

Species of the genus *Eumerus* Meigen, 1822 (Diptera: Syrphidae) from the Northern Minusinsk hollow, Republic of Khakassia

Виды рода *Eumerus* Meigen, 1822 (Diptera: Syrphidae) Северо- Минусинской котловины (Республика Хакасия)

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Abstract. The data on four syrphid species of the genus *Eumerus* collected in the Northern Minusinsk Hollow, Republic of Khakassia, are given. The new species, *E. leleji* sp.n., is described from this region.

Резюме. Приводятся сведения о 4 видах мух-журчалок из рода *Eumerus*, собранных в Северо-Минусинской котловине (Республика Хакасия); описывается новый для науки вид *E. leleji* sp.n.

Introduction

Hoverflies of the genus *Eumerus* Meigen, 1822 are distributed mainly in the arid and semi-arid regions of Eurasia and Africa. About 280 species have been described [Encyclopedia of Life, 2016], and majority of known species are local endemics [Stackelberg, 1961; Peck, 1969, 1972, 1988]. Larvae are phytophages and attack pulpy stems and plant organs. The Lesser bulb flies *Eumerus strigatus* (Fallén, 1817) and *E. funeralis* Meigen, 1822 have been introduced widely across the world by humans, and spread a long time ago across the main part of Russia. Both species are common in Russian settlements south of the tundra. In Yakutia, *E. strigatus* breeds in cabbage roots and potato tubers attacked by other pests [Bagachagova, 1990]. Nine species have been discovered in Siberia between the Urals and Baikal including Northern Kazakhstan [Stackelberg, 1952, 1961; Violovitsh, 1981, 1983; Barkalov, 1990]. Three of them are known only on the type material: *E. arat* Violovitsh, 1981 from Tuva, *E. rezvoi* Stackelberg, 1952 from the North Kazakhstan (Atbasar) and *E. sibiricus* Stackelberg, 1952 from Baikal region (White River). There is no information about species of *Eumerus* from the Khakassia Republic except a single record of *E. funeralis* from Shushenskoe Village, located near the boundary of Krasnoyarsk Territory and the Republic of Khakassia [Zimina, 1981].

Material and methods

This paper is based on material collected by Arkadiy Lelej, Maxim Proshchalykin and Valery Loktionov (Institute of Biology and Soil Science, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok), who explored the environs of Shira and Itkul Lakes (Shirinskiy District, Republic of Khakassia) between June 28th and July 1st, 2014. The territory is a part of the North Minusinsk hollow where is a great range of plant communities, from desert steppe to meadow steppe. Such vegetation diversity causes an abundance of *Eumerus* hoverflies, and 138 specimens belonging to four species of this genus were here collected. One species is recorded from the west of Baikal Lake for the first time, and another one is here described as a new for science. The terminology used for the description is based mainly on Thompson [1999].

Photographs of the imago were made using a digital camera Canon EOS D6 (lens EF100 mm f/2.8L Macro IS USM) and LED lighting (Falcon Eyes Slk-2400S). Illustrations were obtained by montaging an image series, covering different focal planes, into a single in-focus image with the freeware Combine ZM. The final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® software.

The following abbreviations are used for where specimens are deposited: IBSS — Institute of Biology and Soil Science, Far East Branch of the Russian Academy of Sciences (Vladivostok, Russia); ISEA — Institute of Systematics and Ecology of Animals of the Siberian Branch of the Russian Academy of Sciences (Novosibirsk, Russia); VM — V.A. Mutin private collection (Komsomolsk-na-Amure, Russia).

Results

Information about *Eumerus* species found in the North Minusinsk hollow are listed below.

Eumerus arkadii Mutin, 1999

Figs 4–7, 13.

Material. 3♂♂, 3♀♀, Khakassia, 10 km E of Shira village, Itkul Lake, 28.VI.2014 (IBSS, VM); 1♀, Khakassia, Shira Lake, environs of Zhemchuzhnyi village, 01.VII.2014 (IBSS); 1♀, Tuva, Erzin River, 31 km NNE of Erzin village, 28.VI.2014 (IBSS).

Distribution. Primorskiy Territory, Amur Province, Transbaikal, Tuva, Khakassia.

Remarks. This species was described on specimens collected in Transbaikal and the Southern Far East [Mutin, Barkalov, 1999]. It is very similar to *Eumerus grandis* Meigen, 1822, a common species in the Europe and Caucasus and noted for «Asia: Mongolia, China» by Peck [1988]. Females of both species differ from other Palearctic species by their very large basoflagellomere, its width being more than the distance between the eyes. The male genitalia of these species have a diagnostic form of surstyli [Vujic, Simic, 1999]. Two species differ in abdomen coloration: *E. grandis* has more or less red tergites, whereas *E. arkadii* has a black abdomen but sometimes in large specimens 2nd tergite brown laterally (Figs 4–7). We didn't examined specimens of *E. grandis*, but according to A. Vujic, who studied our photos of the male genitalia of *E. arkadii*, there are not obvious differences between these species. Probably these taxa are geographic vicariants or subspecies of one species, that will be better to define after comparison of specimens of both species.

Eumerus leleji sp.n.

Figs 1–3, 12.

Type material. Holotype: male, Khakassia, Shira Lake, environs of Zhemchuzhnyi village, 1.VII.2014 (A. Lelej, M. Proshchalykin, V. Loktionov) (ISEA). Paratypes: 3♂♂, 15♀♀, Khakassia, 10 km E of Shira village, Itkul Lake, 28.VI.2014 (A. Lelej, M. Proshchalykin, V. Loktionov) (IBSS, VM); 1♂, 2♀♀, Khakassia, 27 km E of Shira village, 29.VI.2014 (A. Lelej, M. Proshchalykin, V. Loktionov) (IBSS); 31♂♂, 20♀♀, with the same labels as in holotype (IBSS, VM); 3♂♂, Khabarovsk Territory, Myaochan Mountains, 5.VII.2005 (V. Mutin) (VM).

Etymology. The name is after Arkadiy Lelej for his great contribution to the development of Russian entomology.

Description. Male (Figs 1, 2). Body length 7.0–9.5 mm.

Eyes bare, holoptic; eye joint short, 3.0–5.0 times shorter than frontal triangle. Face and frons densely pale pollinose, with long whitish pile. Vertex sharply enlarged before ocellar triangle, with rare coarse punctures and long erect whitish pile. Ocellar triangle equilateral or isosceles; distance between posterior ocelli greater than distance between anterior and posterior ocelli. Sometimes ocellar triangle with sparse dark pile. Distance between eyes on level of their posterior margin nearly 0.2 times as large as width of head. Antenna black, basoflagellomere longer than width.

Scutum densely punctured, with rather long pale (white or yellowish) pile; length of pile as long as width of basotarsomere of mesotarsus. Scutum with a pair of obscure submedial vittae of pale pollinose which not touched scutellum. Large specimens usually with reddish pile on scutellum. Wing without dark macula. Pro- and mesofemora mainly black except for a brownish apex, with longer pale pile

posteriorly. Posterior surface of mesofemur with dense fringe of pile curved apically, their length equal or longer than thickness of femur. Metatrochanter flattened. Metafemur entirely black, mainly with subpressed pale pile except longer and erect pile ventrally, with two carinae of strong spinae in apico-ventral half. Tibiae reddish-yellow in basal half and black apically, with short pressed pale pile. Tarsomeres 4 and 5 of protarsus black; tarsomeres 1–3 yellowish with dark medial vitta dorsally, broadened baso-anteriorly on basotarsomere, and mainly yellowish ventrally except dark medial macula, which is greatly broadened basally. Tarsomeres 1–4 of protarsus with black flattened seta on posterior-apical corner, which are 1.5 times as long as thickness of corresponding tarsomere. In addition, basotarsomere with 1–2 shorter black or yellow setae on posterior surface; tarsomeres 2–4 usually with yellow setae posteriorly. Mesotarsus with tarsomeres 4 and 5 black; tarsomeres 1–3 mainly darkened dorsally and yellowish ventrally except dark basal macula on tarsomeres 2 and 3. Postero-apical black setae on mesotarsomeres 1–4 slightly more than thickness of corresponding tarsomere. Metatarsus black dorsally, rather brown ventrally, with dense short pressed pale (golden) pile, slightly shorter than metatibia.

Abdomen black, with a pair of pale pollinose falcate maculae on 2nd, 3rd and 4th terga; 2nd tergum shines laterally and pollinose maculae distinctly visible only in submedial part. 3rd tergum mainly with black short pressed pile except lateral margin and pollinose maculae with pale erect pile. 4th tergum mainly with long pale pile except very short black pile basomedially. 4th sternum with wide round groove posteriorly. 8th sternum (pygidium) with long pale pile. Genitalia on Fig. 13.

Female (Fig. 3). Body length 6.5–10.5 mm. Smaller specimens with more darkened abdomen and legs.

Face and frons with erect pale pile; vertex with longer pale pile, sometimes ocellar triangle with a few black pile. Distance between posterior ocelli 1.5 times as long as distance between anterior and posterior ocelli. Distance between eyes on level of their posterior margin about 0.28 of head width. Antenna black, basoflagellomere hardly longer than width.

Scutum with rather short erect pale pile and a pair of weakly pollinose submedial vittae, which do not touch scutellum. Large specimens (with more or less red abdomen) with paler trochanters. Pro- and mesofemora mainly black except for reddish apical 1/5–1/6. Metafemur completely black. Tibiae yellow on basal half and black apically. Tarsomeres 4 and 5 of pro- and mesotarsi black; tarsomeres 1–3 mainly dark dorsally; basotarsomere black ventrally; tarsomeres 2 and 3 yellow ventrally with dark basal macula. Pro- and mesotarsi as a rule with strong black setae posteriorly, which usually longer than setae on anterior surface.

Abdomen black with red subtriangular maculae on 2nd tergum, which is pale pollinose medially, or 2nd and 3rd terga more or less red. 3rd and 4th terga with a pair of pale pollinose oblique maculae; rose coloured chitin appears usually through their surface.

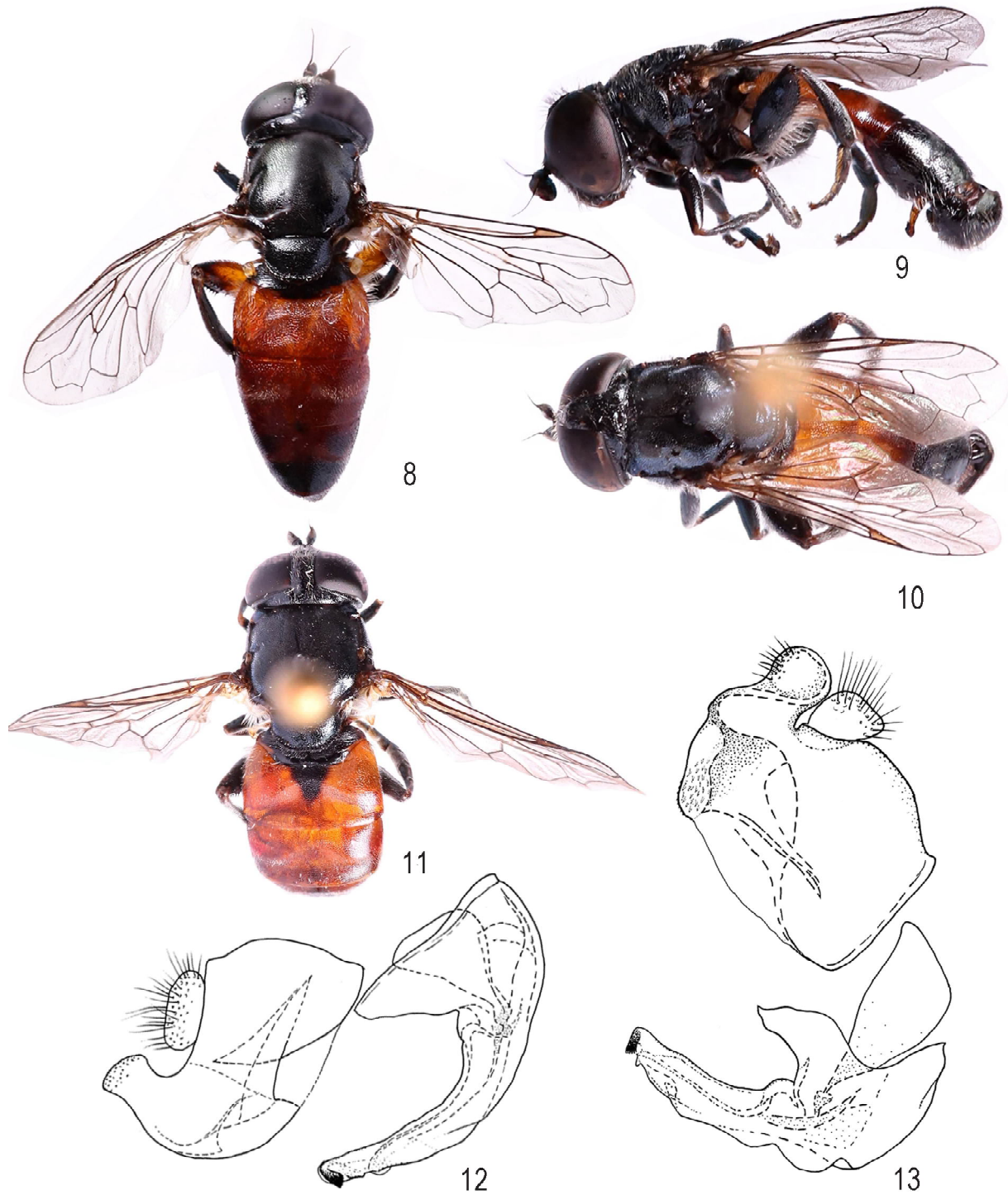
Distribution and habitats. Southern Siberia, Amur region. Steppe, rocky slopes in taiga zone.

Comparative diagnosis. This new species is similar to *Eumerus djakonovi* Stackelberg, 1952, but differs by smaller size, wider vertex and the upper lobe of the surstylus. It is possible that *E. djakonovi* is a senior synonym of *E. spinimanus* Huo, Ren et Zheng, 2007, since we did not find differences between specimens of *E. djakonovi* on the one



Figs 1–7. *Eumerus leleji* sp.n. (1–3) and *E. arkadii* (4–7): 1, 4 — male, lateral view; 2, 5 — male, dorsal view; 3, 6 — female, dorsal view; 7 — female, lateral view.

Рис. 1–7. *Eumerus leleji* sp.n. (1–3) и *E. arkadii* (4–7): 1, 4 — самец, вид сбоку; 2, 5 — самец, вид сверху; 3, 6 — самка, вид сверху; 7 — самка, вид сбоку.



Figs 8–13. *Eumerus tauricus* (8–10), *E. tricolor* (11), *E. leleji* sp.n. (12) and *E. arkadii* (13): 8, 11– female, dorsal view; 9 — male, lateral view; 10 — male, dorsal view; 12, 13 — male genitalia, lateral view.

Рис. 8–13. *Eumerus tauricus* (8–10), *E. tricolor* (11), *E. leleji* sp.n. (12) и *E. arkadii* (13): 8, 11– самка, вид сверху; 9 — самец, вид сбоку; 10 — самец, вид сверху; 12, 13 — гениталии самца, вид сбоку.

hand and the original description of *E. spinimanus* and the drawing of the male genitalia on the other hand [Huo et al., 2007]. However, the male genitalia of *E. leleji* sp.n. does not differ from that of *E. tarsalis* Loew, 1848 [Vujic, Simic, 1999], which has entirely red abdomen or with black apex [Bradescu, 1991]. Other similar species are *E. tjanshanicus* Peck, 1972, which differs from *E. leleji* sp.n. by its very short metatarsus [Peck, 1972]; new species also well differs from *E. ussuriensis* Stackelberg, 1952 by bare eyes (pilose in *E. ussuriensis* [Stackelberg, 1952]). The Far Eastern specimens of *E. leleji* sp.n. differ from Siberian specimens by their paler basal tarsomeres of pro- and mesotarsi.

Eumerus tauricus Stackelberg, 1952

Figs 8–10.

Material examined. 19♂♂, 13♀♀, Khakassia, 10 km E of Shira village, Itkul Lake, 28.VI.2014 [IBSS, VM]; 6♂♂, 1♀, Khakassia, 27 km E of Shira village, 29.VI.2014 [IBSS, VM]; 6♂♂, 6♀♀, Khakassia, Shira Lake, environs of Zhemchuzhnyi village, 1.VII.2014 [IBSS, VM].

Distribution and habitats. Southern Europe, Kazakhstan, southern part of West Siberia (including Altai), Khakassia.

Remarks. This species was additionally described as *Eumerus carasukensis* Barkalov, 1990 [Barkalov, Popov, 2000] from the West Siberia (Novosibirsk Province). Males usually have holoptic eyes that are in contact at one point. Some specimens from Khakassia have almost dichoptian eyes. Stackelberg [1961] used these differences as alternative characters for the species key.

Eumerus tricolor (Fabricius, 1798)

Fig. 11.

Material. 1♂, 2♀♀, Khakassia, 27 km E of Shira village, 29.VI.2014 [IBSS]; 4♀♀, Khakassia, Shira Lake, environs of Zhemchuzhnyi village, 1.VII.2014 [IBSS, VM].

Distribution and habitats. Europe (except taiga and tundra), the Caucasus, Middle Asia, southern part of West Siberia. Steppe, deserts, xeric unwooded sites in temperate forests.

Remarks. Speight [2011] wrote about the distribution of this species across Siberia to Sakhalin without mentioning of the collected material or publications. Peck [1988] pointed out *E. tricolor* in Europe, the Caucasus, the Middle Asia and the Southern Kazakhstan, but did not take into consideration the report of finding of this species in Kuzbass (Sarbal) by Zimina [1981], or Violovitsh [1983], who noted West Siberia as part of the distribution.

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