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


   New record from the Kurile Islands. These two male specimens are very closely allied to those from Hokkaido, the latters 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


   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


New record from the Kuriles, probably a common species.

**ANISOPTERA**

III. Family Aeshnidae

5. *Aeschna juncea* Linne

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


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


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♂).

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** Förster

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* Bartenev

Col. 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* Linne

Col. 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).

Col. 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 (Kinoshta).

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

15. *Sympetrum pedemontanum elatum* Selys

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

Col. 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

New record from the Kuriles. The Paramushir specimens are smaller in size with weakly built pterothorax which feature has an affinity to North Eurasian 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. Asahina:** 2♂ 2♀ Paramushir, N. Kuriles, VII–VIII, 1933, Leg. R. Yosu.

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:** 2♂ 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; Sjøstedt, 1927)
*Agrion armatum* Charpentier (Sjøstedt, 1927)
*Aeschna crenata* Hagen (Sjøstedt, 1927)
Aeschna juncea LINNÉ (HAGEN, 1856; SJOSTEDT, 1927 as var. brachystigma)

"Aeschna palma 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 flavescens LINNÉ (BARTENEF, 1915; SJOSTEDT, 1927)

Sympetrum danae SULZER (BARTENEF, 1915; SJOSTEDT, 1927)

Sympetrum frequens SELYS (BARTENEF, 1915)

Leucorrhinia dubia orientalis SELYS (SJOSTEDT, 1927)

Pantala flavescens FABRICIUS (HAGEN, 1856)

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<tr>
<th></th>
<th>Shikotan</th>
<th>Kanasir</th>
<th>Etrup</th>
<th>Urup</th>
<th>Paramushir</th>
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<td>Pantala flavescens</td>
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* 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.

References

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Okumura, T. 1942: Odonata from the Kurile Islands, (II). Kontyu, 16. (1) 12-19, 1 Pl. (In Japanese)