

## To the fauna of dragonflies (Odonata) of the Mangistauskaya Oblast, southwestern Kazakhstan

### Материалы к фауне стрекоз (Odonata) Мангистауской области юго-западного Казахстана

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**Ключевые слова:** Odonata, Мангистауская область, Казахстан, родниковые водоёмы.

**Key words:** Odonata, Mangistauskaya Oblast, Kazakhstan, spring water reservoir.

**Abstract.** Data gained from specimens and photographs of dragonflies with known locations, as well as literary sources, is summarized for the dragonfly fauna of the Mangistauskaya Oblast of the south-western part of Kazakhstan. Data are provided for 22 species, of which 6, *Sympetma fusca* (Vander Linden, 1820), *S. gobica* Förster, 1900, *S. paedisca* (Brauer, 1877), *Crocothemis erythraea chaldaeorum* Morton, 1920, *Selysiothemis nigra* (Vander Linden, 1825) and *Orthetrum cancellatum* (Linnaeus, 1758), are recorded from the region for the first time, and that *Sympetrum flaveolum* (Linnaeus, 1758), previously registered for the region is erroneous. Under extremely arid areas lacking rivers and lakes, dragonflies live in occasional reservoirs formed by springs.

**Резюме.** Обобщены сведения по фауне стрекоз Мангистауской области (юго-западный Казахстан). Используются данные по коллекционным материалам и на основании фотографий стрекоз с известными местами съёмки, а также литературные источники. Приводится 22 вида, из них 6 — впервые: *Sympetma fusca* (Vander Linden, 1820), *S. gobica* Förster, 1900, *S. paedisca* (Brauer, 1877), *Crocothemis erythraea chaldaeorum* Morton, 1920, *Selysiothemis nigra* (Vander Linden, 1825) и *Orthetrum cancellatum* (Linnaeus, 1758). Установлено, что *Sympetrum flaveolum* (Linnaeus, 1758) для исследуемого региона ранее был указан ошибочно. В крайне засушливых условиях, при отсутствии рек и озёр, стрекозы обитают в редких водоёмах, образованных родниками.

## Introduction

The dragonfly fauna of Kazakhstan has been relatively well studied by now. At the beginning of the century, a generalizing work was published, in which 86 species were indicated [Chaplina et al., 2007]. In the course of further research, information on the distribution of many species of dragonflies was significantly replenished and 8 more species were registered [Borisov, Haritonov, 2007, 2008; Kosterin, Borisov, 2010; Kosterin, Gorbunov,

2010; Schröter, Borisov, 2012; Haritonov, Borisov, 2013; Borisov, 2014; Borisov, Kosterin, 2014; Kosterin, 2015, 2022; Borisov, Kazenas, 2017; Dumont et al., 2018; Borisov, Dumont, 2021; Borisov et al., 2022].

Nevertheless, individual regions of Republic of Kazakhstan in odonatological terms remain very poorly studied, for example, the Mangistauskaya Oblast in the south-west of the Republic. Until recently, there was no information about dragonflies in this area. In the work mentioned above [Chaplina et al., 2007: 352] the map included three localities for this territory (Loc. 60, 63, 74), where dragonflies were supposedly collected, but in the annotated list of species these locations were indicated for neither of them. Probably, the species found there were assigned to the categories «common in most of Kazakhstan» or «common across Kazakhstan», for which (according to the style of the article) locality numbers are not provided and, thus, provenance of these species remained unknown.

The first information about findings in the Mangistauskaya Oblast of 7 species of dragonflies was given according to the collection materials of the Zoological Institute of the RAS (Saint Petersburg) and the Institute of Systematics and Ecology of Animals of the SB RAS (Novosibirsk) [Borisov, Haritonov, 2007, 2008]. Then, 8 species (one of them in error) were indicated according to the collections of P.G. Gorbunov in the Ustyurt Reserve [Kosterin, Gorbunov, 2010]. Later, according to the collections of the Institute of Zoology of the Ministry of Education and Science of the Republic of Kazakhstan (Almaty), three more species were indicated for the same reserve, namely: *Anax ephippiger* (Burmeister, 1839) [Borisov, 2011], *Anax parthenope* (Selys, 1839) [Borisov, 2012] and *Sympetrum tibiale* (Ris, 1897) [Dumont et al., 2018].

Subsequently, all data from the sources listed above were summarized in the Atlas of dragonflies of Western

and Central Asia and 17 species were indicated for the studied region [Boudot et al., 2021]. The sequence of studies of the odonatofauna of the Mangistauskaya Oblast and the revealed species of dragonflies are presented in Table 1. It should be noted that in the papers by Borisov and Haritonov [2007, 2008] and Boudot et al. [2021], the localities of dragonflies are shown only as dots on medium-scale contour maps, without explanation in the text.

The purpose of our work is to summarize the available information, both published and unpublished, about dragonflies in the Mangistauskaya Oblast which includes exact localities, including new, previously unpublished data on collection materials from the Institute of Zoology of the MES of the Republic of Kazakhstan.

## Area, material and research methods

Mangistauskaya Oblast occupies a vast territory (165600 km<sup>2</sup>) in the south-west of Kazakhstan. The study area covers its southern half — the low mountains of Mangistau (another name for Karatau) and the Mangistau Plateau, located on the Mangyshlak (or Mangistau) Peninsula, and the territory of the Ustyurt Reserve, including the Western Chink (escarpment) of the Ustyurt plateau and the sands of Karynzharyk.

According to the climatic and geomorphologic conditions, the region belongs to the continental South Turanian desert zone [Chupakhin, 1968]. The temperature level is quite high in all periods of the year. According to the data for the Ustyurt Reserve, the average annual temperature is +11 degrees, the absolute maximum temperature is +45...+47 °C, the minimum is -24...-34 °C. A feature of the temperature regime in the warm period of the year is a large difference between the temperature of day and night, reaching 26–28 degrees. The duration of the frost-free period is 190 days [Plakhov, 2006].

The region as a whole is characterized by waterlessness (Figs 1, 2). There are no rivers or lakes and very few sources of fresh water. Water is found only in the form of groundwater, which in some places comes to the surface in the form of springs, near which small open reservoirs occasionally form. Many springs are salty. In some places there are seasonal (temporary) reservoirs formed due to rainwater accumulating in depressions, on takyr and sors. However, the water in such reservoirs, as a rule, evaporates already by the beginning or by the middle of the summer. Dragonflies inhabit rare water bodies formed by springs (often brackish) and accompanying artificial water bodies (ponds) (Figs 3, 4). Such habitats are often isolated by vast desert expanses.

The article uses materials from the collections of the Institute of Animal Systematics and Ecology of the

Table 1. The sequence of studying the odonatofauna of the Mangistauskaya Oblast and the indicated species. *Sympetrum flaveolum* is erroneously listed in Kosterin, Gorbunov [2010], Boudot et al. [2021].  
Таблица 1. Последовательность изучения одонатофауны Мангистауской области и указанные виды. *Sympetrum flaveolum* указан ошибочно в работах [Kosterin, Gorbunov, 2010; Boudot et al., 2021].

Species	References					
	Borisov, Haritonov, 2007, 2008	Kosterin, Gorbunov, 2010	Borisov, 2011, 2012	Dumont et al., 2018	Boudot et al., 2021	This paper
<i>Lestes macrostigma</i> (Eversmann, 1836)	+	–	–	–	+	+
<i>Sympetma fusca</i> (Vander Linden, 1820)	–	–	–	–	–	+
<i>S. gobica</i> Förster, 1900	–	–	–	–	–	+
<i>S. paedisca</i> (Brauer, 1877)	–	–	–	–	–	+
<i>Erythromma viridulum</i> (Charpentier, 1840)	+	–	–	–	+	+
<i>Ischnura elegans</i> (Vander Linden, 1820)	+	–	–	–	+	+
<i>I. evansi</i> Morton, 1919	–	+	–	–	+	+
<i>I. fontaineae</i> Morton, 1905	+	+	–	–	+	+
<i>Anax ephippiger</i> (Burmeister, 1839)	–	+	+	–	+	+
<i>A. parthenope</i> (Selys, 1839)	–	–	+	–	+	+
<i>Lindenia tetraphylla</i> (Vander Linden, 1825)	–	–	–	–	+	+
<i>Crocothemis erythraea chaldaeorum</i> Morton, 1920	–	–	–	–	–	+
<i>C. servilia</i> (Drury, 1773)	–	+	–	–	+	+
<i>Orthetrum brunneum</i> (Fonscolombe, 1837)	+	–	–	–	+	+
<i>O. cancellatum</i> (Linnaeus, 1758)	–	–	–	–	–	+
<i>O. cancellatum. anceps</i> (Schneider, 1845)	+	–	–	–	+	+
<i>O. sabina</i> (Drury, 1773)	+	–	–	–	+	+
<i>Pantala flavescens</i> (Fabricius, 1798)	–	+	–	–	+	+
<i>Selysiotthemis nigra</i> (Vander Linden, 1825)	–	–	–	–	–	+
<i>Sympetrum flaveolum</i> (Linnaeus, 1758)	–	in error	–	–	in error	–
<i>S. fonscolombii</i> (Selys, 1840)	–	+	–	–	+	+
<i>S. meridionale</i> (Selys, 1841)	–	+	–	–	+	+
<i>S. tibiale</i> (Ris, 1897)	–	–	–	+	+	+

Siberian Branch of the Russian Academy of Sciences (Novosibirsk) (further ISEA) (6 species), the Zoological Institute of the Russian Academy of Sciences (Saint Petersburg) (further ZIN) (1 species) and the Institute of Zoology of the Ministry of Education and Science of the Republic of Kazakhstan (Almaty) (further IZRK) (13 species). In addition, individual locations are given on the basis of photographs of dragonflies (5 species). Data on the localities of dragonflies in the Ustyurt Nature Reserve [Kosterin, Gorbunov, 2010] given in full. Additionally O.E. Kosterin and P.G. Gorbunov (personal communication) specified the coordinates of one of the dragonfly localities, and also provided a photo of the dragonfly *Sympetrum fonscolombii* (Selys, 1840) for species identification.

The geographic coordinates of the places where dragonflies were collected from the collection materials were established using the Google Earth program. Localities are shown on the map (Fig. 5). The map was prepared using MapCreator 3.

The present work is registered in ZooBank (www.zoobank.org) under LSID urn:lsid:zoobank.org:pub:3D5F37F5-379E-458F-A3A6-798BE4D645AD.

#### LIST OF LOCALITIES INCLUDING DRAGONFLY RECORDS AND PHOTOS

**Loc. 1.** Northern foothills of Western Mangistau Mountains (another name for Karatau), about 20 km northwest of Shetpe village, Akmysh tract, 44°15' N, 51°59' E, 9–10.VI.2008, collector not specified (IZRK); **Loc. 2.** Southern foothills of Western Mangistau Mountains, 20 km west of Shetpe village, near Otpan Tau mountain, 44°09'42" N, 51°53'44" E, 5.VI.2007, photos, V.L. Kazenas; **Loc. 3.** Southern foot of Western Mangistau Mountains, 18 km west of Shetpe village, vicinity of Amanbulak village, 44°09'42" N, 51°54'55" E, 4.VI.2007, photos, V.L. Kazenas (Fig. 3); **Loc. 3a.** Ibidem, 10.VI.2008, photos, V.L. Kazenas; **Loc. 4.** Southern foot of the Western Mangistau Mountains, 15 km west of Shetpe village, vicinity of Tushchybek village, 44°09'28" N, 51°56'46" E, 10.VI.2008, photos, V.L. Kazenas (Fig. 4); **Loc. 4a.** Ibidem, 12.VI.2008, photos, V.L. Kazenas; **Loc. 5.** Mangyshlak, Aktauskiy village (modern city of Aktau, 43°40'N, 51°10' E), 18.VI.1962, collector unknown (ZIN); **Loc. 6.** Mangystauskaya Oblast, city of Novyy Uzen' (modern city of Zhanaozen), water treatment facilities, 43°20'28" N, 58°48'46" E, 23.VI.1987, collector not specified (ISEA); **Loc. 7.** 62 km northeast of Senek village, Beket-ata Mosque (Oglandy), 43°35'41"N, 54°05'00"E, 31.VII.2004, to the light of an ultraviolet lamp (22.30–23.30), the collector is not specified (IZRK); **Loc. 8.** «Karynzhyark sands, being a hilly sand desert with a rich herbaceous and bush vegetation, were examined 20–30 km from Onere, at Al'ke hut, 16.X.2009» [Kosterin, Gorbunov, 2010: 46]. (Wintering Alke (= Kyzylsengir), 42°49'22" N, 54°07'51" E — Kosterin, Gorbunov, pers. comm.); **Loc. 9.** «Onere (42°36' N, 54°08' E), the largest natural spring (salinity 14 g/l) at the border of a saline and



Figs 1–2. Desert landscapes of the Mangistauskaya Oblast. 1 — a waterless plain with hills and ravines between the city of Zhanaozen and the village of Senek, 2 — the southern part of the Western Ustyurt Chink (Photos by V.L. Kazenas).

Рис. 1—2. Пустынные ландшафты Мангистауской области. 1 — безводная равнина с холмами и оврагами между г. Жанаозен и пос. Сенек, 2 — южная часть Западного чинка Устыурта (Фото В.Л. Казенаса).

gypsum desert at 12 m above sea level. It produces a brook, 6–8 km long, entering Kendyrli Sor from the South; 13.V.2009» [Kosterin, Gorbunov, 2010: 45]; **Loc. 9a.** Ibidem, «15.X.2009» [Kosterin, Gorbunov, 2010: 46]; **Loc. 10.** «Tosotkel (42°59' N, 54°22' E), a 30–40 years old well, left from oil prospecting, situated at 50 m below sea level at the border of the Cretaceous chalk outcrops, forming the depression bottom, and the eastern outposts of the Karynzhyark sands bordering Kendyrli Sor on the West. The well produces a spring, about 1 km long, with water rich in iron and containing some dissolved hydrogen sulphate; with cyanobacteria mats; it enters the central part of Kendyrli Sor from the West, 14–17.V.2009» [Kosterin, Gorbunov, 2010: 45]; **Loc. 11.** Ustyurt Nature Reserve, 60 km east of Akkuduk village, 60 km west-north-west of Tulep village, Kendyrli (Kendyrli) spring, 42°57' N, 54°38' E, 6–8.VII.1987, collector not indicated (ISEA); **Loc. 11a.** Same as Loc. 11, Ustyurt Nature Reserve, Kenderli (Kendyrli) tract, 15–17.VI.2008, collector Mukhanov (IZRK).

## List of dragonfly species collected in the Mangistauskaya Oblast of Kazakstan with indication of localities

In total, 22 species of dragonflies were registered in the Mangistauskaya Oblast in 11 localities, 6 of them — for the first time for the study area. They are marked with (\*).

### Lestidae

*Lestes macrostigma* (Eversmann, 1836)

Fig. 6.

**Material.** Loc. 2 (photo ♂); Loc. 5 — 1♂.

\**Sympecma fusca* (Vander Linden, 1820)

**Material.** Loc. 1 — 1♀ teneral.

\**Sympecma gobica* Förster, 1900

**Material.** Loc. 11a — 1♂ teneral.

\**Sympecma paedisca* (Brauer, 1877)

**Material.** Loc. 1 — 1♀ teneral.

### Coenagrionidae

*Erythromma viridulum* (Charpentier, 1840)

**Material.** Loc. 6 — 8♂♂, 4♀♀; Loc. 11a — 1♂.

*Ischnura elegans* (Vander Linden, 1820)

Fig. 7.

**Material.** Loc. 3a (photo); Loc. 4 (photo); Loc. 4a (photo); Loc. 6 — 1♀.

**Notes.** For the problem of subspecies identification of *I. elegans*, see Schröter et al. [2015], Kosterin, Ahmadi [2018], Malikova, Kosterin [2019], Onishko, Kosterin [2022].

*Ischnura evansi* Morton, 1919

**Material.** Loc. 10 — 2♂♂, 2♀♀.

*Ischnura fountaineae* Morton, 1905

**Material.** Loc. 1 — 1♀; Loc. 6 — 1♀; Loc. 10 — 2♂♂, 3♀♀.



Figs 3–4. Dragonfly habitats at the southern foothills of the Western Mangystau (Karatau) mountains. 3 — Groundwater outlet in the vicinity of the Amanbulak settlement (Loc. 3); 4 — A pond in the vicinity of the village of Tushchybek (Loc. 4). Photo by V.L. Kazenas.

Рис. 3–4. Местобитания стрекоз у южного подножия гор Западный Мангистау (Каратау). 3 — выход грунтовых вод в окрестностях пос. Аманбулак (Лок. 3); 4 — пруд в окрестностях пос. Тушчыбек (Лок. 4). Фото В.Л. Казенаса.

### Aeshnidae

*Anax ephippiger* (Burmeister, 1839)

**Material.** Loc. 9 — 1♂; Loc. 11a — 2♂♂, 3♀♀, all individuals are old, with damaged wings.

*Anax parthenope* (Selys, 1839)

Fig. 8.

**Material.** Loc. 1 — 1♀; Loc. 4 (photo); Loc. 7 — 1♀, at night to the light of an ultraviolet lamp.

**Notes.** At present, the species is considered to be monotypic. The closely related *A. julius* Brauer, 1865 replaces *A. parthenope* in the Eastern Palearctic [Kalkman, Proess, 2015].

### Gomphidae

*Lindenia tetraphylla* (Vander Linden, 1825)

**Material.** Loc. 7 — 1♂, 1♀, at night to the light of an ultraviolet lamp.

### Libellulidae

\**Crocothemis erythraea chaldaeorum* Morton, 1920

**Material.** Loc. 1 — 1♀; Loc. 11a — 1♀.

**Notes.** For the subspecific status of *C. e. chaldaeorum* see Borisov, Haritonov [2008], Kosterin, Ahmadi [2018].

*Crocothemis servilia* (Drury, 1773)

**Material.** Loc. 9 — 1♂.

*Orthetrum brunneum*  
(Fonscolombe, 1837)

Fig. 9.

**Material.** Loc. 1 — 3♂♂, 2♀♀; Loc. 3 (photo); Loc. 3a (photo); Loc. 4 (photo); Loc. 4a (photo); Loc. 11 — 2♂♂, 1♀.

\**Orthetrum cancellatum*  
(Linnaeus, 1758)

**Material.** Loc. 1 — 2♂♂.

*Orthetrum coerulescens anceps*  
(Schneider, 1845)

**Material.** Loc. 11 — 1♂.

**Notes.** For the subspecific status of *O. coerulescens anceps* see Kalkman, Ambrus [2015].



*Orthetrum sabina* (Drury, 1773)

Fig. 10.

**Material.** Loc. 3a (photo); Loc. 11 — 1♂.*Pantala flavescens* (Fabricius, 1798)**Material.** Loc. 8 — 1♀.*\*Selysiothemis nigra* (Vander Linden, 1825)**Material.** Loc. 7 — 1♂, 2♀♀, at night to the light of an ultraviolet lamp.*Sympetrum fonscolombii* (Selys, 1840)

Fig. 11.

*Sympetrum flaveolum* (Linnaeus, 1758): [Kosterin, Gorbunov, 2010], misidentification.**Material.** Loc. 8 — 1♀; Loc. 9a — 2♂♂.*Sympetrum meridionale* (Selys, 1841)**Material.** Loc. 9a — 1♂.*Sympetrum tibiale* (Ris, 1897)**Material.** Loc. 11a — 1♂, 2♀♀, all individuals postteneral.

## Discussion

In the study region, *Lestes macrostigma* (Eversmann, 1836) is known from scarce findings at the foot of the Western Mangistau Mountains (Loc. 2) and from the coast of the Caspian Sea near the city of Aktau (Loc. 5). There are no natural fresh water bodies on the coast of the Mangyshlak Peninsula. Apparently, here *L. macrostigma* lives in water bodies that are more or less saline. The ability of this species to develop in mineralized water bodies, where other local species of dragonflies do not live at all or are very rare, is well known [Jödicke, 1997; Lambret et al., 2009; Boudot, Raab, 2015]. The isolation of the Mangistau findings should also be noted. The nearest localities of *L. macrostigma* are at a considerable distance [Boudot et al., 2021]. The range of this species as a whole is noticeably fragmented, especially strongly in Western and Central Europe, which is well studied in terms of odonatologically [Boudot, Raab, 2015]. These dragonflies are also characterized by significant aperiodic changes in abundance. In some place in some years it can be numerous, in other years it is completely absent here [Jödicke, 1997; Borisov, 2005a; Boudot, Raab, 2015].

All three species of the genus *Sympetma* Burmeister, 1839 have been recorded. They are distinguishable by peculiar annual cycles, obligate wintering in the imaginal phase, a short period of preimaginal development (2–2.5 months) and, in the foothill regions of Middle Asia, seasonal altitudinal migrations. In the hot summer period, individuals from the lowland populations fly to the mountains after metamorphosis and only in autumn return to the plains for wintering and reproduction in early spring [Borisov, 2006; Borisov, Haritonov, 2007]. In the study region, rather early emergence of these dragonflies draws attention. Fresh recently winged (teneral) specimens were caught already on June 9–10 (*S. fusca*, *S. paedisca*, Loc. 1) and 15–17 June (*S. gobica*, Loc.



Fig. 5. Map of the research area in the Mangystauskaya Oblast. Locality numbers correspond to those in the list of localities in the text.

Рис. 5. Карта района исследований в Мангистауской области. Номера локалитетов соответствуют таковым в списке местонахождений в тексте.

11a). In the south-east of Kazakhstan, at approximately the same latitudes, the emergence of all three species was noted no earlier than June 18 [Borisov, 2005b].

The finding of *Ischnura evansi* Morton, 1919 in the Ustyurt Nature Reserve (Loc. 10) is the northernmost one for the species [Kosterin, Gorbunov, 2010]. This location is quite isolated. The nearest localities lie in the Kopetdag in the south of Turkmenistan (more than 500 km) [Borisov, Haritonov, 2007] and in the Arys River valley in the south of Kazakhstan (more than 1000 km) [Borisov et al., 2022]. In this regard, the easternmost finding of *I. evansi* in the province of Inner Mongolia in China (39°40' N, 106°30' E) is also of interest [Dumont, 1996]. It is separated from the nearest locations in the south-east of Kazakhstan by almost 3000 km [Borisov, Dumont, 2021; Boudot, et al., 2021].

*Anax ephippiger* (Burmeister, 1839) belongs to the number of obligate migrants [Lambret, Boudot, 2013; Boudot et al., 2021]. In the Ustyurt Reserve, these dragonflies were found on May 15 (Loc. 9) and June 15–17 (Loc. 11a). In the second case, all individuals were very «old» with severely damaged wings. In females, the wing darkening in the form of a smoky band is well expressed. This species is assumed to have a long (more than a year) period of imaginal life, during which dragonflies migrate [Dumont, Desmet, 1990; Lambret, Boudot, 2013; Dumont, 2014]. Presumably, dragonflies arrived in the Mangistau region from the tropical parts of the range. In autumn, the descendants of immigrants (individuals of the temperate generation), who have developed in Central Asia, migrate south. This is evidenced by the autumn migrations of *A. ephippiger* at the Chokpak Pass in South Kazakhstan [Borisov, 2009, 2011, 2015].

*Pantala flavescens* (Fabricius, 1798) is one of the most famous migrant species among dragonflies. Migration studies using the isotope method have shown that these dragonflies arrive in Central Asia in the spring from East Africa and/or the Arabian Peninsula, and their descendants, developed in summer, migrate back

to the south [Borisov et al., 2020a]. The only female was caught on October 16 in the sands of Karynzhyryk (Loc. 8). Judging by the date, this is an individual of the summer (temperate) generation during the autumn migration to the south.

Like the two previous migrant species, *Sympetrum fonscolombii* (Selys, 1840), is characterized by seasonal

latitudinal migrations of different generations. At present, using the analysis of stable isotopes, it has been established that these dragonflies arrive in Central Asia for breeding from the regions of Southwest Asia located to the south, approximately 36° N. In autumn, individuals of the summer generation (descendants of immigrants) migrate in the opposite direction to the



Figs 6–11. Photos of dragonflies from Mangystauskaya Oblast. 6 — *Lestes macrostigma* (Loc. 2); 7 — *Ischnura elegans* (Loc. 3a); 8 — pair of *Anax parthenope* during oviposition (Loc. 4); 9 — *Orthetrum brunneum* (Loc. 3); 10 — *Orthetrum sabina* (Loc. 3a); 11 — *Sympetrum fonscolombii* (Loc. 8). Photo 6–10 by V.L. Kazenas; photo 11 by P.G. Gorbunov.

Рис. 6–11. Фото стрекоз из Мангыстауской области. 6 — *Lestes macrostigma* (Лок. 2); 7 — *Ischnura elegans* (Лок. 3а); 8 — пара *Anax parthenope* при яйцекладке (Лок. 4); 9 — *Orthetrum brunneum* (Лок. 3); 10 — *Orthetrum sabina* (Лок. 3а); 11 — *Sympetrum fonscolombii* (Лок. 8). Фото 6–10 — В.Л. Казенаса; 11 — П.Г. Горбунова.



south [Borisov et al., 2020b]. Dragonflies of this species, caught on October 15 and 16 in the Ustyurt Nature Reserve (Loc. 8, 9a), can most likely be attributed to autumn migrants that developed further north.

Kosterin and Gorbunov [2010, p. 46] reported on the capture in the Karynzhyryk sands (Loc. 8) of one female of *Sympetrum flaveolum* with reduced basal spots on the wings. The authors of the article kindly provided us with a photograph of this specimen. Without a doubt, the female in the photo belongs to the species *Sympetrum fonscolombii* (Fig. 11). Subsequently, due to this error, *S. flaveolum* was faulty listed for southwestern Kazakhstan in Atlas of the dragonflies and damselflies of West and Central Asia [Boudot et al., 2021].

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