



## Morphology and chaetotaxy of the first instar larva of the scorpionfly *Sinopanorpa tincta* (Mecoptera: Panorpidae)

HONG-MIN CHEN<sup>1</sup> & BAO-ZHEN HUA<sup>1,2</sup>

<sup>1</sup>Key Laboratory of Plant Protection Resources and Pest Management, Ministry of Education; Entomological Museum, Northwest A & F University, Yangling, Shaanxi 712100, China. E-mail: [chenhongmin@nwsuaf.edu.cn](mailto:chenhongmin@nwsuaf.edu.cn), [huabzh@nwsuaf.edu.cn](mailto:huabzh@nwsuaf.edu.cn)

<sup>2</sup>Corresponding author

### Abstract

The morphology and chaetotaxy of the first instar larva of the scorpionfly *Sinopanorpa tincta* (Navás, 1931) are described and illustrated for the first time with the aid of light microscopy and scanning electron microscopy, with particular attention to the mouthparts and their sensilla. A comparison is made with the larvae of other known Mecoptera, especially *Panorpa* and *Neopanorpa* in Panorpidae.

**Key words:** *Sinopanorpa*, Panorpidae, larva, chaetotaxy, sensillum, mouthparts

### Introduction

*Sinopanorpa* Cai & Hua was established with *Panorpa tincta* Navás, 1931 as its type species and presently also includes *S. digitiformis* Huang & Hua and *S. nangongshana* Cai & Hua (Cai *et al.* 2008). The genus belongs to the most speciose family of Mecoptera, Panorpidae, and can be recognized by the following characters: wing membrane deeply yellow with sooty brown markings; the end of vein 1A extending beyond the origin of vein Rs; vein R<sub>2</sub> of wings generally 3-branched; tergum VI of male without anal horn, abdominal segment VII much thinner at the basal 1/3 than the distal 2/3; gonostylus of male genitalia long and slender with a well-developed basal lobe, ventral parameres simple. Although the larval stages of *S. tincta* were briefly summarized by Cai *et al.* (2008), a detailed description has not been presented until now.

*Sinopanorpa tincta* (Navás, 1931) is widespread in the Qinling Mountains (Cheng 1957, Chou *et al.* 1981). During our recent investigation, the first instar larvae of *S. tincta* were successfully obtained through rearing. Herein their morphology and chaetotaxy are described and illustrated by means of light microscopy and scanning electron microscopy. Chaetotaxy nomenclature primarily follows Hinton (1946) and Cai & Hua (2009a).

### Material and methods

Adults of *S. tincta* were captured at Mount Taibaishan (33°47'N, 107°38'E, 1250 m), Shaanxi Province, from July to August, 2007. The live adults were reared in screen-wired cages (40 × 60 × 60 cm) and provided live potted plants for resting and wet absorbent cotton pads for drinking and maintaining humidity. Adults were provided freshly killed insects as food items, including katydids, grasshoppers, caterpillars and stick insects. Eggs were collected from about thirty female adults and incubated at room temperature in plastic containers layered with dampened absorbent cotton pads. First instar larvae were fixed and observed in this study.

The larvae were preserved in 75% alcohol after immersion in 60°C water to straighten and expand the body for light microscopy observation. In order to examine chaetotaxy, the larvae were cut longitudinally along the midventral line, macerated in cold 4% NaOH for 24 hours, rinsed with water, and preserved in 75% alcohol mixed with a few drops of glycerol. The integument was temporarily mounted on a slide to observe the chaetotaxy, which was