

# An Early Triassic Scorpionfly (Panorpida = Mecoptera) of the Vologda Region

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**Abstract**—A new scorpionfly species, *Mesopanorpodes mostovskii* sp. nov. (Permochoristidae), is described from the Lower Triassic of the Vologda region.

## INTRODUCTION

The first undisputed scorpionflies are known from the Early Permian. Scorpionflies are quite common and diverse in sediments from that time on up to the Cretaceous, but their abundance in more recent deposits progressively declines. The history of this group has been fairly thoroughly studied (Novokshonov, 1997); however, some details remain to be clarified. For example, Early Mesozoic scorpionfly fauna is poorly known. The reasons for this are that much of the collections of such insects still remains undescribed and, to a lesser extent, that a relatively small number of respective insect localities exist.

A large collection of Triassic scorpionflies from several localities situated in Russia and adjacent countries is stored at the Paleontological Institute of the Russian Academy of Sciences (PIN). The fossil material described in the present paper comes from the locality of Nedubrovo, which lies in the Kichmenga River basin, a left-bank tributary of the Yug River, near the village of Nedubrovo in the Vologda region. These insect fossils come from siltstones of the lacustrine facies of the Nedubrovo Member in the Vokhminsk Formation, which lies at the very base of the Vetluga Group and differs strikingly from the underlying marls of the Vyatka Horizon (Tatarian, Upper Permian). According to paleontological data, the Nedubrovo Member shows the greatest diversity and abundance in terms of continental biota among the units of the Lower Triassic of the Moscow Syncline. Many of the recorded forms possess a high correlation potential, which makes the Nedubrovo Member one of the world's best ecotone sections for the most ancient beds of the continental Triassic (Losovskii *et al.*, 2001). Nedubrovo is now the only insect locality at the base of the Vetluga Group. A total of 44 insect specimens have been found. Most of these specimens are fragments, and only ten specimens are more or less complete wings. Five insect orders (Grylloblattida, Homoptera,

Mecoptera, Blattodea, and Coleoptera) have been identified. At least 5 specimens and, probably, 15 more wing fragments belong to the order Grylloblattida, which flourished in the Permian and Triassic, mainly to the family Chaulioditidae (= Tomiidae). This family is rare in the terminal Permian, is widely distributed in Lower (especially) and Middle Triassic deposits, and constitutes a stratigraphically important group of insects (Aristov, 2003).

Scorpionflies from the locality of Nedubrovo are represented by three fossils, one of which is described below.

Representatives of the genus *Mesopanorpodes* are known from the Middle Triassic of China, *M. shaanxiensis* (Hong *et al.*, 2002), and from Australia, *M. belmontensis* Riek, 1953 and *M. robustus* Riek, 1953 from the Upper Permian and *M. wianamattensis* (Tillyard, 1917) from the Middle–Upper Triassic.

A hindwing from the locality of Nedubrovo (specimen PIN, no. 4811/22, part and counterpart, wing length about 4.5 mm; see Fig. 1c) may belong to the genus *Mesopanorpodes* as well, but it cannot be identified more precisely due to its very bad state of preservation.

## SYSTEMATIC PALEONTOLOGY

### Family Permochoristidae Tillyard, 1917

### Subfamily Permochoristinae Tillyard, 1917

### Genus *Mesopanorpodes* Tillyard, 1918

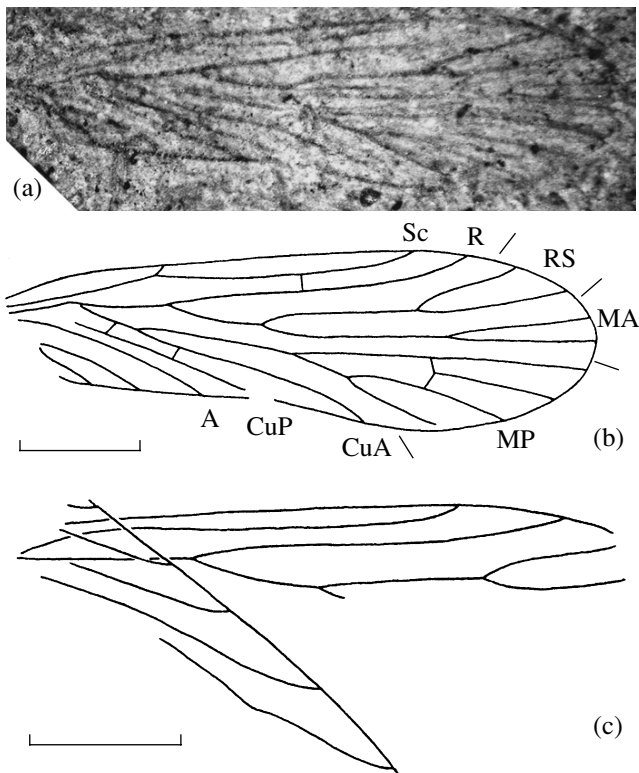
*Mesopanorpodes mostovskii* Novokshonov, Sukacheva, et Aristov, sp. nov.

**E t y m o l o g y.** In honor of M.B. Mostovski, paleontologist.

**H o l o t y p e.** PIN, no. 4811/20, well-preserved forewing part and counterpart; locality of Nedubrovo; Lower Triassic, lower part of the Vokhminsk Formation.

**D e s c r i p t i o n** (Figs. 1a, 1b). The wing is small, with a straight anterior margin, an ovoid apical margin, and an apex situated between the terminations of MA<sub>1</sub> and MA<sub>2</sub>. Sc is simple, medium-long, and enters into the anterior margin substantially distad of the

<sup>†</sup>Deceased.



**Fig. 1.** Wings of Permochoristidae scorpionflies: (a) and (b) forewing of *Mesopanorpodes mostovskii* sp. nov., holotype PIN, no. 4811/20: (a) general appearance and (b) details of wing venation; (c) fragmentary hindwing of *Mesopanorpodes* (?) sp., specimen PIN, no. 4811/22. Vein abbreviations standard. Scale bar 1 mm.

midlength, i.e., in the beginning of the third quarter of the wing. In the subcostal field, there is a humerus and another short and oblique vein, which is located approximately at the level of the R–RS bifurcation, where Sc forms a weak bend. R is straight, has a weak terminal bend, and diverges from the common RS+M stem slightly earlier than the beginning of the second quarter of the wing. The common stem of R+RS is equal to the common stem of RS+M. The MA stem is 1.1 times as long as the RS stem, i.e., the MA fork is slightly shorter than the RS fork. The MP<sub>1+2</sub> stem is 2.1 times as long as the MP<sub>3+4</sub> stem. There is a slightly

oblique crossvein, mp<sub>2</sub>–mp<sub>3</sub>. The MP stem is 2.6 times as long as the MP+CuA stem, and MP is not arched after its separation from CuA. CuA and CuP are simple, with two crossveins between them: mp+cua–cup, which is inserted almost near midlength of the MP+CuA stem, and cua–cup. There is no Y-shaped vein, and the anal veins are simple.

**Measurements**, mm: forewing length, 5; forewing width, 1.5.

**Comparison.** Differs from the other species in that the MP is not arched after its separation from CuA and in the more proximal position of the crossvein mp+cua–cup in relation to the MP–CuA bifurcation.

**Material.** Holotype and paratype PIN, no. 4811/21, part and counterpart.

#### ACKNOWLEDGMENTS

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