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A review of the genus *Xiphovelina* Lundblad, 1933 (Hemiptera: Heteroptera: Veliidae) from China, with descriptions of three new species

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Abstract

Four species of genus *Xiphovelina* Lundblad are now known from China. Of these, *X. glauca* Esaki & Miyamoto, 1959 is the only member of the genus previously recorded from China. In addition, three species, *X. denigrata* **sp. nov.**, *X. fulva* **sp. nov.** and *X. reflexa* **sp. nov.**, are described as new to science. Photographs of the male and female dorsal habitus, male fore and middle legs, male abdominal segment VIII and endosoma with pygophore are provided, accompanied by habitat photographs and a distribution map for all Chinese *Xiphovelina* species. A key to all the four Chinese *Xiphovelina* species is also provided.

Key words: Heteroptera, Veliidae, *Xiphovelina*, new species, China

Introduction

The genus *Xiphovelina* was established by Lundblad in 1933, on the basis of type species *X. ensis* from Sumatra, Indonesia. Esaki & Miyamoto (1959) described four new species (*X. boninensis*, *X. curvifemur* and *X. japonica* from Japan; *X. glauca* from Taiwan) and provided a key to the known species at that time. Polhemus (1977, 1979) transferred *Microvelina lacunana* Drake and Plaumann 1953 to *Xiphovelina* and described a new species *X. iota* from Sri Lanka, but it is doubtful whether the Neotropical species *X. lacunana* (Drake and Plaumann, 1953) is congeneric only depending on the characters of the flat body. Zettel (2012) also expressed his doubt on the placement of *X. lacunana*. Nieser (1995) added one more new species *X. skoteina* from Sulawesi, Indonesia. Zettel (2012, 2014) also described two new species *X. philippinensis* and *X. dentata* respectively, from Philippines. Prior to this study, 10 species have been considered valid in this genus. Based on the material collected recently during several excursions, however, southern and southwest China may harbor a richly undescribed assemblage of *Xiphovelina* species. The aim of the present paper is to review the species of the *Xiphovelina* occurring in China, and to provide descriptions of the new species. In this paper, one previously described species, *X. glauca* Esaki & Miyamoto, 1959, and three new species are described: *X. denigrata* **sp. nov.**, *X. fulva* **sp. nov.** and *X. reflexa* **sp. nov.**. With these additions, 13 species are now considered valid in this genus including the doubtful *X. lacunana*, and 4 species of *Xiphovelina* are now recorded in China. To allow identification of this regional biota, photographs of key male and female characters are provided, and a key to the all four Chinese *Xiphovelina* species is presented.

Depository, material and methods

All the examined specimens in the present study are deposited in the Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, China (NKUM) except for the holotype of *X. glauca*, which is deposited in the Entomological Laboratory, Department of Agriculture, Kyushu University, Japan. The genitalic dissection followed the methods and techniques given by Chen *et al.* (2005). All measurements are given in millimeters

relatively long, erect setae; fore femora straight and thick, fore tibiae slightly curved in apical part, length of grasping comb 0.13, about 0.29 times tibiae length; middle trochanters long and slender, middle femora almost straight and thin, middle tibiae inner margin convexed, with a row of about 7–8 long erect bristles along inner margin (Fig. 18), claws and ventral arolium of middle tarsal segment II leaf-like structure inserted subapically; hind femora stout and narrowed toward both ends, hind tibiae straight and longer than middle tibiae; lengths of leg segments (trochanters, femora, tibiae and tarsi): fore leg: 0.17, 0.45, 0.39 and 0.20, middle leg: 0.22, 0.53, 0.46 and 0.43 (0.17+0.26), hind leg: 0.17, 0.50, 0.57 and 0.32 (0.11+0.21); abdomen dorsally narrowed backwards, connexiva narrow and almost flat. Genital segments: abdominal segment VIII (Fig. 25) about 1.50 times as long as wide, posterior margin with some short, sparse, erect, black brown hairs; pygophore (Fig. 29) swollen at posterior end in ventral aspect and with a ear-like process on each side; paramere rudimental.

Apterous female (Fig. 4). Body small-sized, slightly longer and greatly wider than male, coloration and markings similar to that of male; body length: 1.89–1.91, greatest width: 0.86–0.87; structure of head including antennae as in male, head length: 0.33–0.34, head width: 0.55–0.56, about 1.67 times head length, antennae about 0.50 times as long as body, lengths of antennal segments I–IV: 0.20, 0.21, 0.22, 0.32; pronotum width: 0.60–0.61, pronotum length: 0.09–0.10, about 6.0 times as wide as long; legs similar to those of male except fore tibiae without grasping comb, lengths of leg segments (trochanters, femora, tibiae and tarsi): fore leg: 0.20, 0.45, 0.39 and 0.20, middle leg: 0.21, 0.54, 0.47 and 0.44 (0.17+0.27), hind leg: 0.19, 0.50, 0.57 and 0.33 (0.11+0.22); connexiva broader than in male, hind portions erected and folded over abdomen but not touching each other (Fig. 4); genital segments retracted into abdomen.

Macropterous male and macropterous female: unknown.

Etymology. The specific name is derived from the Latin *reflexus* (meaning reflexed), refers to the reflexed hind portions of connexiva in female.

Distribution. China (Henan) (Fig. 37).

Key to the species of *Xiphovelia* occurring in China

1. Legs black and shining. Male: abdominal sternum VIII slightly concave medially (Figs. 22, 23). Female: connexiva largely widen and flat (Fig. 7) *X. denigrata* sp. nov.
- Legs yellowish brown. Male: abdominal sternum VIII without any concavity. Female: connexiva relatively narrowed and erect or reflexed 2
2. Metanotum with a pair of rounded, silvery hair markings. Female: hind portions of connexiva in apterous female reflexed (Fig. 4) *X. reflexa* sp. nov.
- Metanotum without a pair of rounded, silvery hair markings. Female: hind portions of connexiva in apterous female erect. 3
3. Head dorsum in apterous male yellowish brown (Fig. 8); the ear-like process on each side of pygophore relatively wide (Fig. 28) *X. fulva* sp. nov.
- Head dorsum in apterous male black (Fig. 1); the ear-like process on each side of pygophore narrow (Fig. 26) *X. glauca* Esaki & Miyamoto

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