



## A nearly cryptic Scorpionfly, *Panorpa cryptica* n. sp. (Mecoptera: Panorpidae) from North America

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### Abstract

The first nearly cryptic species of scorpionfly from the United States, *Panorpa cryptica* Bicha and Schiff, n. sp., is described from northern Georgia, southwestern North Carolina and northwestern South Carolina. This insect was initially differentiated from the very similar *Panorpa nebulosa* Westwood by its unique cytochrome oxidase subunit I (COI) mitochondrial DNA. Habitat details, distribution, and biology are described.

**Key words:** COI, DNA, Georgia, new species, North Carolina, *Panorpa*, *Panorpa acuta*, *Panorpa flexa*, *Panorpa nebulosa*, scorpionfly, South Carolina

### Introduction

Mecoptera is an ancient, small, holometabolous order of insects with approximately 650 described extant species assigned to nine families. Two-thirds of the Mecoptera species are in the family Panorpidae, of which the United States has approximately 54 species in one genus, *Panorpa* Linnaeus, 1758. The males of Panorpidae possess a genital bulb recurved upwards, resembling the sting of a scorpion, hence, the common name, scorpionfly. Scorpionflies are widely distributed throughout the Holarctic and Oriental regions (Penny & Byers 1979) and are often the most abundant conspicuous insects in the appropriate habitat.

*Panorpa nebulosa* Westwood, 1841 (Byers 1962, Somma 2011) is one of the most widespread and abundant scorpionflies in the spring in the eastern United States (Byers 1954). The insect generally has a boreal distribution, extending south along the Appalachian Mountains at moderate altitudes. *Panorpa nebulosa* is replaced by *Panorpa flexa* Carpenter, 1935, at the higher elevations of the Great Smoky Mountains National Park and the mountains associated with the Blue Ridge Parkway. *Panorpa nebulosa* shows some variation of the male ventral parameres throughout the range and is most pronounced in mountainous areas of Virginia. Dr. Oliver Flint, of the National Museum of Natural History (USNM), Washington, DC, has expressed interest and has questioned the significance of these forms (Flint 2013).

We sequenced the COI mitochondrial DNA region (the “DNA barcode”) (Hebert *et al.* 2003) of multiple examples, often at extremes of the geographical range, of each of the 54 currently recognized species of Panorpidae from the United States, as well as 55 additional species from Mexico, Asia, and Europe (unpublished data). It was anticipated that molecular differences between the Virginia mountain forms of *P. nebulosa* might be revealed during our COI study. In contrast, we found that the COI results were similar throughout that portion of the range, but differed at the far southern extent of the range, on the south side of the Appalachian Mountains in northern Georgia. For several years we thought this to be a cryptic species, but careful study has revealed several subtle, but consistent, morphological differences between *Panorpa nebulosa* and the new northern Georgia species. This is possibly the insect that Byers observed from the middle elevations in eastern Tennessee and western North