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Ephemeroptera, Plecoptera, Mecoptera, Megaloptera and Neuroptera-Planipennia of Tsushima

By

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朝比奈正二郎*：対馬の蜉蝣類，績翅類，長翅類，広翅類及び扁翅脈翅類

From the Islands of Tsushima no representative of Ephemeroptera and Plecoptera has been recorded, whereas these islands are noted as the type-locality of a megalopteron, *Parachauliodes continentalis* VAN DER WEELE. The majority of the Planipennia and Mantispidae here recorded were kindly identified by Dr. Waro NAKAHARA. I am also grateful to Prof. T. SHIRÔZU and Prof. S. MIYAMOTO for their kind suggestions.

I. Ephemeroptera

I. Ecdyonuridae

1. *Rhithrogena japonica* UÉNO ヒメヒラタカゲロウ

1♂ (ad) Sasuna, 7. VI. 1968, ASAHINA.

Though the female adult and male subimago were described by UÉNO (1931, 1950) I could not find any description of adult male insect.

2. *Epeorus latifolium* UÉNO エルモンヒラタカゲロウ

3 larvae Sago, 8. VI. 1968, ASAHINA.

II. Plecoptera

According to Dr. KAWAI no stonefly has been recorded from Tsushima. The following four species are consequently new record therefrom.

I. Perlidae-Perlinae

1. *Perla tibialis* PICTET f. *uenoi* (KOHNO) カワゲラ (黒色型) (Pl. 21, fig. 1)

1♀ Sasuna, 1. VI. 1968, SUGA; 1♂ Sasuna, 3. VI. 1968, SUGA; 2♂ Sasuna, 7. VI. 1968, KUROSAWA; 1♀ Sasuna, 7. VI. 1968, ASAHINA; 2♂ 1 larva, 2 exuviae Sago, 8. VI. 1968, ASAHINA; 1♀ Meboro, 13. VI. 1968, KUROSAWA; 1♀ Meboro, 16. VII. 1969, MIYAMOTO; 1♀ Meboro, 17. VII. 1969, KUROSAWA.

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Perla [syn. *Kamimuria*] *tibialis* PICTET is a common stonefly throughout Japan and Korea, but in Tsushima we captured the adults of its forma *uenoi* KOHNO which is a dark insect with the anterior margin of the forewing pale yellowish and superficially resembles the next two species. It is not known if there is solely this dark form inhabiting Tsushima since the larval material we got shows a M-shaped yellow marking anterior to the median ocellus.

2. *Togoperla limbata* (PICTET) キベリトウゴウカワゲラ

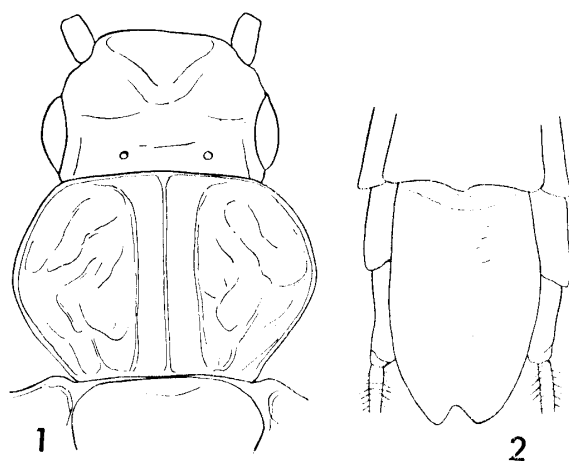
2♀ Ariakeyama, 19. VII. 1969, MIYAMOTO.

Dr. KAWAI has kindly identified this species for me. According to him this species has been known to occur in "Yakushima, Fukuoka, Hyogo, Nara and Kyoto".

II. Perlidae-Neoperlinae

3. *Kiotina picteti* KLAPÁLEK マエキフタツメカワゲラ (Pl. 21, fig. 2) (Text-figs. 1-2)

1♀ Sasuna, 3. VI. 1968, SUGA; 2♀ Sasuna, 7. VI. 1968, KUROSAWA; 1♀ Nii, 11. VI. 1968, ASAHINA.



Figs. 1-2. *Kiotina picteti* ♀. Tsushima.
—1: Prothorax, dorsal view.— 2:
Subgenital plate, ventral view.

A black coloured stonefly with costal border of the wings narrowly yellow. This is a rather common Japanese species hitherto recorded from Gifu, Nagano, Mie, Aichi, Tokyo, Kyoto and the Island of Yakushima.

III. Leuctridae

4. *Rhopalopsole okamotoa* (CLAASSEN)

1♀ Meboro, 15. VII. 1969, MIYAMOTO.

Hitherto known from Hokkaido and Honshu.

III. Mecoptera

I. Panorpidae

1. *Panorpa* sp. (Pl. 21, figs. 3-4)

1♂ 2♀ Sasuna, 8. VI. 1968, ASAHINA; 2♀ Hitakatsu, 8. VI. 1968, KUROSAWA; 1♀ Taterayama, 12. VI. 1968, ASAHINA.

This might be a new form with characteristic wing markings, the structure of male caudal organs somewhat resembles that of *Panorpa trizonata* MIYAKE. From Tsushima CHENG (1957) described a new species, *Panorpa thompsoni* (♀) based on a specimen in the California Academy of Sciences, collected by J. C. THOMPSON, "Tsu-shima, Lu Chu Island". His description does not agree with ours in the coloration and wing markings.

IV. Megaloptera

I. Chaulioididae

1. *Protohermes grandis* (THUNBERG) ヘビトンボ (Pl. 21, fig. 5)

1♂ Meboro, 22. VI. 1968, KUROSAWA; 1♂ Ariakeyama, 9. VII. 1969, KUROSAWA; 1♀ Taterayama, 18. VII. 1960, leg. M. SATO in Coll. Ehime University.

These are smaller in size, the hindwing length being 34, 38 (♂), and 39 mm (♀), respectively, against the average of Japanese specimens, but the genital structure shows no difference.

2. *Parachauliodes continentalis* VAN DER WEELE ツシマヘビトンボ (改称) (Pl. 21, fig. 6)

1♂ Sasuna, 1. VI. 1968, SUGA; 1♂ Sago, 8. VI. 1968, ASAHINA; 1♂ Ōhoshiyama, 13. VI. 1968, KUROSAWA; 1♂ Kashino, 20. V. 1930; 2♂ 1♀ Uchiyama, 25. V. 1930, ESAKI & FUJINO in Coll. Kyushu University.

VAN DER WEELE (1909, p. 259) established the genus *Parachauliodes* based on Japanese "*Chauliodes japonicus* MACLACHLAN" as the type-species, and described the second species, *Parachauliodes continentalis* based on "one couple from Korea in the British Museum". In his monograph (1910, p. 60) he repeated the description and gave the locality as "Habitat: Korea, Tsushima" with a note that runs "The male is indicated: Tsushima 27. May 1891 (H. t), the female: Tsushima, 31. May 1891 (H. t), both are from the Seebohm-bequest, 96-103." Thus, it is evident that VAN DER WEELE mistook Tsushima to be in Korea. Also the figures of male caudal end, his figs. 47 and 48, are erroneously translocated. This last respect was later pointed out by KIMMINS (1954, p. 432), but the habitat was again mistaken as "Korea." It is not yet clear if there is *P. continentalis* actually in the Korean Peninsula, but this is rather common in Honshu, Shikoku and Kyushu.

3. *Neochauliodes sinensis* (WALKER) モンヘビトンボ (Pl. 21, figs. 7-8)

1♂ Uchiyama, 26. VII. 1968, SUGA; 1♂ Meboro, 15-18. VII. 1968, MIYAMOTO; 1♀ Uchiyama, 18-19. VII. 1960, M. SATO, and 1♂ Hitakatsu, 20-22. VII. 1960, both in Coll. Ehime University; 1♀ in Coll. Kyushu University, det. T. ESAKI.

The insects of the genus *Neochauliodes* are essentially those of Asiatic Continent. The *sinensis*-group which is characterized by remarkably spotted wings is known to occur, other than the continental eastern Asia, in Taiwan and the Ryukyu Islands. One of them has been recorded from Korea (*N. koreanus* WEELE, 1909), but never from the Japanese Islands.

Tsushima is therefore noticeable because of the presence of a Megalopteron of Asiatic continental origin. The occurrence of this species in Tsushima was first mentioned by Prof. SHIRÔZU (1964). An analysis of the *sinensis*-group of this genus should be attempted on a sufficient material in future, because many subspecific names were given to each local population of this species upon rather poor material.

V. Neuroptera-Planipennia

The identification of Mantispidae, Osmylidae, Neurothridae, Hemerobiidae and Chrysopidae was made by Dr. Waro NAKAHARA, whom I have to express my sincere thanks.

I. Ascalaphidae

1. *Hybris subjacens* (WALKER) ツノトンボ

2♂ 2♀ Izuhara, VIII. 1968, URATA; 1♂ Nii, 28. VII. 1968, SUGA; 1♂ Sasuna, 11-16. IX. 1968, ISHIKAWA; 1♀ Ariakeyama, 19. IX. 1968, ISHIKAWA; 1♀ Kamisaka, 18. IX. 1968, ISHIKAWA.

Apparently common in Tsushima, this is widely distributed in northeastern Asia.

II. Myrmeleontidae

2. *Hagenomyia micans* MACLACHLAN ウスバカゲロウ

1♂ Izuhara, 14. VIII. 1905, URATA.

A common species in northeastern Asia.

III. Mantispidae

3. *Cercomantispa shirozui* NAKAHARA ツシマカマキリモドキ (新称) (Pl. 21, fig. 9)

Cercomantispa shirozui NAKAHARA, 1961, Mushi, 35, p. 63, "♂ Kamizaka-Shiratake, Tsushima, June 8, 1941; ♀ Izuhara-Sasutoge, Tsushima, June 7, 1941" 2♂ 4♀ (Paratypes).

1♂ Izuhara, 14. VIII. 1965, URATA; 1♂ Tsutsu-Uchiyama, 11. VII. 1969, KUROSAWA; 1♀ Ariakeyama, 9. VII. 1969, KUROSAWA.

This species was described recently; apparently not uncommon in Tsushima. According to Prof. SHIRÔZU he collected another species, *Mantispa japonica* MACLACHLAN from Tsushima and this was identified by Dr. NAKAHARA.

IV. Osmylidae

4. *Spilosmylus nipponensis* (OKAMOTO) カスリヒロバカゲロウ

1♀ Taterayama, 12. VI. 1968, ASAHINA.

5. *Spilosmylus tuberculatus* (WALKER) ヤマトヒロバカゲロウ

1♂ Ariakeyama, 19. VII. 1969, MIYAMOTO.

V. Neurothridae

6. *Nipponeurothus pallidinervis* NAKAHARA ホシシロカゲロウ

Nipponeurothus pallidinervis NAKAHARA, 1958, p. 26 "5♂ 2♀ Uchiyama, Tsushima Is. May 26, 1957, Dr. K. BABA".

Nipponeurothus pallidinervis: KUWAYAMA, 1962, p. 338 "Tsushima Is."

1♀ Sasuna, 8. VI. 1968, KUROSAWA.

IV. Hemerobiidae

7. *Symphorobius tessellatus* NAKAHARA

1 Nii, 9. VI. 1968, ASAHINA.

8. *Eumicromus numerosus* (NAVÀS) チャバネヒメカゲロウ

2 Tsutsu-Uchiyama, 11. VII. 1969, KUROSAWA; 3 Ariakeyama, 19. VII. 1969, KUROSAWA; 2 Meboro, 17. VII. 1968, MIYAMOTO; 1 Ariakeyama, 12. VII. 1968, MIYAMOTO; 1 Nita, 13. VII. 1969, KUROSAWA.

9. *Spilomicromus maculatipes* (NAKAHARA) アシマダラヒメカゲロウ

8 Ariakeyama, 12. VII. 1968, MIYAMOTO; 3 Do., 19. VII. 1969, MIYAMOTO; 1 Meboro, 16. VII. 1969, MIYAMOTO; 2 Tsutsu-Uchiyama, 11. VII. 1969, KUROSAWA.

10. *Micromus multipunctatus* MATSUMURA

1 Tsutsu, 11. VII. 1969, MIYAMOTO; 1 Nii, 18. VII. 1969, MIYAMOTO; 2 Ariakeyama, 19. VII. 1969, MIYAMOTO.

12. *Pseudomicromus angulatus* (STEPHENS)

1 Ariakeyama, 15. VII. 1968, MIYAMOTO.

13. *Hemerobius japonicus* NAKAHARA ヤマトヒメカゲロウ

1 Meboro, 15. VII. 1969, MIYAMOTO; 1 Ariakeyama, 19. VII. 1969, MIYAMOTO.

14. *Hemerobius harmandus* NAVÀS キバネヒメカゲロウ

1♀ Tsutsu-Uchiyama, 11. VII. 1969, KUROSAWA.

VII. Chrysopidae

15. *Chrysopa cognatella* OKAMOTO ヒメヨツボシクサカゲロウ

1♂ Nii, 13. VII. 1968, MIYAMOTO.

16. *Chrysopa formosana* MATSUMURA タイワンクサカゲロウ

1 Meboro, 14. VII. 1969, MIYAMOTO; 1 Tsutsu-Uchiyama, 11. VII. 1969, KUROSAWA; 1 Ariakeyama, 12. VII. 1968, MIYAMOTO.

17. *Chrysopa septenpunctata* WESMEAL ヨツボシクサカゲロウ

1 Nii, 9. VI. 1968, ASAHINA; 1 Nita, 8. VI. 1968, KUROSAWA; 1 Sasuna, 3. VI. 1968, SUGA; 1 Ariakeyama, 12. VII. 1968, MIYAMOTO; 1 Nii, 13. VII. 1969, MIYAMOTO; 1 Ariakeyama, 19. VII. 1969, MIYAMOTO.

18. *Chrysopa carnea* STEPHENS ヒメクサカゲロウ
1 Taterayama, 12. VI. 1968, SUGA; 1 Meboro, 16. VII. 1969, MIYAMOTO.
19. *Notochrysa japonica* MACLACHLAN セアカクサカゲロウ
1 Tsutsu, 17. VI. 1968, KUROSAWA; 4 Tsutsu, 11. VII. 1969, MIYAMOTO; 2
Ariakeyama, 12. VII. 1968, MIYAMOTO.

There are two other recorded Neuroptera from Tsushima:

Hemero bi i d a e

Notiobiella subolivaceum NAKAHARA ミドリヒメカゲロウ
KUWAYAMA, 1962, p. 359 "Tsushima I. (Mt. Ariake)".

A p o c h r y s i d a e

Nacaura matsumurae OKAMOTO アミメカゲロウ
KUWAYAMA, 1956, p. 29 "Tsushima Is."

要 約

従来対馬からはカゲロウ類及びカワゲラ類は未知であったが、ここにカゲロウ2種（1種は幼虫）を記録し、カワゲラ4種を記録する。このうち3種のカワゲラは、大きさや色彩が一見すこぶる似ていることは偶然であろうか。

シリアゲムシ類はすでに1種、旧い California Academy of Sciences の標本で新名が与えられているが、今回得られたのはそれと異なると考えられる。しかしここでは命名しなかった。

ヘビトンボ類では3種が得られ、このうちヘビトンボは本土産のものに比しやや小型であり、次の対馬を原記載地とする *Parachauliodes continentalis* VAN DER WEELE (ツシマヘビトンボ改称) は、日本にひろく分布する1種であるが、この "Tsushima" があたかも朝鮮に存在する如く記されていたので、ここに訂正した。第3のモンヘビトンボに完全な大陸種で、琉球列島を除いた日本列島には見られず、対馬における大陸系昆虫の1代表と見るべきものである。本種の多数の亜種群は将来整理するべきであろう。

扁翅脈翅類のうち、カマキリカゲロウ2種の一方は対馬より新種として最近発表されたものであり、ここに記録したヒメカゲロウ科、クサカゲロウ科、ヒロバカゲロウ科はすべて中原和郎博士の同定にかかわるものである。ここに中原博士及び本小文について多くの御助言を与えられた白水隆、宮本正一両教授に対して深謝の意を表する。

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Explanation of Plate 21

- Fig. 1. *Perla tibialis* f. *uenoi*, ♀ Tsushima.
Fig. 2. *Kiotina picteti*, ♀ Tsushima.
Fig. 3. *Panorpa* sp., ♂ Tsushima.
Fig. 4. " " ♀ Tsushima.
Fig. 5. *Protohermes grandis*, ♂ Tsushima.
Fig. 6. *Parachauliodes continentalis*, ♂ Tsushima.
Fig. 7. *Neochauliodes sinensis*, ♂ Tsushima.
Fig. 8. " " ♀ Tsushima.
Fig. 9. *Cercomantispa shirozui*, ♂ Tsushima.

