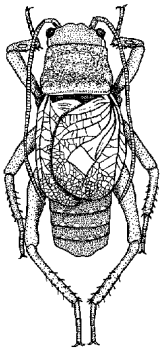


Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch
of the Russian Entomological Society
and Laboratory of Entomology,
Institute of Biology and Soil Sciences,
Vladivostok

Number 188: 1-7 ISSN 1026-051X September 2008

NEW GRYLLOBLATTIDA (INSECTA) FROM THE MIDDLE AND UPPER PERMIAN OF THE RUSSIA

D. S. Aristov

Paleontological Institute of Russian Academy of Sciences, Profsoyuznaya str., 123, Moscow 117868, Russia. E-mail: danil_aristov@mail.ru

Two new genera and five new species of grylloblattids (Grylloblattida) are described from Permian of the Russia: *Liomopterella kirovensis* **sp. n.**, *Kostovatoprisca acuminata* **gen. et sp. n.**, *Megakhosarina chepanikhensis* **sp. n.**, *Sigmophlebia udmurtica* **sp. n.**, and *Kerbia aptera* **gen. et sp. n.**

KEY WORDS: Grylloblattida incertae sedis, Liomopteridae, Megakhosaridae, Tshekardominidae, Lemmatophoridae, Permian, new taxa.

Д.С. Аристов. Новые гриллоблаттидовые (Insecta: Grylloblattida) из средней и верхней перми России // Дальневосточный энтомолог. 2008. N 188. С. 1-7.

Из перми России описаны два новых рода и 5 новых видов гриллоблаттидовых насекомых (Grylloblattida): *Liomopterella kirovensis* **sp. n.**, *Kostovatoprisca acuminata* **gen. et sp. n.**, *Megakhosarina chepanikhensis* **sp. n.**, *Sigmophlebia udmurtica* **sp. n.** и *Kerbia aptera* **gen. et sp. n.**

Палеонтологический институт РАН, ул. Профсоюзная, 123, Москва 117868, Россия.

INTRODUCTION

Until now six species of the order Grylloblattida are known from Kityak locality (Russia, Middle Permian, Kazanian Stage): *Protomia proteus* Aristov, 2004, *Miraliioma monstrosa* Aristov, 2004, *Liomopterella acuminata* Aristov, 2004, *L. kitiakensis*

Aristov, 2004 (Liomopteridae), *Microkhosara fragilis* Storozhenko, 1993 (Megakhosaridae), and *Stenasopodites magna* Storozhenko, 1992 (Ideliidae) (Storozhenko, 1992; 1993; Aristov, 2004). *Liomopterum novissimus* Aristov, 2004, *Rigidilioma radialis* Aristov, 2004, *Parapermula tatarica* Aristov, 2004, *Miralioma udmurtica* Aristov, 2008 (Liomopteridae), and *Chepanichoptera lacera* Aristov, 2008 (Aliculidae) are known from Chepanikha locality (Russia, Middle Permian, Urzhumian Stage) (Aristov, 2004; Aristov & Bachkuev, 2008). Only one species of grylloblattids, *Paraliomopterum rectum* Aristov, 2004, is known from Galevo locality (Russia, Middle Permian, Urzhumian Stage) (Aristov, 2004), as well as a single species, *Kaltanympha ornata* Aristov, Novokshonov et Pan'kov, 2006, (Liomopteridae) was described from the Kerbo locality (Russia, Upper Permian, Severodvinian Stage) (Aristov et al., 2006).

New taxa of the grylloblattid insects (Grylloblattida) from the Permian localities Kityak, Chepanikha, Galevo and Kerbo are described below. The holotypes of new species are deposited in the Paleontological Institute RAS (Moscow).

DESCRIPTION OF NEW TAXA

FAMILY LIOMOPTERIDAE SELLARDS, 1909

Genus *Liomopterella* Sharov, 1961

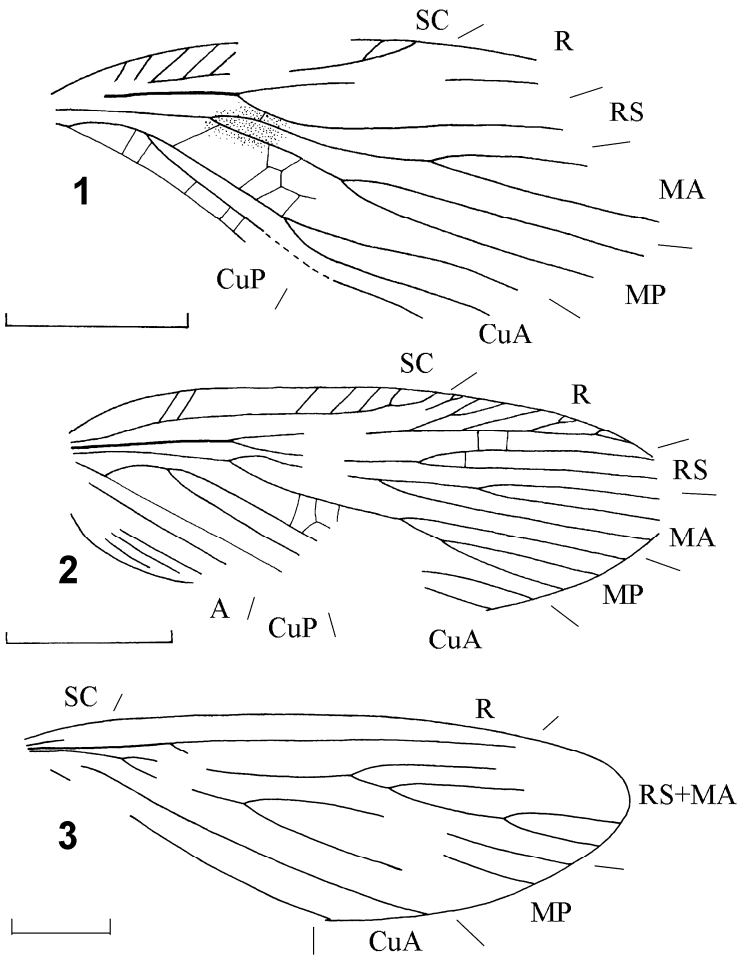
***Liomopterella kirovensis* Aristov, sp. n.**
Figs 1, 2

MATERIAL. Holotype: PIN, No 1366/124, forewing impression; Kityak locality (Russia, Kirovskaya oblast, Malmyzha District, left bank of the Kityak River on the opposite the Bolshoi Kityak Village; Middle Permian, Kazanian Stage, Upper Kazanian Substage, Belebeevo Formation). Paratypes: PIN, No 1366/184, 1366/250, 1366/266 from the same locality

DESCRIPTION. Forewing elongate, anterior margin weakly convex, apex acuminate. The width of costal field comparable to subcostal field, *SC* terminating near middle of wing. *R* straight, the radial field broad or relatively narrow. *RS* arising in the basal third of wing. The anterior branches of *SC* and *R* simple, or forked and linked by crossveins. Total number of *RS*, *MA*, and *MP* branches usually six, but may increase up to eight. *RS* with 2-3 branches, the first bifurcation of *RS* situated near its base or near its apex. *MA* with 1-4 branches, *MP* with 1-3 branches, but both *MA* and *MP* more often two-branched. *RS* and *MA* run independently, or fused for a small distance, or form a complex anastomosis. *CuA* with 2-5 branches, pectinate forward, rearward, or dichotomized. CuA_1 apices terminate on the posterior margin of wing, fuse with each other, or lost among crossveins. CuA_2 terminates either on CuA_1, or on the posterior margin of wing. The crossveins simple, but form a double row of cells in the radial and medial fields. A_1 simple, A_2 with 3 branches.

MEASUREMENTS. Length of forewing 16-18 mm.

DIAGNOSIS. New species is similar to *L. kitiakensis* Aristov, 2004 from Kazanian Stage of Russia (Aristov, 2004), but differs in having narrow costal field and smaller size (in *L. kitiakensis* the costal field two times wider than subcostal and forewing length about 25 mm).



Figs. 1-3. Families Liomopteridae and Lematophoridae: 1, 2) *Liomopterella kirovensis* sp. n., forewing: 1) holotype PIN No 1366/124, 2) paratype PIN No 1366/184; 3) *Kostovatoprisca acuminata* gen. et sp. n., forewing, holotype PIN No 3695/9. Scale bar in Figs. 1. 2 – 5 mm, in Fig. 3 – 2 mm.

FAMILY LEMMATOPHORIDAE SELLARDS, 1909
SUBFAMILY PARAPRISCINAE CARPENTER, 1950

Genus *Kostovatoprisca* Aristov, gen. n.

Type species: *Kostovatoprisca acuminata* sp. n. (Galevo locality; Middle Permian, Urzhumian Stage).

DESCRIPTION. Small insect. Anterior margin of the forewing slightly convex. In the basal part of wing the costal field wider than subcostal one. *R* straight. *RS* arising from *R* in the basal quarter of wing and fused with *MA*. *RS*+*MA* split into branches near its middle. *MP* split into branches near its basal third. *CuA* split into CuA_1 and CuA_2 near its base.

DIAGNOSIS. *Kostovatoprisca* gen. n. similar with genus *Paraprisca* Handlirsh, 1919 from Artinskian Stage of USA (Carpenter, 1935), but differs by simple CuA_1 (in *Paraprisca* CuA_1 branched).

SPECIES INCLUDED. Type species only.

***Kostovatoprisca acuminata* Aristov, sp. n.**
Fig. 3

MATERIAL. Holotype: PIN No 3695/9, imprint of fore wing; Galevo (= Kostovaty) locality (Russia, Middle Urals, Udmurtia, right bank of Kama River, 6.4 km downstream of the Galevo Village; Middle Permian, Urzhumian Stage).

DESCRIPTION. *RS*+*MA* with four branches, *MP* with three ones. CuA_2 simple.

MEASUREMENTS. Length of forewing 12 mm.

FAMILY MEGAKHOSARIDAE SHAROV, 1961

Genus *Megakhosarina* Storozhenko, 1993

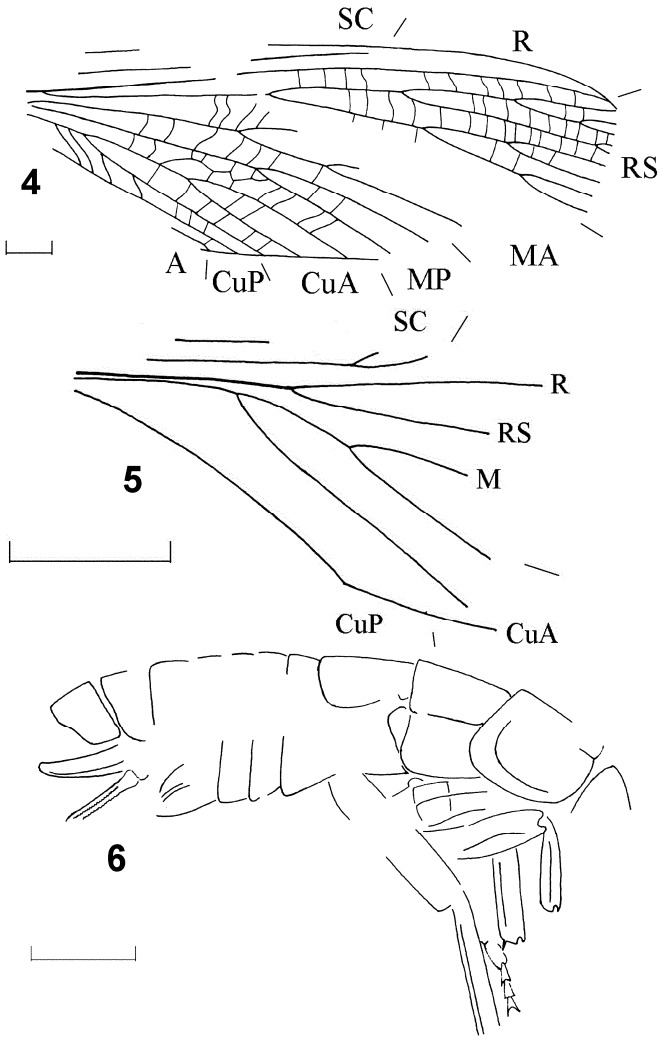
***Megakhosarina chepanichensis* Aristov, sp. n.**
Fig. 4

MATERIAL. Holotype: PIN No 3286/85, imprint of basal half of fore wing; Chepanikha locality (Russia, Middle Urals, Udmurtia, Zavjalovskii District, Rossokha River valley, 1.8 km north of the Chepanikha Village; Middle Permian, Urzhumian Stage).

DESCRIPTION. Large insect. Anterior margin of the forewing slightly convex. Costal field slightly wider than subcostal one. *SC* reaches the distal third of the wing. *RS* arising from *R* near the middle of the wing, with 9 branches. *MA* with 3 branches, *MP* and CuA_1 with 2 branches. CuA_2 and *CuP* simple and straight. Crossveins simple, in the field between *M* and *CuA* and forming double row of cells, in intercubital field crossveins S-shaped.

DIAGNOSIS. New species similar to *M. explicata* (Sharov, 1961) from Kazanian Stage of Russia (Sharov, 1961), but differs in having *RS* with 3 branches and *MA* with 3 ones (in *M. explicata RS* with 4 branches and *MA* with 7 ones).

MEASUREMENTS. Length of forewing about 40 mm.



Figs. 4-6. Families Megakhosaridae, Tshekardominidae and Grylloblattida incertae sedis: 4) *Megakhosarina chepanikhensis* sp. n., forewing, holotype PIN No 3286/85; 5) *Sigmophlebia udmurtica* sp. n., forewing, holotype PIN No 3286/118; 6) *Kerbia aptera* gen. et sp. n., general appearance, holotype PIN No 2987/315. Scale bar in Figs. 4, 5 – 2 mm, in Fig. 6 – 3 mm.

FAMILY TSHEKARDOMINIDAE NOVOKSHONOV ET ARISTOV, 2002

Genus *Sigmophlebia* Bethoux et Beckmeyer, 2007

***Sigmophlebia udmurtica* Aristov, sp. n.**
Fig. 5

MATERIAL. Holotype: PIN No 3286/118, imprint of basal half of fore wing; Chepanikha locality (Russia, Middle Urals, Udmurtia, Zavjalovskii District, Rossokha River valley, 1.8 km north of the Chepanikha Village; Middle Permian, Urzhumian Stage).

DESCRIPTION. Small insect. Anterior margin of the forewing straight. Costal field crossed by simple anterior branches of *SC*. The width of costal field equal to the subcostal field. *SC* reaches the middle of wing. *RS* arising from *R* in the basal third of the wing. The base of *M* fused with *CuA*, and separated from it near basal third of CuA_1. *CuP* straight. Intercubital space wide.

DIAGNOSIS. New species differs from *S. engeli* Bethoux et Beckmeyer, 2007 from Artinskian Stage of USA (Bethoux & Beckmeyer, 2007) by separation of *M* from *CuA* proximal to *RS* base (in *S. engeli M* separated from *CuA* before *RS* base).

MEASUREMENTS. Length of forewing about 10 mm.

GRYLLOBLATTIDA INCERTAE SEDIS

Genus *Kerbia* Aristov, gen. n.

Type species: *Kerbia aptera* sp. n. (Kerbo locality; Upper Permian, Severodvinian Stage).

DESCRIPTION. Body medium sized, moderately robust. Pronotum large, trapezoidal; paranotal ring narrow, widened posteriorly. Meso- and metanotum shorter than pronotum. Legs long and thick; fore leg shortest, hind leg strongly elongate. Tarsi 5-segmented, apical tarsal segment with a pair of short claws. Wings absent. Ovipositor short, ventral valve with lateral and ventral serrate longitudinal ridges, lateral valve smooth, wedge-shaped, with broadly rounded apex, slightly curved upward. No strong ecological specialization (aquatic, digging, etc.) are apparent.

DIAGNOSIS. New genus distinguished from all other fossil representatives of the order Grylloblattida by completely wingless adults. From genera of the recent apterous family Grylloblattidae Walker, 1914 genus *Kerbia* gen. n. differs by the presence of paranotal ring, by thick legs, by blunt, serrate ovipositor, and by generally more robust body.

SPECIES INCLUDED. Type species only.

***Kerbia aptera* Aristov, sp. n.**
Fig. 6

MATERIAL. Holotype: PIN No 2987/315, imprint of body; Kerbo locality (Russia, Krasnojarskii krai, right bank of Taimura River near Kerbo Village; Upper Permian, Severodvinian Stage, Degali Formation).

DESCRIPTION. Body without ovipositor 5.5 times as long as pronotum. Head widened posteriorly. Forelegs without tarsus 1.5 times as long as pronotum, hind legs 1.5 times as long as forelegs. Femora and tibiae with longitudinal ridge. Mid tibia with apical spurs. Apical tarsal segment smallest.

MEASUREMENTS. Length of body about 17 mm.

ANKNOWLEDGMENTS

I am grateful to A.P. Rasnitsyn (Moscow) and S.Yu. Storozhenko (Vladivostok) for critical reading of manuscript.

REFRENCES

Aristov, D.S. 2004. Grylloblattids of the family Liomopteridae (Insecta: Grylloblattida) of the Upper Half of the Upper Permian. – Paleontological Journal 38(2): 150-157. (In Russian).

Aristov, D.S. & Bachkuev, A.S. 2008. New insects (Insecta; Mecoptera, Grylloblattida) from the Middle Permian Chepanikha locality, Udmurtia. – Paleontological Journal 42(2): 159-165. (In Russian).

Aristov, D.S., Novokshonov, V.G. & Pan'kov, N.N. 2006. Taxonomy of the fossil grylloblattid nymphs (Insecta: Grylloblattida). – Paleontological Journal 40(1): 79-89. (In Russian).

Bethoux, O. & Beckmeyer, R.J. 2007. New and rare insect species from the Wellington Formation (Orthoptera, Grylloblattodea; Lower Permian, USA). – ALAVESTIA 1: 49-61.

Carpenter, F.M. 1935. The Lower Permian insects of Kansas. Pt 7. Order Protoperlaria. – Proceeding of American Academy of Arts and Sciences 70(4): 103-146.

Storozhenko, S.Yu. 1992. Permian fossil insects of North-East Europe: new and little-known Ideliidae (Insecta, Plecopteroidea, Grylloblattida). – Entomologica Fennica 3: 21-39.

Storozhenko, S.Yu. 1993. Revision of the family Megakhosaridae (Grylloblattida). – Trudy Paleontologicheskogo Instituta Rossiiskoi Akademii Nauk 252: 100-112. (In Russian).

Storozhenko, S.Yu. 1998. Sistematics, phylogeny and evolution of the grylloblattids (Insecta: Grylloblattida). Vladivostok: Dalnauka. 207 p. (In Russian).

Sharov, A.G. 1961. Paleozoic insects of Kuznetsk Bassin: Orders Protoblattodea, Paraplecoptera. – Trudy Paleontologicheskogo Instituta Akademii Nauk SSSR 85: 157-234. (In Russian).