



## XANTHONEURIA, A NEW GENUS OF STONEFLY (PLECOPTERA: PERLIDAE) FROM JAPAN

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### ABSTRACT

*Xanthoneuria* is proposed as a new genus of acroneurine stonefly with *Acroneuria fulva* (Klapálek) as type species. *Xanthoneuria bolivari* (Klapálek), new combination, *X. joukliei* (Klapálek), new combination, and *X. unimaculata* (Zhiltzova) are also transferred to the new genus, and a key is presented to assist in distinguishing Japanese members of the genus.

**Keywords:** *Xanthoneuria*, Plecoptera, Perlidae, New genus, Japan

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### INTRODUCTION

Ricker (1950) endorsed the practice of recognizing stonefly subgenera by listing, among others, *Beloneuria* Needham & Claassen, *Eccoptura* Klapálek and *Hesperoperla* Banks as subgenera of *Acroneuria* Pictet. Ricker (1954) added *Attaneuria* and *Calineuria* as new subgenera of this genus and Illies (1966) gave them generic status. Uchida (1983) transferred *Acroneuria stigmatica* Klapálek and *Acroneuria jezoensis* Okamoto to genus *Calineuria* and also recognized a new species, *C. crassicauda* Uchida for Japan. Later Uchida (1990) proposed a new genus for *Perla bolivari* Klapálek, *Acroneuria fulva* Klapálek and *Acroneuria joukliei* Klapálek, however that generic name was never published. In this study, we propose a new generic name, *Xanthoneuria*, to include these three Japanese species and one species from the Russian Far East and Korea, as suggested by Uchida (1990).

### RESULTS AND DISCUSSION

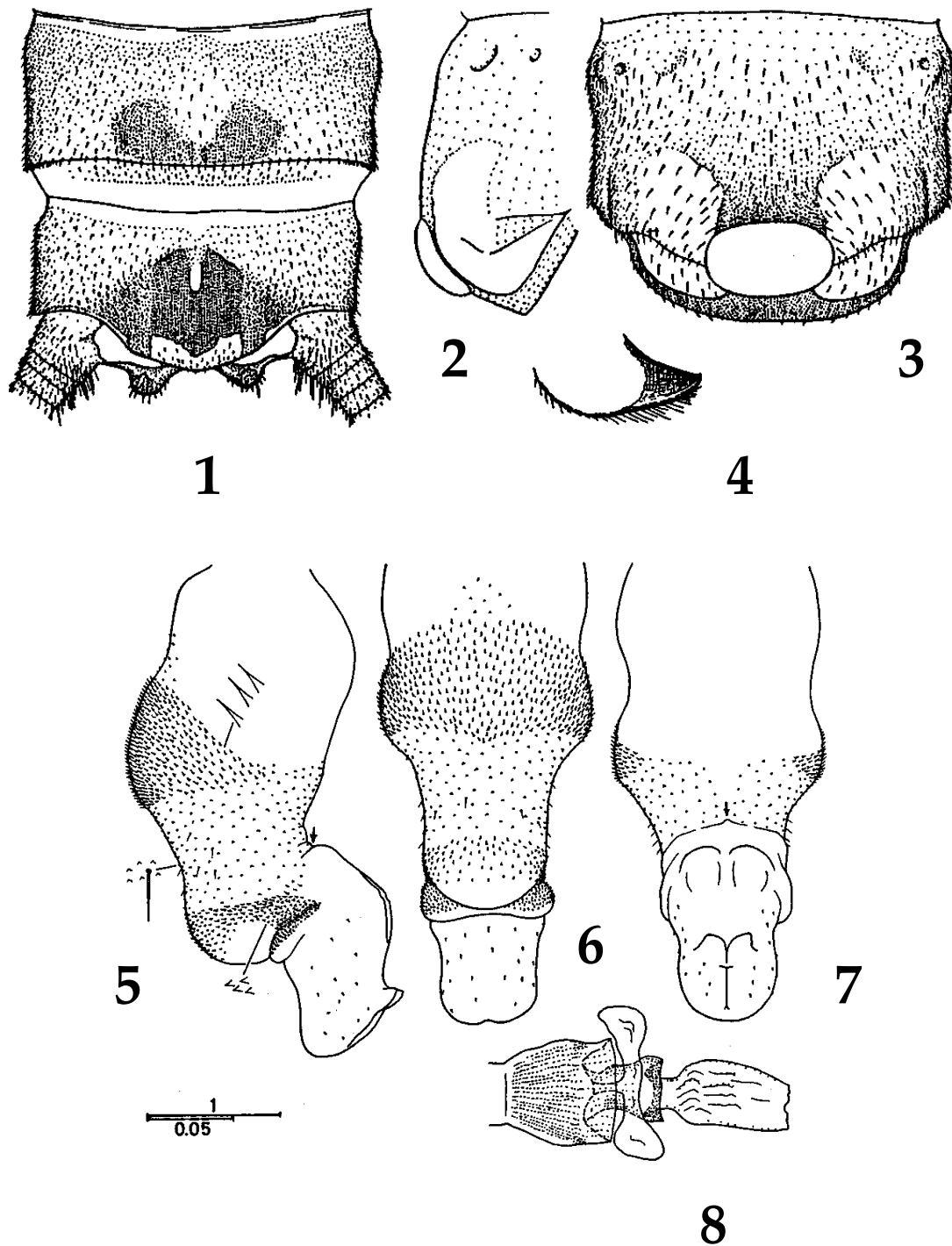
*Xanthoneuria* Uchida, gen. nov.  
(Figs. 1-14)

Type species: *Acroneuria fulva* Klapálek, 1907

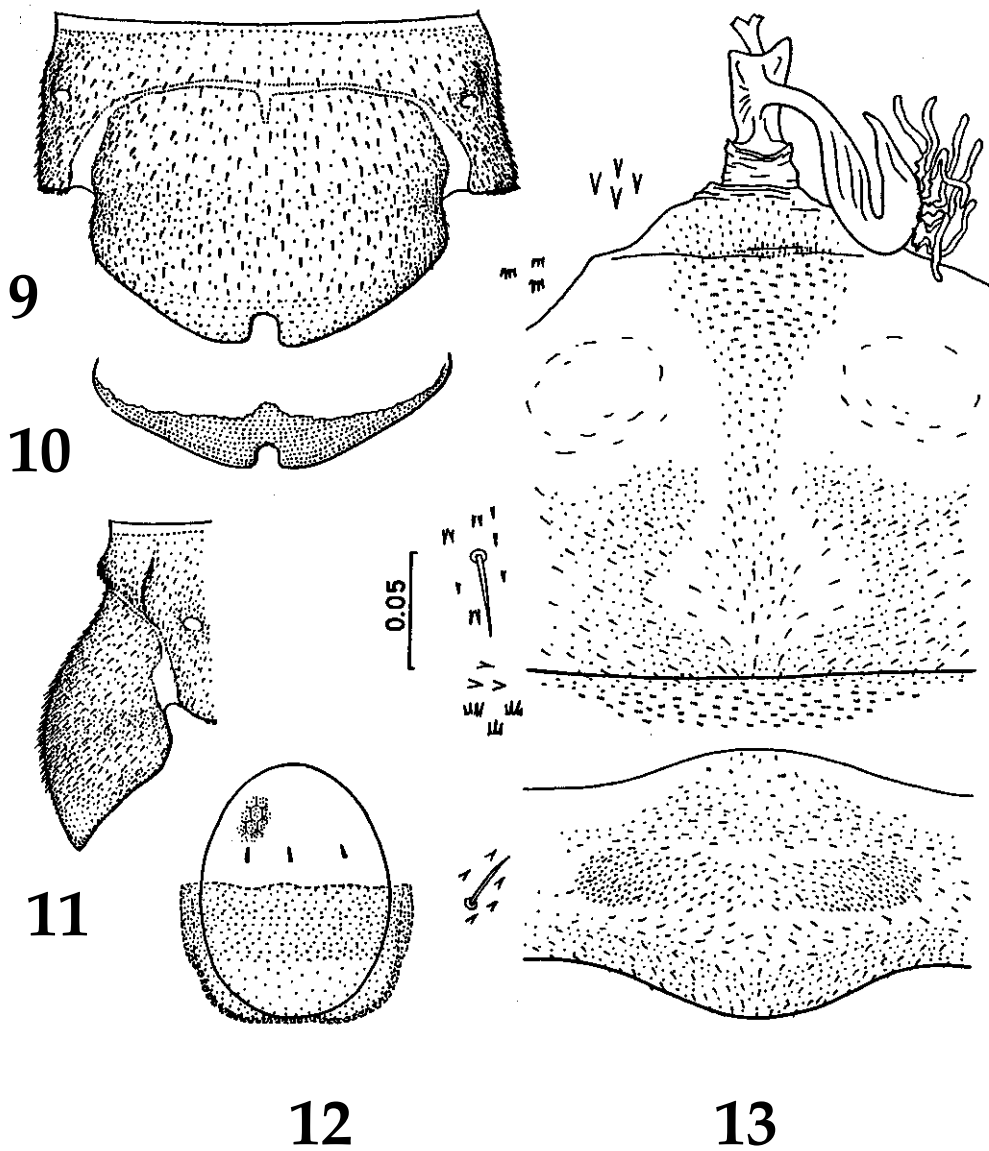
Species list and known distribution:

*Xanthoneuria bolivari* (Klapálek, 1907), comb. nov. -  
Honshu  
*X. fulva* (Klapálek, 1907), comb. nov. - Hokkaido,  
Honshu  
*X. joukliei* (Klapálek, 1907), comb. nov. - Honshu  
*X. unimaculata* (Zhiltzova, 1981) - Korea, Russian  
Far East

**Male genitalia.** Abdominal terga 1-8 unmodified;  
tergum 9 with a posteromedian pair of dark sclerites



Figs. 1-8. Male genitalic structures of *Xanthoneuria fulva*. 1. Terga 9-10. 2. Sternum 9, lateral aspect. 3. Sternum 9, ventral aspect. 4. Right paraproct, anteromedian aspect. 5. Everted penis, lateral aspect. 6. Everted penis, ventral aspect. 7. Everted penis, dorsal aspect. 8. Contracted penis, dorsal aspect.



Figs. 9-13. Female genitalic structures and egg of *Xanthoneuria fulva*. 9. Subgenital plate, ventral aspect. 10. Subgenital plate margin, dorsal aspect. 11. Subgenital plate, lateral aspect. 12. Egg. 13. Vagina and sterna 8-9 (scale 0.05 mm for setal detail insets).

and tergum 10 bearing a darkened, fused epiproct sclerite (Fig. 1). Paraprocts with a short pointed hook (Fig. 4). Sternum 9 with a transversely elongate, ellipsoidal hammer (Figs. 2-3); membranes adjacent to hammer hairy, convex anteriorly and concave posteriorly. Penis membranous, without sclerites and

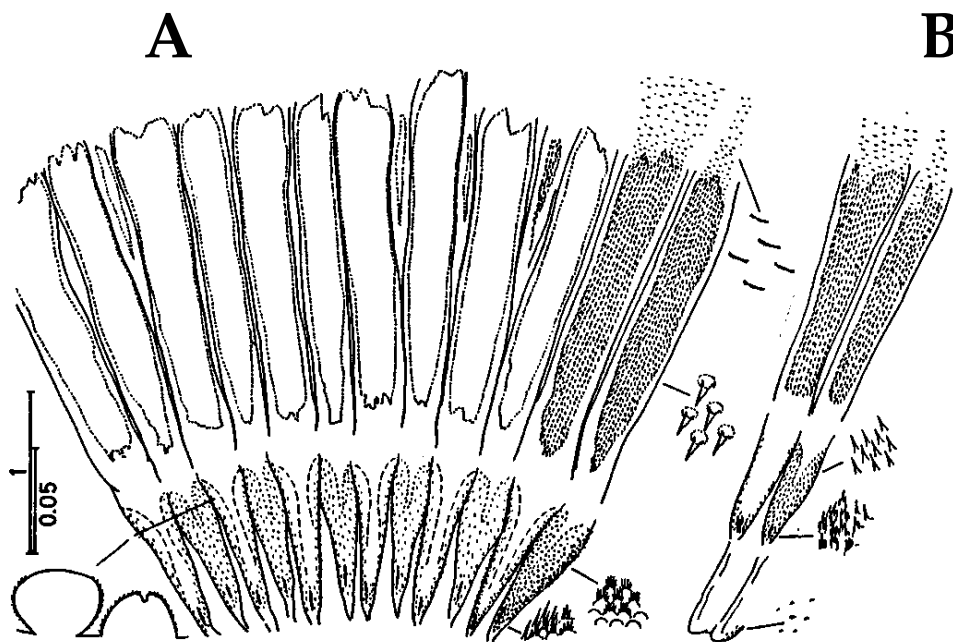
consisting of five telescoped sections variously armed with fine spinules and hairs (Figs. 5-8). Basal section bearing a ventral band of slender spinules; second section short and covered by fine, short spinules and sparse hairs ventrally and laterally; third section bearing lateral patches of short spinules;

fourth section very short with dense band of short spinules laterally and ventrally and apical section with sparse covering of fine slender spinules, a pair of dorsobasal swellings and a pair of dorsal projections adjacent to gonopore.

**Female genitalia.** Sternum 8 with a round convex subgenital plate delimited anteriorly by a narrow membranous fold (Figs. 9-11). Posterior margin with a small mesal notch; margin bearing minute hairs; dorsal membrane of plate bearing a transverse sclerite. Vagina membranous, without sclerites but

bearing fine internal spinules (Fig. 13). Spermatheca larger than vagina, with thick stalk and 5-12 accessory glands.

**Egg.** Oval, or with one or two large lateral depressions. Anchor large, bowl shaped, without pedicel and covering basal half of egg (Fig. 12). Distal third of anchor thickened, forming a wide circular band. Collar absent. Chorion with minute punctures and shallow hexagonal follicle cell impressions. Micropylar canals straight.



## 14

Fig. 14. Larval proventriculus for *Xanthoneuria fulva* (A) and *X. joukii* (B) (scale 0.05 mm for details of armature, 1.0 mm for others).

**Mature larva.** Body length 17-37 mm. General color pale yellow marked with dark brown in fresh specimens, bleaching to white in alcohol. Occipital spinule row irregularly spaced. Anterior strip of proventriculus flat, completely armed with golden spines except bare posterior end (Fig. 14). Strip on superior fold was as wide as, or slightly wider than,

that on inferior fold. Accessory patch of spines often present between major anterior strips. Posterior spinule patch ca. two-fifths as long as anterior patch. **Diagnosis.** *Xanthoneuria* is allied to the *Calineuria-Doroneuria-Hesperoperla* group of tribe Acroneuriini by virtue of the shared epiproct sclerite and irregularly spaced larval occipital spinule row. Penial

armature in *Calineuria* and *Hesperoperla* consists of much heavier concentrations of thicker and longer spines (Stark & Gaufin 1974; Baumann & Stark 1980) than is present in the new genus, and that of *Doroneuria* is fundamentally different with the presence of a large dorsal sclerite (Stark & Gaufin 1974). Eggs of *Xanthoneuria* lack a collar which distinguishes them from eggs of *Calineuria* and *Hesperoperla* (Stark & Gaufin 1976); the eggs are generally similar to those of *Doroneuria* (Stark & Gaufin 1976) but the females of that genus lack a developed subgenital plate. Larvae of the new genus are distinct from related genera by several characters, most notably in the presence of pale pigment over most of the abdominal terga.

The following species key will distinguish adult species of *Xanthoneuria* from Japan.

- 1 Femora and tibiae yellow except for black distal femoral margin and dark tibial base ..... *fulva*
- 1' Femora and/or tibiae with extensive dark brown pigment ..... 2
- 2 Dorsodistal margin of femora yellow ..... *bolivari*
- 2' Dorsodistal margin of femora dark brown .. *joukliai*

#### ACKNOWLEDGMENT

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