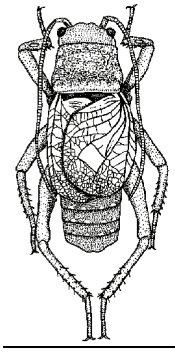

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A NEW SPECIES OF THE SHORE-FLY GENUS *SCATOPHILA* BECKER, 1896 (DIPTERA, EPHYDRIDAE) WITH REDUCED WINGS FROM WRANGEL ISLAND, RUSSIA

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Scatophila gorodkovi Krivosheina et Ozerov **sp. n.** is described from Wrangel Island, Russia. The new species belongs to *noctula* species-group and differs from the congeners by strongly reduced wing, black halter, shape of face medial process and structure of male terminalia. Key to the Palaearctic species of *noctula* group of the genus *Scatophila* is given.

KEY WORDS: Diptera, Ephydridae, *Scatophila*, new species, reduced wing, Chukotka, Russia.

М. Г. Кривошеина[1)], А. Л. Озеров[2)]. Новый вид мух-береговушек рода *Scatophila* Becker, 1896 (Diptera, Ephydridae) с редуцированными крыльями с острова Врангеля, Россия // Дальневосточный энтомолог. 2016. N 311. С. 1-6.

С острова Врангеля описан новый для науки вид *Scatophila gorodkovi* Krivosheina et Ozerov **sp. n.** Вид относится к группе видов *noctula* и отличается от близких видов сильно редуцированными крыльями, черной окраской жужжалец,

формой лицевого выступа и строением гениталий самца. Составлена определительная таблица палеарктических видов группы *noctula* рода *Scatophila*.

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INTRODUCTION

Ephydridae or shore flies is rather large family of flies, uniting according to the latest data 1957 species from 128 genera (Mathis & Zatwarnicki, 1995, updated version 10 December 2015). The great majority of species possesses well developed wings and is good flyers, although brachyptery or reduced wings is observed in a few number (about 30) of species. Bezzi was the first author who reported about five ephydrid species that exhibit brachyptery with wing length ranging from "wing reduced in dimension but with venation normal or well developed" to "wings reduced in dimension, each vein more or less rudimentary, though always distinguishable". Up to now at least 4 species with reduced wings distributed in Palaearctic were described: *Nostima semialata* (Collin, 1913), *Philygria mocsaryi* Kertész, 1910, *Philygria stenoptera* Hollmann-Schirrmacher, 1998 and *Philygria nubeculosa* Strobl, 1909 (Hollmann-Schirrmacher, 1998). As for representatives of the genus *Scatophila*, one described species only with reduced wings is known from Papua New Guinea (Papp, 1979) and two undescribed species are distributed in Subantarctic (W.N. Mathis, personal communication). So we were really satisfied to discover one more *Scatophila* species with reduced wings among materials of the Zoological Institute, St.-Petersburg, which will be the first representative with such character of this genus in Palaearctic region. However its discovery on Wrangel Island confirms the distribution of brachypterous species on islands; sometimes it means terricolous life history (Gavruishin & Krivosheina, 2010).

TAXONOMY

Genus *Scatophila* Becker, 1896

Scatophila is rather large genus of Ephydridae, countering more than 50 species worldwide, 19 of which are registered in Palaearctic. The genus is easily determined for it represents one of few genera of Ephydridae with short costal vein extended to R_{4+5} only and not reaching M_{1+2}. Generally the members of the genus are small flies with body length not exceeding 2 mm and with spotted wings. Face protrudent. 1 fronto-orbital seta lateroclinate, exceptionally 2 setae in some Neotropical species. Thorax as a rule with light stripes and spots. Gonal arch is divided ventrally and in most cases is separated into 3 parts: two lateral gonites and a ventral band-like neohypandrium which may be reduced (Zatwarnicki & Mathis, 1994). Several species groups were distinguished by the abovementioned authors. One of them, the *noctula*

group, includes 5 described species: *Scatophila noctula* Meigen, 1830, *S. unicornis* Czerny, 1900, *S. hirtirostris* Sturtewant et Wheeler, 1954, *S. variofacialis* Sturtewant et Wheeler, 1954 and *S. zlobini* Krivosheina, 2009. Three of the species are known from the Palaearctic region, namely *S. noctula*, *S. unicornis* and *S. zlobini* (Zatwarnicki, 1987; Mathis & Zatwarnicki, 1995; Krivosheina, 2009), all these species possess well developed long wings. The species included in *noctula* group differ from other groups by the following combination of characters: most of males have the lower portion of face with medial process of various form; tergites of abdomen shining; aedeagus with ventral process, sinuous; fold on dorsal aedeagal opening generally angulate and without lateral processes; fold incised medially or broadly semicircular; distal margin of epandrium sometimes with lateral processes or with broad medial projection (Zatwarnicki & Mathis, 1994).

Scatophila gorodkovi **Krivosheina et Ozerov, sp. n.**
Figs 1–4, 7, 9

MATERIAL. Holotype – ♂, Russia: Bay Somnitelnaya, south of Wrangel Island, Gorodkov leg., 26.VII. [1]966; 5 km N, southern slope of Mineeva Mountains, 100 m, near lemming hole [in Russian]. Holotype is intact. Paratypes: 3 ♂, 3 ♀, the same label. One paratype male with abdomen cut, genitalia dissected and put in plastic tube with glycerol, one male dissected and completely put in glycerol, other specimens intact. Holotype and part of paratypes are deposited in the collection of Zoological Institute, St.-Petersburg, part of paratypes are kept in the collection of Zoological Museum, Moscow University.

DIAGNOSIS. The new species is distinguished from related congeners (*noctula* group) by the following combination of characters: wings significantly shortened, 0.5–0.75 as long as abdomen, relatively shorter in females than in males, haltere black, medial process of face of another shape (Fig. 1), distal margin of epandrium elongate, with small incision (Fig. 7).

DESCRIPTION. Male. Small shore-flies, body length 1.4–1.8 mm, generally black with brown pollen. Head: frons black with spot of brown pollen on ocellar triangle, around it and with small spot above each antenna. Face (lateral view) with medial process in lower part (Fig. 1). Face (dorsal view) protruding forward like broad rectangle. Face (anterior view) black with brown medial stripe of pubescence beginning from base of antenna and splitting in two downward near face process (Fig. 2). Parafacial and gena seem less pollen and partly subshining. Gena low, eye-to-gena ratio 3.8 : 1. Margin of mouth opening with 2 larger setae, anterior of which weaker and shorter and many short and thin setae at each side of medial process (Fig.1). Antenna black; arista black, shortlty pubescent. Palpus black.

Thorax: black with brown pollen, including scutellum, unicolorous, without stripes or spots. Wing shortened, 0.75 as long as abdomen in holotype, varying in length in other specimens, with thick veins, brownish, without distinct spots, with washed light spot in front of *dm-cu* crossvein (Fig. 9). Haltere black. Costal vein ration about 0.3; M vein ratio 0.6. Legs completely black, fore femur not thickened.

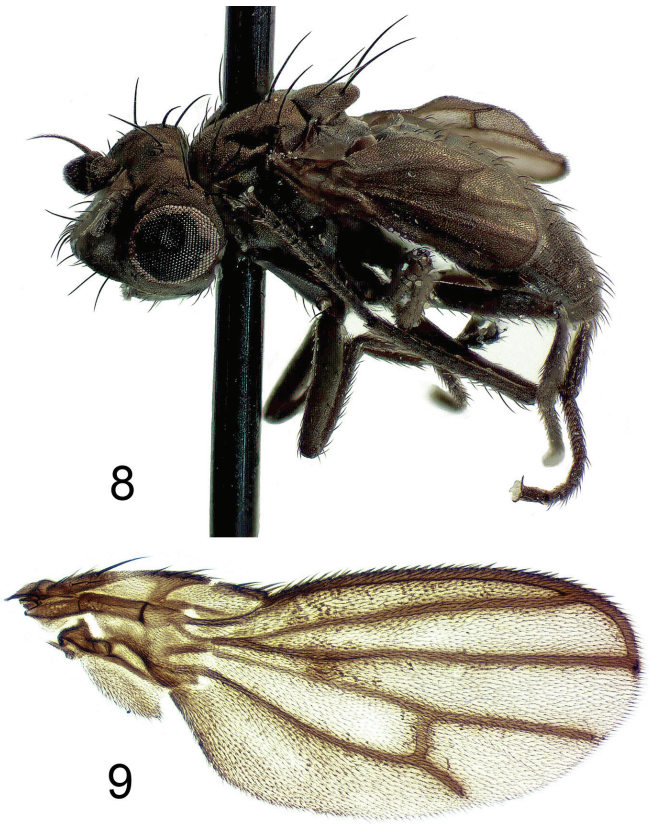
Figs. 1–7. *Scatophila gorodkovi* sp. n. (1–4, 7), *S. noctula* (5), *S. unicornis* (6). 1 – head, lateral view; 2 – head, anterior view; 3 – gonite and neohypandrium, lateral view; 4 – aedeagus and aedeagal apodeme, lateral view; 5–7 – epandrium, posterior view.

Abdomen: black, subshining. Male terminalia: distal margin of epandrium (posterior view) narrowing with small incision and many relatively long setae, differing from *S. noctula* by the shape of distal part and from *S. unicornis* by the presence of medial incision (Figs 5–7). Cercal cavity round, about 1/3 as long as epandrium, relatively smaller than in *S.noctula* and *S. unicornis*. Aedeagus (lateral view) as on Fig. 4, aedeagal apodeme (lateral view) well sclerotized, with arms of about equal length (Fig. 4). Gonite (lateral view) with apex pointed and covered with many setulae, with wide basal part, neohypandrium like narrow band (Fig. 3).

Female. Same as male excluding face: face evenly convex, shortly pubescent, with 2 lateroclinate medial setae and 2–3 downwardly directed setae at the margin of mouth opening (Fig. 8).

ETHYMOLOGY. The new species is named in memory of famous Russian dipterologist Kirill Borisovich Gorodkov, who collected the specimens.

DISTRIBUTION. Russia: Chukotka, Wrangel Island.



Figs. 8–9. *Scatophila gorodkovi* sp. n., female. 1 – body, lateral view; 2 – wing, dorsal view.

Key to Palaearctic species of the *noctula* species-group of the genus *Scatophila*

1. Wings reduced, shortened, 0.5–0.75 as long as abdomen, haltere black …… …… ***S. gorodkovi*** sp. n.
– Wings long, normally developed, haltere yellow ……. 2
2. Head in profile triangular, gradually protruding (Krivosheina, 2009, Fig. 8); the lower part of face dorsally looks like broad protuberance at least twice as wide as pedicel. Distal margin of epandrium incised medially ..... ***S. noctula*** Meigen
– Head in profile of another form; the lower part of face dorsally looks like narrow protuberance as wide as or narrower than pedicel. Distal margin of epandrium broadly rounded, without incision ……..…….. 3
3. Lower part of face in profile looks like slender horn (Krivosheina, 2009, Fig. 9); dorsally looks like long spine significantly narrower than pedicel …… ……..…… ***S. unicornis*** Czerny
– Lower part of face in profile looks like square protuberance (Krivosheina, 2009, Fig. 7); dorsally looks like short spine as wide as pedicel ……..…… ……..……..…. ***S. zlobini*** Krivosheina

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The authors express their sincere thanks to Mrs. Galina Suleymanova, who helped much in the work with the collection of the Zoological Institute (St.-Petersburg). We are very grateful to Dr. W.N. Mathis (Washington) and Dr. P. Vilkamaa (Helsinki) for the help in preparing of this work. Morphological studies and illustrations were made on equipment purchased due to the support of the Russian Science Foundation, research project No. 14-50-00029.

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http/urn:lsid:zoobank.org:pub:7ABE97FC-E066-4C75-AB2E-7AB39E3ED62B

A. S. Lelej. THE NEW SYNONYMY OF *PHYSETOPODA* SPECIES (HYMENOPTERA: MUTILLIDAE) FROM THE UNITED ARAB EMIRATES. – Far Eastern Entomologist. 2016. N 311: 7-8.

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Summary. The new synonymy is proposed: *Physetopoda vanharteni* Lelej, 2014, male = *Physetopoda deserticola* Lelej, 2014, female, **syn. n.**

Key words: velvet ants, new synonymy, Arabian Peninsula.

А. С. Лелей. Новая синонимия видов рода *Physetopoda* (Hymenoptera: Mutillidae) из Объединенных Арабских Эмиратов // Дальневосточный энтомолог. 2016. N 311. С. 7-8.

Резюме. Установлена новая синонимия: *Physetopoda vanharteni* Lelej, 2014, самец = *Physetopoda deserticola* Lelej, 2014, самка, **syn. n.**

Five species of the genus *Physetopoda* Schuster, 1949 were recorded from the United Arab Emirates: *Ph. vanharteni* Lelej, 2014, ♂; *Ph. arabica* Lelej, 2014, ♂; *Ph. schwarzi* Lelej, 2014, ♂; *Ph. deserticola* Lelej, 2014, ♀, and *Ph. tschernovi* Lelej, 2014, ♂ (Lelej & van Harten, 2014a, b). They are nocturnal species, except diurnal *Ph. tschernovi.* Recently I received the material collected from January to September 2015 at Al Wathba Wetland Reserve (UAE, Abu Dhabi) by Malaise trap, which belongs to *Ph. vanharteni* Lelej, 2014, 108♂; *Ph. deserticola* Lelej, 2014, 1♀, and *Rasnitsynitilla* sp., 12♂. Furthermore, the single female of *Ph. deserticola* was collected by Malaise trap together with seven males of *Ph. vanharteni* in January and I think that at least one pair was caught *in copula*; therefore they are the opposite sexes of the same species.

TAXONOMY

Physetopoda vanharteni Lelej, 2014

Physetopoda vanharteni Lelej in Lelej & van Harten, 2014a: 507, ♂ (holotype, United Arab Emirates: Wadi Bih dam, 4-9.VI 2008, Light trap, van Harten [RMNH], examined).

Physetopoda deserticola Lelej in Lelej & van Harten, 2014a: 516, ♀ (holotype, United Arab Emirates: Sharjah Desert Park, 16.VI–17.VII 2008, Light trap, van Harten [RMNH], examined); **syn. n.**

MATERIAL EXAMINED (Additional to the type material recorded by Lelej & Van Harten, 2014a). **United Arab Emirates**: Al Wathba Wetland Reserve, January 2015, Malaise trap, 7♂ 1♀, leg. A. Saji & A. van Harten; same place, February 2015, Malaise trap, 4♂, leg. A. Saji & A. van Harten; same place, March 2015, Malaise trap, 22♂, leg. A. Saji & A. van Harten; same place, April 2015, Malaise trap, 2♂, leg. A. Saji & A. van Harten; same place, May 2015, Malaise trap, 4♂, leg. A. Saji & A. van Harten; same place, June 2015, Malaise

trap, 4♂, leg. A. Saji & A. van Harten; same place, July 2015, Malaise trap, 48♂, leg. A. Saji & A. van Harten; same place, 1–15.VIII 2015, Malaise trap, 11♂, leg. A. Saji & A. van Harten; same place, 15.IX–31.X 2015, Malaise trap, 6♂, leg. A. Saji & A. van Harten.

DISTRIBUTION**.** United Arab Emirates, Yemen.

SEASONAL DYNAMIC. The males and females are active most part of the year (Fig. 1). The occurrence of females in November-February reflects their overwintering, while the males have the peak of activity in July. The females of *Ph. vanharteni* were collected mainly by pitfall traps, while the males mainly by light traps.

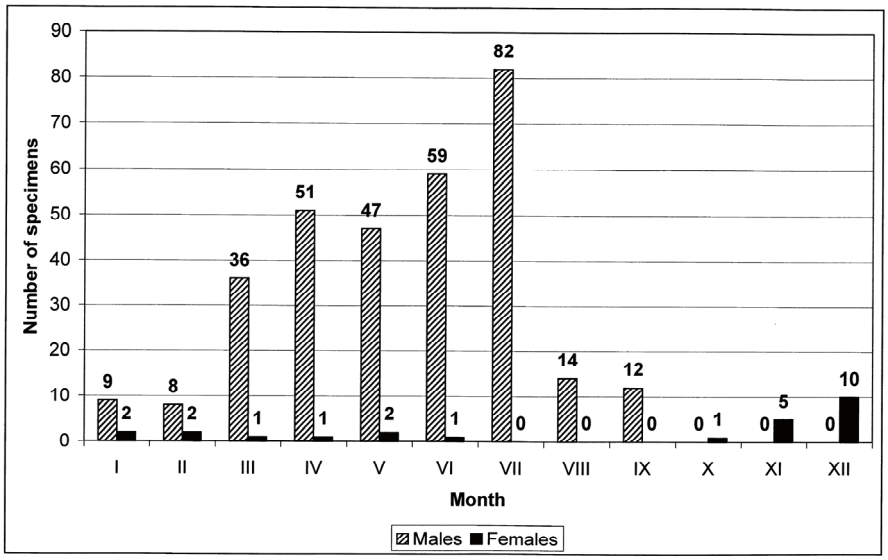

Fig. 1. Seasonal dynamic of *Physetopoda vanharteni* based on published (Lelej & van Harten, 2014a) and current data.

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Lelej, A.S. & van Harten, A. 2014b. A new species of the genus *Physetopoda* Schuster, 1949 (Hymenoptera, Mutillidae) from the United Arab Emirates. *Zoologicheskii Zhurnal*, 93(1): 205–208. [In Russian, English translation: *Entomological Review*, 2014, 94(4): 639–642.]

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http/urn:lsid:zoobank.org:pub: 02BE5092-289D-478A-B978-CEFAFBE10604

R. V. Yakovlev[1,2*)], Th. J. Witt[3)]. CARPENTER-MOTHS (LEPIDOPTERA: COSSIDAE) OF SWAZILAND, SOUTH AFRICA. – Far Eastern Entomologist. 2016. N 311: 9-12.

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Summary. An annotated list of seven species of Cossidae (Lepidoptera) of the Swaziland fauna is given. Five species are recorded from Swaziland for the first time.

Key words: Lepidoptera, Cossidae, carpenter-moths, fauna, Swaziland, Africa.

Р. В. Яковлев, Т. Витт. Древоточцы (Lepidoptera: Cossidae) Свазиленда, Южная Африка // Дальневосточный энтомолог. 2016. N 311. С. 9-12.

Резюме. Приводится аннотированный список 7 видов семейства Cossidae (Lepidoptera) фауны Свазиленда, из которых 5 видов приводятся впервые для этой страны.

INTRODUCTION

The Kingdom of Swaziland is a small country (area of 17363 km^2) in South Africa, bordering with the Republic of South Africa in the North, West and South and with Mozambique in the East. The country lies on the Veld Plateau, which decreases stepwise from the West to the East. The highest peak is Emlembe Mt. (1862 m). The climate is transitional from subtropical to tropical, the average monthly temperature is from 12−15ºC to 20−24ºC. The precipitation is from 500-700 mm/year in the East to 1,200-1,400 mm/year in the West. The vegetation is a typical savanna in the West, thickets of xerophytic shrubs in the East.

The Cossidae of Africa are still poorly studied. Only a few publications of the recent years are devoted to the systematics and faunistics of African Cossidae (Yakovlev & Lenz, 2013; Yakovlev & Murphey, 2013; Yakovlev, 2014, 2015; Mey, 2015). In many areas the faunal data are still completely absent.

Swaziland is no exception, as there is a total lack of data on it, but for the description of *Aethalopteryx rudloffi* Yakovlev, 2011 from Swaziland, Ndzevane area, Matala near Nsogo, 240 m, Akazien, Agaven Buscland, S 26°58'; E031°58'. *Aethalopteryx obsolete* (Gaede, 1930) was reported for Swaziland with no indication of the exact localities (Yakovlev, 2011).

Due to the expeditions of the German entomologist J.P. Rudloff in 2007 and the Russian entomologists V.N. Kovtunovich and P.Ya. Ustuzhanin in 2009 and 2011 the first data on the Swaziland Cossidae fauna have been received. All specimens were collected at light sources. Almost all specimens examined are deposited in the collection of R.V. Yakovlev (Barnaul, Russia) except holotype and paratypes of *Aethalopteryx rudloffi* Yakovlev, 2011 which are stored in the Museum Witt (München, Germany). List of species is given below.

***Macrocossus toluminus* (Druce, 1887)**

Cossus toluminus Druce, 1887: 684–685 (holotype – male, Gambia; in British Museum of Natural History, London).

MATERIAL EXAMINED. **Swaziland**: Mlawula N.R., 26°12'37" S, 32°00'04" E, 150 m, 14–15.X 2009, 1 ♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. Africa from the Gambia and Ivory Coast to Malawi, Tanzania, Namibia, and Republic of South Africa (Schoorl, 1990; Vári *et al.*, 2002; Yakovlev, 2011).

***Strigocossus crassus* (Drury, 1782)**

Phalaena (*Noctua*) *crassa* Drury, 1782: Pl. 2: fig. 1 (type material is lost?, Sierra Leon [Sierra Leone])

MATERIAL EXAMINED. **Swaziland**: Mlawula N.R., 26°12'37" S, 32°00'04" E, 150 m, 14–15.X 2009, 1 ♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. Cental and Southern Africa (Schoorl, 1990; Yakovlev, 2011).

***Aethalopteryx obscurascens* (Gaede, 1930)**

Xyleutes obscurascens Gaede, 1930: 547. (holotype – male, Maraquo, Centr. Abyss. [Central Ethiopia]; in British Museum of Natural History, London)

MATERIAL EXAMINED. **Swaziland**: Mlawula N.R., 26°12'37" S, 32°00'04" E, 150 m, 06.XII 2011, 4 ♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. East Africa (from Ethiopia to Malawi) and South Africa (Yakovlev, 2011).

***Aethalopteryx rudloffi* Yakovlev, 2011**

Aethalopteryx rudloffi Yakovlev, 2011: 81 (holotype – male, Swaziland, Ndzevane area, Matala near Nsogo, Akazien, Agaven Buscland; in Museum Witt, München).

MATERIAL EXAMINED. **Swaziland**: Ndzevane area, Matala near Nsogo, Akazien, Agaven Buscland, 26°58' S, 031°58' E, 240 m, 23.I 2007, 3 ♂ (holotype and paratypes), leg. J.P. Rudloff.

DISTRIBUTION. Endemic to Swaziland.

***Aethalopteryx forsteri* (Clench, 1959)**

Xyleutes forsteri Clench, 1959: 14−15 (holotype – male, SW Africa, Okahandja [Namibia]; in Zoologische Sammlung der Bayerischen Staates, München).

MATERIAL EXAMINED. **Swaziland**: Mlawula N.R., 26°12'37" S, 32°00'04" E, 150 m, 06.XII 2011, 1 ♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. South-Western Africa (Vari *et al*., 2002; Yakovlev, 2011).

***Azygophleps leopardina* Distant, 1902**

Azygophleps leopardina Distant, 1902: 213–214 (holotype – male, Transvaal, Pretoria; in British Museum of Natural History, London).

MATERIAL EXAMINED. **Swaziland**: Mlawula N.R., 26°12'37" S, 32°00'04" E, 150 m, 14–15.X 2009, 1 ♂, leg. V. Kovtunovich & P. Ustjuzhanin; Malolotja N.R., 26°08'25" S, 31°08'10" E, 1530 m, 13.X 2009, 2 ♂♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. Zambia, Namibia, Kenya, Republic of South Africa (Pinhey, 1979; Yakovlev, 2011).

***Azygophleps inclusa* (Walker, 1856)**

Zeuzera inclusa Walker, 1856: 1534 (holotype – female, Port Natal [Durban, South Africa]; in British Museum of Natural History, London)

MATERIAL EXAMINED. **Swaziland**: Malolotja N.R., 26°08'25" S, 31°08'10" E, 1530 m, 13.X 2009, 1 ♂, leg. V. Kovtunovich & P. Ustjuzhanin.

DISTRIBUTION. This species is known from Arabian Peninsula to South Africa (Pinhey, 1979; Vári *et al*., 2002; Yakovlev, 2011).

DISCUSSION

Thus, seven Cossidae species are reported for the fauna of Swaziland, which is about 50% of the expected amount of fauna. One species (*Aethalopteryx rudloffi*) is endemic to Swaziland. Perhaps in the further study of Cossidae of South Africa this species will be discovered in the neighboring areas of RSA and Mozambique. The other species are widely spread in the South and South-East of Africa.

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D. S. Aristov. NEW SUBORDER OF THE PALEOZOIC-MESOZOIC ORDER CNEMIDOLESTIDA (INSECTA: GRYLLONES). – Far Eastern Entomologist. 2016. N 311: 13-22.

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Summary. Families Parmapteridae Aristov et Rasnitsyn, 2015, Protembiidae Tillyard, 1937, Pinideliidae Storozhenko, 1997 from the Paleozoic of the North America and Eurasia, and Juraperlidae Huang et Nel, 2007 from the Mesozoic of the Asia are assigned to the new suborder Parmapterina **subord. n.** of the order Cnemidolestida. Origin of the superorder Orthopteroidea is discussed.

Key words: Insecta, Cnemidolestida, Parmapterina, taxonomy, Carboniferous, Permian, Triassic, Jurassic.

Д. С. Аристов. Новый подотряд палеозойско-мезозойского отряда Cnemidolestida // Дальневосточный энтомолог. 2016. N 311. С. 13-22.

Резюме. Семейства Parmapteridae Aristov et Rasnitsyn, 2015, Protembiidae Tillyard, 1937 и Pinideliidae Storozhenko, 1997 из палеозоя Северной Америки и Евразии и Juraperlidae Huang et Nel, 2007 из мезозоя Азии выделены в качестве подотряда Parmapterina **subord. n.** отряда Cnemidolestida. Обсуждается происхождение надотряда Orthopteroidea.

Gerarida is considered as the most primitive order of the orthopteroids (superorder Orthopteroidea) (Gorochov, 2004). Eoblattida *sensu* Rasnitsyn, 2002 were supposedly ancestral to this order; the branching *CuP* in the forewing was considered the principal apomorphy. In addition, gerarids, as well as the other orthopteroids, have the precostal area separated by the "*C*", *SC* ending on *C*, base of *RS* and first bifurcation of *M* shifted towards the middle of the wing, and *CuA* dividing into CuA_1+M_5 and CuA_2 (Gorochov, 2004). *R* and CuA_1+M_5 in Gerarida are convex, and *RS* and *M* are strongly concave. Most of the above-listed characters are typical of the Carboniferous Cheliphlebiidae (Aristov, 2014). This family is distinguished from gerarids only by the presence of posterior branches of *CuA* in the intercubital area and by the simple *CuP*. This similarity is so strong that it makes cheliphlebiids more similar to gerarids than to other primitive Orthopteroidea. Therefore, it is preferable to treat Cheliphlebiidae as Orthopteroidea incerti ordinis.

All the above-listed apomorphies of orthopteroids are separately found in several families of primitive Perlidea (Parmapteridae, Protembiidae, Pinideliidae and Juraperlidae), assigned in this study to the suborder Parmapterina of the order Cnemidolestida. The family Parmapteridae is characterized by the anastomosis M_5+CuA_1. The genus *Parmaptera* is also known to have the base of *RS* and first bifurcation of *M* shifted towards the middle of the wing (Figs. 1–3), and one of the species of *Heterologus* is known to have a short bifurcation on *CuP*. In *Heterologus R* and *M* are basal to M_5, M_5 itself and CuA_1 are strongly convex, *RS* and *M* are concave. Some Protembiidae have the anastomosis M_5+CuA_1 and the costal lobe (area at the base of the costal area separated by a fold, functional counterpart of the precostal

area; Fig. 4). All Juraperlidae have the typical false costa; *Ferganomadygenia* has M_5 joining CuA_1 and a short fork on *CuP* (Fig. 5); *Juraperla* has the base of *RS* shifted towards the middle of the wing. In *Juraperla* M_5 joins *CuA* just proximal to its bifurcation. The common feature of all above-listed families distinguishing them all from orthopteroids is *SC* that ends on *R* or ends in bifurcation on *R* and *C*. Paranota of the pronotum are absent in these families, as well as in gerarids. Thus, gerarids are probably descended from Carboniferous Parmapterina similar to Parmapteridae, in which the apex of *SC* shifted onto *C*, the precostal area evolved (the structure of the base of the costal area of Parmaridae is unknown), and the division of *CuP* became proximal.

Several groups of Carboniferous insects that demonstrate some similarity to Parmapterina and Gerarina are known to date. The family Cheliphlebiidae is compared to these groups above. *Herbstiala herbsti* Shmidt, 1953 of the family Herbstialidae (Protorthoptera: Carpenter, 1992; Paoliida: Prokop *et al*., 2013, Westphalian of Germany) is characterized by the precostal area present, *SC* ending on *R*, *M* dividing in the middle of the wing, and *CuP* dividing. *Herbstiala* is distinguished from Parmapterina and Gerarina in the absence of division of *CuA* into CuA_1 and CuA_2 and presence of the clavus (assigned to Gryllones incerti ordinis: Rasnitsyn & Aristov, 2016). *Merlebachia grimaldi* Waterlot, 1934 (incerti ordinis: Carpenter, 1992; Westphalian of France) has a combination of the precostal area, *RS* beginning distally, *M* dividing distally, and *CuP* dividing (Fig. 6). This species is distinguished from Parmapterina and Gerarina by the absence of the division of *CuA* into CuA_1 and CuA_2 and by the very long anal area (Waterlot, 1934). *Polyernus complanatus* Scudder 1885 (Eoblattida incertae familiae: Rasnitsyn, 2002, Westphalian of the United States) possibly also had the precostal area; the base of *RS* and first bifurcation of *M* are shifted in this species towards the middle of the wing, M_5 joins CuA_1, and *CuP* divides (Fig. 7). *P. complanatus* is especially similar to Gerarida and differs from Gerarida and Parmapterina in the presence of broad paranota. In addition, this species differs from Gerarida in *SC* ending on *R* (Rasnitsyn, 2002). *Stenoneura fayoli* Brongniart, 1885 (Stephanian of France; Eoblattida, Stenoneuritidae: Rasnitsyn, 2004) is similar in the absence of paranota, distal beginning of *RS* and first bifurcation of *M*, M_5 joining *CuA* distal to its first bifurcation, and dividing *CuP* to Parmapterina and Gerarina and differs from them in *SC* ending on *C* and *CuA* without division into CuA_1 and CuA_2 (Béthoux & Nel, 2002; Rasnitsyn *et al*., 2004). The absence of the division of *CuA* into CuA_1 and CuA_2 in *Herbstiala*, *Merlebachia*, and *Stenoneura* and the presence of paranota in *Polyernus* do not allow me to assign these genera to Parmapterina. Until additional material on primitive Carboniferous Gryllones becomes available, I suggest treating the above-listed genera as Cnemidolestida incertae sedis, close to Parmapterina.

TAXONOMY

CLASS INSECTA LINNÉ, 1758

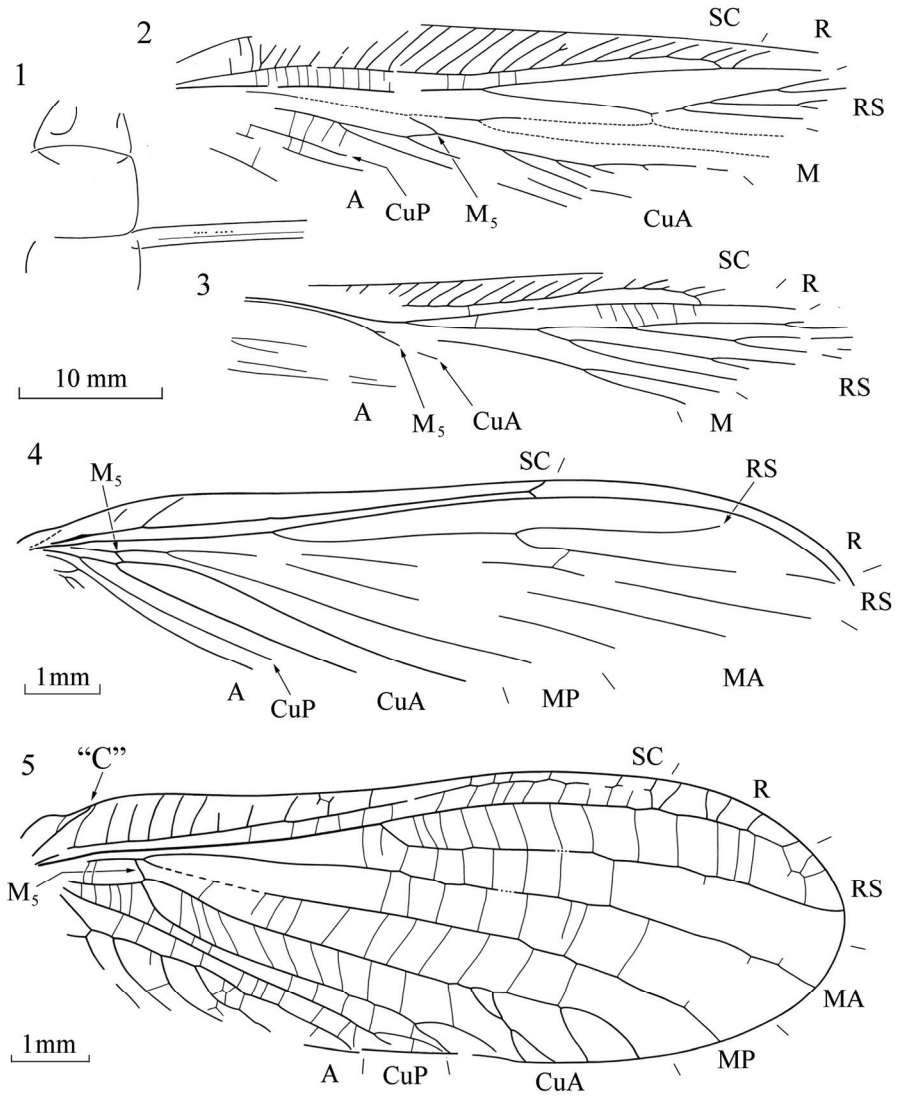
INFRACLASS GRYLLONES LAICHARTING, 1781

Superorder Perlidea Latreille, 1802

Order Cnemidolestida Handlirsch, 1937

Cnemidolestodea: Handlirsch, 1937: 63.
Cnemidolestida: Aristov, 2014: 5.

DIAGNOSIS. Pronotum without paranota; hindlegs not saltatorial. Wings folded flatly; right and left pairs of wings incompletely overlapping at rest. Forewing not elytrized, often



Figs. 1–5. Suborder Parmapterina, families Parmapteridae, Protembiidae and Juraperlidae. 1–3 – *Parmaptera p–ermiana* Aristov et Rasnitsyn, 2015, holotype PIN, No 1700/4935: 1 – part of body; 2, 3 – fore and hindwings, Chekarda, Lower Permian of Russia (after Aristov, Rasnitsyn, 2015, with changes); 4 – *Tshekardembia sharovi* Novokshonov, 1995, fragment of holotype PIN, No 4987/103, forewing (after Aristov, 2015a); 5 – *Ferganomadygenia plicata* Storozhenko et Vrsansky, 1995, holotype PIN, No 2555/717, Madygen, Middle Triassic of Kyrgyzstan (original).

with oligomerized venation. *RS* without sharp at joining crossveins; strong *r-rs* and *rs-m* absent. Base of *M* free, often with developed M_5 or fused with *CuA*. *M* starting branching in basal one-third of wing at some distance distal to M_5 (except in some Cnemidolestina). *CuA* usually without posterior branches in intercubital area (except in some Cnemidolestina), dividing rather distally, usually pectinate posteriad or (in Parmapterina) divided into CuA_1 and CuA_2 in its basal quarter; *CuP* simple (in some Parmapterina with short fork). Clavus usually absent. Hindwing at rest not tucking down transversely, with anal lobe tucking down, distinguished from forewing mainly by more proximal *RS* and more distally dividing *M* and *CuA*. Male genitalia symmetrical; ovipositor present; cerci articulate.

COMPOSITION. Two suborders from the late Paleozoic and early Mesozoic.

Suborder Cnemidolestina Handlirsch, 1937

DIAGNOSIS. "*C*" absent (except in Ctenoptilidae and some Cnemidolestidae), costal lobe absent (except in Prygidae and some Spanioderidae and Sylvabestiidae). *SC* ending in distal third of wing in bifurcation on *SC* and *R* (except in Gerapompidae, Cymenophlebiidae, and Sylvabestiidae). *RS* beginning in basal third of wing (except in Prygidae and some Sylvabestiidae). *RS* and *M* convex or neutral. If first bifurcation not reduced (in some Cnemidolestidae), *M* dividing in basal one-third of wing (in Tillyardembiidae and Cymenophlebiidae near wing middle; in Prygidae M simple or with short fork). M_5 and first bifurcation of *M* not closely set. M_5 joining *CuA* at some distance proximal to its division into branches. *CuA* not divided into CuA_1 and CuA_2, pectinate posteriad, densely branching distal to its basal one-third. Posterior branches of *CuA* absent (except in Ctenoptilidae); *CuP* simple. Clavus absent (except in Cymenophlebiidae and some Cnemidolestidae).

COMPOSITION. 11 families from the Carboniferous and Permian of North and South America, Eurasia, Madagascar and from the Triassic of Europe: Cnemidolestidae Handlirsch, 1906, Spanioderidae Handlirsch, 1906, Gerapompidae Handlirsch, 1906, Cymenophlebiidae Pruvost, 1919, Emphylopteridae Handlirsch, 1922, Tillyardembiidae G.Zalessky, 1938; Psoropteridae Carpenter, 1976; Sylvabestiidae Aristov, 2000, Prygidae Aristov et Rasnitsyn, 2014, Neraphidiidae Aristov, 2014, and Ctenoptilidae Aristov, 2014.

Suborder Parmapterina Aristov, subord. n.

DIAGNOSIS. Base of costal area with costal lobe or with false *C*. *SC* ending in distal one-third of wing on *R* or in bifurcation (in some Protembiidae *SC* possibly ending on *C*). *RS* beginning near wing middle (in Protembiidae in basal one-third of wing). *M* dividing in basal quarter of wing (in Parmapteridae near middle or more distally). M_5 and first bifurcation of *M* closely set. M_5 joining *CuA* distal to its division into branches or immediately proximal to this bifurcation (in most Protembiidae base of *M* fused with *CuA* and also in most Protembiidae CuA_1 and CuA_2 diverging from this anastomosis as separate stems). In *Heterologus R* and *M* basal to M_5, M_5 itself and CuA_1 strongly convex, *RS* and *M* concave. In other genera *RS* and *M* weakly convex or neutral. *CuA* divided into CuA_1 and CuA_2 in its basal quarter, posterior branches of *CuA* absent, *CuP* simple (in *Heterologus duyiwuer* and *Ferganomadygenia* with short forks), clavus absent.

COMPARISON. The new suborder is distinguished from the suborder Cnemidolestina in the proximal division of *CuA* into CuA_1 and CuA_2, so that M_5 joins CuA_1, rather than the stem *CuA*. In Cnemidolestina M_5 joins *CuA* proximal to its division into branches, and *CuA* is not divided into CuA_1 and CuA_2.

COMPOSITION. Four families: Parmapteridae Aristov et Rasnitsyn, 2015 from the Carboniferous of USA and China and from the Permian of Russia; Protembiidae Tillyard, 1937 from the Permian of USA, Czech, Russia, Kazakhstan and Mongolia, Pinideliidae Storozhenko, 1997 from the Permian of Russia and Juraperlidae Huang et Nel, 2007 from the Triassic of Kyrdyzstan and the Jurassic of China.

NOTE. Juraperlidae are similar in wing venation to the Upper Permian Tunguskapteridae (Storozhenko & Vršanský, 1995), represented by a single genus, *Tunguskaptera* (the second genus of this family, *Ferganomadygenia*, is transferred below into Juraperlidae). This family is distinguished from Juraperlidae in the paranota of the pronotum, *SC* ending on *C*, and M_5 joining *CuA* basal to its first bifurcation. The family Tunguskapteridae (which includes only the type genus) should be assigned to the order Reculida (*sensu* Aristov, 2015b).

Key to families of the suborder Parmapterina

1 (2) *SC* ending on *R*. *M* dividing into branches near wing middle or distal to it .... **Parmapteridae** Aristov et Rasnitsyn, 2015
2 (1) *SC* ending on *C* or ending in bifurcation on *C* and *R*. *M* dividing into branches in basal quarter of wing.
3 (6) Base of costal area with costal lobe.
4 (5) CuA_2 simple ..... **Protembiidae** Tillyard, 1937
5 (4) CuA_2 dividing ..... **Pinideliidae** Storozhenko, 1997
6 (3) Wing with precostal area ..... **Juraperlidae** Huang et Nel, 2007

Family Parmapteridae Aristov et Rasnitsyn, 2015

Parmapteridae: Aristov & Rasnitsyn, 2015: 19.

Type genus: *Parmaptera* Aristov et Rasnitsyn, 2015.

DIAGNOSIS. Large insects with small head, rather small pronotum, and long, possibly raptorial, forelegs. Forewing with costal area wide, *SC* ending on *R* in distal one-third of wing, *RS* beginning near wing middle (except in *Heterologus*), *M* starting branching near wing middle (in some *Heterologus* slightly more distally). M_5 joining CuA_1 proximal to its first bifurcation, M_5 and first bifurcation of *M* not closely set (except in *Parmaptera*). *CuP* simple (in some *Heterologus* with short bifurcations).

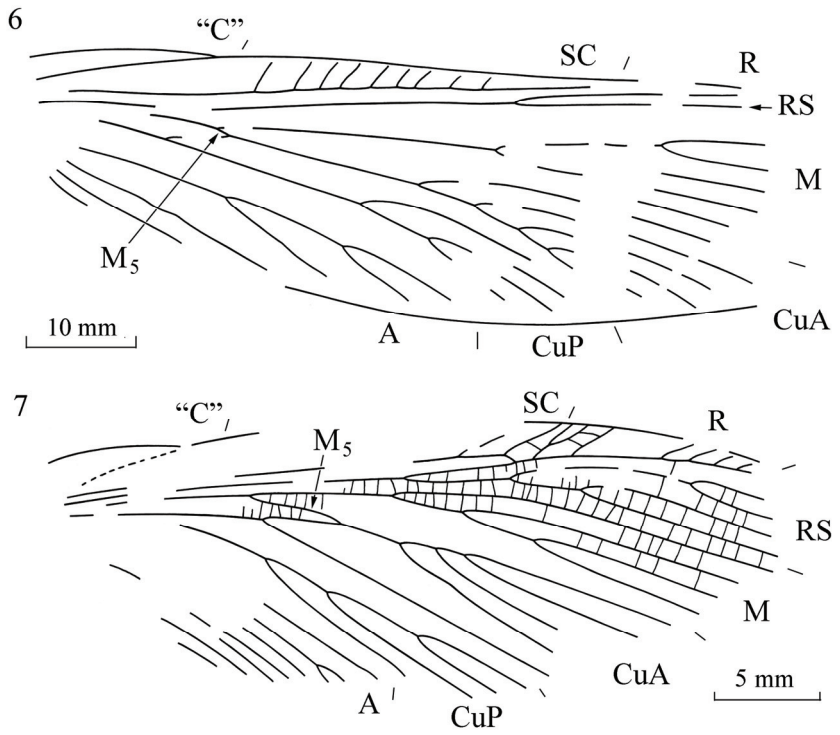
COMPOSITION. Two genera: *Parmaptera* Aristov et Rasnitsyn, 2015 from Chekarda (Russia, Perm Region; Lower Permian, Kungurian Stage) (Figs. 1–3) and *Heterologus* Carpenter, 1944 from Mazon Creek (USA, Illinois; Upper Carboniferous, Westphalian Stage) and Xiaheyan (China, Ningxia; Upper Carboniferous, Namurian Stage).

Family Protembiidae Tillyard, 1937

Protembiidae: Tillyard, 1937: 243; Carpenter, 1950: 207; Sharov, 1962: 124; Rasnitsyn, 1980: 152; Carpenter, 1992: 115; Storozhenko, 1997: 7; 1998: 91; 2002: 279; Aristov & Rasnitsyn, 2011: 120.

Sylvardembiidae: Novokshonov, 2000: 44; Storozhenko, 2002: 297; Aristov, 2004: 85; synonymised by Aristov & Rasnitsyn, 2011: 120.

Type genus: *Protembia* Tillyard, 1937.



Figs. 6–7. Gryllones incertae sedis, forewings: 6 – *Merlebachia grimaldi* Waterlot, 1934, fragment of holotype, Merlebach, Upper Carboniferous of France (original drawing based on photograph of holotype MhUL, after Waterlot, 1934: Pt. XVIII, Fig. 1); 7 – *Polyernus complanatus* Scudder 1885, fragment of holotype USNM, No 38144, forewing; Mazon Creek, Upper Carboniferous of USA (original drawing based on photograph by A.P. Rasnitsyn).

DIAGNOSIS. Medium-sized insects. Head large or medium-sized; pronotum medium-sized, comparable in size to or markedly smaller than head. Legs medium-sized or shortened (sometimes strongly). Forewing with costal area usually somewhat wider than subcostal area, with pronounced costal lobe. *SC* ending in bifurcation on *C* and *R* or on *C* (in some *Aibolitus* on *R*) in distal half of wing (in *Soyanocadaver* and *Parbarmaleus* in basal quarter of wing). *RS* beginning in basal one-third of wing, often fused with *M*. Base of *M* usually fused with *CuA; CuA_1* and *CuA_2* diverging from anastomosis as separate stems (except in *Soyanocadaver* and some *Tshekardomina*). In *Tshekardembia* base of *M* free, *M_5* joining *CuA_1* and set closely to first bifurcation of *M*. *M* dividing in basal one-third of wing (in *Sigmophlebia* near wing middle). *CuP* simple. Ovipositor short (except in *Sojanoraphidia* and *Aibolitus*).

COMPOSITION. 15 genera: *Protembia* Tillyard, 1937 from Elmo (United States, Kansas; Lower Permian, Leonardian (Artinskian) Stage), *Sojanoraphidia* O. Martynova, 1952 from Chekarda (Russia, Perm Region; Lower Permian, Kungurian Stage) and Soyana (Russia, Arkhangelsk Region; Middle Permian, Kazanian Stage); *Ventopterum* Kukalová, 1964 from

Obora (Czech Republic, Moravia; Lower Permian, Sakmarian Stage); *Aibolitus* Novokshonov et Storozhenko, 1996 from Elmo and Chekarda; *Tshekardembia* Novokshonov, 1995 (Fig. 4); *Sylvardembia* Novokshonov, 1997; *Barmaleus* Novokshonov, 1997; *Paratillyardembia* Aristov, 2000 from Chekarda; *Parbarmaleus* Novokshonov, 1997 from Soyana; *Tshekardomina* Novokshonov et Aristov, 2002 from Chekarda, Soyana, and Bor-Tologoi (Mongolia, East Gobi Province; Middle Permian, Urzhumian Stage); *Sigmophlebia* Béthoux et Beckmeyer, 2007 from Midco (United States, Oklahoma; Lower Permian, Leonardian (Artinskian) Stage), Chepanikha (Russia, Udmurtia; Middle Permian, Urzhumian Stage), and Karaungir (Kazakhstan, East Kazakhstan Province; Middle Permian, Urzhumian Stage); *Repka* Aristov et Rasnitsyn, 2011 from Soyana; *Kuplya* Aristov, 2013 from Novo-Aleksandrovka (Russia, Orenburg Region; Upper Permian, Severodvinian Stage); *Soyanocadaver* Aristov, 2015 from Soyana; and *Kirovopteron* Aristov, 2015 from Kityak (Russia, Kirov Region; Middle Permian, Kazanian Stage).

Family Pinideliidae Storozhenko, 1997

Pinideliidae: Storozhenko, 1997: 11; 1998: 116; Aristov, 2004: 91; 2015: 1324.

Type genus: *Pinidelia* Storozhenko, 1997.

DIAGNOSIS. Medium-sized and large insects. In forewing costal area with precostal lobe, costal area at base of *RS* narrower than or as wide as subcostal area. *SC* ending on *C* in distal half of wing. *RS* beginning in basal one-third of wing, free. Base of *M* free (in *Pinidelia* fused with CuA_1 over short distance), M_5 joining CuA_1, M_5 and first bifurcation of *M* closely set. *M* starting branching in basal quarter of wing, *MP* in *Kishertia* Aristov, 2004 desclerotized in wing middle. CuA_1 and CuA_2 branching; *CuP* simple.

COMPOSITION. Three genera: *Pinidelia* Storozhenko, 1997 from Tyulkino (Russia, Perm Region; Lower Permian, Ufimian Stage); *Kishertia* Aristov, 2004 from Kischert (Russia, Perm Region; Lower Permian, Kungurian Stage); *Idelopterum* Aristov, 2015 from Soyana (Russia, Archangelsk Region; Middle Permian, Kazanian Stage).

Family Juraperlidae Huang et Nel, 2007

Juraperlidae Huang, Nel, 2007: 837; Cui *et al*., 2010: 710.

Type genus: *Juraperla* Huang et Nel, 2007.

DIAGNOSIS. Medium-sized insects. Head and pronotum medium-sized, legs rather long. Forewing with costal area in basal half of wing wider than subcostal area. In *Ferganomadygenia* "*C*" short; in *Juraperla* "*C*" reaching wing middle. *SC* ending in bifurcation on *C* and *R*. *RS* beginning near wing middle (in *Ferganomadygenia* in basal third of wing). *RS*, *MA*, and *MP* simple. M_5 joining CuA_1 or joining *CuA* immediately proximal to its bifurcation. *M* starting branching in basal quarter of wing; M_5 and first bifurcation of *M* closely set. *CuP* simple or (in *Ferganomadygenia*) with short fork.

COMPOSITION. Two genera: *Juraperla* Huang et Nel, 2007 from Daohugou (China, Inner Mongolia; Middle Jurassic, Jiulongshan Formation) and *Ferganomadygenia* Storozhenko et Vrsansky, 1995 from Madygen (Kyrgyzstan, Osh Region; Middle Triassic, Ladinian Stage).

NOTE. *Ferganomadygenia* from Madygen was mentioned in the publication of the original description of Juraperlidae but was not included in this family (Huang & Nel, 2007).

Re-examination of the type has shown that in *F. plicata* Storozhenko et Vršanský, 1995 (Fig. 5) a short false costa runs at the base of the costal area, separating a small precostal area. This character and the general venation pattern (oligomerized *RS*, *MA*, and *MP* and M_5 joining CuA_1) make it possible to assign this genus to Juraperlidae. *Ferganomadygenia* differs from *Juraperla* in the short "*C*" and two-branched *CuA*. In *Juraperla* "*C*" reaches the wing middle, and *CuA* has four or five branches (Huang & Nel, 2007; Cui *et al*., 2010).

CONCLUSION

Therefore, the order Cnemidolestida is divided into two suborders, Cnemidolestina and Parmapterina. The former includes 11 families and 22 genera from the Paleozoic and Early Mesozoic of North and South America, Madagascar, and Eurasia. The latter includes four families and 22 genera from the Paleozoic and Mesozoic of North America and Eurasia. The order Cnemidolestida is assigned to Perlidea (Gryllones). Representatives of Cnemidolestida were ancestral to superorder Perlidea (stoneflies and earwigs) and to superorder Orthopteroidea (orthopterans, phasmids, and titanopterans). Titanopterans were ancestral to the other Orthopteroidea and most probably had evolved from Carboniferous representatives of Parmapterina.

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S. Yu. Storozhenko. FIRST RECORD OF THE PYGMY MOLE CRICKETS (ORTHOPTERA: TRIDACTYLIDAE) FROM THE TYVA REPUBLIC AND THE REPUBLIC OF KHAKASSIA. – Far Eastern Entomologist. 2016. N 311: 23-24.

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Summary. *Bruntridactylus tartarus* (Saussure, 1874) is recorded from the Tyva Republic (= Tuva) and the Republic of Khakassia for the first time.

Key words: Orthoptera, Tridactylidae, fauna, new record, Tuva, Khakassia, Russia.

С. Ю. Стороженко. Первое указание триперстов (Orthoptera: Tridactylidae) из Республики Тыва и Республики Хакасия // Дальневосточный энтомолог. 2016. N 311. С. 23-24.

Резюме. Впервые для фауны республик Тыва и Хакасия указывается пустынный триперст *Bruntridactylus tartarus* (Saussure, 1874).

The pygmy mole crickets (Orthoptera: Tridactylidae) has not been recorded from Tuva and Khakassia (southern Siberia). I visited these regions in 2014 and collected few specimens of the genus *Bruntridactylus*. Here the family Tridactylidae is firstly recorded from the Tyva Republic and the Republic of Khakassia.

NEW RECORD

Family Tridactylidae Brullé, 1835

Subfamily Dentridactylinae K.K. Günther, 1979

Genus *Bruntridactylus* K.K. Günther, 1979

***Bruntridactylus tartarus* (Saussure, 1874)**

MATERIAL. **Russia**: Tyva Republic, Tez-Khem River, 7 km SW Erzin settlement, 50°12′ N, 95°08′ E, bank of river, dump soil near water,16.VII 2014, 22 ♂, 21 ♀ (S. Storozhenko); Republic of Khakassia, Shira Lake, vicinity of Zhemchyzhnyi settlement, 54°30′ N, 90°08′ E, shore of lake, yellow trap, 1.VII 2014, 1 ♀ (S. Storozhenko, V. Loktionov); 14 km SEE Zhemchyzhnyi settlement, vicinity of Borets settlement, bank of Son River, 54°27′ N, 90°21′ E, yellow trap, 30.VI 2014, 1 ♀ (S. Storozhenko, M. Proshchalykin).

DISTRIBUTION. Rumania, Ukraine, Russia, Kazakhstan, Uzbekistan, Mongolia (Günther, 1980, 1991).

NOTES. This species has been recorded as *Tridactylus tartarus* from the follow localities in Siberia: Omskaya oblast, vicinity of Omsk (Tarbinsky, 1940: 20), Krasnoyarskii krai, 36 km SE Minusinsk, Maly Kyzykul Lake (Ivanova, 1967: 130) and Irkutskaya oblast, vicinity of Balagansk (Bey-Bienko, 1933: 327). Here *Bruntridactylus tartarus* is recorded from Tuva and Khakassia for the first time.

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