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A DRAGONFLY (ODONATA) COLLECTION FROM THE BOLSHEKHEKHTSIRSKII STATE NATURE RESERVE (KHABAROVSKII KRAI, RUSSIA). II. SEASONS 2006 AND 2007

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[Е. И. Маликова*, О. Э. Костерин**, В. В. Дубатолов***. Коллекция стрекоз (Odonata) из Большехехцирского заповедника (Хабаровский край, Россия). II. Сезоны 2006 и 2007 гг.]

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В 2006 и 2007 г. в Большехехцирском Государственном Природном Заповеднике собрано 36 видов стрекоз. К опубликованным материалам 2005 г. [Kosterin, Dubatolov, 2005] добавилось 14 видов, включая первые находки *Shaogomphus postocularis epophthalmus* (Selys, 1872), *Anisogomphus maacki* (Selys, 1872), *Trigomphus citimus* (Needham, 1931), *Sympetrum risi* Bartenev, 1914 и *Macromia daimoji* Okumura, 1949 в Хабаровском крае (последний вид впервые приводится для территории России в печати). Неправильное определение *Stylurus flavipes* (Charpentier, 1825) в предыдущей публикации исправляется на *Stylurus occultus* (Selys, 1878), который впервые указывается для территории России. Кроме того, 3 вида стрелок дополнительно упомянуты для заповедника в его летописи природы за 1988 г. Таким образом, в границах заповедника на данный момент найден 41 вид.

INTRODUCTION

In the previous communication [Kosterin, Dubatolov, 2005] we reported about Odonata collected by one of us, V. V. Dubatolov, in the Bolshekhekhtsirskii State Nature Reserve and its close surroundings (with one wrong identification). In May-August 2006 and June-September 2007 he spent two more seasons in this Reserve investigating its Lepidoptera fauna and collecting also Odonata, again mostly dispersal individuals in woody areas (females predominating in the collections). Some collections were also made by A. M. Dolgikh. In 2006-2007 they managed to collect 14 species not met within 2005. One species, *Stylurus occultus* (Selys, 1878) was misidentified in (Kosterin, Dubatolov, 2005) as *S. flavipes* (Charpentier, 1825); here we correct it and report *S. occultus* for the first time for the Russian territory. A detailed paper by E. I. Malikova about the record of this species in Russia is forthcoming. So the number of species collected within the Reserve limits for three seasons along with Lepidoptera, that is without special odonatological attention, have now risen to 38 (we do not count *Shaogomphus schmidti* (Asahina, 1956) which was collected in 2005 outside the Reserve). Three more species are mentioned for the Reserve in the unpublished data by S. N. Khlebas (see below), so the total list is increased to 41.

For a description of the research area in Russian see [Мельникова, 2002] and for its brief digest in English see [Kosterin, Dubatolov, 2005]. Most specimens are kept in the collection of the Institute of Systematics and Ecology of Animals of the Siberian Division of the Russian Academy of Sciences, Novosibirsk (SZMN).

THE COLLECTING SITES AND COLLECTORS

Bychikha [Бычиха]: the Bychikha village environs (48°17-18' N 134°48-50' E); collection at light were carried out at the Reserve office within the village (48°18' N 134°49' E).

Sosnenskii: the Sosnenskii Brook [Ключ Сосненский] 5-6 km W of Bychikha, the Ecological Centre of the Reserve (48°17' N 134°45' E).

Chirki: the area of the Chirki River mouth [устье р. Чирки], the Reserve cordon environs (48° 11-12’ N 134° 41’ E).

Belaya: the Belaya River [р. Белая] lower reaches, a valley meadow.

Chirki-Belaya: a road section (about 10 km) from Chirki village to the Belaya River.

Odyr: the Odyr cordon in the Odyr River middle reach.

Osinovaya Rechka: the Osinovaya Rivulet [Осиновая Речка] valley at the ‘Km 19’ road halt, a road through a broad-leafed forest, with some pools with reed patches at sides (48° 19’ N 134° 52’ E).

Kazakevichevo: a KPP [Control Block Post] at Kazakevichevo village [Казакевичевский КПП], a similar environment as above (48° 16’ N 134° 45’ E).

Khekhtsir watershed: the Khekhtsir Range main watershed (crest), spruce/fir/*Betula daurica* forest with gaps, 650 m above sea level.

Collections on 5/VI and in IX 2006 and on 28-30/V, 4-5 and 16/VI, 9, 26 and 31/VII, 21-22/VIII 2007 and in IX 2007 were made by A. M. Dolgikh, all other collections were made by V. V. Dubatolov.

ANNOTATED SPECIES LIST

Calopteryx atrata Selys, 1853.
Chirki: 20/VII 2007 – 1♀.
Not collected in 2005.
Calopteryx japonica Selys, 1869
Chirki-Belaya: 4/VII 2007 – 1♂.
Lestes dryas Kirby, 1890
Bychikha: 10/VIII 2007 – 1♀.
Lestes sponsa (Hansemann, 1823)
Bychikha: 21/VIII 2006 – 1♂; 24/VIII 2006 – 5♂♂; Chirki: 22/VI 2006 – 1♀; Chirki-Belaya: 4/VII 2007 – 1♂.
Sympecma paedisca (Brauer, 1877)
Bychikha: 20/V 2006 – 1♀; 5/VI 2006 – 1♂; 6/VIII 2006 – 1♀; 19/VIII 2006 – 1♂ (by light); 20/VIII 2006 – 1♀ (by light); 21/VIII 2006 – 2♀♀; 24/VIII 2006 – 2♂♂; 6/IX 2006 – 2♂♂; 25/IX 2006 – 1♀; 7/X 2006 – 1♀; 16/VIII 2007 – 10♂♂, 8♀♀; 17/VIII 2007 – 2♀♀; 18/VIII 2007 – 15♂♂, 8♀♀; 19/VIII 2007 – 5♂♂, 9♀♀; 20/VIII 2007 – 17♂♂, 4♀♀; Chirki: 30/V 2007 – 3♀♀; 20/VII 2007 – 1♀; Sosnenskii: 30/VIII 2006 – 1♀; Odyr: 12/IX 2007 – 3♂♂, 2♂♂; 15/IX 2007 – 2♂♂; 17/IX 2006 – 1♂, 2♀♀; 18/IX 2006; Kazakevichevo: 16/VI 2007 – 1♀f.
Coenagrion lanceolatum (Selys, 1872)
Bychikha: 30/VI 2006 – 1♂; Chirki-Belaya: 4/VII – 1♂.
Coenagrion hastulatum (Charpentier, 1825)
Bychikha: 30/VI 2006 – 2♂♂.
Not collected in 2005. *C. hastulatum* is widespread in West Palaearctic in a great range of latitudes. In South Siberia east of Altai it is nearly replaced by the closely related *C. lanceolatum* but at northern latitudes of E Siberia it remains to be common [Маликова, 1995], co-existing with *C. lanceolatum*, predominating over it or excluding it completely, e. g. in Kamchatka [Dumont et al., 2005]. Co-existence of these two species in the area considered is rather a northern feature, peculiar along with quite southern species.
Coenagrion sp.
Bychikha: 12/VI 2006 – 1♀; 30/VI 2006 – 2♀.
Females of the two previous species cannot be unequivocally distinguished.
Coenagrion glaciale (Selys, 1872)
Chirki: 28/V 2007 – 2♂♂; 30/V 2007 – 1♂, 1♀.
Not collected in 2005.
Aeshna juncea (Linnaeus, 1758)
Bychikha: 18/VIII 2006 – 1♂; 21/VIII 2006 – 2♂♂; Odyr: 5/IX 2007 – 2♂♂; 19/IX 2006 – 1♂ (dead on a road).
Aeshna crenata Hagen 1856
Chirki: 9/VIII 2006 – 2 m; Chirki-Belaya: 4/VII – 1♂; Kazakevichevo: 29-30/VIII 2007; Osinovaya Rechka, 1/IX 2007 – 1♂.
Not collected in 2005.
Nihonogomphus ruptus (Selys, 1857)
Bychikha: 6/VIII 2006 – 1♀; 7/VIII 2006 – 1♂; 18/VIII 2007 – 1♀; Chirki: 9/VIII 2006 – 1♂; 9/VII 2007 – 1♂, 2♀♀; Khekhtsir watershed: 26/VII 2007 – 2♂♂.
Shaogomphus postocularis epophthalmus (Selys, 1872)
Osinovaya Rechka: 27/VI 2007 – 1♀.

Not recorded in 2005. This continental subspecies of a species described from Japan is locally abundant in the eastern part of West Siberia (Novosibirsk and Kemerovo Province, Altai Republic) and western part of Central Siberia (Krasnoyarskii Krai) [Kosterin, 2005] but was considered as very rare in the Russian Far East [Маликова, 1995]. Recently quite a number of records of this species appeared for Amur Province: at Svobodnyi Town, Malaya Sazanka village [Malikova, Ivanov, 2003], Kumara terrain and Krasnoe village at the Upper Amur [Маликова, 2005], Blagoveshchensk (8/VI 2007 – 1♀ teneral, E. Malikova leg.); for Primorskii Krai: at Poltavka village [Маликова, Иванов, 2001], the Ilistaya River at Lake Khanka (23/VII 2005 – 4♂♂, A. Streltzov & P. Osipov leg.); and for Khabarovskii Krai: at Sovetskaya Gavan' (2 ♀♀ without date collected by students of the Khabarovsk Pedagogical Institute before 1992). Noteworthy that in 2007 V. V. Dubatolov made another record of this species for Khabarovskii Krai by collecting on 8/VII a male at Ubiennyi Cape (Vaida) 53˚ 13' N 140˚ 21' E, at the Amur River mouth, and V. Yakubovich collected in 2007 a series of this species at Lower Amur near Nikolaevsk [Якубович, 2007]. This is the first published report of this species for Khabarovskii Krai.
Anisogomphus maacki (Selys, 1872)
Chirki: 20/VII 2007 – 1♂, 1♀.
Not recorded in 2005; hitherto has not been reported for Khabarovskii Krai, though found in Malyshevo by V. Yakubovich in 2006 [Якубович, 2007].
Stylurus occultus (Selys, 1878)
Chirki: 20/VII 2007 – 1♂; Kazakevichevo: 21-22/VIII 2007 – 1♂.
This little known species was described from Ordos (China) and later reported from central and northern China and from 4 points in Korea [Lee, 2001]. The specimen from Bychikha collected on 4th August 2005 and reported in [Dubatolov, Kosterin, 2005] as "Stylurus flavipes Charpentier, 1825)" in fact belonged to this species too.
Sieboldius albardae (Selys, 1886)
Chirki: 22/VI 2006 - 1 teneral ♀ and exuvium.
Not collected in 2005.
Trigomphus nigripes (Selys, 1887)
Sosninskii: 26/VI 2006 – 1♂;
Trigomphus citimus (Needham, 1931)
Belaya: 4/VII 2007 – 1♀; Chirki-Belaya: 4/VII – 1♀.
Not collected in 2005. For the first time reported for Khabarovskii Krai. The species was known hitherto in Russia only from Primorye: Spassk: 14/VI 1961 – 1♂, 1♀ [Маликова, 1995]; Nadezhdinskii district, 7 km W of Venevitinovo village, an Ananievka (Elduga) River oxbow (Надеждинский р-н, 7 км З с. Венивитиново, оз.-курья р. Ананьевка (Эльдуга): 28/VII 1998 – 3♂♂ (E. Malikova leg.); Lazo village, the Lazovka River: 27/VI 2006 – 2♂♂, 2♀♀, 18 exuvia (E. Malikova leg.) [Маликова, 2007].
Cordulia aenea amurensis Selys, 1887
Bychikha: 8/VIII 2006 – 1♂, 5/VI 2007 – 1♂, 1♀; 20/VI 2007 – 1♀; Chirki: 30/V – 2♂♂, 1♀.

Both females have a little bit of amber at the bases of both wings and one male in the anal triangles of hind wings.

Somatochlora graeseri Selys, 1887

Bychikha: 24/VIII 2006 – 1♂; 10/VIII 2007 – 1♂; 18/VIII 2007 – 1♀ (the wings are strongly smoked towards tips); Sosnenskii: 30/VIII 2006 – 1♂.

Not collected in 2005.

Somatochlora japonica Matsumura, 1911 (=*exuberata* Bartenev, 1911)

Bychikha: 27/VIII 2006 – 1♂.

Epitheca bimaculata (Charpentier, 1825)

Bychikha: 29/V 2006 – 1♀; 5/VI 2007 – 1♀; Chirki: 9/VII – 1♀; Osinovaya Rechka: 27/VI 2007 – 1♂.

Macromia amphigena fraenata Martin, 1907

Chirki: 22/VI 2006 – 1♂, 1♀; 9/VII 2007 – 1♂.

Macromia daimoji Okumura, 1949

Bychikha: 31/VII 2007 – 1♀.

The specimen is broken: one fore wing is missing, the others detached, the head is detached and somewhat squashed, the thorax completely broken, the abdomen entire. Identification is based on a specific yellow pattern of the frons, with two widely set rounded yellow spots and larger yellow spots at the lower lateral angles, and a strong development of the abdominal yellow pattern (although not so strong as in *M. manchurica* Asahina, 1964, that is without broad yellow rings), with the spot on tergite 7 occupying 3/4 of the tergite length. The wings have an amber tint throughout: the hind wing have an amber basal spot almost reaching the triangle and the amber tint throughout gradually increasing to the wing tip; on the fore wing the basal amber spot extends to about halfway to the nodus and its diffuse projection between Sc and R reaches the node, then the tint is increased distally of the node and M.

The species was hitherto reported only from Japan and Korea [Lee, 2001], but recently one specimen was collected in Ussurijsk vicinities by Shin-ishi Suda (personal communication, unpublished) and one more in Primorye: the Ilistaya River at Lake Khanka: 23/VII 2005 – 1♂ (A. Streltzov & P. Osipov leg.). The latter specimen, identified by the first author, is kept in the collection of Blagoveshchensk State Pedagogical University. So this is the third record of the species in the territory of Russia, and the first published report.

Pantala flavescens (Fabricius, 1798)

Bychikha: 18/VIII 2006 – 1♀; 27/VIII 2006 – 1♂; Chirki: 20/VII 2007 – 1♀.

Not collected in 2005.

Libellula quadrimaculata Linnaeus, 1758

Bychikha: 5/VI 2007 – 1♀; Chirki: 30/V 2007 – 1♀.

Sympetrum croceolum (Selys, 1883)

Bychikha: 5/X 2006 – 1♂; Chirki: 20/VII 2007 – 1♂; Khekhtsir watershed: 26/VII 2007 – 1♀.

Sympetrum uniforme (Selys, 1883)

Bychikha: 20/VIII 2006 – 1♂; Chirki: 20/VII 2007 – 1♀; Odyr: 13/IX 2006 – 2♀♀; 17/IX 2006 – 1♂, 1♀f; 7/X 2006 – 1♂; Osinovaya Rechka, 1/IX 2007 – 1♀; Kazakevichevo: 31/VIII-1/IX 2007 – 1♀; Khekhtsir watershed: 26/VII 2007 – 1♀.

Not collected in 2005.

Sympetrum flaveolum (Linnaeus, 1758)

Bychikha: 6/VIII 2006 – 1♂, 1♀; 18/VIII 2006 – 1♀; 20/VIII 2006 – 1♂, 1♀; 21/VIII 2006 – 1♂; 24/VIII 2006 – 1♀; 7/X 2006 – 1♂; Belaya: 4/VII 2007 – 1♂; Chirki-Belaya: 4/VII 2007 – 1♂; Odyr: 13/IX 2006 – 1♂.

The species is famous for its variation for wing amber spots. Of the specimens collected, all males are f. typica, all but one females are f. typica heterochroma (with isolated nodal spots), one female of 20/VIII has the basal amber hardly reaching triangles and very large nodular amber spots (ab. nodalis Bart.).

Sympetrum pedemontanum (Müller in Allioni, 1766)

Bychikha: 30/VIII 2007 – 1♂.

Sympetrum danae (Sulzer, 1776)

Bychikha: 29/IX 2006 – 2♀♀; 5/X 2006 – 1♂; 7/X 2006 – 1♂; Odyr: 12/IX 2007 – 1♀; 13/IX 2006 – 1♂, 7♀♀; 15/IX 2007 – 2♂♂, 3♀♀.

Sympetrum cordulegaster (Selys, 1883)

Bychikha: 6/VIII 2006 – 1♀; 19/VIII 2006 – 1♀; 20/VIII 2006 – 1♂, 2♀♀; 21/VIII 2006 – 2♂♂, 1♀; 24/VIII 2006 – 1♀; 6/VIII 2006 – 1♀; 18/VIII 2007 – 2♀♀; Chirki: 20/VIII 2007 – 1♂, 3♀♀; Sosninskii: 30/VIII 2006 – 2♀♀; Odyr: 5/IX 2007 – 1♀; 13/IX 2006 – 9♀♀; Kazakevichevo: 3-4/IX 2007 – 1♂.

Of the females collected, 7 have entirely hyaline wings, 5 have a brown smoky darkening at the fore wing nodes, 1 has such darkenings at the nodes of both wings, 1 has quite intensively darkened distal halves of the fore wings and apices of the hind wings, 4 have darkened the distal half of fore wing and the nodular area of the hind wing (in one the darkening was very intensive), and 5 have the distal halves of all wings darkened. The females also varied in size, with the range of the hind wing length of 24-29 mm. The wing darkening in females supposedly resulted from environmental modifications, since its degree seems to correlate with size, although not so tightly.

Sympetrum eroticum (Selys, 1883)

Bychikha: 6/VIII 2006 – 2♂♂, 1♀; 7/VIII 2006 – 1♂,; 11/VIII 2006 – 1♀ (f. fastigiata) (by light), 20/VIII 2006 – 1♂, 2♀♀; 14/VIII 2007 – 1♂; 16/VIII 2007 – 1♀ (f. fastigiata); 19/VIII 2007 – 1♂; Chirki: 9/VII 2007 – 1♂; 20/VIII 2007 – 1♂, 2♀♀; Sosninskii: 30/VIII 2006 – 1♂; Odyr: 5/IX 2007 – 1♂, 1♀; 13/IX 2006 – 2♂♂, 1♀; ; Khekhtsir watershed: 26/VII 2007 – 1♀.

Females differ in the width of the black along the dorsal suture at the fore part of the pterothorax.

Sympetrum depressiusculum (Selys, 1841)

Bychikha: 20/VIII 2006 – 2♀♀; 21/VIII 2006 – 3♀♀; Khekhtsir watershed: 26/VII 2007 – 1♀.

Interestingly, both females of 20/VIII have the hind wing 26 mm long and the abdomen 21 mm long, while all the three females collected next day were larger and had the wing 29 mm and the abdomen 24 mm.

Sympetrum infuscatum (Selys, 1883)

Bychikha: 14/VIII 2007 – 2♀♀; Chirki: 9/VIII 2006 – 1♀; Sosninskii: 30/VIII 2006 – 1♀; Odyr: 19/IX 2006 – 1♀.

A female from Odyr has a somewhat shrunk black colouration: the black stripe on the first lateral suture is narrowed and slightly interrupted at its very end, there are well expressed yellow spots on VIII-X tergites and yel-

low black-tipped cerci. The female from Chirki has the stripe wide and continuous and no yellow spots on segments IX-X. That from Sosninskii and those from Bychikha have the stripe wide and continuous, the abdominal spots as in that from Odyr but dark cerci.

Sympetrum risi risi Bartenev, 1914

Bychikha: 21/VIII 2006 – 1♂, 24/VIII 2006 – 1♂, 1♀.

Not collected in 2005. Hitherto not reported for Khabarovskii Krai [Маликова, 1995].

Sympetrum vulgatum imitans (Selys, 1886)

Bychikha: 24/VIII 2006 – 1♀.

Not collected in 2005.

Leucorrhinia (rubicunda) intermedia Bartenev, 1910

Bol'shoi Ussuriiskii: 24/V 2006 – 3♀♀, 1/VI 2006 – 1♂; Bychikha: 5/VI 2006 – 1♂, 3♀♀, 11/VI 2006 – 1♀; Chirki: 29/V 2006 – 2♂; 28/V 2007 – 3♀♀; 29/V 2007 – 2♂♂, 4♀♀; 30/V 2007 – 2♀♀.

In [Kosterin, Dubatolov, 2005] this species was reported only for the former locality which is out of the Reserve limits. Now it is found within the Reserve as well. Our females have very variable development of the wing amber. In a series from Chirki it is completely missing in 4 females; spreads along the main veins from the wing bases approximately to the triangles and very faintly to the nodes in 5 females, while in one female the wing bases bear a strong amber to the triangles inclusively, than strong amber spreads between veins C and R to the nodes where substantial nodular amber spots are developed.

The following three species were collected in the Reserve in 2005 [Kosterin, Dubatolov, 2005] but not in 2006-2007: *Coenagrion ecornutum* (Selys, 1872); *Nehalennia speciosa* (Charpentier, 1840).

The Letopis' Prirody [Летопись природы, translated as 'Chronics of Nature'] of the Bol'shekhekhtsirskii Reserve of 1988, that is an official annual document being a report on the research activity and monitoring of each State Reserve, appeared to contain the following list of odonate species of the Reserve provided by S. N. Khlebas who was a researcher at the Reserve that time: "*Callopteryx virgo* L., *Lestes sponsa*, *Coenagrion concinnum* Johanssen, *Coenagrion hylas* Trybom, *Coenagrion glaciale* Sel., *Erythromma najas* Hans., *Aeschna juncea* L., *Epitheca bimaculata* Charp., *Somatochlora metallica* v.d.Lind, *Pantala flavescens* Fabr.". According to the presently accepted taxonomical concept and knowledge of species distribution, in this list, *C. virgo* is apparently *Calopteryx japonica* Selys, 1869 (a good eastern species), *C. concinnum* is *C. johanssoni* (Wallengren, 1894) (a synonym), *E. najas* is *Erythromma najas humerale* Selys, 1887 (the eastern subspecies), *S. metallica* is *Somatochlora japonica* Matsumura, 1911 (the eastern vicariant species). The list represents the early summer odonate aspect, all the species are quite expected. There is no information who identified species, but such identifications could be provided by an expert. It is not excluded that it was the late Prof. Z. Spuris who did identifications. So, more species above those collected in 2006 and 2007 are added in to the Reserve fauna:

Coenagrion johanssoni (Wallengren, 1894)

Coenagrion hylas (Trybom, 1889)

Erythromma najas humerale Selys, 1887

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