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# INSECTA MATSUMURANA

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## A REVISION OF THE ODONATA OF THE KURILE ISLANDS

SYOZIRO ASAHINA

Totsuka, III-123, Shinjuku-ku, Tokyo

Our knowledge of the Odonate fauna of the Kurile Islands which lie between Hokkaido and Kamchatka Peninsula seems to be still very insufficient.

In the years 1941/42 OKUMURA enumerated eleven species based mainly upon a collection taken in the South Kuriles by Prof. TOICHI UCHIDA and Mr. YUZO SUGIHARA. Apart from nine indigenous species OKUMURA's list includes two most problematical endemic [!] species, "*Argia kurilis* HAGEN" and "*Gomphus kurilis* HAGEN," both have never been collected since HAGEN's record.

One month prior to OKUMURA's work Mrs. L. GLOYD published a paper (Oct. 30) attempting to clear up these points. According to Mrs. GLOYD the type specimen of "*Argia kurilis*" which has been brought by Russian explorers and named by HAGEN (1861, p. 400) agrees well with a Californian specimen of *Argia vivida* HAGEN (1861, p. 406). It was also revealed that "*Gomphus kurilis* HAGEN (1857)" is conspecific with Californian *Gomphus donneri* KENNEDY (1917). Mrs. GLOYD supposed that in an earlier time *Gomphus kurilis* could possibly have been forwarded to the Russian explorers by their friends living in California. Consequently the two doubtful historical dragonflies should be dropped from Kurile Odonata-list.

During the summer of 1940, Dr. S. KUWAYAMA and Mr. Y. SUGIHARA made an extensive survey in the southern three islands of the Kuriles, i.e., Shikotan, Kunashiri, and Etrup (Etorofu). The specimens of the Odonata taken during this period were, a few years ago, submitted to me for identification. The material is the richest so far brought from

that area and contains ten additional species increasing the total Kurile Odonata up to nineteen. In this occasion I examined the other materials brought from North Kuriles and now preserved in the National Institute of Agricultural Sciences, Tokyo, and in my own collection.

Before going further I wish to thank to Dr. KUWAYAMA for giving me this opportunity. My thanks are also due to Prof. T. UCHIDA who gave me the facilities to examine the Hokkaido University collection. Prof. R. YOSII of Kyoto University has been kind enough to give me several interesting specimens taken by him from Paramshir Island, North Kuriles. I further owe to Dr. ERICH SCHMIDT, Bonn a. Rh., for his kind suggestions, and to Mrs. GLOYD, Illinois Natural History Survey, for the gift of her publications.

## ZYGOPTERA

### I. Family Agrionidae

#### 1. *Agrion ecornutum* SELYS

Coll. KUWAYAMA: 2♂ Furukamapp, Kunashir, 14. VIII. 1940.

New record from the Kurile Islands. These two male specimens are very closely allied to those from Hokkaido, the latter seem to represent a distinct geographical race.

#### 2. *Enallagma deserti yezoensis* ASAHINA

*Enallagma* sp. OKUMURA, 1941, p. 94, (Etotofu; Shikotan).

Coll. KUWAYAMA: 9♂ 1♀ Chinomiji, Kunashir, 6. VIII. 1940; 9♂ Furukamapp, Kunashir, 14. VIII. 1940; 5♂ 3♀ Tofutsu, Kunashir, 17, VIII. 1940; 1♂ Kunashir (TANAKA); 3♂ Rubetsu, Etrup, 28. VIII. 1940; 2♀ Toshimoe, Etrup, 29-30, VIII. 1940; 1♂ 2♀ Sanku, Etrup, 31. VIII. 1940; 2♂ 2♀ Shana, Etrup, 1♂ VIII. 1940 (KINOSHITA).

Apparently a common species. These are quite identical with the typical *yezoensis* from Hokkaido.

### II. Family Lestidae

#### 3. *Lestes dryas* KIRBY

Coll. KUWAYAMA: 5♂ Chinomiji, Kunashir, 6. VIII. 1940; 2♂ Furukamapp, Kunas., 15. VIII. 1940.

New record from South Kuriles. In Hokkaido this boreal species is found from several northern and eastern localities, hence the occurrence from South Kuriles is quite possible.

4. *Lestes sponsa* HANSEMANN

Coll. KUWAYAMA: 2♂ 11♀ Chinomiji, Kunashir, 6. VIII. 1940; 13♂ 12♀ Furukamapp, Kunashir, 14. VIII. 1940; 2♀ Furukamapp-Seseki, Kunashir, 15. VIII. 1940; 3♂ 4♀ Tomari, Kunashir, 21-23. VIII. 1940; 1♀ Tofutsju, Kunashir, 17. VIII. 1940; 2♂ 3♀ Kunashir (TANAKA).

New record from the Kuriles, probably a common species.

## ANISOPTERA

## III. Family Aeschnidae

5. *Aeschna juncea* LINNÉ

*Aeschna juncea* OKUMURA, 1940, p. 98 (Paramushir; Etrup; Kunashir).

Coll. KUWAYAMA: 1♀ Chinomiji, Kunashir; 1♂ Uennai, Kunashir, 12. VIII. 1940; 3♀ Kotankeshi, Kunashir, 19. VIII. 1940; 2♂ Tomari-Nioi, Kunashir, 8. IX. 1940; 4♂ 3♀ Rubetsu, Etrup, 28. VIII. 1940; 2♀ Sanku, Etrup, 31. VIII. 1940; 2♂ Shana, Etrup, 4. IX. 1940 (KINOSHITA).

Coll. N.I.A.S.: 2♂ 1♀ Bettobi, Shmush, N. Kuriles, 26. VIII. 1931 (Leg. Koba et Okada).

Specimens from Shmush, N. Kuriles, are smaller and much darker in general colouration. A detailed consideration of the infraspecific subdivisions of this species found in the Far East is hoped to be attempted in a near future upon a plentiful material.

## IV. Family Cordulegasteridae

6. *Anotogaster sieboldii* SELYS

Coll. KUWAYAMA: 2♂ Tofutsu-Kotankeshi, Kunashir, 18. VIII. 1940; 1♂ Kotankeshi, Kunashir, 19. VIII. 1940.

First record from the Kurile Islands. These are, like specimens from Hokkaido, smaller in size (H. W. 48 mm) than the typical Japanese ones.

## V. Family Corduliidae

7. *Somatochlora arctica* ZETTERSTEDT

*Somatochlora gratiosa* OGUMA, 1913, p. 447 (Etrup).

*Somatochlora arctica* OKUMURA, 1940, p. 100 (Etrup; Kunashir).

*Somatochlora arctica* SCHMIDT, 1957, p. 95 (Kurilen, 2♂).

Coll. KUWAYAMA: 1♂ Chinomiji, Kunashir, 5. VIII. 1940; 1♀ Kotankeshi, Kunashir, 19. VIII. 1940; 2♂ Bettobi, Etrup, 5. IX. 1940.

These are most closely allied to the specimens from Hokkaido. Dr. SCHMIDT's discussion on the structure of the male caudal appendages relates on my information of the present material.

8. *Somatochlora japonica* MATSUMURA

Coll. KUWAYAMA: 1♂ Furukamapp, Kunashir, 14. VII. 1940; 1♂ 1♀ Tofutsu-Kotankeshi, Kunashir, 18. VIII. 1940; 4♂ 2♀ Tomari, Kunashir, 21. VIII. 1940; 1♀ Kunashir (TANAKA); 1♂ Tomariyama, Kunashir, 3. IX. 1940.

New record from the Kurile Islands. This species will be an invader from Hokkaido.

9. *Somatochlora uchidai* FOERSTER

Coll. KUWAYAMA: 3♂ 2♀ Kotankeshi, Kunashir, 19. VIII. 1940; 1♂ Nioi, Kunashir, 2. IX. 1940 (MASAKI); 2♂ Ditto, 9. IX. 1940 (MASAKI).

New to the fauna of the Kuriles. These are quite identical with Hokkaido specimens, perhaps an invader from there.

10. *Somatochlora graeseri graeseri* SELYS

*Somatochlora graeseri* OKUMURA, 1940, p. 101 (Shikotan; Kunashir)

Coll. KUWAYAMA: 1♂ Uennai, Kunashir, 11. VIII. 1940; 1♀ Kunashir (TANAKA); 1♀ Bettobi-Sekiya, Etrup, 5. IX. 1940; 2♂ Shana, Etrup, 4. IX. 1940 (KINOSHITA).

It should be noted that like the individuals from Sachalin and the Asiatic Continent these specimens have no golden yellow tinge at the base of the wings. It is uncertain if these insects are direct invaders from Hokkaido or not.

## VI. Family Libellulidae

11. *Libellula quadrimaculata asahinai* SCHMIDT

*Libellula quadrimaculata* OKUMURA, 1940, p. 13 (Urupp; Etrup).

Coll. KUWAYAMA: 2♂ Chinomiji, Kunashir, 6. VIII. 1940; 1♂ Uennai, Kunashir, 11. VIII. 1940; 1♂ 1♀ Fufukamapp, Kunashir, 14. VIII. 1940; 1♂ Tofutsu, Kunashir, 17. VIII. 1940; 1♂ Tofutsu-Kotankeshi, Kunashir, 18. VIII. 1940; 7♂ Kotankeshi, Kunashir, 19. VIII. 1940; 5♂ Tomari, Kunashir, 21. VIII. 1940; 1♂ Chinomiji, Kunashir, 16. IX. 1941 (MASAKI); 1♂ Shana, Etrup, 10. VII. 1940.

These all belong to the Japanese race *asahinai* SCHMIDT which has a proximally attenuated black marking on the 7th abdominal segment.

12. *Sympetrum striolatum imitoides* BARTENEF

Coll. KUWAYAMA: 1♂ Tofutsu-Kotankeshi, Kunashir, 18. VIII. 1940; 1♂ Kotankeshi, Kunashir, 19. VIII. 1940; 2♂ Nioi, Kunashir, 2. IX. 1940 (MASAKI); 2♀ Tomariyama, Kunashir, 3. IX. 1940 (MASAKI); 1♂ Tomari-Nioi, Kunashir, 8. IX. 1940 (MASAKI).

New record from the Kuriles. In northern and eastern part of Hokkaido this species is not uncommon.

13. *Sympetrum flaveolum flaveolum* LINNÉ

Coll. KUWAYAMA: 1♀ Chinomiji, Kunashir, 6. VIII. 1940; 4♂ 1♀ Uennai, Kunashir, 12. VIII. 1940; 12♂ 15♀ Furukamapp, Kunashir, 14. VIII. 1940; 2♂ 2♀ Furukamapp-Seseki, Kunashir, 15. VIII. 1940; 1♀ Rubetsu, Etrup, 28. VIII. 1940; 1♀ Kunashir (TANAKA); 1♀ Tomari-Nioi, Kunashir, 8. IX, 1940 (MASAKI); 2♂ 1♀ Chinomiji, Kunashir, 16. IX. 1940 (MASAKI).

New record from the Kuriles where apparently not uncommon, a rather rare species in Hokkaido.

14. *Sympetrum danae* SULZER

*Sympetrum danae* OKUMURA, 1940, p. 14 (Kunashir).

Coll. KUWAYAMA: 1♂ 1♀ Chinomiji, Kunashir, 6. VIII. 1940; 2♂ Uennai, Kunashir, 11. VIII. 1940; 11♂ 11♀ Furukamapp, Kunashir, 14. VIII. 1940; 1♀ Furukamapp-Seseki, Kunashir, 15. VIII. 1940; 3♂ 3♀ Tomari, Kunashir, 21. VIII. 1940; 1♀ Kunashir (TANAKA et NAKANO); 1♀ Nioi, Kunashir, 2. IX. 1940 (MASAKI); 2♂ 2♀ Tomariyama, Kunashir, 3. IX. 1940 (MASAKI); 1♂ 1♀ Tomari-Nioi, 8. IX. 1940; 4♂ Chinomiji, Kunashir, 16. IX. 1940 (MASAKI); 1♂ 3♀ Bettobi-Shamanbe, Etrup, 26. IX. 1940 (KINOSHITA).

This seems to be very common. SJOSTEDT recorded the same species from Kamchatka to be abundant.

15. *Sympetrum pedemontanum elatum* SELYS

*Sympetrum pedemontanum elatum* OKUMURA, 1940, p. 16 (Kunashir).

Coll. KUWAYAMA: 1♀ Furukamapp-Seseki, Kunashir, 15. VIII. 1940; 3♂ 1♀ Seseki, Kunashir, 15. VIII. 1940.

Quite similar to the specimens of Hokkaido, probably an invader therefrom.

16. *Sympetrum frequens* SELYS

Coll. KUWAYAMA: 1♂ Kunashir (TANAKA & NAKANO).

Coll. ASAHINA: 2♂ 2♀ Paramushir, N. Kuriles, VII-VIII, 1933, Leg. R. YOSII.

New record from the Kuriles. The Paramushir specimens are smaller in size with weakly built pterothorax which feature has an affinity to North Eurasiatic *S. depressiusculum* SELYS, but it would be reasonable, from the general pattern of the body markings, to place these specimens in the category of *S. frequens* SELYS.

17. *Sympetrum infuscatum* SELYS

Coll. KUWAYAMA: 1♂ 1♀ Chinomiji, Kunashir, 6. VIII. 1940; 4♂ Ditto, 16. IX. 1941 (MASAKI).

New to the Kuriles. These are closely related to the specimens from Hokkaido. The size is also smaller (h. w. 28-32 mm).

18. *Leucorrhinia dubia orientalis* SELYS

*Leucorrhinia dubia* OKUMURA, 1940. p. 17, a note (Kunashir).

Coll. KUWAYAMA: 28♂ 6♀ Furukamapp, Kunashir, 14. VIII. 1940.

This seems strictly localized.

19. *Pantala flavescens* FABRICIUS

*Pantala flavescens* OKUMURA, 1940, p. 12 (Etrup).

Coll. KUWAYAMA: 5♂ 2♀ Toshimoe, Etrup, 29-30. VIII. 1940; 1♀ Shana, Etrup, 1-3. IX. 1940; 1♂ 1♀ Shana, Etrup, 4. IX. 1940 (KINOSHITA).

As this species has been known to occur as far north as Kamchatka the present record is quite natural. It seems, however, rather strange that this wide ranging species is captured only from Etrup and Urup Islands.

### FAUNISTIC NOTES

The above-listed nineteen species are tabulated in the following distribution table.

Unfortunately it is difficult to draw a conclusion from this table as the records from the central and northern Kurile Islands are extremely fragmentary.

From the Kamchatka Peninsula which lies adjacent northerly to Shmush Island the following 14 species of the Odonata have been listed.

*Enallagma cyathigerum* CHARPENTIER (HAGEN, 1856; SJOSTEDT, 1927)

*Agrion armatum* CHARPENTIER (SJOSTEDT, 1927)

*Aeschna crenata* HAGEN (SJOSTEDT, 1927)

- Aeschna juncea* LINNÉ (HAGEN, 1856; SJOSTEDT, 1927 as  
var. *brachystigma*)  
"Aeschna palmata HAGEN" HAGEN (1856)  
*Anax junius* DRURY (HAGEN, 1856)  
*Somatochlora arctica* ZETTERSTEDT (HAGEN, 1856; SJOSTEDT, 1927)  
*Cordulia aenea* LINNÉ (HAGEN, 1856)  
*Libellula quadrimaculata* LINNÉ (HAGEN, 1856; SJOSTEDT, 1927)  
*Sympetrum flaveolum* LINNÉ (BARTENEFF, 1915; SJOSTEDT, 1927)  
*Sympetrum danae* SULZER (BARTENEFF, 1915; SJOSTEDT, 1927)  
*Sympetrum frequens* SELYS (BARTENEFF, 1915)  
*Leucorrhinia dubia orientalis* SELYS (SJOSTEDT, 1927)  
*Pantala flavescens* FABRICIUS (HAGEN, 1856)

	Shiko- tan	Kuna- shir	Etrup	Urup	Para- mushir	Shmush
<i>Agrion ecornutum</i>		+				
<i>Enallagma des. yezoensis</i>	(+)*	+	+			
<i>Lestes dryas</i>		+				
<i>Lestes sponsa</i>		+				
<i>Aeschna juncea</i>		+	+		+*	+
<i>Anotogaster sieboldii</i>		+				
<i>Somatochlora arctica</i>		+	+			
<i>Somatochlora japonica</i>		+				
<i>Somatochlora uchidai</i>		+				
<i>Somatochlora g. graeseri</i>	(+)*	+	+	(+)*		
<i>Libellula q. asahinai</i>		+	+			
<i>Sympetrum str. imitoides</i>		+				
<i>Sympetrum flav. flaveolum</i>		+	+			
<i>Sympetrum danae</i>		+	+			
<i>Sympetrum pedem. elatum</i>		+				
<i>Sympetrum frequens</i>		+			+	
<i>Sympetrum infuscatum</i>		+				
<i>Leucorrhinia d. orientalis</i>		+				
<i>Pantala flavescens</i>			+	+*		

\* Recorded by OKUMURA (1941/42).

(+) Subspecific character unknown.

OKUMURA (1941/42) stated that a distribution boundary should be placed at the Boussole channel north of Etrup Island. But he gave no essential data at all, hence it is a mere imagination. At most one may be able to mention the following four points:

1. No endemic species or subspecies is recognized.
2. All the species except *Somatochlora graeseri graeseri* can be found in Hokkaido.
3. Kamchatka fauna which contains three continental Asiatic species, *Aeschna crenata*, *Enallagma cyathigerum*, and *Agrion armatum* seems somewhat different from that of the Kuriles.
4. A further detailed study on the infraspecific subdivision of *Aeschna juncea*, *Libellula quadrimaculata*, etc., might throw some light upon the characteristic of the Odonate fauna of this area.

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