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**NEW DATA ON THE HOVER-FLIES OF THE GENUS *EUMERUS*
(DIPTERA: SYRPHIDAE) FROM RUSSIA**

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Summary. Three species, *Eumerus montanum* Grković, Radenković et Vujić, 2017, *E. roborovskii* Stackelberg, 1952 and *E. turcmenorum* Paramonov, 1927, are recorded from Russia for the first time. The previously unknown female of *E. roborovskii* is described. New synonymy is proposed: *Eumerus sogdianus* Stackelberg, 1952 = *Eumerus arat* Violovitsh, 1981, **syn. n.**

Key words: Diptera, Syrphidae, *Eumerus*, hover-flies, synonymy, fauna, new record, Russia.

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Резюме. Впервые для России приводятся три вида мух-журчалок: *Eumerus montanum* Grković, Radenković et Vujić, 2017, *E. roborovskii* Stackelberg, 1952 и *E. turcmenorum* Paramonov, 1927. Описана неизвестная самка *E. roborovskii*. Установлена новая синонимия: *Eumerus sogdianus* Stackelberg, 1952 = *Eumerus arat* Violovitsh, 1981, **syn. n.**

INTRODUCTION

The continually increasing interest of dipterologists in the genus *Eumerus* Meigen, 1822 is due primarily to its huge species diversity and practical significance as phytophages (Vujić & Simić, 1999; Steenis *et al.*, 2017; Chroni *et al.*, 2017). Particular attention has been paid to the onion bulb fly *Eumerus strigatus* (Fallén, 1817), the lesser bulb fly *Eumerus funeralis* Meigen, 1822 and similar species that damage agricultural and ornamental plants (Popov, 2011a; Speight *et al.*, 2013).

After his review of the Palaearctic *Eumerus* species (Stackelberg 1961), Stackelberg (1970) added some information about the Russian species in his key to syrphids of the European part of Russia, and further data were added later by Violovitsh (1983) and Mutin (Mutin & Barkalov, 1999) for the Asian part of Russia. The last of these authors did not take into account the revision of Hurkmans (1993), where *Merodon scutellaris* Shiraki, 1968, previously placed by Kuznetsov (1992) in the genus *Eumerus*, was recognized as a member of the genus *Azpeytia*. New faunistic finds of L.V. Zimina in Crimea were noted by Popov

(1997) without re-examining her syrphid collection. Recently Mutin (2016) described a new species *Eumerus leleji* from Siberia and Russian Far East.

Having studied hoverflies of the genus *Eumerus* collected in Siberia, we found species not previously mentioned from the territory of Russia, and have established a new synonym as well. Here we give the differential diagnoses of the discussed species, together with a description of the female of *E. roborovskii*, which has not been described formally so far.

MATERIALS AND METHODS

The paper is based on the private collection of the first author and on the collection of the Siberian Zoological Museum (Institute of Systematics and Ecology of Animals, Novosibirsk). The types of some species described by A.A. Stackelberg and N.V. Violovitsh were examined in their depositories. The examined specimens are kept in the following collections: PMC – Private collection of V.A. Mutin (Komsomolsk-na-Amure); SZMN – Siberian Zoological Museum of the Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences (Novosibirsk); ZIN – Zoological Institute of the Russian Academy of Sciences (St. Petersburg).

The text is supplied with photos of the flies and figures of the male genitalia, 4th sternum of the male abdomen and the antennae of males and females. The photographs were taken with a Canon EOS 600D attached to Zeiss Stemi-2000 stacked with Helicon Focus, as well as with the stereomicroscope ZEISS SteREO Discovery V12 and digital camera AxioCam MRc, and stacked using CombineZM. The final illustrations were post-processed for contrast and brightness using Adobe® Photoshop® software.

Diagnoses, descriptions and illustrations were made from Siberian specimens, except for the male *Eumerus turcmenorum* collected in Repetek Nature Reserve (Turkmenistan). All drawings are original and were prepared with the aid of an ocular grid and graph paper. The terminology used for the description is based mainly on Thompson (1999).

RESULTS

Eumerus montanum Grković, Radenković et Vujić, 2017

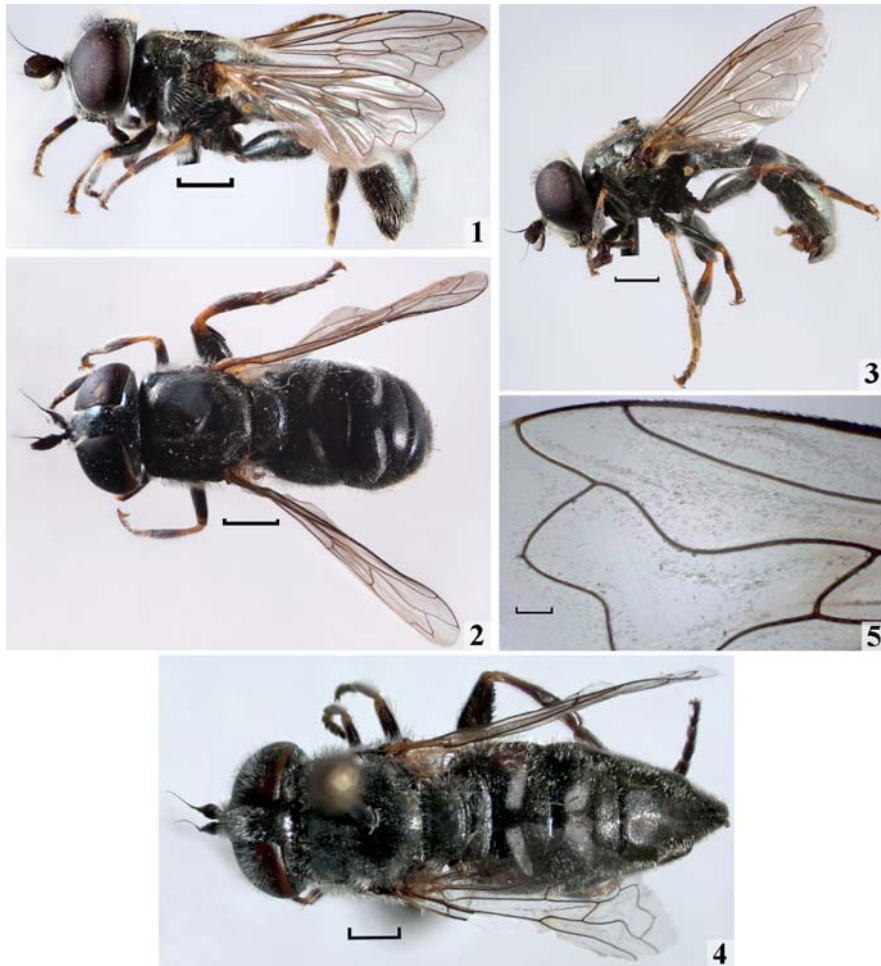
Figs 1–3, 10–13

Eumerus montanum Grković, Radenković & Vujić, 2017: 182, holotype: ♂, **Montenegro**: “[Durmitor Mountain], Komarnica, beside Poščensko Lake [42°58'39.2"N, 19°04'15.9"E], [1045 m.a.s.l.], 16.VIII 2015, leg. Vujić A.” (not examined).

SPECIMENS EXAMINED. **Russia:** Omskaya oblast: environs of Omsk City, 14.VI 1984, 1 ♂ (A. Barkalov); Novosibirskaya oblast: 29 km SW of Karasuk Town, Biological station of ISEA, 12–19.VI 1988, 11 ♂, 1 ♀ (I. Kharitonova); same place, 8–22.VI 1982; 6.VII 1990; 28.VI 2002; 6.VII 2004; 4.VII 2004, 4 ♂, 4 ♀ (A. Barkalov); Ordynskij District, 25.VIII 1958, 1 ♂ (O. Ivanovskaya); Altai Republic: Gorno-Altai Town, 22.VI 1983, 1 ♂ (A. Barkalov); Cherga settlement, 20-30.VIII 1992, 1 ♂ (V. Marchenko); Terekta settlement, 3.VII 1973, 1 ♂ (L. Levina); Republic of Buryatia: Baikal Nature Reserve, Tankhoi, 26.VI 1980, 1 ♂ (A. Barkalov) [SZMN].

DIAGNOSIS. This species belongs to the *Eumerus strigatus* species-group (Speight *et al.*, 2013; Speight, 2016; Grković *et al.*, 2017). All members of the species-group have the following characters: eyes with short sparse pile; male with holoptic eyes; ventral surface of metatibia with a shallow, longitudinal ridge carrying short, black procumbent setulae in the basal half of its length; abdomen black with pairs of lunulate-shaped oblique maculae of silver-grey pollinosity on 2nd, 3rd and 4th terga.

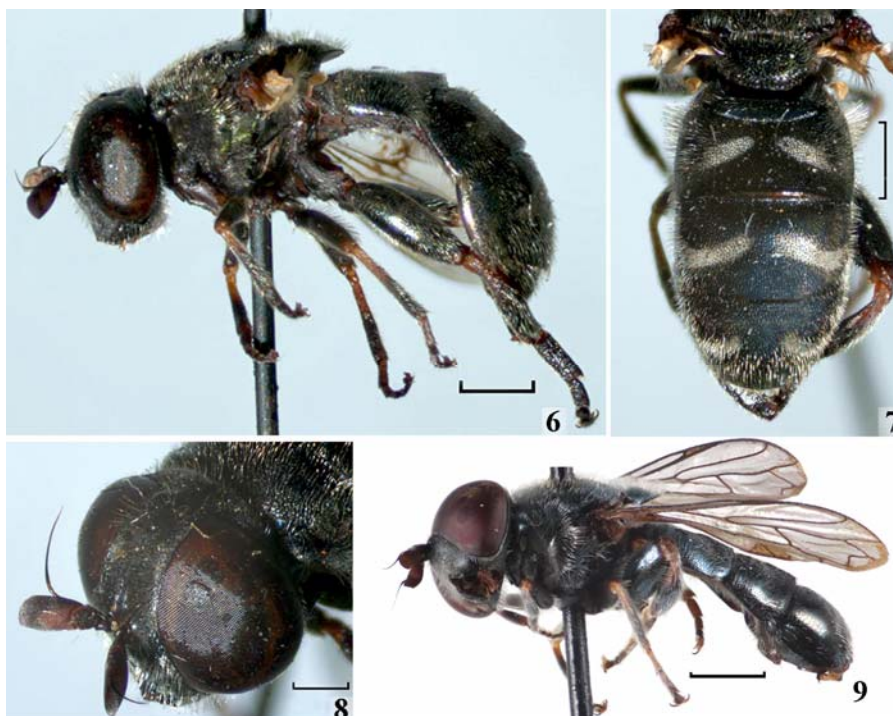
Eumerus montanum is extremely similar to *E. consimilis*, *E. sogdianus* and *E. strigatus*, all of which have the metafemur without a baso-ventral tubercle, large oval basoflagellomere in females and pale pile on the 8th sternum in males. The male of *E. montanum* is easily distinguished by the shape of the genitalia and the form of the 4th sternum (Figs 12, 13). The upper lobe of surstylus long and broadened apically. Posterior margin of 4th sternum with deep cut, similar to *E. sogdianus*.



Figs 1–5. *Eumerus* spp.: 1–3 – *E. montanum*; 4–5 – *E. turcmenorum*; 1 – female, lateral view; 2, 4 – female, dorsal view; 3 – male, lateral view; 5 – wing membrane. Scale bars: 1–4 = 1 mm; 5 = 0,2 mm.

The female of *E. montanum* does not differ essentially from *E. consimilis*, *E. sogdianus* and *E. strigatus*. In addition to the original description of *E. montanum*, Grković *et al.* (2017) gave a table for diagnosing related species, which is unsuitable for determining the above-mentioned species except for a single character: the form of the ocellar triangle. The female

E. montanum has an isosceles ocellar triangle, longer than wide. The female *E. sogdianus* has a similar state of this character, whereas those of *E. consimilis* and *E. strigatus* have equilateral ocellar triangles. A second character of this table may be useful in distinguishing females, namely longer pilosity on the ventral surface of the metafemur (Grković *et al.*, 2017); the pile length in *E. montanum* is about half as long as the depth of the metafemur, whilst that of *E. consimilis*, *E. sogdianus* and *E. strigatus* is shorter, only about 1/3 the depth of the metafemur.



Figs 6–9. *Eumerus roborovskii*: 6 – female, lateral view; 7 – female abdomen, dorsal view; 8 – female head, dorso-frontal view; 9 – male, lateral view. Scale bars: 6, 7, 9 = 1 mm; 8 = 0,5 mm.

Siberian specimens of *E. montanum* have variable shapes of the ocellar triangle, whereas the pattern of pollinosity on the frons and occiput is rather constant. The pollinosity of the frons forms narrow silver strips along the eyes, whilst the medial part of the frons is shiny (Fig. 10). However, this character is found only among small females of *E. strigatus* from the Far East; normally they are more or less densely pollinose between the lateral silver stripes (Fig. 19). Female *E. sogdianus* have less developed pollinosity on the medial part of the frons (Fig. 21).

REMARKS. Males of this species have not been found together with other males of the *strigatus* species-group in the same places, and therefore females collected simultaneously are considered by us to be conspecific.

DISTRIBUTION. Russia (new record): West Siberia (Omskaya oblast, Novosibirskaya oblast), Altai, Buryatia. – Southern Europe (Montenegro, Greece).

***Eumerus roborovskii* Stackelberg, 1952**

Figs 6–9, 14–18

Eumerus roborovskii Stackelberg, 1952: 398, holotype: ♂, **China**: «Бугас у Хами, на ЮВ от Тянь-Шаня, 7 IX 1895 (Роб[оровский], Козлов)» [ZIN] (examined).

SPECIMENS EXAMINED. **Russia**: Zabaykalsky krai: 70 km SW of Chita, Sokhondo, 30.VII 1984, 1♀ (V. Makarkin); Tyva Republic: Dyttykh-Khem River, 12 km SE Samagaltai settlement, 9.VII 2013, 1♂, 1♀ (M. Proshchalykin & V. Loktionov); the same place, 17.VII 2014, 1♀ (M. Proshchalykin, A. Lelej & V. Loktionov) [PMC].

DIAGNOSIS. This species belongs to the *E. strigatus* species-group and is more similar than *E. funeralis* Meigen, 1822 is to *Eumerus consimilis*, *E. montanum*, *E. sogdianus* and *E. strigatus* in not having a baso-ventral tubercle on metafemur. The visibly narrower basoflagellomere of *E. roborovskii* is the main difference from these other species; the male basoflagellomere is 2.5 times longer than wide (Fig. 15), and the female basoflagellomere is 1.5 times longer than wide (Figs 8, 16). For example, male *E. sogdianus* and *E. strigatus* have almost oval basoflagellomeres, with a ratio of length:width of 4:3. The female basoflagellomere of *E. sogdianus* is rather rounded, its length is slightly more than its width. The female *E. strigatus* has a rounded basoflagellomere. Like *E. strigatus*, the female *E. roborovskii* has an equilateral ocellar triangle, differentiating them at least from European specimens of *E. sogdianus* and *E. montanum* with their isosceles ocellar triangles. The male genitalia of *E. roborovskii* are similar to *E. strigatus*, but the inner tooth on the upper lobe of surstylus is poorly developed (Fig 18). In addition, male *E. roborovskii* have the posterior margin of the 4th sternum sharply v-shaped with a small medial notch (Fig. 17).

FEMALE (nova). Body length 6,8–8,0 mm, wing length 5,5–6,0 mm.

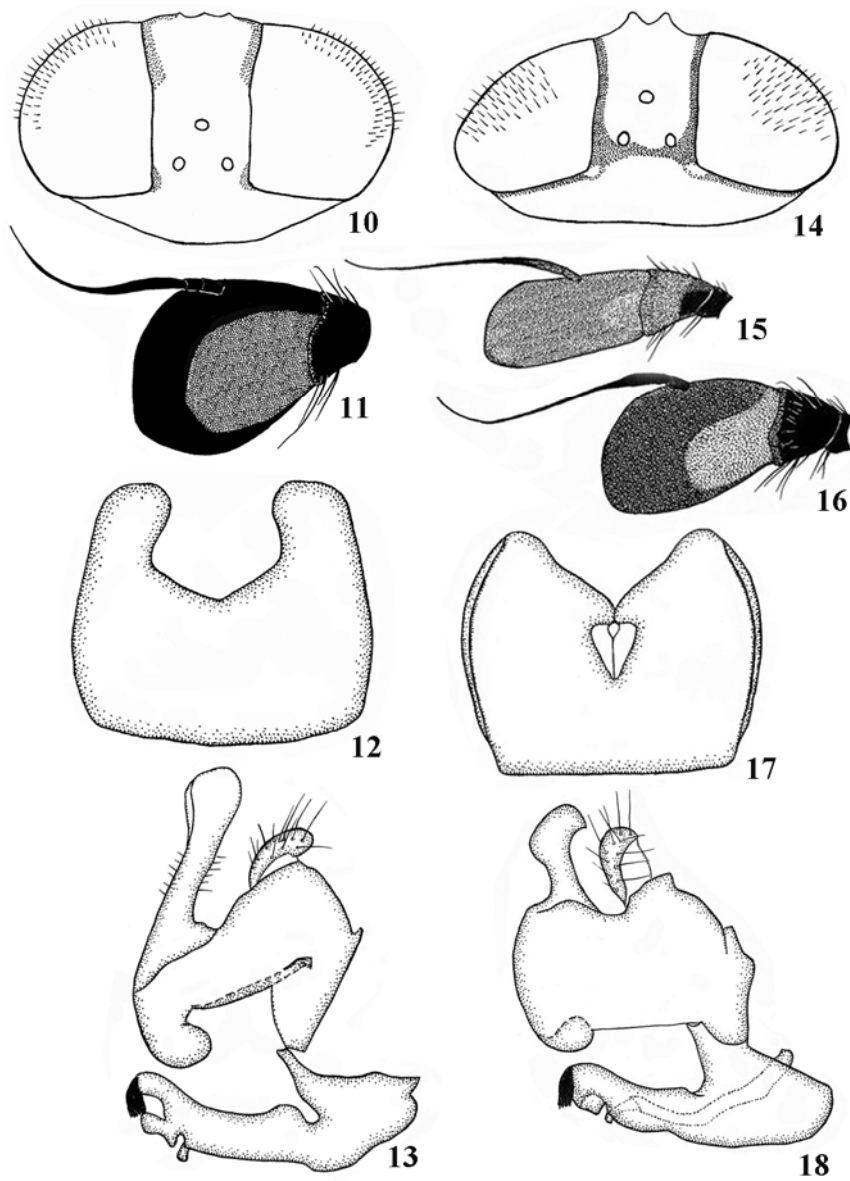
Head. Face weakly widened ventrally, black, dense greyish pollinose, except for gene and epistoma under tentorial groove shiny, with erected white pile. Frons, vertex and occiput behind ocellar triangular weakly shiny black except greyish pollinose in the form of narrow stripes of along eyes, with short erect white or yellowish pile, sometimes with a few black pile near antenna base and black pile on ocellar triangle. Minimal width of frons more than 1/4 the width of the head. Ocellar triangle equilateral (Fig. 14). Scapus and pedicel black; basoflagellomere mainly dark brown except baso-ventral part red or red-brown, distinctly longer than its width with a ratio of length:width of 3:2 (Figs 8, 16); arista black. Eyes with very short sparse white pile.

Thorax. Postpronotum brightly shiny. Mesonotum black, with bluish or steel reflections, with short semi-erect yellowish pile dorsally and longer white pile laterally. Scutum with more or less broad submedial vittae of greyish pollinose before transverse suture. Legs: coxae and metatrochanter black; pro- and mesotrochanter brown; femora black with reddish apex; metafemur thickened, with longer white pile ventrally, as long as 1/2 of the femur depth, with a pair of spinose ridges apico-ventrally; tibia mainly black, except basal 1/3 reddish, metatibia with baso-ventral ridge of shallow procumbent black setulae; tarsi black dorsally and reddish ventrally, basotarsomere of metatarsus shorter than total length of subsequent tarsomeres. Wings translucent, membrane without visible spots and lacking in microtrichia.

Abdomen a little broader than mesonotum, black with three pairs of oblique grey pollinose maculae on 2nd, 3rd and 4th terga; maculae on 3rd tergum rather bigger than others; 2nd and 3rd terga with white erect pile laterally; 4th tergum in the main and 5th tergum entirely with whitish pile; other parts of abdomen with shorter adpressed black pile.

REMARKS. The species was described by Stackelberg (1952) on the basis of two males from China (Xinjiang Uygur Autonomous Region) and Uzbekistan (Kattakurgan Region). Later Peck (1988) noted this species for other territories of Central Asia.

DISTRIBUTION. Russia (new record): Zabaykalsky krai, Tyva Republic. – Kirghizia, Tajikistan, Uzbekistan, China.



Figs 10–18. *Eumerus* spp.: 10–13 – *E. montanum*; 14–18 – *Eumerus roborovskii*: 10, 14 – head, dorsal view; 11, 16 – female antenna, lateral view; 15 – male antenna, lateral view; 12, 17 – male 4th sternum, ventral view; 13, 18 – male genitalia, lateral view.

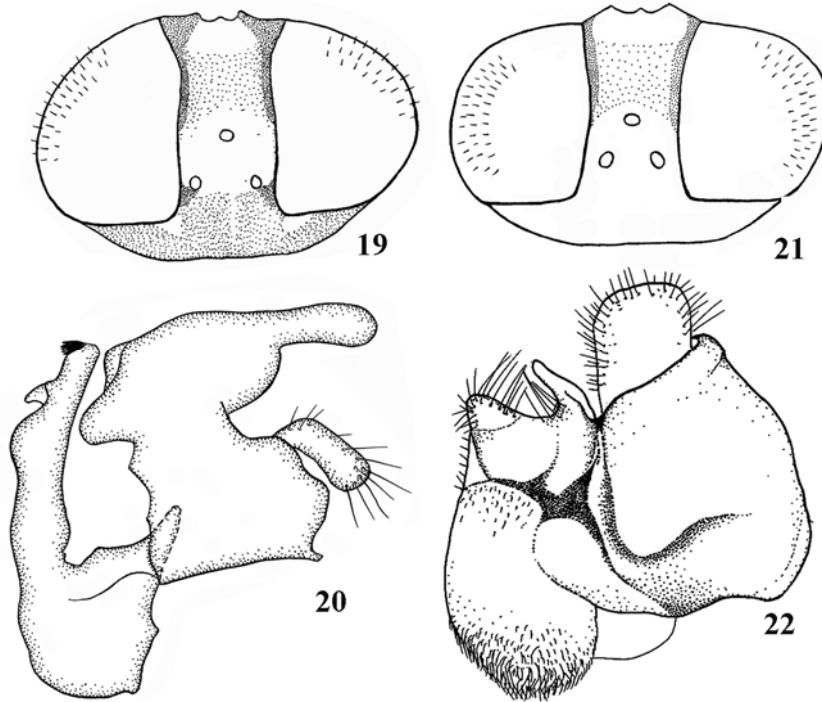
***Eumerus sogdianus* Stackelberg, 1952**

Figs 20–21

Eumerus sogdianus Stackelberg, 1952: 390, lectotype (designated by V. Richter and S. Kuznetsov (2007): ♂, **Tajikistan**: Dushanbe: «Сталинобад, дол. р. Кафирниган 20 V 1943 (Штакельберг)» (examined) [ZIN].

Eumerus arat Violovitsh, 1981: 93, holotype: ♂, **Russia**: Tuva: «Тува, заболоченный берег оз. Амдайгын-Холь, 5.VII 1963 (Н. Виолович)» (examined) [ZIN]; **syn. n.**

SPECIMENS EXAMINED. **Russia**: Novosibirskaya oblast: Karasuk district, environs of Karasuk, 8.VI 1982, 1 ♂ (A. Barkalov); Altai Republic: Gorno-Altai Town, 22.VI 1983, 1 ♂ (A. Barkalov).



Figs 19–22. *Eumerus* spp.: 19 – female head of *Eumerus strigatus*, dorsal view; 20–21 – *Eumerus sogdianus*; 20 – male genitalia, lateral view; 21 – female head, dorsal view; 22 – epandrium of *E. turcmenorum*, lateral view.

DIAGNOSIS. This species belongs to the *E. strigatus* species-group and is very similar to *Eumerus consimilis*, *E. montanum*, *E. roborovskii* and *E. strigatus*. The male can easily be distinguished by the genitalia (Fig. 20) and the form of the 4th sternum from males of these other species. Females of *Eumerus sogdianus*, *E. consimilis*, *E. montanum* and *E. strigatus* do not have stable specific characters to be distinguished, but they all are characterized by their large oval or rounded basoflagellomeres, unlike the female *E. roborovskii* with its elongated basoflagellomere. Female *E. sogdianus* from Europe and Central Asia (Tajikistan)

have an isosceles ocellar triangle. This character is not stable among Siberian females, but they as well as females from Central Asia have a narrower frons with its width in front of the ocellar triangle 4.3-4.5 times less than the head width (Fig. 21).

REMARKS. Comparison of the lectotype of *Eumerus sogdianus* and the holotype of *E. arat* made it possible to establish their species identity, and therefore we synonymize *E. arat* with *E. sogdianus*. The paper of Violovitsh (1981) with the original description of *E. arat* does not contain any mention of *E. sogdianus*. This species was also not included in his key to Siberian syrphids (Violovitsh, 1983).

DISTRIBUTION. Russia: Crime, West Siberia, Tyva Republic. – Europe, Transcaucasus, Kazakhstan, Central Asia, Mongolia, China.

***Eumerus turcmenororum* Paramonov, 1927**

Figs 4–5, 22

Eumerus turcmenororum Paramonov, 1927: 324, syntypes: **Turkmenistan:** 1♀, “Repetek, Transcaspia”, 25.IV 1926, leg. Paramonov; 1♂, in the same place, [1.V 1926], leg. Paramonov.

SPECIMENS EXAMINED. **Russia:** Tyva Republic: Dyttykh-Khem River, 12 km SW Samagaltai settlement, 19.VII 2014, 1♀ (M. Proshchalykin, A. Lelej & V. Loktionov); Tore-Khol’ Lake, 27 km SSW Erzin, 12.VII 2014, 2♀ (M. Proshchalykin, A. Lelej & V. Loktionov). **Turkmenistan:** Repetek, 16.IX 1978, 1♂ (A. Lelej) [PMC].

DIAGNOSIS. The species differs from the majority of *Eumerus* spp. by its wing membrane with strongly reduced microtrichia (Fig. 5). Face, frons and vertex with white dense pile. Antennae from reddish to almost black in the smallest females. Basoflagellomere with a pattern that includes a subbasal arched crease connected with a few radial creases on the distal part. Abdomen with three pairs of pale pollinose maculae on 2nd, 3rd and 4th terga. Maculae of 3rd and 4th terga are more oblique with teardrop-shaped medial top, that is expressed especially in females (Fig. 4). The lateral swollen surface of 2nd tergum with a brownish subtriangular mark, more or less reduced in some females. Metafemur with a pair of setate flanges apico-ventrally divided by a bare groove. Anterior flange more carinate, with 11–12 strong long setae in the male and 7–8 long setae in the female. Posterior flange with a smaller number of setae. Metatibia with a pair of setulate flanges baso-ventrally.

REMARKS. 7♂ and 4♀ from Repetek (Turkmenistan) were taken by Paramonov for describing the species. At present one male and one female, designated as syntypes, are kept in the I.I. Schmalhausen Institute of Zoology (the National Academy of Sciences of Ukraine, Kiev) (Popov, 2011b). G.V. Popov assumes that the other syntypes were lost. We have studied the genitalia of the male, collected in the type-locality (Fig. 22). The male complies fully with the original description of *Eumerus turcmenororum* and characters of the male syntype, which was examined by G.V. Popov at our request. Our females are also similar with syntype females. This species was mentioned in the revision of Palaearctic species of the genus *Eumerus* (Stackelberg, 1961) from sandy deserts of the Middle Asia and Kazakhstan.

An incorrect spelling of the species epithet as “*turcmenororum*” was probably used by Stackelberg (1949) for the first time. This change does not comply with the Code of International Zoological Nomenclature (Article 32, paragraph 32.5.1).

DISTRIBUTION. Russia (new record): Tyva Republic. – Central Asia (Turkmenistan), West Kazakhstan.

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