

The first Palaeontinidae (Homoptera: Cicadomorpha) from the Triassic of Russia

Первая находка Palaeontinidae (Homoptera: Cicadomorpha) в триасе России

D.E. Shcherbakov
Д.Е. Щербаков

Borissiak Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya St. 123, Moscow 117647 Russia.

Палеонтологический институт им. А.А. Борисяка РАН, ул. Профсоюзная 123, Москва 117647 Россия.

Dmitry Shcherbakov: dshh@narod.ru ORCID <https://orcid.org/0000-0003-4508-9259>

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КЛЮЧЕВЫЕ СЛОВА: Hemiptera, Auchenorrhyncha, Palaeontinoidea, Урал, Челябинский угольный бассейн.

ABSTRACT. A giant cicada *Uralontina khamitovi* **gen. et sp.n.** is described from the Late Triassic of Korkino, Southern Urals. This is the first Triassic Palaeontinidae from Russia and the third palaeontinid species with a pair of large eyespots on its forewings, intimidating for the predator.

РЕЗЮМЕ. Гигантская цикада *Uralontina khamitovi* **gen. et sp.n.** описана из позднего триаса Коркино, Южный Урал. Это первая триасовая находка Palaeontinidae в России и третий вид палеонтинид с парой больших глазчатых пятен на передних крыльях для отпугивания хищника.

Giant moth-like cicadas of the family Palaeontinidae were widespread and diverse in the Jurassic and Early Cretaceous [Wang *et al.*, 2009; Li *et al.*, 2019]. From the Triassic, only three genera with five species from Kyrgyzstan, South Korea and South Africa have been recorded [Riek, 1976; Nam *et al.*, 2017; Shcherbakov, 2022], as well as a hindwing from China, erroneously assigned to a Jurassic genus and species [Lin, 1992]. A new monotypic palaeontinid genus based on a forewing is described below from the Triassic of the Chelyabinsk coal basin, South Urals.

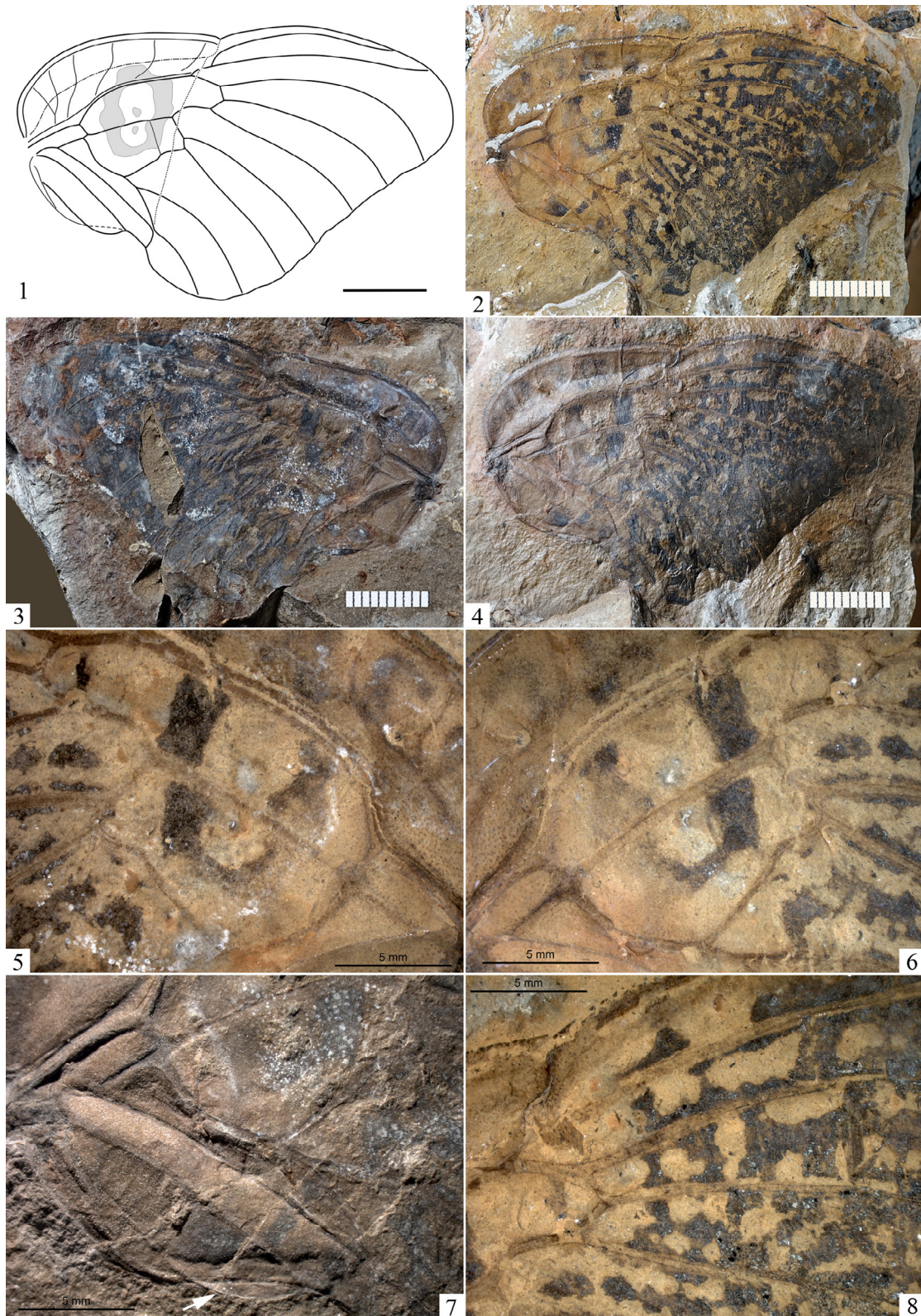
The new palaeontinid had a pair of eyespots on its forewings, an intimidating pattern also known from two other Triassic species. Such colour pattern is not found in younger members of the family. Most palaeontinids of the Jurassic, but only a few from the Cretaceous, had disruptive camouflage of dark transverse bands on their wings. This change of dark patterns in palaeontinids (eyespot – bands – no bands) was likely related to the progress of visual perception in insectivorous reptiles and birds [Shcherbakov, 2022]. Similarly, the increase in flight per-

formance of palaeontinids in the late Mesozoic may have been driven by their bird predators [Xu *et al.*, 2024].

Fossil insects from the Early Mesozoic of the Chelyabinsk coal basin were first described by Martynov [1935]. A beetle elytron (*Mesosagrites multipunctatus* Martynov, 1935, Schizocoleidae), a cockroach forewing (described as a neuropteran, *Archedilaropsis furcata* Martynov, 1935), and two mayfly nymphs were recorded from boreholes and spoil heaps of several coal quarries [Martynov, 1935; Sinitschenkova, 2000]. In addition, a poorly preserved damselfly nymph is kept in the collection of Borissiak Paleontological Institute, Russian Academy of Sciences, Moscow (PIN).

The new palaeontinid specimen was discovered in the spoil heaps of the Korkino open pit coal mine by amateur paleontologist Danila Khamitov (Chelyabinsk) and kindly donated to PIN. The wing was found when splitting a large block (several decimeters wide and deep) of sideritized calcareous siltstone. The part and counterpart are now preserved on two massive slabs (up to 20 x 15 x 5 cm), which also contain abundant and diverse plant megafossils, kindly identified by Eugeny Karasev: *Cladophlebis haiburnensis* (Lindley), *Osmundopsis?* cf. *bojakovae* Vladimirovich, *Katasiopsis?* sp., *Dictyophyllum?* cf. *japonicum* Yokoyama, *Glossophyllum* sp. and *Yuccites* sp. This plant assemblage corresponds to the Late Triassic age of the rock.

The fossil was photographed using a Sony Alpha ILCE-7 with a Sony FE 50mm F2.8 Macro lens (images z-stacked with Zerene Stacker 1.04) and a Leica DFC425 camera coupled to a Leica M165C stereomicroscope. The vein nomenclature follows Shcherbakov [1984, 1996].



Figs 1–8. *Uralontina khamitovi* Shcherbakov, **gen. et sp.n.**, holotype forewing, part and (3, 5) counterpart (photographs 2–4 by Stepan Vdovichenko): 1 — venation (eyespot shaded); 2, 5, 6, 8 — under alcohol; 3, 7 — dry; 4 — wet; arrow, commissural carina. Scale bars: 1–4 — 10 mm, 5–8 — 5 mm.

Рис. 1–8. *Uralontina khamitovi* Shcherbakov, **gen. et sp.n.**, голотип, переднее крыло, прямой и (3, 5) обратный отпечатки (фото 2–4 Степана Вдовиченко): 1 — жилкование (глазчатое пятно показано серым); 2, 5, 6, 8 — под спиртом; 3, 7 — сухое; 4 — влажное; стрелка — коммиссуральный киль. Масштаб: 1–4 — 10 мм, 5–8 — 5 мм.

Family Palaeontinidae Handlirsch, 1906
Uralontina Shcherbakov, **gen.n.**

TYPE SPECIES. *Uralontina khamitovi* Shcherbakov, **sp.n.**

DIAGNOSIS. Forewing broad subtriangular; costal margin strongly arched near base; apical margin concave; well-developed tornus (posteroapical angle) much projecting beyond line continuing commissural margin. R forked just before, and RA just beyond nodal line. Basal cell elongate rectangular; CuA abruptly bent at apex of basal cell and arched beyond it. Prenodal *m-cu* Y-shaped (with weaker anterior branch), connecting MP2 near base and CuA stem before fork; nodal *m-cu* absent; CuA2 nearly straight beyond nodal line. Clavus obliquely truncate at apex, with high carina at commissural margin. Forewing pale with large prenodal eyespot and extensive dark pattern in postnodal part.

COMPOSITION. Type species.

COMPARISON. Similar to the genera *Hallakkungis* Nam *et al.*, 2017 (Late Triassic of South Korea) and *Papilontina* Shcherbakov, 2022 (Middle to Late Triassic of Kyrgyzstan), and distinct from *Karoontina* Shcherbakov, 2022 (Late Triassic of South Africa) in the subtriangular forewing with the tornus projecting beyond continuation of the commissural margin, and the long RA1. Similar to *Hallakkungis* and the type species of *Papilontina* in the clavus truncate. Similar to *Papilontina* in the concave apical margin and presence of a large eyespot on the forewing, but in *Papilontina* the eyespot is postnodal, and the basal cell is narrowed apically. Similar to *Hallakkungis* in the basal cell elongate rectangular, R forked just before nodal line, the nodal *m-cu* absent, and the CuA2 bend close to the truncate claval apex, but in *Hallakkungis* the CuA is straight beyond basal cell, the unforked prenodal *m-cu* connects MP and CuA stems before their forks, CuA2 is strongly arched forwards beyond the nodal line, and the forewing is pale with dark veins and several small dark spots.

REMARKS. The long, usually Y-shaped crossvein connecting the stems of M and CuA in many palaeontinids (prenodal *m-cu*) is usually less prominent than another *m-cu* crossvein located just distal to the nodal flexion line (nodal *m-cu*). On the contrary, in the new genus and *Hallakkungis* the nodal *m-cu* is reduced, while the prenodal is well developed.

ETYMOLOGY. From the Ural Mountains and the genus *Palaeontina*; gender feminine.

Uralontina khamitovi Shcherbakov, **sp.n.**

Figs 1–8.

MATERIAL. Holotype forewing PIN 6025/1±; spoil heaps of Korkino open pit coal mine, 5 km NWN Korkino, Chelyabinsk Province; Korkino(?) Formation, Upper Triassic.

DESCRIPTION. Forewing broadly triangular, 53 mm long, 33 mm wide (1.6:1). Costal margin arched, especially near base, indented at nodus, with numerous short spinules; precostal carina rather wide. Sc adjacent to R (except base). Costal area with depression along midline, crossed by five transverse Sc branches, first of which forked (depression proximally vein-like, and basal Sc branches appear arising from it). RA1 longer than 3/4 RA2. Basal cell closed with very short arculus. Prenodal *m-cu* Y-shaped (with weaker anterior branch

joining M stem at 3/4 length), connecting MP2 near base and CuA before fork; M stem nearly equidistant from R stem and middle part of prenodal *m-cu*. MA stem arched, much longer than MP stem. CuA2 at nodal line sharply bent and touching opposite bend of CuP at claval apex. Posterior claval vein (1A) distally running along commissural margin and forming high lobe-like carina. Marginal membrane very narrow. Wing surface punctate proximally; some veins with short spine-like setae. Prenodal part pale with dark spots between Sc branches and large, slightly eight-shaped ocellate spot across R and M stems, with dark outer ring, pale inner part and two dark flecks in the middle. Clavus pale, beyond midlength with C-shaped dark band extended into intercubital area. Postnodal part with rich dark pattern, proximally imitating prolific cross-venation, including irregular longitudinal intercalary stripes in spaces between M and CuA branches, distally more extensive, leaving pale only small spots (up to two irregular rows of spots per space between veins).

ETYMOLOGY. Named after the discoverer of the fossil, amateur paleontologist Danila Khamitov.

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