



## THE FIRST RECORD OF GENUS *SUWALLIA* RICKER 1943 (PLECOPTERA: CHLOROPERLIDAE) FROM CHINA

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### ABSTRACT

The chloroperline stonefly genus *Suwallia* is reported from China for the first time from the Inner Mongolia Autonomous Region. A supplementary description is provided for the identification of *Suwallia teleckojensis* (Šámal 1939).

**Keywords:** Plecoptera, *Suwallia teleckojensis*, Inner Mongolia Autonomous Region

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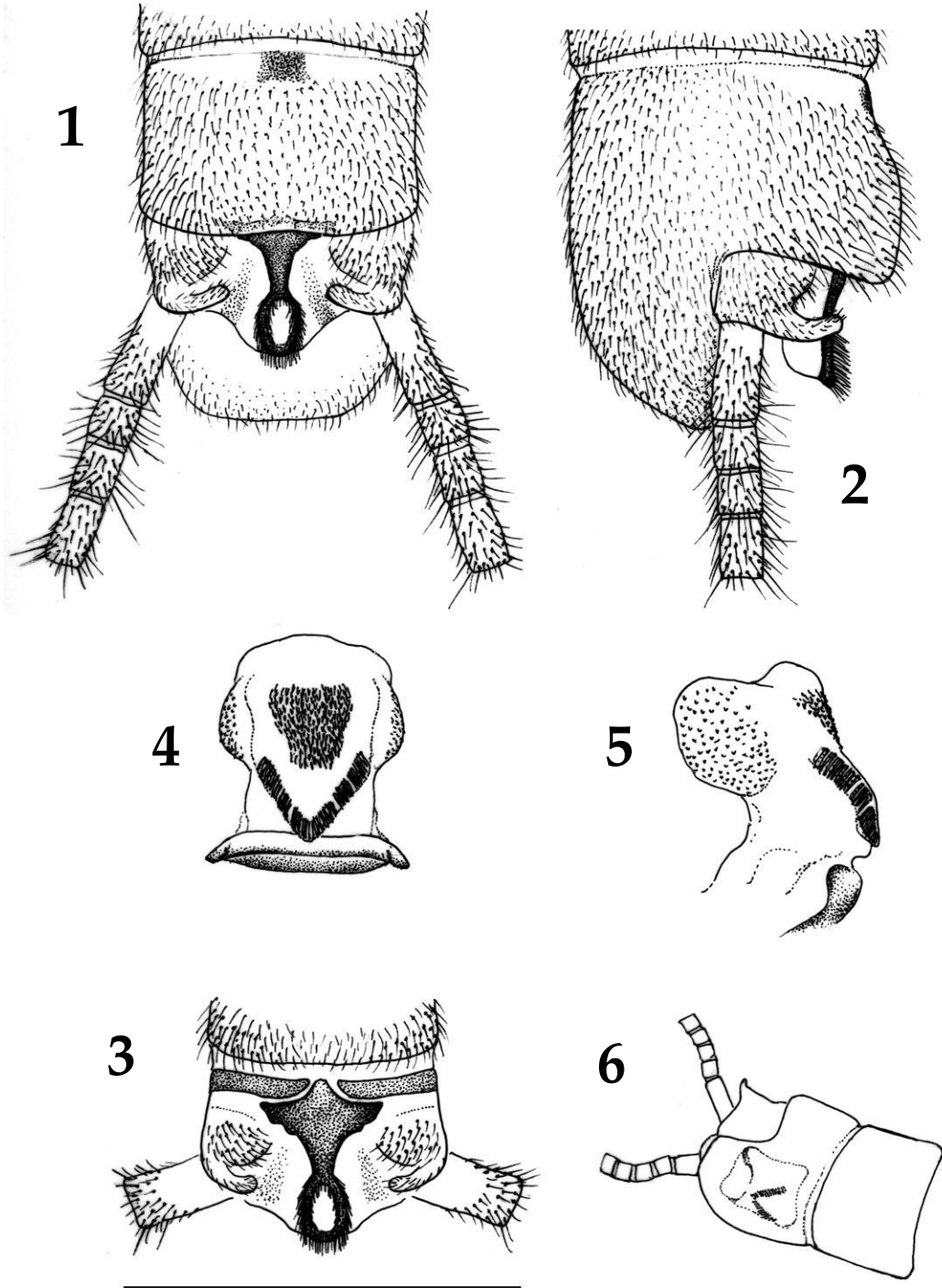
### INTRODUCTION

In 2013, several field surveys were carried out to document the biodiversity of the major aquatic insect groups in Inner Mongolia Autonomous Region. Field work was carried out and led by the third author and the senior author provided the identifications. A species of *Suwallia* Ricker 1943, representing the first record of the genus from China was collected. Characters of the male terminalia were similar to *S. teleckojensis* (Šámal 1939). However, when compared to earlier taxonomic works and illustrations in recent papers (Zwick et al. 1971, Alexander & Stewart 1999, Teslenko & Zhiltzova 2009, Judson & Nelson 2012),

we found slight differences. After comparing our illustrations based on the terminalia and everted aedeagi after treatment with KOH our colleagues (Prof. Peter Zwick and Dr. Valentina A. Teslenko) confirmed that the species is *S. teleckojensis*. Thus, we take this opportunity to completely redescribe this species and provide a description of the everted aedeagus for further studies on the genus.

### MATERIAL AND METHODS

Specimens were collected by hand and stored in 75% ethanol. The terminalia of the specimens used for drawings were cleared in KOH. Illustrations were made with the aid of a drawing tube attached



Figs. 1-6. *Suwallia teleckojensis* (Šámal 1939), male. 1. Terminalia, dorsal view. 2. Terminalia, lateral view. 3. Terminalia, dorsal view, after KOH treatment, 4. Aedeagus, ventral view. 5. Aedeagus, lateral view. 6. Terminalia with unverted aedeagus after KOH treatment, dorsolateral view.

to a Nikon SMZ800 microscope. All scale lines represent 1 mm.

Specimens are deposited in the Department of Plant Protection, Henan Institute of Science and Technology, Xinxiang, China (HIST), and the Collection of Smaller Insect Orders, Department of Zoology, Hungarian Natural History Museum, Budapest, Hungary (HNHM).

## RESULTS

### *Suwallia* Ricker 1943

**Diagnosis:** The hemitergal process on tergum 10 of the male forms a medially directed finger-like hook, which easily separates this genus from other genera in the subfamily Chloroperlinae (Surdick 1985, Alexander and Stewart 1999, Baumann & Lee 2014) (Fig. 1). The general color of the adult is yellow with a distinct head pattern, U-shaped markings on the meso- and metanota, and a narrow, but distinct abdominal stripe that extends beyond the middle of the terga (Fig. 7-8).

### *Suwallia teleckojensis* (Šámal 1939) (Figs. 1-10)

*Alloperla teleckojensis* Šámal 1939 – Šámal 1939:423 (original description of female); Zapekina-Dulkeit 1955:172 (description of male and female); Raušer 1968:336 (type lost).

*Chloroperla teleckojensis* (Šámal 1939) – Illies 1966:443 (comb. n.).

*Suwallia teleckojensis*: Zwick et al. 1971:857 (comb. n., description of male and female); Zwick 1973:297 (catalog); Zhiltzova & Teslenko 1997:258 (description of larva); Alexander and Stewart 1999:221 (description of male, female and egg); Teslenko & Zhiltzova 2009:86, 312 (keys to male, female and larva); Judson & Nelson 2012:28 (description of male, female and larva).

**Material Examined.** China, Inner Mongolia Autonomous Region, Mt. Aershan (Arxan), Budong River, 120° 24' 37.97"E, 47° 17' 26.49"N, 29 VII 2013, 1107 m, leg. Li Shi, Chunyan Jin and Chaoqun De: 2♂, 3♀ (HIST); 3♂, 1♀ (HNHM).

### **Description of the Chinese specimens**

**Habitus:** The general color is yellow in alcohol

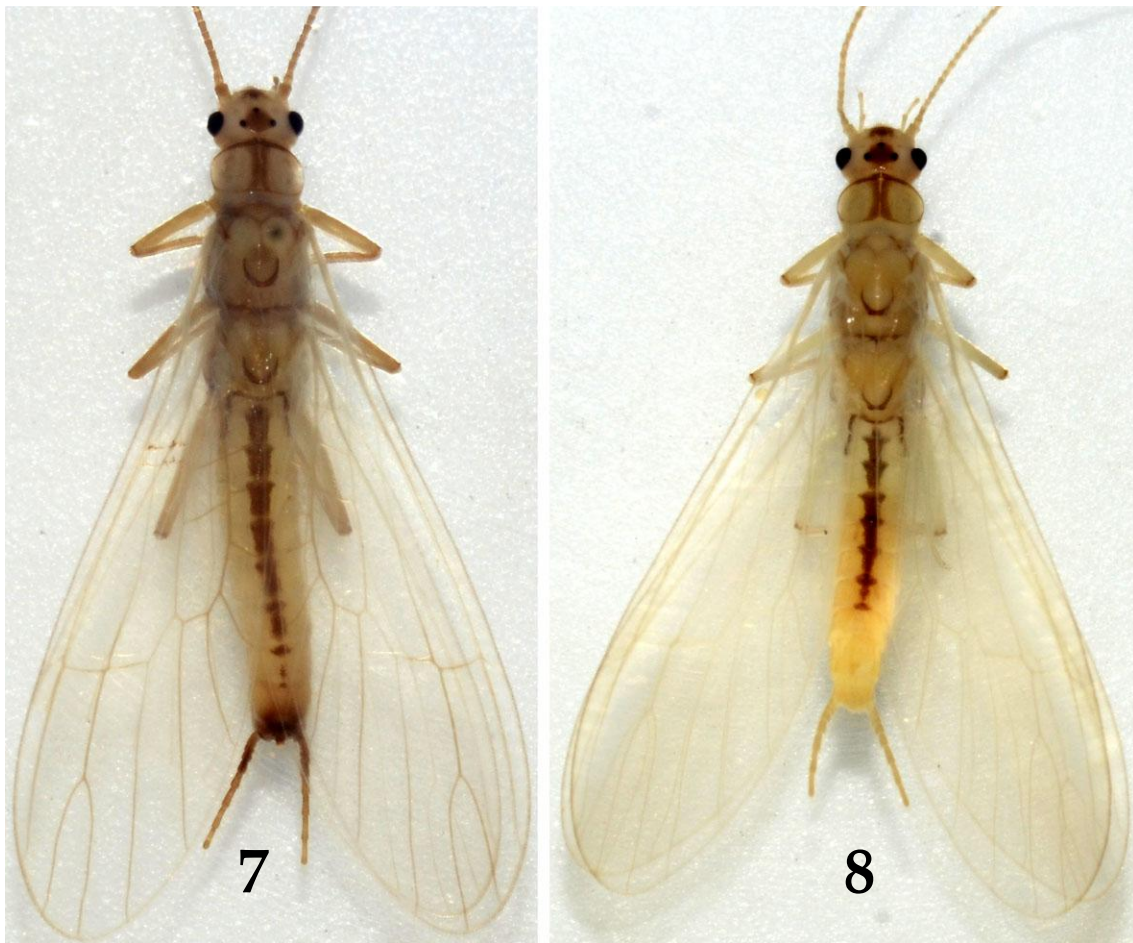
(Figs. 7-8), antennae faded to yellow. Dark U-shaped markings on the meso- and metanota, and abdominal medial stripe extending down most of the abdominal terga.

**Male.** Head with a rounded dark area between ocelli, and with another dark area anterior to distinct M-line. The pronotum is yellow with brown lateral and anterior bands on disc and a dark medial stripe (Fig. 9). The median abdominal stripe is trapezoidal-shaped at each tergum and terminates at the posterior margin of tergum 8 and a small quadrate vestige at anterior margin of tergum 9 (Figs. 1, 7).

**Terminalia.** Tergum 9 posterior margin slightly concave medially, covered by fine hairs, overhanging anterior margin of tergum 10 before treated by KOH (Fig. 1). Tergum 10 with anterior margins divided into two separate thin sclerites, median portion to base of epiproct forming a sclerotized area that resembles a flying eagle, paired longitudinal sclerites positioned lateral to the epiproct are lightly sclerotized. Hemitergal processes finger-shaped, medially directed and slightly curved backward in natural position (Figs. 1, 2). Epiproct knob-like, with a central, light colored, bald area, and margins covered with long hairs (Figs. 1-3). Aedeagus (Figs. 4-5) before eversion, an angular V-shaped sclerite could be seen through the cuticle of segment 9 (Fig. 6). Everted aedeagus subquadrate with two ventrolateral lobes at subapical portion, and with a wide basal sclerite. A large V-shaped sclerite consisting of closely set setae, and a large setose trapezoidal area located forward of the sclerite. The apex rounded in lateral aspect, lobes covered by fine spinules (Fig. 5).

**Female.** Head and pronotum similar to male, the abdominal stripe extends only to tergum 7 (Fig. 2). Subgenital plate large; broad basally, slightly constricted mesolaterally, then slightly tapering, posterior margin convex, barely extending to the posterior margin of sternum 9. Sternum 10 posterior margin not produced. Paraprocts small and triangular (Fig. 10).

**Remarks.** Our specimens differ slightly from Russian and Mongolian specimens by having lightly sclerotized sclerites laterally to the epiproct; instead of strongly sclerotized ones (compare Figs.

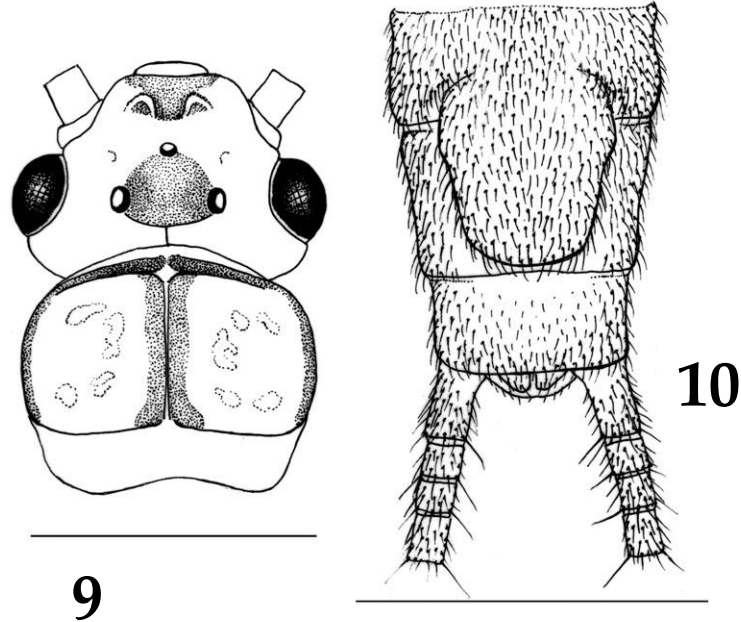


Figs. 7-8. *Suwallia teleckojensis* (Šámal 1939). 7. Male habitus, dorsal view. 8. Female habitus, dorsal view.

1, 3 with figs. 533-534 in Teslenko & Zhiltzova (2009) and fig. 127 in Judson & Nelson (2012)). In addition, the head pattern of the Chinese specimens consists of two dark patches, while patches are connected on Mongolian specimens (compare Figs. 7-9 with figs. 120, 126 in Judson & Nelson (2012) and fig. 21.E in Alexander & Stewart (1999)). Shape of the female subgenital plate is intermediate between those illustrated for specimens from Kamchatka (fig. 535 in Teslenko & Zhiltzova (2009)) and Mongolia (fig. 128 in Judson & Nelson (2012)).

The original figure of the female type of *A. teleckojensis* (Šámal 1939, fig. 6) is noticeably different from the specimens subsequently figured

as *A. teleckojensis* (Zapekina-Dulkeit 1955, figs. 10-15) or later as *S. teleckojensis* (Zwick et al. 1971, figs. 23-25; Zhiltzova & Teslenko 1997, figs. 50.1; Alexander & Stewart 1999: fig. 20; Teslenko & Zhiltzova 2009, figs. 533-535, 1643-1644; Judson & Nelson 2012: figs. 120, 126-129; Figs. 1-10) and more like an *Alloperla* Banks, 1906 than a *Suwallia*. Unfortunately, the type is lost and considered to be destroyed during World War II (Raušer 1968, Zwick et al. 1971). Efforts of the second author to locate the type in the National Museum Prague, where the remnants of the Jaromír Šámal collection were deposited, were unsuccessful. However, the name *S. teleckojensis* is now used for an identifiable taxon since the redescription by Zapekina-Dulkeit



Figs. 9-10. *Suwallia teleckojensis* (Šámal 1939). 9. Head and pronotum, male, dorsal view. 10. Female terminalia, ventral view.

(1955) based on *Suwallia* specimens collected at the type locality of *A. teleckojensis*. According to the General Recommendations of the Code about stability of nomenclature (ICZN 1999), the current prevailing usage of the name should be considered instead of unnecessarily providing a new name for this taxon and treating *A. teleckojensis* as a nomen dubium.

## DISCUSSION

Although this genus was not an unexpected find in China, the present distribution appears confined to the southern edge of the distribution of *Suwallia* in continental Asia, the Budong River ('never frozen river' in Chinese) of Arxan Mountain, southeastern Greater Khingan Ranges. Our finding supports the expectation of Levanidova & Zhiltzova (1979) that *S. teleckojensis* may not occur in non-mountainous regions in the southern reach of its range. This species has a wide distribution in Palaearctic Asia, from the Altai Mountains in the west, to the far north and the south Pacific Range (Kamchatka to Hokkaido) in

the east (Teslenko & Zhiltzova 2009).

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