HOKKAIDO UNIVERSITY

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NEUROPTERA-PLANIPENNIA FROM THE DAISETSUZAN NATIONAL PARK, HOKKAIDO, JAPAN

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The Daisetsuzan National Park is located in the centre of Hokkaido, containing some perpetually snow-capped volcanic ranges which form the ceiling of the island. The highest peak is Mt. Asahidake, a height of 2290 m. All the slopes of the mountains in the park are dotted with extensive forests and fields of alpine flowers. In the foots of the mountains there are many hot springs, several gorges, and few lakes.

The late MOTOMU TAKIZAWA, Mr. SYUSIRO ITO and the author visited the park from time to time and collected the Neuroptera, the specimens being now deposited with the collection of the Hokkaido National Agricultural Experiment Station. The species listed below are present in the collection.

I. OSMYLIDAE

1. **Osmylus tessellatus** MACLACHLAN

Osmylus tessellatus MACLACHLAN, Trans. Ent. Soc. Lond., 1875-II, p. 180 (1875); NAKAHARA, Ann. Zool. Jap., VIII, p. 511 (1914); KRÜGER, Stett. ent. Zeit., LXXVI, p. 75 (1915); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1537 (1932); KUWAYAMA, ditto, ed. II (reform), p. 399 (1950); KUWAYAMA, Trans. Shikoku Ent. Soc., III, p. 178 (1953).

Osmylus? tessellatus KRÜGER, Stett. ent. Zeit., LXXIV, p. 270 (1913).

Locality: Sounkyo (2♀♀ 9-10.VII.1932, M. TAKIZAWA; 2♂♂, 1♀, 8.VIII.1952, S. KUWAYAMA), Nukabira (1♂, 12. VII. 1953, S. ITO); Mt. Upepesanke (1♂, 1♀ 13. VII. 1953, S. ITO).

Distribution : Hokkaido, Honshu, Shikoku, Kyushu.

Remarks ; Very common in Hokkaido.

2. **Plethosmylus hyalinatus** MACLACHLAN

Osmylus hyalinatus MACLACHLAN, Trans. Ent. Soc. Lond., 1875-II, p. 181 (1875); NAKAHARA, Ann. Zool. Jap., VIII, p. 516 (1914).

Plethosmylus hyalinatus KRÜGER, Stett.ent. Zeit., LXXIV, p. 274 (1913); KRÜGER, ditto, LXXVI, p. 76 (1915); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1537 (1932); KUWAYAMA, ditto, ed. II (reform), p. 399 (1950); KUWAYAMA, Trans. Shikoku Ent. Soc., III, p. 179 (1953).

Locality: Sounkyo (1♀, 9—10. VII. 1932, M. TAKIZAWA); Mitsumata (2♂♂, 14. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu, Shikoku, Kyushu; Saghalien; Siberia.

Remarks: It is not rare in this territory.

3. **Spilosmylus flavicornis** MACLACHLAN

Osmylus flavicornis MACLACHLAN, Trans. Ent. Soc. Lond., 1875—II, p. 179 (1875).

Osmylus?? flavicornis KRÜGER, Stett. ent. Zeit., LXXIV, p. 271 (1913).

Spilosmylus flavicornis NAKAHARA, Ann. Zool. Jap., VIII, p. 505 (1914).

Heliosmylus flavicornis KRÜGER, Stett. ent. Zeit., LXXVI, p. 84 (1915); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1536 (1932); KUWAYAMA, ditto, ed. II (reform), p. 399 (1950).

Locality: Sounkyo (1♀, 8. VII. 1929, S. KUWAYAMA).

Distribution: Hokkaido, Honshu, Shikoku, Kyushu.

Remarks: *S. flavicornis* is not rare in Hokkaido.

4. **Lysmus harmandinus** NAVÁS

Osmylus harmandinus NAVÁS, Ann. Soc. Sci. Brux.. 1910, p. 190 (1910).

Lysmus Harmandinus NAVÁS, Rev. Russ. d' Entom., XI, p. 113 (1911); NAVÁS, Mus. Barc. Sci. Nat. Opera, Ser. Zool., XI, p. 14 (1917).

? *Lysmus harmandinus* KRÜGER, Stett. ent. Zeit., LXXIV, p. 211 (1913).

Spilosmylus Harmandinus NAKAHARA, Ann. Zool. Jap,, VIII, p. 508 (1914).

Eososmylus?? Harmandinus KRÜGER, Stett. ent. Zeit., LXXVI, p. 74 (1915).

Eososmylus harmandinus KUWAYAMA, Icon. Ins. Jap., ed. I. p. 1538 (1932); KUWAYAMA, ditto, ed. II (reform), p. 400 (1950)

Locality: Sounkyo (1♀, 27. VII. 1953, S. ITO); Mitsumata (1♂, 14. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu, Kyushu; Saghalien.

Remarks: Very common in Hokkaido. The generic position of this species is quite unstable. Though NAVÁS erected the genus *Lysmus* taking this species as genotype, KRÜGER discussed on the position of the genus *Lysmus* and placed

this species in his genus *Eososmylus* with some introgation. KIMMINS considered *Lysmus* as a synonym of *Spilosmylus*, but he did not touch with *Eososmylus*. However, this species stands in different characters from the others of *Spilosmylus*, and the author thinks that it is safe to consider this species as different from the genus *Spilosmylus* of KIMMINS at present.

II. HEMEROBIIDAE

5. **Micromus variegatus** FABRICIUS

Hemerobius variegatus FABRICIUS, Ent. Syst., II, p. 85 (1793).

Micromus variegatus RAMBUR, Hist. nat. Ins. Névropt., p. 417 (1842); KILLINGTON, Mon. Brit. Neur., I, p. 252 (1936).

Locality: Mt. Kurodake (1♂, 7. VII. 1929, S. KUWAYAMA).

Distribution: Hokkaido; Europe.

Remarks: This handsome species is new to the fauna of Japan. It has a wide distribution in Europe, including the British Isles.

6. **Eumicromus alpinus** NAKAHARA

Eumicromus alpinus NAKAHARA, Ann. Zool. Jap., IX, p. 41 (1915).

Locality; Mt. Kurodake (1♂, 7. VII. 1929, S. KUWAYAMA); Mitsumata (1♂, 14. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu.

Remarks: This species was hitherto only known from the alpine districts of central Japan.

7. **Eumicromus angulatus** STEPHENS

Hemerobius angulatus STEPHENS, Illus. Brit. Ent., Mand., VI, p. 106 (1836).

Micromus angulatus BANKS, Trans. Am. Ent. Soc., XXXII, p. 45 (1905); NVAÂS, Rev. Russ. d' Entom., XII, p. 420 (1912).

Eumicromus angulatus NAKAHARA, Ann. Zool. Jap., IX, p. 42 (1915); NAKAHARA, Ins. World, XXIII, p. 137 (1919); KILLINGTON, Mon. Brit. Neur., I, p. 259 (1936).

Locality: Nukabira (1♀, 28. VII. 1933, S. KUWAYAMA; 1♂, 11. VI. 1952, S. KUWAYAMA).

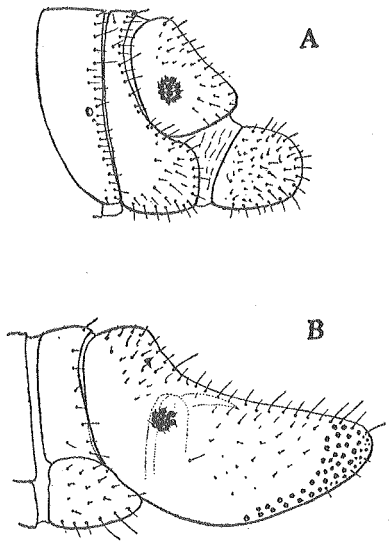
Distribution: Hokkaido; Siberia; Europe; Madeira; N. America.

Remarks: It is not rare in Hokkaido.

8. **Hemerobius tristriatus** sp. nov.

Head shining blackish-brown; clypeus brownish; palpi blackish brown. Vertex ochreous yellow. Eyes blackish-brown in dried specimen. Antennae about a half length of the forewing; testaceous, becoming somewhat darker apically.

Thorax with a longitudinal median dorsal band of pale yellow, bordered with dark brown. Lateral projections of pronotum pale. Legs mostly pale yellowish; tarsi slightly darkened with brown, the fifth segment wholly dark.



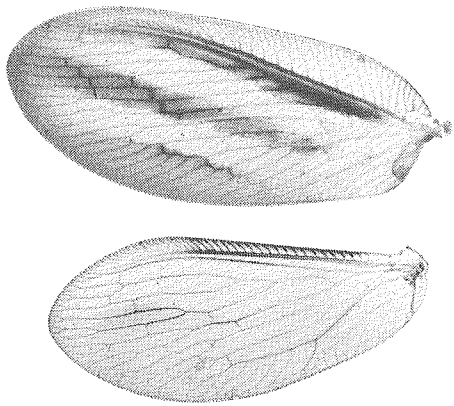
Textfig. 1.
Abdominal apices of *Hemerobius tristriatus* sp. nov.
[lateral view, X ca 25] A. ♀ ; B. ♂.

Forewing oval, uniformly pale greyish brown, tinged with testaceous especially on the costal area, with three prominent dark brownish broad streaks; the fore streak runs on the whole of the posterior area of R, being most concentrated at the basal half; the middle one runs from the basal third where a cross-vein connects M_{3+4} and Cu_1 to the apex; the hind one broad and runs along the posterior margin. Longitudinal veins and costal veinlets almost pale greyish brown, except Sc and the portions of streaks which are dark brown; gradate cross-veins almost blackish brown.

Hindwing paler and more transparent, the costal area greyish brown, and the inner and outer borders shaded with pale grey; the costal veinlets from the base to the pterostigmatic region are darker. A broad dark brownish streak runs from the position of cross-vein at the middle of M_{1+2} to the apex. Veins concolorous with the membrane, except Sc, R, and the portions of streak which are dark brown.

Abdomen usually dark fuscous. Anal plates of the female somewhat triangular,

with rouuded angles; lobes of the ninth sternite rather long and broadly rounded apically. Anal plates of the male elongate tapering gradually and curving towards the rounded apex; each inner and outer margin of distal part set with rows of serrate teeth. Ninth



Textfig. 2.
Wings of *Hemerobius tristriatus* sp. nov.
[X 8]

sternite rather short. Processes of aedeagus fused basally, bent slightly downwards, the apices sharply pointed.

Measurements: Length of body 5.0 mm., of forewing 7.5 mm., of hindwing 3.5 mm., width of forewing 6.5 mm.

Locality: Sounkyo (1♀, Holotype, 21. VII. 1953, S. ITO); Noborippo, Saghalien (1♂, Allotype, 19. VIII. 1924, T. KANO); Motodomari, Saghalien (2♂♂, 3♀♀, Paratypes, 17. VIII. 1924, T. KANO).

Distribution: Hokkaido; Saghalien.

Remarks: The genital aspects of this distinguished species are somewhat allied to those of *H. marginatus* STEPHENS in Europe. KANO observed that *H. tristriatus* has a habit to crowd on the branches or leaves of larch tree and easily fly out by disturbance.

9 **Hemerobius humulinus** LINNÉ

Hemerobius Humulinus LINNÉ, Syst. Nat. ed. X, 1, p. 550 (1758).
Hemerobius Humuli LINNÉ, Faun. Suec., p. 383 (1761).
Hemerobius humuli NAKAHARA (part), Ann. Zool. Jap., IX, p. 24 (1915); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1547 (1932); KUWAYAMA, ditto, ed. II (reform),

p. 391 (1950).

Hemerobius humulinus KILLINGTON, Mon. Brit. Neur., II, p. 5 (1937).

Locality: Mt. Kurodake (1♂, 7. VII. 1929, S. KUWAYAMA).

Distribution: Hokkaido, Honshu; Siberia; Europe; N. America.

Remarks: It is not common in Japan, being usually taken in wooded land of alpine districts.

10. **Neuronema albostigma** MATSUMURA

Hemorobius albostigma MATSUMURA, Konchu Bunruigaku (Syst. Ent.), I. p. 171 (1907).

Megalomus deltoides NAVÁS, Rev. Russ. d' Ent., IX, p. 396 (1910).

Ninguta deltoides NAVÁS, Rev. Russ. d' Ent., XII, p. 420 (1912); NAKAHARA, Ann. Zool. Jap., IX, p. 46 (1915).

Ninga deltoides NAVÁS, Bol. Soc. Aragon., XII, p. 122 (1913); NAKAHARA, Ins. World, XXIII, p. 137 (1919); KUWAYAMA, Trans. Sapporo Nat. Hist. Soc., IX, p. 107 (1924); KUWAYAMA, Ioc. Ins. Jap., ed. I, p. 1545 (1932); KUWAYAMA, ditto, ed. II (reform), p. 393 (1950).

Neuronema deltoides KRÜGER, Stett. ent. Zeit., LXXXIII, p. 170 (1922); KIMMINS, Ann, Mag. Nat. Hist., Ser. 11, X, p. 47 (1943); KUWAYAMA, Trans. Shikoku Ent. Soc., III, p. 178 (1953).

Locality: Nukabira (1♂, 12. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu, Shikoku, Kyushu; Saghalien.

Remarks: This species is not rare in Hokkaido.

III. CHRYSOPIDAE

11. **Chrysopa vittata** WESMAEL

Chrysopa vittata WESMAEL, Bull. Acad. Brux., VIII, p. 211 (1841); SCHNEIDER, Sym. Mon. Gen. Chrysop., p. 65 (1851); NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 119 (1915); KILLINGTON, Mon. Brit. Neur., II. p. 163 (1937).

Nineta vittata NAVÁS, Crisòp. d' Europa, p. 87 (1915); OKAMATO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 30 (1919); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1542 (1932); KUWAYAMA, Zool. Mag., XLVIII, p. 813 (1936); KUWAYAMA, Icon. Ins. Jap., ed. II (reform), p. 394 (1950).

Nothochrysa olivacea GERSTAECKER, Mitt. Ver. Neu.-Vorpom. u. Rügen., XXV, p. 74 (1893); OKAMOTO, Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 54 (1914).

Parachrysa olivacea NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 118 (1915).

Chrysopa inornata MATSUMURA, Jour. Coll. Agr., Tohoku Imp. Univ., IV, p, 14 (1911); OKAMOTO, Trans. Sapporo Nat. Hist. Soc., V, p. 56 (1913); OKAMOTO, Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 63 (1914).

Chrysopa inornatella NAKAHARA, Ins. World., XVIII, p, 399 (1914)

Locality; Sounkyo (1♀, 8. VIII. 1952, S. KUWAYAMA); Nukabira (1♀, 28. VII. 1933, S. KUWAYAMA; 3♂♂, 12—14. VII. 1953,

S. ITO); Mitsumata (1♂, 14. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu; Saghalien; Siberia; Europe.

Remarks: This species has been often changed its generic position, and also possesses many synonyms of specific name. In Japan, the name *Nineta vittata* is accepted by many research workers in recent years. However, the generic separation of *Nineta* from *Chrysopa* is upon slight venational and genital characters, and the author thinks the better course is to consider the genus *Nineta* at present as synonym of *Chrysopa*. Very common in Hokkaido.

12. **Chrysopa japonica** NAKAHARA

Chrysocerca japonica NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 121 (1915)

Chrysotropia japonica OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 33 (1919); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1542 (1932); KUWAYAMA, Zool. Mag., XLVIII, p. 813 (1936); KUWAYAMA, Icon. Ins. Jap., ed. II (reform), p. 395 (1950).

Locality: Sounkyo (1♀, 22. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu; Saghalien.

Remarks: This species was described by NAKAHARA as a member of *Chrysocerca*, and then transferred to the genus *Chrysotropia* by OKAMOTO. But, KILLINGTON discussed in 1935 that the genera above mentioned are synonyms of *Chrysopa*. The author also considers that KILLINGTON's opinion is correct.

13. **Chrysopa intima** MACLACHLAN

Chrysopa intima MACLACHLAN, Trans. Ent. Soc. Lond., 1893, p. 230 (1893); OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 36 (1919); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1541 (1932); KUWAYAMA, Zool. Mag., XLVIII, p. 814 (1936); KUWAYAMA, Icon. Ins. Jap. ed. II (reform), p. 395 (1950).

Chrysopa perla var. *fracta* NAVÁS, Broteria, Ser. Zool., IX, p. 39 (1910).

Chrysopa perla intima NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 118 (1915).

Chrysopa perla (nec MACLACHLAN) MATSUMURA, Thous. Ins. Jap., I, p. 179 (1904).

Locality: Nukabira (1♀, 11. VI. 1952, S. KUWAYAMA; 4♂♂, 9♀♀, 12—14. VII. 1953, S. ITO); Mt. Upepesanke (1♀, 13. VII. 1953, S. ITO).

Distribution: Hokkaido, Honshu; Kuriles; Saghalien; Siberia.

Remarks: This species is rather common in Hokkaido, especially in the mountainous regions and cooler districts of the island.

14. **Chrysopa sapporensis** OKAMOTO

Chrysopa sapporensis OKAMOTO, Jour. Coll. Agr., Tohoku Imp. Univ., VI, p. 60 (1914); OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 44 (1919); KUWAYAMA, Zool. Mag., XLVIII, p. 815 (1936).

Chrysopa formosa (nec BRAUER) NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 118 (1915).

Locality: Mt. Kurodake (1♂, 7. VII. 1929, S. KUWAYAMA).

Distribution: Hokkaido, Honshu.

Remarks: *C. sapporensis* occurs commonly throughout Hokkaido.

15. **Chrysopa parabola** OKAMOTO

Chrysopa parabola OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 51 (1919); KUWAYAMA, Zool. Mag., XLVIII, p. 816 (1936).

Locality: Shikaribetsu (1♂, 2♀♀, 17. VII. 1952, S. KUWAYAMA).

Distribution: Hokkaido, Honshu; Korea.

Remarks: This species occurs in deciduous woods, and is not rare in Hokkaido.

16. **Chrysopa septempunctata** WESMAEL

Chrysopa septempunctata WESMAEL, Bull. Acad. Brux., VIII, p. 210 (1841); SCHNEIDER, Sym. Mon. Gen. Chrysop., p. 101 (1851); KILLINGTON, Mon. Brit. Neur., II, p. 194 (1937); KUWAYAMA, Icon. Ins. Jap., ed. II (reform), p. 396 (1950).

Chrysopa cognata MACLACHLAN, Jour. Linn. Soc., Zool. IX, p. 249 (1867); OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 53 (1919).

Chrysopa septempunctata cognata KUWAYAMA, Trans. Sapporo Nat. Hist. Soc., IX, p. 114 (1924); KUWAYAMA, Icon. Ins. Jap., ed. I, p. 1539 (1932).

Chrysopa septempunctata forma *cognata* KUWAYAMA, Zool. Mag., XLVIII, p. 818 (1936).

Nothochrysa robusta GERSTAECKER, Mitt. Ver. Neu.-Vorpom. u. Rügen., XXV, p. 73 (1893).

Chrysopa ricciana NAVÁS, Rev. Russ. d' Ent., X. p. 193 (1910).

Cintameva cognata NAVÁS, Rev. Acad. Cien. Zaragoza, IX, p. 23 (1924).

Locality: Nukabira (1♀, 28. VII. 1933, S. KUWAYAMA).

Distribution: Hokkaido, Honshu, Kyushu; Saghalien; Siberia; Europe; Korea; Formosa; China; Cambodia; Turkestan; Mauritius; India; Persia.

Remarks: This species is one of the commonest Chrysopids in Japan, and it is widely distributed throughout Hokkaido. It may be taken in woods and also in orchards, and is known as one of effective natural enemies against the woolly apple aphid.

17. **Chrysopa yamamurae** NAKAHARA

Chrysopa yamamurae NAKAHARA, Ann. Ent. Soc. Am., VIII, p. 122 (1915); OKAMOTO, Rep. Hokkaido Agr. Exp. Sta., IX, p. 55 (1919); KUWAYAMA, Zool. Mag., XLVIII, p. 819 (1936); KUWAYAMA, Trans. Shikoku Ent. Soc., III, p. 180 (1953).

Locality: Mt. Kurodake (1♀, 7, VII, 1929, S. KUWAYAMA).

Distribution: Hokkaido, Honshu, Shikoku.

Remarks: *C. yamamurae* is not common in Hokkaido.

IV. MYRMELEONTIDAE

18. **Myrmeleon formicarius** LINNÉ

Hemerobius formicaleo LINNÉ, Syst. Nat., ed. X, p. 550 (1758).

Myrmeleon formicarius LINNÉ, Syst. Nat., ed. XII, p. 914 (1767); OKAMOTO, Wien. ent. Zeit., XXIX, p. 298 (1910); ESBEN-PETERSEN, Ent. Medd., XII, p. 124 (1918); OKAMOTO, Icon. Ins. Jap., ed. I, p. 1532 (1932); OKAMOTO et KUWAYAMA, Icon. Ins. Jap., ed. II, (reform), p. 402 (1950).

Locality: Sounkyo (1♂, 8. VIII. 1952, S. KUWAYAMA).

Distribution: Hokkaido, Honshu, Shikoku, Kyushu; Kuriles; Saghalien; Siberia; Korea; China; Loo-choo; Formosa; Europe.

Remarks; This widely distributed species occurs commonly in Hokkaido.