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

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

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INTRODUCTION

Until now six species of the order Grylloblattida are known from Kityak locality (Russia, Middle Permian, Kazanian Stage): *Protomia proteus* Aristov, 2004, *Miralio-ma 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, *Kaltanympa 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.

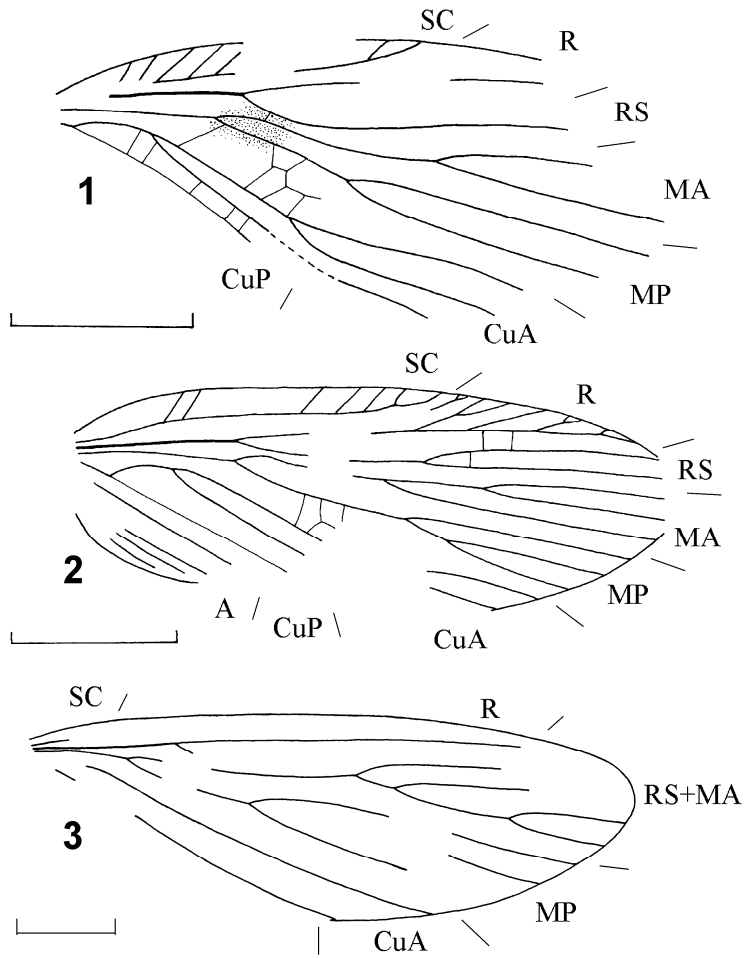
Figs 1, 2

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, Belebeyev 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) *Kostovatorprisca 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 *CuA₁* and *CuA₂* near its base.

DIAGNOSIS. *Kostovatoprisca* gen. n. similar with genus *Parapriscia* Handlirsh, 1919 from Artinskian Stage of USA (Carpenter, 1935), but differs by simple *CuA₁* (in *Parapriscia* *CuA₁* 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. *CuA₂* simple.

MEASUREMENTS. Length of forewing 12 mm.

FAMILY MEGAKHOSARIDAE SHAROV, 1961

Genus *Megakhosarina* Storozhenko, 1993

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

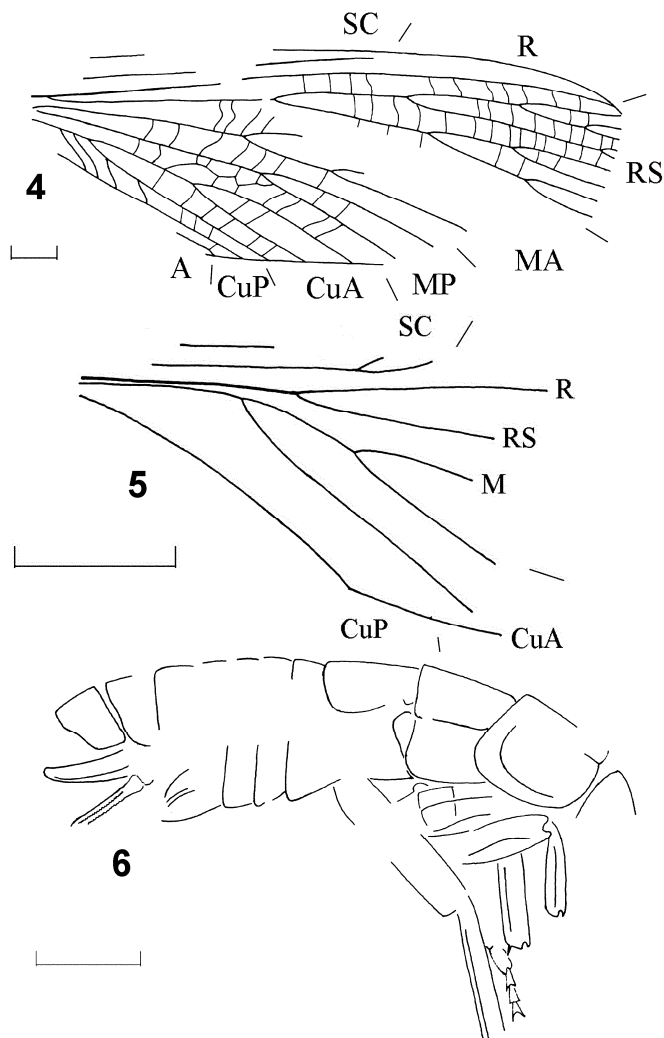
Fig. 4

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 *CuA₁* with 2 branches. *CuA₂* 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*. *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.

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SHORT COMMUNICATION

S. Yu. Storozhenko. *Diestrammena coreana* (Yamasaki, 1969) is newly recorded cave-cricket species (Orthoptera, Raphidophoridae) from Russia. – Far Eastern Entomologist. 2008. N 188: 8.

С. Ю. Стороженко. *Diestrammena coreana* (Yamasaki, 1969) – новый для России вид пещерных кузнечиков (Orthoptera, Raphidophoridae) // Дальневосточный энтомолог. 2008. N 188. С. 8.

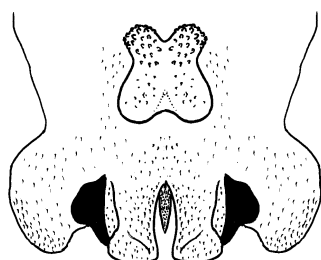
A new for the fauna of Russia species of the genus *Diestrammena* Brunner-Wattenwyl, 1888 is recorded below. Present study was supported by grant of FEB RAS N 06-III-A-06-151.

Diestrammena (Tachycines) coreana (Yamasaki, 1969)

Fig. 1

MATERIAL. Russia: Vladivostok, 10.I 1999, 1 ♂ (collector unknown); 26.IX 2008, 1 ♂ (A.L. Tkachev).

DISTRIBUTION. Russia: Vladivostok (new record); China: Zhejiang; Korea: from north to south including Jeju Island; Japan: Honshu [2].



NOTES. A first specimen of this species was introduced in Vladivostok at least in the 1999 as result of the increasing of turnover between Republic of Korea and Russian Federation, but don't include in the list of Russian Orthoptera [1]. The acclimatization of *D. coreana* in Russia during last years was successful. Now this species inhabits the houses basements and gardens in the central part of Vladivostok City.

Fig. 1. Male genitalia of *Diestrammena coreana*.

1. Storozhenko, S.Yu. 2004. Long-horned orthopterans (Orthoptera: Ensifera) of the Asiatic part of Russia. Vladivostok: Dalnauka. 280 p. (In Russian)
2. Storozhenko, S.Yu. & Paik, J.-Ch. 2007. Orthoptera of Korea. Vladivostok: Dalnauka. 232 p.

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