

The First Record of Kaltanidae (Insecta: Mecoptera: Kaltanidae) from the Permian of European Russia

A. S. Bashkuev

Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya ul. 123, Moscow, 117997 Russia

e-mail: lab@palaeontolog.ru

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Abstract—Two new species and a new genus of scorpionflies of the family Kaltanidae, *Pseudochorista occidentalis* sp. nov. and *Kamochorista novokshonovi* gen. et sp. nov. (Mecoptera: Kaltanidae), are described from the Urzhumian of Udmurtia (Chepanikha locality). This is the first record of kaltanids on the Russian Platform.

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Key words: scorpionflies, Mecoptera, Kaltanidae, new taxa, Russian Platform.

INTRODUCTION

The family Kaltanidae was established by Martynova (1958, 1961) for mecopterans of the Kuznetsk and Ilyinsk formations of the Kuznetsk Coal Basin, which we consider Biarmian¹ following Shcherbakov (2000). Later Kaltanidae were found in the Upper Permian of eastern Kazakhstan, Mongolia, and Krasnoyarsk Region (Novokshonov, 1994). *Moravochorista* Kukalová-Peck et Willmann, 1990, supposedly belonging to Kaltanidae, was described from the Lower Permian of Moravia, but its assignment even to Mecoptera is still not clear (Novokshonov, 1998). Recently, mecopterans were recorded from the beds near the Carboniferous/Permian boundary in New Mexico with CuA forked but with SC with few branches and oligomerous venation, either belonging to Kaltanidae or representing a separate family (Rasnitsyn et al., 2004). Thus, reliable data on distribution of the family were restricted to Angaria and adjacent regions (eastern Kazakhstan and Mongolia).

Morphology and taxonomy of kaltanids and their position in the system of Mecoptera were discussed in detail by Novokshonov (1994, 1997, 1998, 2002). Kaltanidae demonstrating such unique plesiomorphies as multibranching SC and forked CuA are considered the most archaic family of the order. This supposition disagrees with the late appearance of Kaltanidae in the fossil record (since the Kazanian), whereas the more advanced Permochoristidae are common in two Early Permian localities: Chekarda, Middle Urals and Elmo, Kansas. The absence of kaltanids therein may be explained by the fact that these localities lie in the arid and semiarid paleoclimatic zones, whereas all kaltanid

localities were situated in more humid regions, mainly within Angaria (Novokshonov, 2004).

In 2006 we found kaltanid fossils in the Biarmian (Urzhumian) of Udmurtia (Zavyalovo District, Ros-sokha River valley, 1.8 km north of the village of Chepanikha, Chepanikha locality). Mecopterans from this locality were known earlier, but they were restricted to the Permochoristidae. There are five specimens of Kaltanidae collected (among 30 specimens of Mecoptera), which belong to three species described below: *Pseudochorista occidentalis* sp. nov., *Kamochorista novokshonovi* gen. et sp. nov., Kaltanidae gen. indet.

It is the first record of Kaltanidae on the Russian Platform. Paleobiogeographically Chepanikha occupies an intermediate position, in the Subangaria zone near the southern boundary of Angaria (Gomankov, 2006). Thus, the new data allows to essentially expand the distribution of Kaltanidae from the Kuznetsk Basin to the paleo-south, up to the paleo-northern periphery of the Russian Platform.

MATERIAL

All specimens, including types, are housed in the Paleontological Institute, Russian Academy of Sciences (PIN).

SYSTEMATIC PALEONTOLOGY

Family Kaltanidae O. Martynova, 1958

Genus *Pseudochorista* Novokshonov, 1994

Pseudochorista occidentalis Bashkuev, sp. nov.

E t y m o l o g y. From the Latin *occidentalis* (western).

H o l o t y p e. PIN, no. 3286/74, forewing without basal area (part and fragment of counterpart); Chepanikha locality; Biarmian, Urzhumian.

¹ Permian subdivisions are accepted according to the resolution of the Interdepartmental Stratigraphic Committee (*Resolution...*, 2006).

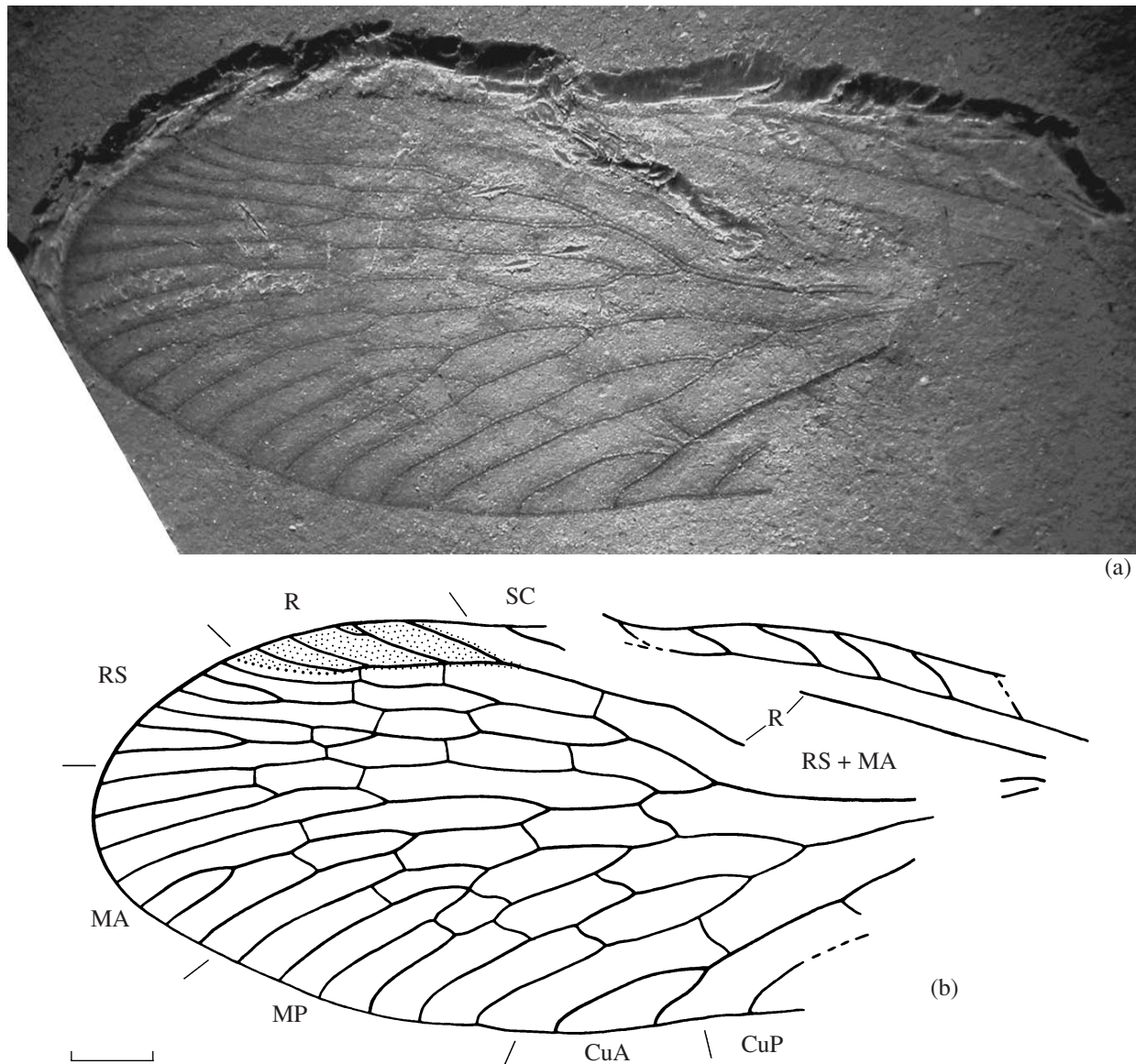


Fig. 1. *Pseudochorista occidentalis* sp. nov., holotype PIN, no. 3286/74, forewing: (a) photograph; (b) venation diagram. Scale bar 1 mm.

Description (Fig. 1). The forewing is broad, has anterior margin slightly convex. The wing base is wide. SC bears at least six branches (apparently more). R with three anterior branches, sharply deflects backwards at the origin of the first one. The pterostigma is well marked. RS + MA with 13 terminations, MA₁ is simple. MP with six terminations. Longitudinal veins are regularly beset with well-marked tubercles (bases of setae). Crossveins are numerous: in the posterior wing half, long, oblique, S-shaped, nearer to the anterior margin, shorter and straighter. The wing membrane in the distal wing half is darkened; the color pattern is formed by dark stripes along longitudinal veins, widening towards the wing margin, and with dark spots at crossveins.

Measurements (mm): forewing length: as preserved, 11.8; reconstructed, about 13.5; forewing width, 4.7.

Comparison. Distinct from other species in the richer venation of RS + MA and in stronger tubercles on longitudinal veins.

Material. Holotype.

Genus *Kamochorista* Bashkuev, gen. nov.

Etymology. From the Kama River and genus *Chorista*; gender feminine.

Type species. *K. novokshonovi* sp. nov.

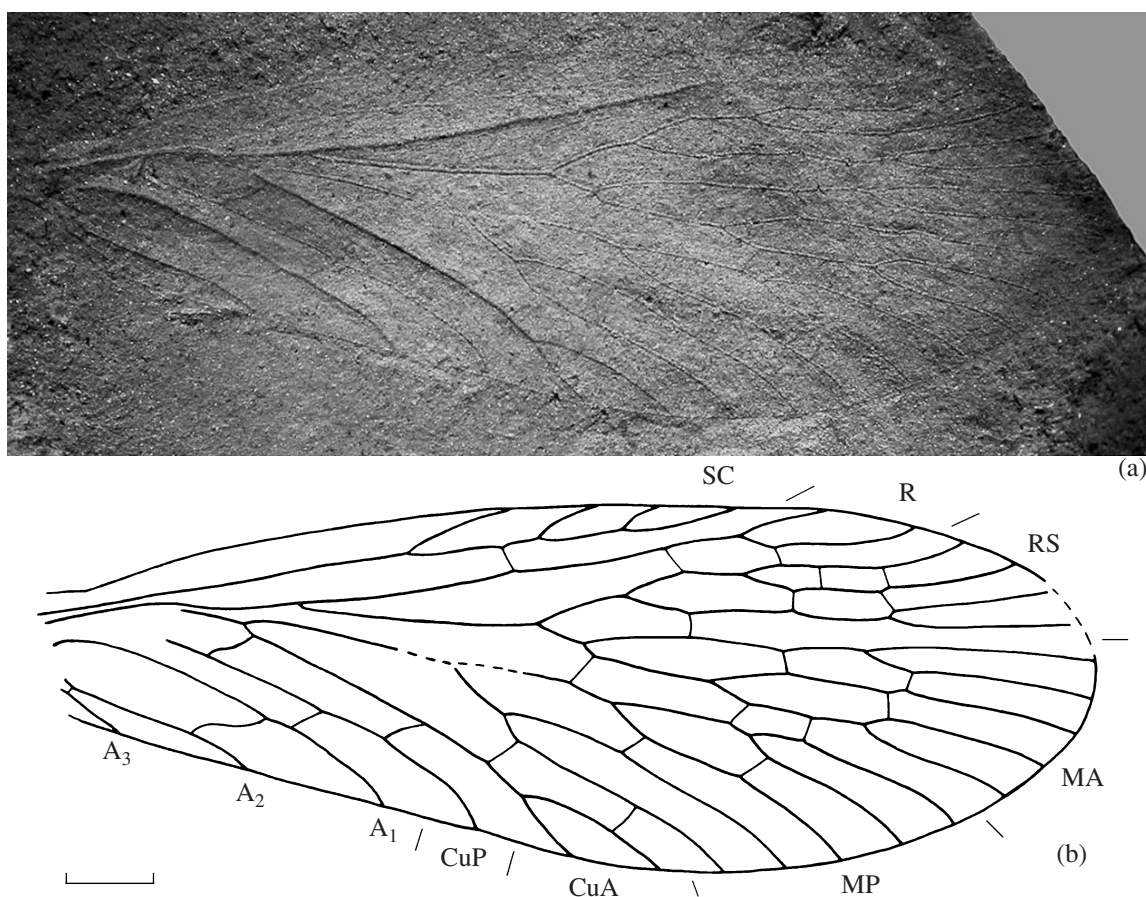


Fig. 2. *Kamochorista novokshonovi* sp. nov., holotype PIN, no. 3286/70, forewing: (a) photograph; (b) venation diagram. Scale bar 1 mm.

Diagnosis. Anterior margin of forewing slightly convex. SC with 3–4(?) branches (see Remarks). RS + MA with 9 terminations, MP with 5. Hind wings unknown. Forewing length about 10–12 mm.

Composition. Type species.

Comparison. Distinct from all genera of the family in the SC with few branches (at most 4 branches). Also differs from *Altajpanorpa* O. Martynova, 1958 in the larger size and in the richer venation of RS + MA, and from *Pseudochorista* in the poorer venation of RS + MA.

Remarks. Besides the type material, a very fragmentary forewing was collected (specimen PIN no. 3286/72), having four branches on SC (not counting the free apex and humeral crossvein), which may belong to *Kamochorista*. This assumption is very tentative and based solely on the RS + MA venation pattern and the few branches on SC. Strictly speaking, this specimen may not belong even to Kaltanidae, as it is unknown whether the CuA is forked. Nevertheless, the assumption that *Kamochorista* might have a four-branched SC is quite appropriate. Further finds will allow us to clarify the diagnosis of this genus.

In the few branches on SC the new genus is similar to some undescribed species from the beds near the Carboniferous–Permian boundary of New Mexico (Rasnitsyn et al., 2004, text-figs. 38–40), which are close to, or belong to, Kaltanidae, but they are much smaller (forewing length about 5 mm) and have much poorer venation.

Kamochorista novokshonovi Bashkuev, sp. nov.

Etymology. In memory of the paleontologist V.G. Novokshonov.

Holotype. PIN, no. 3286/70, well-preserved forewing; Chepanikha locality; Biarmian, Urzhumian.

Description (Fig. 2). SC bears three anterior branches. The MP-MP₁₊₂ is desclerotized at short distance about the origin of MP₃₊₄. The free base of M₅ is shorter than that of CuA.

Measurements (mm): forewing length, 10.5–11.8.

Remarks. Tubercles on the latitudinal veins are not traceable.

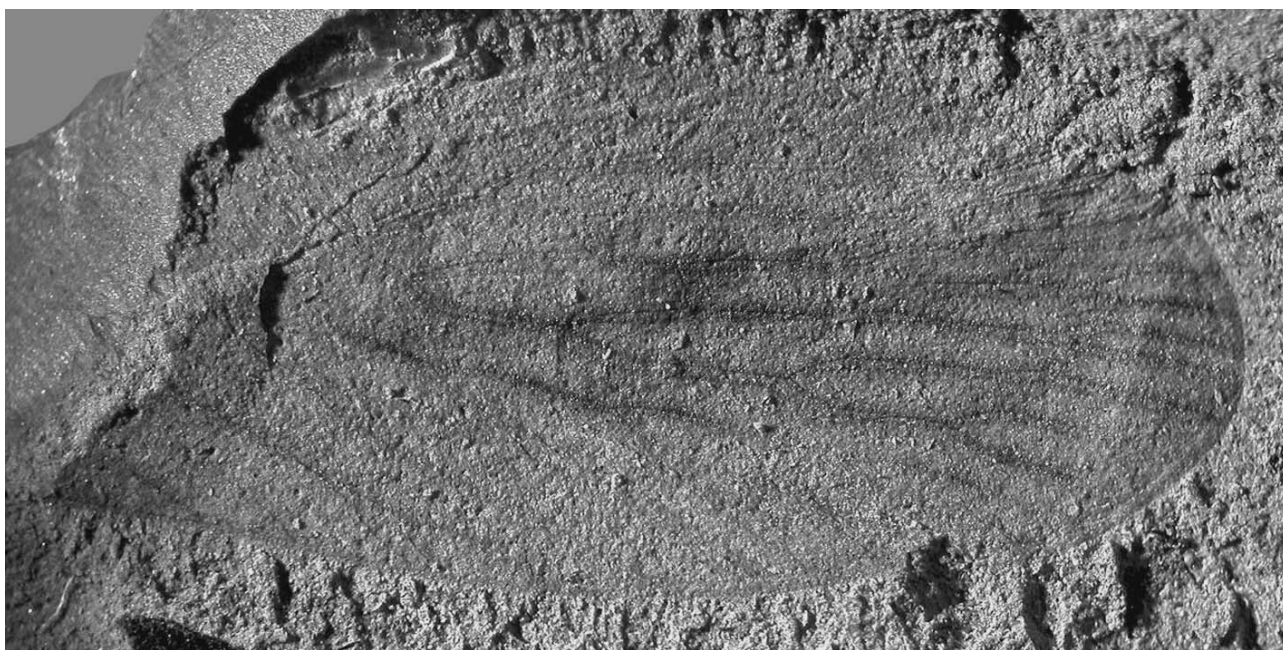


Fig. 3. Kaltanidae gen. indet., PIN, no. 3286/73, forewing, ($\times 12$).

Material. Besides the holotype, paratype PIN, no. 3286/71, forewing without costal area (part and counterpart) from the type locality.

The specimen PIN, no. 3286/73, Kaltanidae gen. indet. from the Chepanikha locality is preserved as an incomplete part and counterpart of superimposed fore and hind wings without basal area and costal margin (Fig. 3) and possibly represents a new genus. However, due to the fragmentary character of the specimen it is impossible to describe formally a new taxon.

RS has three, MA eight terminations. MP in forewing with at least six branches (both wings are slightly deformed by the latitudinal fold near the MP₂, as a result it is difficult to trace the venation pattern of MP of fore and hind wings). The CuA fork in forewing is shorter than that of both species described above. The length of the preserved portion of the forewing 8.5 mm, giving a reconstructed forewing length of about 11 mm.

This specimen is clearly distinct from other genera of family in the ratio of RS to MA branches.

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