

On the Taxonomic Position of the Genus *Parapryg* (Homoptera, Fulgoroidea) and Classification of Protorthoptera and Related Groups

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Abstract—*Parapryg alogus* Aristov et Rasnitsyn, 2014 (terminal Permian of European Russia) is transferred from Pterygota (Cnemidolestida) to Surijokocixiidae (Homoptera, Fulgoroidea). Some characters and approaches used in classification of Protorthoptera and related groups are briefly discussed.

Keywords: Homoptera, planthoppers, Protorthoptera, fossil, Permian, Russia

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In the paper recently published in this journal, Aristov and Rasnitsyn (2014) described the genus and species *Parapryg alogus* in the order Eoblattida, infra-class Polyneoptera based on a forewing from the terminal Permian of Nedubrovo, Vologda Region. From the accompanying drawing and photograph, this taxon is immediately recognizable as belonging to a different infraclass (Paraneoptera), order Homoptera, superfamily Fulgoroidea, and its most primitive family Surijokocixiidae (Shcherbakov, 2000). The drawing is incorrect in some respects, but the photograph shows all essential characters clear enough, including the precostal carina developed along the costal margin, the short basal cell, and the stem of claval Y-vein ending near the apex of the clavus. These conclusions were confirmed by reexamination of the holotype (Fig. 1). This genus is distinct from three other surijokocixiid genera known from the Permian (*Scytocixius* Martynov, 1937, *Boreocixius* Becker-Migdisova, 1955, *Surijokocixius* Becker-Migdisova, 1961).

This is not the first case when homopterans were described as protorthopterans. The family Mesojabloniidae from the Triassic of Kyrgyzstan erected by Storozhenko (1992) was later shown to belong to Homoptera Cicadomorpha (Shcherbakov, 2011).

The genus *Parapryg* and the family Pterygota containing it were described in the order Eoblattida (Aristov and Rasnitsyn, 2014). In the same year, this family, including this genus was transferred to a different order, Cnemidolestida (Aristov, 2014). The latter article was published in May, 2014, earlier than the former (June 2014), so the names Pterygota, *Pryg absurdus*, and *Parapryg alogus* in Aristov (2014) are to be regarded as

nomina nuda for the purposes of zoological nomenclature.

Systematics of the fossil Protorthoptera and related groups is a difficult business and their system is still in flux. Classics of paleoentomology proposed for these insects several ordinal names and so widely different classifications (Handlirsch, 1906–1908; Martynov, 1938; Sharov, 1961) that, in *the Treatise on Invertebrate Paleontology*, most of these groups are lumped into the order Protorthoptera in the broad sense (Carpenter, 1992). Aristov and Rasnitsyn (2010, 2015; Aristov, 2015a, and references therein) are now developing yet another classification for protorthopteroids. However, the characters used by them to diagnose several extinct orders and family groups are not reliable at this taxonomical level. For example, the presence/absence of

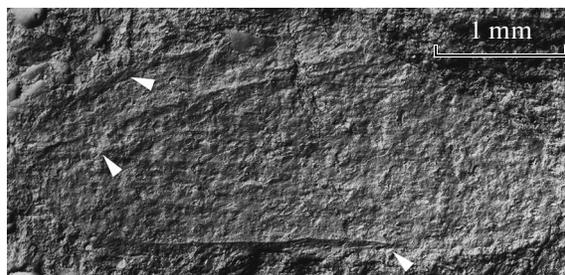


Fig. 1. *Parapryg alogus* Aristov et Rasnitsyn, 2014, holotype forewing (negative impression, mirrored); Nedubrovo; terminal Permian (SEM microphotograph, back-scattered electron detector); arrows—precostal carina, basal cell, and apex of Y-vein.

pronotal paranota is variable in such related orders as Plecoptera (usually absent, but well-developed in nymphs of Peltoperlidae) and Blattodea (usually developed, but reduced in some Nocticolidae), and position of the Sc apex (joining C or R) in the forewings is variable in Plecoptera (Béthoux, 2005) and even within some primitive families of Neuroptera (extinct Permithonidae, extant Ithonidae sensu lato; Winterton and Makarkin, 2010).

Sometimes, Aristov and Rasnitsyn overestimate a single body character: after discovery of pronotal paranota in one species of the genus *Sylvardembia* Novokshonov, 1997, this species despite being virtually identical to the type species in its wing structure, was singled out into the genus *Jubala* Aristov et Rasnitsyn, 2015 and assigned not only to a different family, but also to a different order and even superorder, which is impossible to accept—the former genus is currently in the family Protrembiidae, order Cnemidolestida, superorder Perlidea, while the latter is placed in the family Euryptilonidae, order Eoblattida, superorder Blattidea (Aristov, 2015b; Aristov and Rasnitsyn, 2015). And conversely, in the other case, based on the superficial venation similarity, these authors synonymized the families Sojanoraphidiidae and Tshekardominidae under Protrembiidae (Aristov, 2015b), ignoring important differences in their body structure—in the number of tarsomeres (constant in many orders) and the type of the ovipositor.

These examples demonstrate that the classification of Protorthoptera and related groups proposed by Aristov and Rasnitsyn is inconsistent, largely unnatural, and no more successful than the previous ones.

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