

**SOME ODONATA COLLECTED IN ALDAN ULUS OF SAKHA (YAKUTIA) REPUBLIC IN LATE JUNE 2002**

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**Abstract** – 13 spp. were collected in S Yakutia at the towns of Aldan and Tommot. Most of them were confined to peat-moss bogs with open larch stand (loc. 'mari') on terraces of the major Aldan R., while the main area of the Aldan Upland seems to be almost devoid of Odon.. The record of the only rheophilic sp. found, *Nihonogomphus*

*ruptus* (although not its northernmost record), and of a northern boreal sp. *Somatochlora sahlbergi* are new for Yakutia. A list of 32 spp. presently known for Yakutia is given.

**Introduction**

Yakutia (presently the official name of this

land is "Sakha (Yakutia) Republic" is a vast (3,103,200 km<sup>2</sup>) and scarcely populated (about 1 million) region situated in NE Asia and characterized by a severe continental climate (the absolute annual amplitude of temperature reaching 101.8°C at Verkhoyansk (SUSLOV, 1954). Most of its territory, except for high mountains of its NE part, is covered by open taiga of low-growing larch (*Larix gmelinii*) with admixture of pine (*Pinus silvestris*) and birch (*Betula pendula* s. l.). The forests exist there in spite of extremely low precipitation (mostly in late summer, annual precipitation ranging from 90 to 300 mm), which is compensated by a low evaporation. The summer is quite short (80-110 days without frost) but sunny and hot (at Yakutsk the average temperature of July is 19°C, the maximum temperature registered 38°C), so many animal species extend more northerly in Yakutia than in West Siberia (SUSLOV, 1954). Rather a high latitude provides a very long daytime in June and July and hence a rapid passing of all phenological phases in the beginning of the summer; the best time to collect almost all insects there is June. These conditions are scarcely suitable for most dragonfly species, so few of them occur in Yakutia. There is no checklist published, but thanks to the activity by BELYSHEV (1973), the founder of Siberian odonatology who worked in Yakutia himself, its odonate fauna has been documented rather completely but hitherto included as few as 30 known species. Most data originate from the plain of central Yakutia, with its numerous lakes, but there is also information from transpolar regions and from mountainous NE Yakutia (BELYSHEV, 1973), while moderate mountains of S Yakutia remained unexplored. After Belyshev, there were only two works concerning the odonate fauna of Yakutia. FUKUI (1992) reported 17 species for the environs of Yakutsk including *Aeshna serrata* Hag. and *Coenagrion ecornutum* (Sel.), recorded for the first time for Yakutia. POPOVA et al. (2001), in a note in a local ecological journal, reported a finding of "*Calopteryx virgo*" from SW Yakutia (at the sequence of the subordinate rivers Melyuk - Kil'lemtine - Vakunaika, the Chona River basin, and at the Biryuk River, a left tributary of the Lena; both sites between 61° and 62° N). In fact, this appeared to be *C. japonica* Sel., that was elu-

dated upon my request by one of the authors of that paper, Dr N. Vinokurov (pers. comm.)

On June 18-30, 2002 I managed to visit the Aldan Ulus [district] of Yakutia, namely, the environs of towns Aldan and Tommot (the landscape photographs available at <http://pisum.bionet.nsc.ru/kosterin/yakutia>), and collected there 12 odonate species. (Aldan town is not situated on the Aldan River; 'aldan' in Yakutian meaning 'gold').

#### Location 1

The territory around Aldan town (which I mostly examined) belongs to the gentle Aldan Upland, being a plateau without expressed mountain ranges but supporting groups of mountains protruding above tree line (here at about 800 m above sea level) up to 1300-1600 m above sea level. In the middle of the Upland, more or less around Aldan town, more southerly looking spruce (*Picea obovata*) forests appear with participation of Siberian stone pine (*Pinus sibirica*), fir (*Abies sibirica*), aspen (*Populus tremula*), silver birch (*Betula pendula* s. l.) and stone birch (*B. lanata*). These forests reflect a certain local climatic optimum and somewhat resemble the dark-needle taiga of southern Siberia, being isolated from them in the South by the large upland of Stanovoi Range, covered with larch taiga. There are numerous small rivers and rivulets, fast and cold, flowing among gentle mountains of the Aldan Upland. Depressions of many of their valleys as a rule accumulate cold air and provide a microclimate too harsh for tree stands to exist, so these rivers wander over treeless bogs and damp meadows without steady beds. Moreover, most of the rivers have been destroyed by mechanical gold dragging. There are no lakes, except for some bog pools, artificial reservoirs and pools accumulated in old pits. I examined a large pond on the Orto-Sala River within the town, constructed after gold dragging had taken place and now-adays surrounded by grass and bush vegetation, and a smaller pond on the Tamarak River, 5 km N of Aldan, surrounded with rich grasses.

**Records** — For 8 days of intense collecting around Aldan town, I collected only a male *Coenagrion lunulatum* (Charp.) at the forest edge on a hill just North of the town (125°22'30"E, 58°36'30"N, ca 720 m above sea level) on June

19, 2002. At the two ponds examined, not a single dragonfly was found, although there were lots of Trichoptera and Plecoptera in the surrounding vegetation.

### Location 2

The Aldan Upland is bordered on the W and N by the great Aldan River, a main tributary of the Lena River. At Tommot town the river is still in its upper reaches but is already large and powerful. It has clean cold water (although the fish population is said to have been depleted dramatically, thanks to the gold dragging on its tributaries) and shingle banks. On either of its banks there occur wide terraces occupied by specific NE Asian communities called 'mari', i.e. open stands of depressed larch on peat-moss bogs with dense *Ledum palustre* in the understorey and with numerous pools narrowly rimmed with some sedge. There are also larger oxbow lakes, surrounded by willows, birches, hairy alder (*Alnus hirsuta*) and bushes of dwarf alder (*Duschekia fruticosa*). These terraces are bordered by limestone mountains with larch/pine forests. Where the mountains come closer to the river banks, there appear stripes of spruce forests. Observations were made during June 23-25 on the Aldan River left bank 7-9 km upstream of Tommot town: 126°11'E, 59°00'40"N, about 280 m above sea level; all collections were made on June 24, except for *Nihonogomphus ruptus* collected on June 25 and *Lestes sponsa* collected on June 25 in a somewhat different locality: within Tommot town.

### Records

#### Lestidae:

– *Lestes sponsa* (Hans.): 1 ♀ collected within Tommot town on June 25

#### Coenagrionidae:

– *Coenagrion johannsoni* (Wallengren): 1 ♂ plus several tandems observed visually on small pools on a large peat-moss bog.

– *Coenagrion hastulatum* (Charp.): 1 ♂, together with the previous species.

– *Enallagma cyathigerum antiquum* (Bart.): 10 ♂, 4 ♀ on cotton plus about 30 specimens of both sexes in alcohol. These damselflies occurred on peat-moss bogs, were common in sedge along larger oxbow lakes and extremely abundant in grass on edges of birch/spruce forest approaching the Aldan River bank. Most

of the specimens had the black lateral stripes on the abdomen, variable in expression, in some reduced to short streaks. These stripes are characteristic for the taxon *antiquum* Bart. ranging in NE Asia. Males of this taxon (including all males collected in the Aldan River valley) have the appendages superiores as in the nominotypical *cyathigerum* (Charp.) (with the yellow 'lip' protruding behind, not inwards and below as in the Central Asian / South Siberian subspecies *E. c. risi* Schmidt). Hence, *antiquum* may represent no more than a climatic modification of the nominotypical subspecies. Here it is treated as a subspecies preliminarily. Two oldest available species group names proposed for this taxon were published in the same collected paper edition (BARTENEV, 1956; BELYSHEV, 1956): *antiquum* and *continentale* Belyshev. According to the new International Code for Zoological Nomenclature (1999), Art. 24.1, of two names simultaneously proposed and later considered as synonymic, that proposed as a higher rank taxon remains valid. Therefore, Bartenev's name has priority although proposed in a wrong subfamily (as "*Agrion antiquum*") and although the taxon itself is at most a subspecies. The whole long taxonomic history of this confusing taxon will be considered elsewhere.

#### Aeshnidae

– *Aeshna caerulea* Ström: 1 ♂ plus other individuals observed flying above pools over a large peat moss (quite common) and flushed from trunks of larches and pines on the bog and on the southern slope of a bordering mountain (several individuals). During the evening, few individuals were observed along forest edges facing the Aldan River bank, flying and landing high on tree branches.

#### Gomphidae

– *Nihonogomphus ruptus* (Sel.): 1 ♀ (teneral), 2 exuviae. Exuviae were found, on June 24 and 25, attached to boulders on a shingle bank, about 1 m off the water. In the hot morning of June 25 at about 10 o'clock we flushed, along a bank section about 1 km long, six teneral that flew off the river and perched high in trees on the bank terrace. Although still soft and not yet coloured, they were very wary, and we managed to collect only one.

## Corduliidae

- *Cordulia aenea* (L.): 4 ♂ (one on cotton, 4 in alcohol) – males were quite abundant along the banks of oxbows.
- *Somatochlora graeseri* Sel.: 4 ♂, along with the previous species and about as abundant.
- *Somatochlora exuberata* Bart.: 1 ♂, among the other corduliids.
- *Somatochlora sahlbergi* Trybom: 1 ♀, among the other corduliids.

## Libellulidae

- *Libellula quadrimaculata* (L.): 1 individual observed on a peat-moss bog with depressed larches.
- *Leucorrhinia dubia orientalis* Sel.: 6 ♂, 6 ♀, some teneral. Common on banks of oxbow lakes where perched on dry branches; often found on willow bushes and grasses on wide shingle bank of the Aldan.

The specimens will be transferred to Siberian Zoological Museum at the Institute of Animal Systematics and Ecology, Siberian Division of the Russian Academy of Sciences. Alcohol-preserved specimens of *E. c. antiquum* were sent for DNA analysis to Drs R. Stoks and H. Dumont (Belgium), and those of *C. aenea* to Dr R. Jödicke (Germany).

## Discussion

According to our current knowledge, we have in Yakutia 7 holarctic species: *Lestes dryas* Kirby, *Enallagma cyathigerum* Charp., *Aeshna juncea* (L.), *A. caerulea* (Ström), *A. subarctica* Walker, *Somatochlora sahlbergi* Trybom, *Sympetrum danae* (Sulz.); 20 transpalearctic species: *Lestes sponsa* Hans., *Sympetma paedisca* (Brauer), *Coenagrion hylas* (Trybom) (an eastern species with one isolate in Europe), *C. johannsoni* (Wallengren), *C. armatum* (Charp.), *C. glaciale* (Sel.), *C. hastulatum* (Charp.), *C. lunulatum* (Charp.), *Erythromma najas* (Hans.), *Aeshna crenata* Hag., *A. serrata* Hag., *Epiptera bimaculata* (Charp.), *Cordulia aenea* (L.), *Somatochlora arctica* (Zett.), *Libellula quadrimaculata* L., *Sympetrum flaveolum* (L.), *S. vulgatum* (L.), *Leucorrhinia dubia* (Vander L.) s. l. (ssp. *orientalis* Sel.), *L. rubicunda* (L.) s. l. (ssp. *intermedia* Bart.) and 6 eastpalearctic species: *Calopteryx japonica* Sel., *Coenagrion lanceolatum* (Sel.), *C. ecorutum* (Sel.), *Nihonogomphus ruptus* (Sel.),

*Somatochlora exuberata* Bart., *S. graeseri* Sel.; in total 32 species. Highly probable is also a transpalearctic *Somatochlora alpestris* (Sel.), known from the Kolyma River near the eastern border of Yakutia (BELYSHEV, 1973).

It is evident that in the area considered the dragonflies concentrated in the valley of the great river (although only one species dwells in the river as such) and are almost absent elsewhere. It is hard to say what contribution to their scarcity on the upland has been done by gold dragging, but my observations in Magadan Province and Kamchatka furnish evidence that mountain northern taiga landscapes are almost devoid of dragonflies naturally. So, only peat-moss bogs with larch stand provide a shelter for a considerable dragonfly fauna. It is of interest that these 'mari' are favourite habitat not only for dragonflies: there I found also some butterfly species, such as *Maculinea teleius*, *Lycaeides idas* s. l., *Brenthis ino*, *Coenonympha glycerion*, that southerly, in the mountains of southern Siberia, are mostly characteristic of meadow steppe. The change of habitat from steppes to peat moss bogs in the north-eastern range is well known (KORSHUNOV & GORBUNOV, 1995) and is consistent with the Principle of Habitat Shift of BEI-BIENKO (1966). However, the dragonflies found on pools among peat-moss bogs are those that are well-known to dwell in such a habitat, and no species preferring other habitats elsewhere was recorded on peat-moss bogs.

The area considered in this paper seems to be impoverished in diversity of Odonata even as compared to the more northerly situated (about 62°N) region of Yakutsk, where most of the previous records have been found. That flat region with numerous depressions of recent and extinct lakes, with meadows and steppoids, and cut through by the wide valley of the great Lena River, provides more diverse habitats for dragonflies and damselflies.

No *Sympetrum* were found, but we should expect at least *S. danae* which could appear in July. It is of interest that I collected a specimen of *C. hastulatum* but not *C. lanceolatum*. In the SE Siberian and the Far East, the former is very scarce while the latter is common (MALIKOVA, 1995), but perhaps in NE Siberia the relation may be opposite. The number of corduliids collected

somewhat reflect the relative abundance of their species.

*S. sahlbergi* is new for Yakutia but it was expected, since the species was reported from the Kolyma River at Verkhni Seimchan, not far from Yakutian eastern borders (BELYSHEV et al., 1978). The second addition to the fauna of Yakutia is *Nihonogomphus ruptus*. However, this is not its northernmost record, for it was found, as well as *Calopteryx japonica*, even at 60°N on the Podkamennaya Tunguska River (formerly the Evenk National Region of Krasnoyarskii Krai Province) (BELYSHEV, 1973; MALIKOVA, 1995).

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**Note added in proof** — In collections provided by N.N. Vinokurov I recently also found both species firstly reported for Yakutia by FUKUI (1992): *C. ecomutum*: 2 ♀, Namtsy, Lena Valley, 75 km of Yakutsk, 18/19-VII-2003, Vinokurov,

and *A. serrata*: 1 ♂, Tabokhoi, Vilyui valley, 30 km W of Suntar, 10-VIII-1997, Stepanov.

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