4. Data relating to Siberian Dragonflies.

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(With 7 figures.)

eingeg. 1. November 1909.

1.

Dragonflies collected by S. Chugunof in the region of Oby-Enissei canal (Narymski district Tomsk government).

1) *Leptetrum quadrimaculatum* L.; ♂.

2) *Leucorrhinia dubia* var. *tschugunovi* var. n.

♀: This variety differs from *Leucor. dubia* Lind., typ., in the following respects: The base and the spots at the sides of the upper lip are yellow. The frontal tubercle (vesicula verticalis) is black without spots. The triangle of the occiput (cuneus) is marked with a yellow spot in the hinder part. The thorax between the wings is yellow. The yellow spots of the 2d and 3d segments of the abdomen are smaller than those of *Leuc. dubia*. In addition to the black spots found at the base of the fore and hind wings of *Leuc. dubia* there are also at the base of both pairs of wings a black stripe between the subcostal nervure (costal nervure Kirby) and the principal radius (subcostal nervure Kirby) and at the base of the fore wings a black stripe on the lower basal cell occupying all the basal half of cell to the first cross nervure. All the spots on the wings are surrounded with a sharply defined fringe of saffron colour. The body is smaller: length of the abdomen — 23 mm, length of the hind wing — 24 mm; pterostigma — 2—2,25 mm. Four ♀. The male is unknown.

3) *Sympetrum flaveolum* L.; ♀.

4) *Somatochlora gratiosa* sp. n. (fig. 1 and 2).

2 ♀: The colour of the body is dark bronze. The labium, rhinarium, a triangular spot beside each eye, the middle line and hinder margin of the anterior surface of the thorax (devant du thorax Selys), the hinder margin of the 1st segment of the abdomen, the cross stripe on 2d segment broken in the centre and turning upward at the sides to the margin of the first segment, all the anterior margin, a large oval spot on each side of the anterior half of the 3d segment, the under surface of the abdomen and vulvar lamina — are yellow. The vulvar scale (lamina) is not notched, a little raised and blunt at the end, in length from $^2/_3$ to $^3/_4$ of the 9th segment. The 9th and 10th segments together are equal to the 8th. Anal appendages are longer than 9th and 10th together. The abdomen does not narrow in the 3d segment. The legs are black. The wings transparent, a little dingy between the nodus and the apex of the wings. Plerostigma is light brown. The membranule is white. Fore

wings with 8 antenodals (nervules antécubitales Selys) and 7 postnodals (nervules postcubitales Selys). Triangle (triangle discoïdal Selys) with 1 cross nervure.

The length of the abdomen	36	mm.
- - - hinder wing	35	-
- maximum of breadth of the hinder wing	11,5	-
Pterostigma	2,5	-

The male is unknown.

5) *Somatochlora arctica* Zett. (fig. 3).

1 ♀: In colour of the body this specimen resembles the *Somat. gratiosa*, but the yellow spots on the abdomen (especially the oval spots on the 3[d] segm.) are considerably smaller. The vulvar scale is large, longer than the 9[th] segment, a little raised, pipe-shaped, the free terminal edge forming a more or less rounded angle. The wings as in the *Somat. gratiosa*, but the pterostigma is dark-brown and there are only 5—6 postnodal nervures.

The sizes are as in the *Somat. gratiosa*.

6) *Somatochlora sahlbergi* Trybom[1] (?) (fig. 4).

1 ♀: The body is dark-bronze colour. The labium, rhinarium and a triangular spot beside each eye are yellow. The thorax is without yellow spots. The abdomen is all bronze-green, excepting the posterior margin and a small round spot on each side of the 2[d] tergit, which are yellow. The under part of the abdomen is all black. The abdomen does not narrow in the 3[d] segment.

The 9[th] and 10[th] are together equal in length to the 8[th]. The vulvar scale is yellowish, half the length of the 9[th] segment, a little sharpened at the end and raised. The legs are black. The wings transparent. The triangle of both pairs of wings bisected by a nervure. Fore wings with 9 antenodals and 8 postnodals. The pterostigma is yellow brown. darker and straighter than in the case of *Somat. gratiosa*. The membranule is white in front and dark brown behind.

This female resembles the *Somat. alpestris* Sel.

The length of the abdomen	31	mm.
- - - hind wing	34	-
Pterostigma:	2,75	-

Not being able to obtain the work of M. Trybom I was obliged to limit himself to work of Jakobson and Bianki (Orthoptera and Pseudoneuroptera of Russia, St. P. B. 1902, russian), though the description of this species given in this work is very brief to the point of inadequacy and thus the determination of this specimen remains open to question.

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[1] Bih. Svensk. Vetensk. Akad. Handl. XV. 1889. No. 4. p. 7. tab. 1. fig. 1.

7) *Somatochlora borealis* sp. n. (fig. 5—7).

2 ♀: The body is bronze-green. The yellow spot on the head and thorax as in *Somat. gratiosa*. On the 2d segment of the abdomen there is a yellow cross stripe on each side; one yellow spot near the lower edge of the 2d tergit and hinder margin of this tergit are yellow. On either side of the 3d segment there is a yellow cross stripe, wider than on the 2d segment with the upper end broadened out in the form of a small triangle. On either side of the 3d tergit underneath there is a larger yellow triangle, joining the yellow stripe above mentioned. The

Fig. 1.

Fig. 2.

Fig. 1. *Somatochlora gratiosa* ♀; VIII—X segments of abdomen from side.
Fig. 2. *Somatochlora gratiosa* ♀; I—III segments of abdomen from above.

Fig. 3.

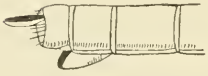

Fig. 4.

Fig. 3. *Somatochlora arctica* ♀; VIII—X segments of abdomen from side.
Fig. 4. *Somatochlora sahlbergi*? ♀; VIII—X segments of abdomen from side.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 5. *Somatochlora borealis* ♀; VIII—X segments of abdomen from beneath.
Fig. 6. *Somatochlora borealis* ♀; VIII—X segments of abdomen from side.
Fig. 7. *Somatochlora borealis* ♀; I—III segments of abdomen from above.

under margin of 8th and 9th tergits are yellow. The other segments of the abdomen have no yellow spots. The under surface of the abdomen is black. The abdomen does not narrow on the 3d segment. The 9th and 10th segments together are longer than the 8th. The vulvar scale is short, equal in length to half the 9th segment, sharply raised, with the broad rounded or quadrangular notch (looking upwards), black; the lower edge of vulvar scale, with a small triangular notch in the middle. The wings are transparent, saffron coloured at the base to the outside edge of the triangle. Fore wings with 8—9 antenodals and 6—7 postnodals.

The triangle with 1 cross nervure. The hinder wings are broad. The membranule is grayish, especially behind and very long. The pterostigma is dark brown, straighter, than in the case of *Somat. gratiosa*. The anal appendages are shorter, than 9th and 10th segments together. The legs are black.

The length of the abdomen . . . . . 35 mm.
- - - - hinger wing. . . . . 39 -
The maximum of the breadth of the hind wing . 13,5—14 mm.
Pterostigma . . . . . 2,25 mm.

8) *Aeschna squamata* Müll.; 1 ♂ and 1 ♀.
9) *Aeschna juncea* L.; 1 ♀.
10) *Lestes dryas* Kirby.; 1 ♀.

2.

Dragonflies collected by A. Bartenef in the neighbourhood of Tomsk.

(1908.)

1) *Leptetrum quadrimaculatum* L., common.
2) *Leucorrhinia dubia* Lind., common.
3) - *rubicunda* L., less common.
4) *Sympetrum sanguineum* Müll., less common.
5) - *scoticum* Don., common.
6) - *flaveolum* L., common.
7) - *vulgatum* L., common.
8) *Epitheca bimaculata* var. *sibirica* Sel., col. by G. Johansen; 1 ♂.
9) *Somatochlora metallica* Lind., common.
10) - *flavomaculata* Lind., col. by V. Anikin 1892; 4 ♀.
I have not seen this species in Siberia.
11) *Cordulia aenea* L., common.
12) *Aeschna gigas* Bartenef[2], common.
13) - *juncea* L., common.
14) - *viridis* Ev., col. by G. Johansen; 4 ♂ and 2 ♀.
15) - *grandis* L., common.
16) *Ophiogomphus cecilia* var. *obscura* var. n., common.

This variety differs from normal type of *Ophiogomphus cecilia* in the following particulars:

♂: The upper lip with the thick black stripe at the end and a thinner margin of the same colour at the base. At the sides the rhinarium is divided from the nasus by a pair of the black stripes with a

[2] Works of Society of Naturalist of Univ. of Casan T. XLI. 1. 1908. p. 15.

space between, not shorter than either of the stripes themselves, sometimes even longer. There is not a black stripe among the nasus and the frons. The vertex without the yellow spot among the „ocelli". The hinder surface of the head is black, having the small yellow spot beside each eye and the yellow stripe along the under margin of them. The two middle black stipes on the front of thorax generally united the whole length. The humeral and antehumeral black stripes are thick and the green stripe between them is most often narrower than either, or at any rate not wider than the narrower of the two. The lower anal appendage is not shorter than the upper, often even longer, so that viewed from the side the hooked ends of the lower appendage are seen to curl slightly round the end of the upper. The legs are black with yellow stripes on the inside of the first pair of thighs and on the base of the outer side of the 2d and 3d pairs of thighs. The tibia are all black. The body is dull green.

Length of the abdomen	42—44 mm.
- - - hinder wing	34—35 -
Pterostigma	3,25—3,5 mm.

The female is unknown.

17) *Gomphus flavipes* var. *sibirica* var. n., rare in the neighbourhood of Tomsk; more common south from Tomsk. The specimens of the *Gomphus flavipes* of Siberia differ from those of Europe in following respects: The black antehumeral stripes of the thorax are more widened in the middle. The black middle and antehumeral stripes are not joined behind or in front. The abdomen is shorter.

	♂♂	♀♀
Length of the abdomen.	34—35 mm.	35 mm.
- - - hinder wing. . . .	31—32 -	34 -
Pterostigma	3,5 -	4,5 -

18) *Calopteryx virgo* L., col. by V. Anikin, 1891; 2 ♂.
19) - *splendens* Har. common.
20) *Lestes dryas* Kirby, less common than the following species.
21) - *sponsa* Hans, common.
22) - *virens* Ch., common.
23) *Sympycna braueri* Nob., common.
24) *Agrion armatum* Ch., common.
25) - *hastulatum* Ch., common.
26) - *vernale* Hag., less common.
27) *Erythromma najas* Hans, common.
28) *Platycnemis pennipes* Pal., common.

The fauna of dragonflies of neighbourhood of Tomsk is very similar in the constitution of species to that of the governments of the central belt of European Russia. We find, for instance, out of 28 species in the collection that 13 are identical with species found in the government of Moscow ($82^1/_2$ %).

In the neighbourhood of Tomsk however the following, rare or entirely absent in central European Russia, are very common: 1) the eastern species — *Aeschna gigas*, *Aeschna juncea*[3] and *Ophiogomphus cecilia*, 2) the southern species — *Gomphus flavipes*, *Lestes virens* and *Sympycna braueri*, 3) the nothern species — *Agrion armatum*[4] and 4) *Agrion vernale*.

Categories 2) and 3) shew amongst other things, that in the neighbourhood of Tomsk the same intermixture of the southern and northern species is to be remarked as we noted before in dealing with the dragonflies of the Central Oural[5].

Besides this the following species frequently met with in the central belt of European Russia, are apparently wanting in Tomsk district: *Libellula depressa*, *Aeschna cyanea*, *Gomphus vulgatissimus*, *Onychogomphus forcipatus*, *Agrion pulchellum* and *Agrion puella*.

3.

Dragonflies collected by S. Chugunof in Barabinsk Steppe (Kaïnsk district Tomsk government).

(1907.)

1) *Leptetrum quadrimaculatum* L. ♂♀.
2) *Leucorrhinia rubicunda* L.; ♂♀.
The basal part of wing of the femals is very much saffron coloured.
3) *Sympetrum scoticum* Don.; ♂♀.
4) - *flaveolum* L.; ♂♀.
5) - *vulgatum* L.; 1 ♂ and 1 ♀.
6) *Aeschna serrata* Hag.

To the description of this species recently given by René Martin[6] must add the following:

1) The length of pterostigma ♂: 3,5—3,75 mm.
♀: 4—4,25 mm.
2) Auricles of the male have five teeth.

[3] In Moscow government this species is much more rarely met with than in Tomsk.

[4] Probably another northern species — *Agrion concinnum* Joh. — will be found here.

[5] Works of the Soc. of Natural. of Univ. of Casan. XLI. 1. 1908.

[6] Collections zoologiques du baron Edm. de Selys Longchamps. Fasc. XVIII. p. 37. — Bruxelles 1908.

3) The abdomen of the female is narrowing in the 3rd segment, as in the case of *Ae. juncea*.

4) The length of the anal appendages ♀ — 7 mm; they with bow-shaped longitudinal ridge above, are rounded at the end.

This species differs from *Ae. juncea* in following respects:

1) the vertical T-shaped black spot at the frons allways thin and long.

2) the anterior part of the thorax with two long yellowish stripes, turning outward in a marked degree, with a convexity directed inwards.

3) The yellow stripes at the sides of the thorax are very long.

4) The ridge at the upper anal appendages of the male with 4—5 teeth.

5) The lower anal appendage is more broad and short.

6) The costal nervure of the wing is white (yellow in the case of *Ae. juncea*).

7) Pterostigma ♂: 3,5—3,75 mm; ♀: 4—4,5 mm.

8) The auricles of ♂ with 5 teeth.

9) The anal appendages of the female in the shape are similar to that of *Ae. gigas*, but longer and broader, and are rounded at the end.

7) *Aeschna coluberculus* Har. (?).
1 ♂ without the abdomen.

8) *Aeschna viridis* Ev.; 1 ♂ and 1 ♀.

9) - *grandis* L.; 1 ♀.

10) *Gomphus flavipes* var. *sibirica* Bartenef[7]; 1 ♀.

11) *Lestes sponsa* Hans.; 1 ♀.

12) *Lymphyena braueri* Nob.; ♂♀.

13) *Agrion armatum* Ch.; ♀.

14) - *vernale* Hag.; ♂♀.

4.

Dragonflies collected by V. Kvorof in Kuznetsk district. Tomsk government:

(1908.)

1) *Sympetrum scoticum* Don.

2) *Lestes dryas* Kirby.

3) *Agrion hastulatum* Ch.

4) *Erythromma najas* Hans.

[7] Vide above p. 274.

5.

Dragonflies collected by M. Mordohovich in Balagansk district Irkutsk government (Belskoe).

(1908.)

1) *Leptetrum quadrimaculatum L.*
2) *Leucorrhinia dubia* Lind.
3) - *rubicunda* L.
4) *Sympetrum scoticum* Don.
5) *Ophiogomphus cecilia* var. *obscura* Bartenef[8]; 1 ♂.
6) *Aeschna juncea* L.
7) *Enallagma cyathigerum* Ch.
8) *Agrion vernale* Hag.

6.

Dragonflies collected by A.N. Bartenef in the region of river Tuba (tributary of Jenisei, Minusinsk district Jenisei government).

(1908.)

1) *Leptetrum quadrimaculatum* L.; very common.
2) *Leucorrhinia dubia* Lind.; 1 pair in coitu and 1 ♀ riv. Magarka; 25. VI. 1908.
3) *Leucorrhinia rubicunda* Lind.; ♀♀; lake of Kizil-Kul; 20. VI. and 2. VII. 1908.
4) *Sympetrum pedemontanum* Al.; ♂♂ and ♀♀; village of Bugurtat; lake of Kizil-Kul; 28. VI—2. VII. 1908.
5) *Sympetrum depressiusculum* Sel. ♂♂ and ♀♀; village of Bugurtat and lake of Chernoe; 28. VI—3. VII. 1908.
6) *Sympetrum sanguineum* Müll.; ♂♂ and ♀♀; village of Bugurtat; 28.—29. VI. 1908.
7) *Sympetrum scoticum* Don.; very common.
8) *Sympetrum flaveolum* L.; very common.
9) - *vulgatum* L.; common.
10) *Orthetrum cancellatum* L.; this species was found only in the neighbourhood of the lake of Kizil-Kul 20. VI and 2. VII. 1908 in many specimens (♂♂ and ♀♀).

In other localities of Minusinsk district (and of Siberia generally) *Orth. cancellatum* was not found.

11) *Somatochlora metallica* Lind.; 1 ♂ on river of Irba 23.VI.1908.
12) *Cordulia aenea* L.; common.

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[8] Vide above p. 273.

13) *Ophiogomphus cecilia* Fourcr. (typ., not var. *obscura*!); isle on Jenisei near the town Minusinsk; ♂♂ and ♀♀; 19. VI. 1908.
14) *Aeschna gigas* Bart.; common.
15) - *juncea* L.; common.
16) - *grandis* L.; less common.
17) *Lestes dryas* Kirby; common.
18) - *sponsa* Hans.; common.
19) *Sympycna braueri* Nob.; ♂♂ and ♀♀ at Minusinsk 15. and 16. VI. 1908.
20) *Enallagma cyathigerum* Ch.; very common.
21) *Agrion concinnum* Joh.; less common; riv. Magarka, Irba, lake Kizil-Kul: only ♂♂.
22) *Agrion armatum* Ch.; common.
23) - *hastulatum* Ch.; common.
24) - *lanceolatum* Selys[9]; ♂♂.

The posterior margin of prothorax is almost rounded, sometimes a trifle angulated (in this point *Agr. lanceolatum* differs from *Agr. hastulatum* Ch.). The figures of anal appendages of this species are given by Selys[9] sufficiently exact.

Common in Minusinsk district: Minusinsk, Irba, Bugurtat, isle on Jenisei near Minusinsk.

25) *Agrion vernale* Hag.; very common.
26) *Agrion ecornutum* Selys[10]; very common; ♂♂ and ♀♀.

The upper anal appendages of ♂ are shorter than the lower ones the figure of anal appendages given by Selys is not sufficiently exact). The other differences of this species from *Agrion mercuriale* given by Selys are very exact.

27) *Nehalennia speciosa* Ch.; 1 ♂ on the lake Chernoe near the town Minusinsk, 3. VII. 1908.

There is no difference in this male from the specimens of Europe. Till now this species was not known from Siberia.

28) *Erythromma najas* Hans; very common.

15./28. X. 1909.

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[9] Selys Longchamps et MacLachlan: »Matériaux pour une faune Névroptérologique de l'Asie septentrionale.« — Extrait des Annales de la Soc. Entomolog. de Belgique T. XV. 1872. p. 43 (21). tab. II. fig. 10.

[10] l. c. p. 44 (22). tab. II. fig. 11.