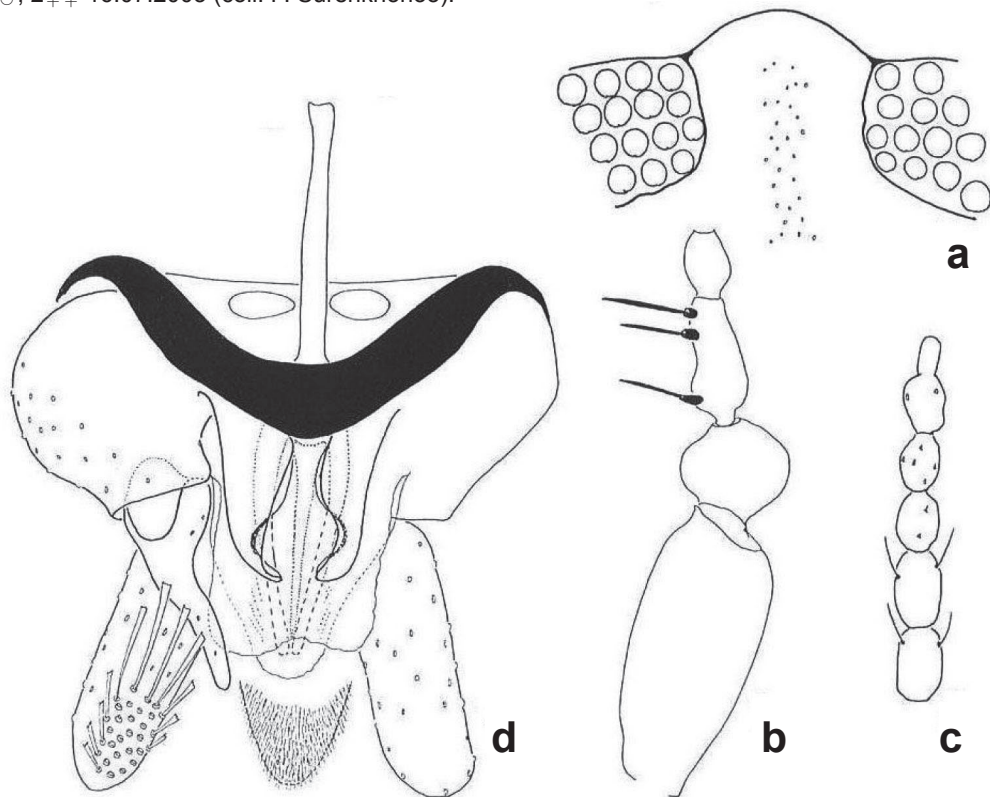
Thorax without patagia and tegulae. Legs without specific features. Wing length 2.8 mm. Subcostal vein ends in vein R1, M2 with basal spur. All tips of veins, forks r2/3, m1/2, the base of R5 and the Tapp of subcosta/radius1 with brownish spots.

Genitalia: sternal bridge broad slightly bent distally. Gonocoxites spherical, separated from one another with an elongate, strong, distally pointing appendage, tip is distal from the tip of the

gonostyle. Appendage lies ventrally of basistyles and conceals under greater part of the aedeagus. It is broad basally with strong tip curved inward. Gonostyle approximately triangular, inserted distally at the gonocoxite, movable in the vertical plane. Gonostyle medially with setae. Tergite 9 broader than long, basally much broader than distally. Cercopodia elongate, slightly curved, with about 30 distally serrate tenacula. Aedeagus with elongate dorsal Y-shaped, and thin median sclerite. Distal portion of the aedeagus covered by thin chitinous sheath with two ventral tips, dorsally conical. Subgenital plate conical, setose.

Material: Holotypus: 1♂ Russland: Mischina, lake Baikal, river Mischina, 15.6.1993; Paratypus, 1♂, Mischina, Baikal, stream, 15.6.1993; all leg. Mey.

Additional material: Mongolia: Selenge aimag, Mandal sum, Bar-Chuluut river, 1♂, 1♀ 09.07.2003; 1♂, 2♀♀ 16.07.2003 (coll. P. Surenkhorloo).



Figs. 1a-d: *Bazarella baikalensis* Wagner. **a** – eye-bridge, **b** – basal of antennal segments, **c** – distal antennal segments, **d** – genitalia, ventral view (illustrated by WAGNER).

List of stoneflies (Plecoptera) in the Eroo river and its tributaries

Family: Pteronarcyidae

Pteronarcys reticulata (Burmeister, 1839)

Agnatina brevipennis (Navás, 1912)

Family: Perlodidae

Arcynopteryx compacta (McLachlan, 1872)

Diura majuscula (Klapálek, 1912)

Megarcys ochracea Klapálek, 1912

Isoperla lunigera (Klapálek, 1923)

Isoperla altaica Šámal, 1939
Isoperla eximia Zapekina-Dulkeit, 1975
Isoperla kozlovi Zhiltzova, 1971
Isoperla asiatica Raušer, 1968
Isoperla obscura (Zetterstedt, 1840)
Kaszabia spinulosa Raušer, 1968
Skwala pusilla (Klapálek, 1812)

Family: Chloroperlidae

Alaskaperla longidentata (Raušer, 1968)
Alloperla deminuta (Zapekina-Dulkeit, 1970)
Haploperla lepnevae Zhiltzova et Zwick, 1971
Suwallia teleckojensis (Šámal, 1939)
Suwallia kerzhneri Zhiltzova et Zwick, 1971

Family: Taeniopterygidae

Taenionema japonicum (Okamoto, 1922)

Family: Leuctridae

Leuctra fusca (Linnaeus, 1758)
Paraleuctra zapekinae Zhiltzova, 1974

Family: Capnidae

Eucapnopsis brevicauda Claassen, 1924
Capnia nigra (Pictet, 1833)

Family: Nemouridae

Nemoura arctica Ebsen-Petersen, 1910
Amphinemura borealis (Morton, 1894)

Discussion

In the Eroo river and its tributaries is found a rather high diversity of aquatic insects. Among them, 3 species of stoneflies and moth flies were newly recorded in Mongolia, namely: *Paraleuctra zapekinae* Zhiltzova, *Isoperla eximia* Zapekinae-Dulkeit and *Bazarella baikalensis* Wagner (PUREVDORJ et al. 2003, ZWICK & SURENKHORLOO 2005, present work). At present 13 species of Psychodids are known from Mongolia by previous and current studies. In those were 5 species of Psychodids described new to science from Mongolian materials.

Currently, 25 species of stoneflies are known from the Eroo River basin. Thus, 47 % of the stonefly fauna of Mongolia occurs there. The majority of the species recorded here have a wide eastern Palearctic (76%) distribution, and only a few (16 %) have a trans-Palearctic distribution and 8 % have a holarctic distribution. Three species (*Isoperla kozlovi* Zhiltzova, *I. lunigera* (Klapálek), and *I. obscura* (Zetterstedt)) are newly recorded from the Selenge river basin in Russia and one species *Filchneria mongolica* (Klapálek) represents a new record to the Russian fauna of the Plecoptera (TESLENKO & BAZOVA 2009).

SAULEGUL (2006) recorded the species, *Taeniopteryx nebulosa* (Linnaeus) and *Sweltsa insularis* Zhiltzova & Levanidova in the river Bar-Chuluut, but the identity of these species appears in doubt.

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