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NEW AND RARE SPECIES OF *MECOPTERA* FROM COREA, FORMOSA AND JAPAN

By

Syuti Isshiki

My intension is to carry out a phylogenetic study on the species of *Mecoptera* found in Far East. But, owing to the deficiency of materials and the lack of identifications, there lies still a deep gap to be filled in. The present small paper is a preliminary report on way to make a revision of the oriental *Mecoptera.*

This paper has been kindly seen through by Prof. Dr. S. Matsumura to be put on press, for whom the author expresses his cordinal thanks.

PANORPIDÆ

Panorpodes pulchra n. sp.

Head, thorax and three terminal abdominal segments beautiful orange-yellow; a region enclosing the ocelli brownish black; antennae and maxillary palpi brown; sides of meso- and metanotum, first six abdominal segments, gonostyli of male and cerci of female blackish brown. Sixth abdominal segment with pleural membrane as long as 5th; 7th cylindrical, broader than long; 8th narrower than 7th, being broader than long, broadened towards the apex; distal segment of gonostyli (chelae) short, broad; hypandrium (lower appendage) very broad, branches broad and long, widely apart from each other, extending beyond the middle of chelae, with apex truncated;

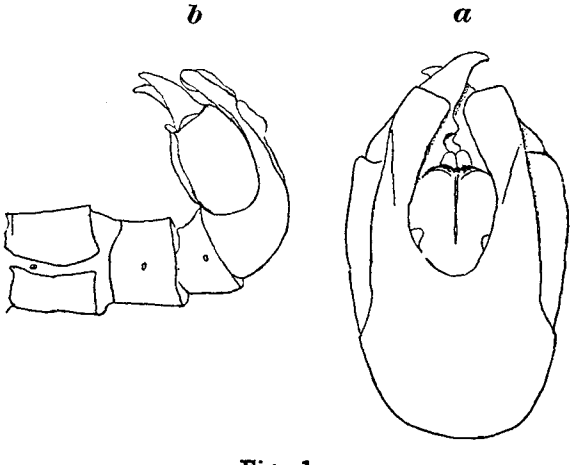

Fig. 1.
Panorpodes pulchra n. sp.

epiandrium (upper appendage) narrowed towards the tip, without incision. Wings rather narrow with acute tips; Sc in fore-wing joins R_1, or sometimes joins the costa before the pterostigma; fork of M_1 and M_2 stalked from medial cell; only one inter no-cubital cross-vein; only a cross-vein between 1A and 2A, inspite of 1A extending beyond the level of *rf* (origin of radial sector); membrane hyaline, colourless, pterostigma opaque, venation dark brown or blackish brown, apical cross-vein colourless, no marking, or only a faint indication of pterostigmatical band.

Fore-wing—12 mm.

Hab.—Japan; 1 ♂ Gokanosho, Kiushu 5–VI, 1926 (author); 2 ♀ Mt. Kirishimayama, Kiushu 9–VI, 1926 (author); 6 ♀ Mt. Kunimiyama, Awa, Shikoku 3–VII, 1926 (author).

Panorpa peterseana n. sp.

Head and rostrum yellowish brown, a black spot between the eyes above the antennae. Maxillary palpi yellowish brown, the apical joint with dark brown tip. Antennae blackish brown. Thorax black above, on the sides and venter

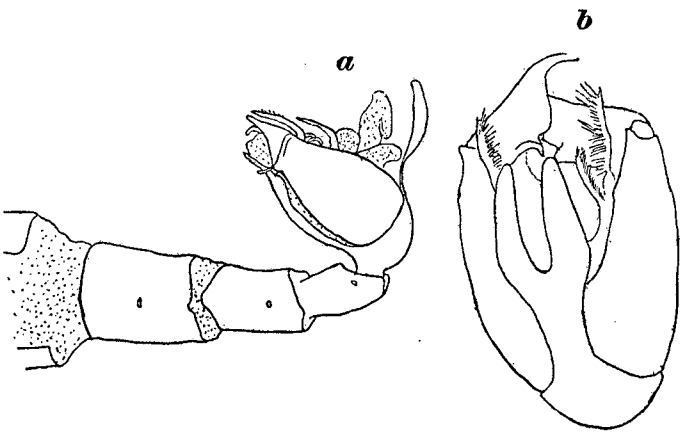

Fig. 2.

Panorpa peterseana n. sp.

yellowish. Abdomen in the female blackish above, becoming brown towards the apex and pale brown ventrally. Second to 6th abdominal segments in the male blackish dorsally, yellowish ventrally; 7th to 9th segments yellowish brown; hind border of the 3rd tergite produced into a short broad median lobe, 4th tergite with a small pointed median process at the anterior $\frac{1}{4}$. Chelae short, the basal portion broad. Hypandrium with the distal half narrow; branches broad, flattened, at the apex elliptical, moderately separate from each other, scarcely reach-

ing to the cheliferous joint. Ventral valves (titilators) branched, with a row of hairs, extending beyond the cheliferous joint. Epiandrium long, extending far beyond the cheliferous joint, slightly narrowed towards the apex, which is deeply cleft leaving the subconical hypovalvae. Wings with an elliptical apex; Sc in fore-wing joins the costa before pterostigma, internal cross-vein normal; markings sooty brown; arrangement of markings nearly the same with that of *P. multifasciaria* MIYAKE. Closely allied to *P. multifasciaria.*

Fore-wing—12–14 mm.

Hab.—Formosa; 3 ♂, 5 ♀ Shinsuiei 18–III, 1926 (author); 2 ♂, 1 ♂ Kunanau, 15–III, 1927 (author).

Panorpa ochraceocauda n. sp.

Head black, at the sides brown; rostrum ochraceous yellow with two brown longitudinal streaks; palpi brown, at the tip of apical joint blackish. Thorax above black, at the sides pale greyish yellow. First five abdominal segments above brownish black, below pale brown, 3rd tergite of male with a broad short round median lobe; 6th subcylindrical, a little longer than broad, black; 7th cylindrical, narrower, longer than broad, ochraceous brown; 8th narrower, as long as 7th, ochraceous yellow. *Gonostyli* beautiful ochraceous yellow, at the tip of distal segment brown, which is very short; basal joint long. Hypandrium with the branches broad, narrowed towards the tip, flattened, considerably shorter than the basal segment of gonopods; ochraceous brown. Epiandrium long, extending beyond the cheliferous joint, at the apex with a deep incision. In the female the last three abdominal segments ochraceous yellow, cerci black.

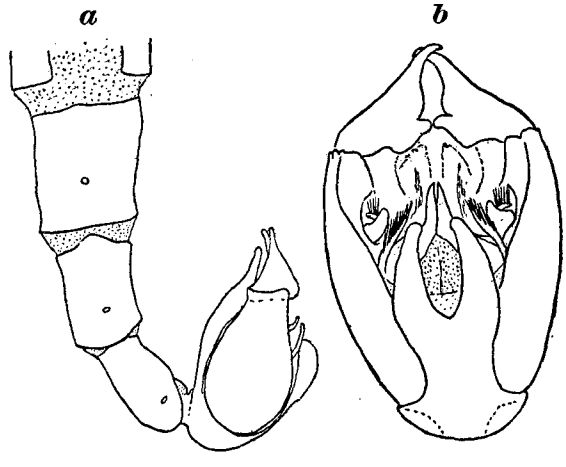

Fig. 3.
Panorpa ochraceocauda n. sp.

Wings narrow, at the apex elliptical; Sc joins the costa before the pterostigma, two cross-veins between R_2 and R_3, anal vein and their cross-veins normal; membrane hyaline, with a purplish reflection; venation brownish black, no marking, except a spot in pterostigma, indicating the pterostigmatical band.

Fore-wing—14–15 mm.

Hab.—Formosa; 1 ♂, 1 ♀ Tattaka V, 1927 (K. FUKUDA); 1 ♀ Tattaka

20–VII, 1925 (author). Numerous dried and shrinked specimens in the collection of Government Research Institute in Taihoku.

Panorpa concolor PETERSEN

E. PETERS., Ent. Medd. Vol. X, p. 220 (1915):—Mecoptera, Coll. Zool. Selys. Longchamps, p. 32 (1921).

As ESBEN-PETERSEN's description was of the female only, I shall describe herein the male. This belongs to the *cornigera*-group. Hind border of the 3rd abdominal tergite slightly produced; 6th segment slightly narrowed towards the apex, blackish brown above, brownish yellow beneath, at the hind border produced above into a slender brownish yellow raised horn; 7th and 8th slender, each broadened towards the apex, and a little curved at the base, brownish yellow. Hypandrium very short; branches rather long, flattened, at the apex obtusely angulated, with some short bristles, slightly approaching to each other towards the apex, extending to only about a half of the basal segment of gonostyli. Ventral valves strong, pointed towards the tip, reaching the base of chelae. The apex of Epiandrium with a deep broad incision. Wings in both sexes constantly with no cross-vein between R_{2a} and R_{2b}, and one between R^{2b} R_3 (this description was made from the dried specimens).

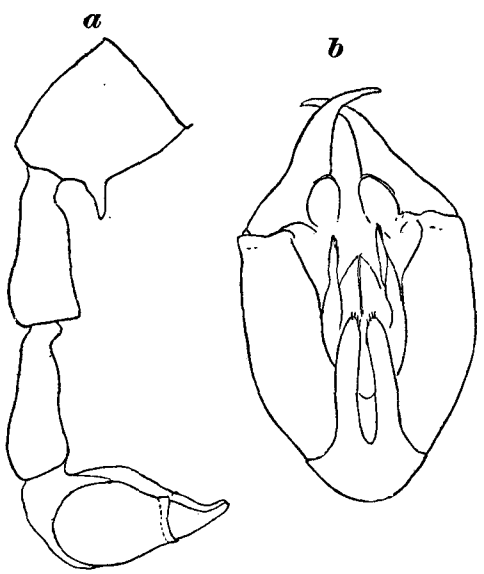

Fig. 4.
Panorpa concolor PETERSEN (♂)

Hab.—Formosa; 3 ♂, 3 ♀ Hori 10–V, 1913 (M. MAKI). In the collection of Government Research Institute in Taihoku.

Panorpa leucoptera UHLER

Uhler Proc. Ac. Nat. Soc. Phild. p. 31 (1858); MACLACHL., Trans Ent. Soc. Lond., p. 196 (1875); E. PETERS., Mecoptera, Coll. Zool. Selys. Longchamps. p. 42 (1921).

♂. Third abdominal tergite with an extraordinary long subcylindrical prolongation; 6th cylindrical, broader than long; 7th slightly longer than 6th, slightly broadened towards the apex; 8th narrower, broadened towards the apex. Basal

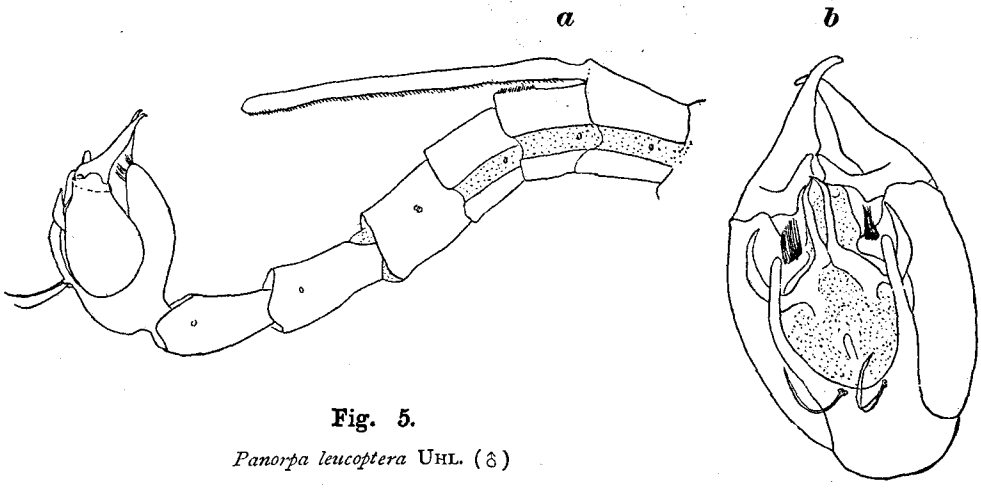

Fig. 5.

Panorpa leucoptera UHL. (♂)

segment of gonopods forms a inner lobe at the distal half, with a tuft of black stiff hairs on it; distal segment (chelae) with a prolonged ventral branch from the base. Hypandrium short, broad; branches narrow, long, flattened, wide apart, not extending to the cheliferous joint; a pair of double long hairs at the bases of branches. Titilators branched, the outer branches shorter than the inner ones, widely apart from it, pointed towards the apex. Epiandrium broad, long, extending beyond the cheliferous joint, at the apex without any incision.

The orginal description of this species was made from a female only. MACLACHLAN's description of the male (Mitt. Schwz. Ges. p. 402, 1887) was based upon an incorrect supposition.

This species is closely approximated to *P. takenouchii* MIYAKE, but may be distinguished from it by a pair of hairs at the bases of hypandrial branches, and slender and proportionally short outer branches of titilators.

Hab.—Japan; 2 ♂ Tokugo-toge, Shinano, 6–VII, 1926 (author); 1 ♀ Kamikochi, Shinano, 16–VII, 1922 (author); 3 ♀ Kawamata, Shimotsuke 1–VIII, 1922 (author).

Panorpa okamotona n. sp.

Head black; rostrum yellowish brown at the base, blackish towards the tip. Thorax pale yellow, pronotum and the anterior lateral margins of meso- and metanotum blackish brown. Abdomen castaneous brown above, brownish ventrally, the terminal segments in the male yellowish; gonostyli blackish, with the inner side paler; in the male the hind border of 3rd tergite produced into a short very broad lobe; 6th cylindrical, slightly longer than broad; 7th narrower than 6th, cylindrical, longer than broad; 8th broadened towards the apex

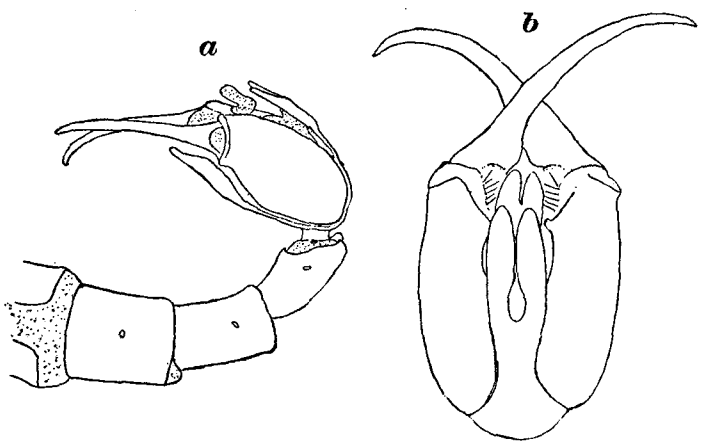

Fig. 6.
Panorpa okamotona n. sp.

which is obliquely truncated. Basal segments of gonostyli elongated; distal segments very long, gently curved, slender, with acute tips.

Hypandrium rather narrow, branches broad, flattened, at the apex obtusely angulated, closed with each other, not reaching to the base of chelae. Epiandrium very long, extending to the cheliferous segments, at the apex obtusely angulated. Wings with a yellowish tinge, at the apex elliptical; venation dark yellow in an apical half; Sc in fore-wings joins the costa before the pterostigma, the fork of R_2 and R_3 situated far distally, and stalked from radial cell, 3A so short that the distal cross-vein from 2A joins the hind margin. Markings sooty brown; submedian band with a posterior half broad, but at the anterior third being eliminated; marginal spot very small, isolated from the costa; pterostigmatical band with the branches complete, in the male the apical branches of hind-wing reduced; apical bands in the female often with basal branches.

Fore-wing—13–15 mm.

Hab.—Corea; 4 ♂, 3 ♀ Shakoji 25–VI, 1926 (author).

Neopanorpa makii n. sp.

This species is closely allied to *N. formosana* NAVAS, but may be distinguished by the following characters:

Basal segment of gonostyli small, short, with an oval outline. Hypandrium narrowed towards the apex; branches long, extending beyond the cheliferous joints, broad, flattened, with a narrow petiole. Epiandrium long, without an incision at the apex. Wings moderate, at the apex elliptical; a narrow streak runs from the apical band along R_3 and then bends forwards to meet the ptero-

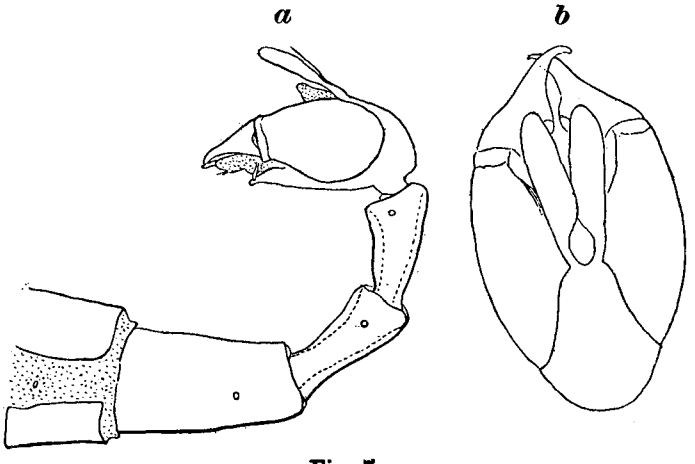

Fig. 7.
Neopanorpa makii n. sp.

stigmatical band, enclosing a small circular costal space, while in *formosana* the apical band joins the pterostigmatical band along the costal margin, having no such streak.

Fore-wing—13–14 mm.

Hab.—Formosa; 1 ♂ Arisan, VI, 1914 (M. MAKI); 1 ♀ Hori V, 1913 (M. MAKI) (In the Government Research Institute in Taihoku); 1 ♂, 4 ♀ Funkiko, Arisan 6–V, 1926 (author).

Neopanorpa magna n. sp.

Head, rostrum, thorax and abdomen reddish brown, at the apical joints of

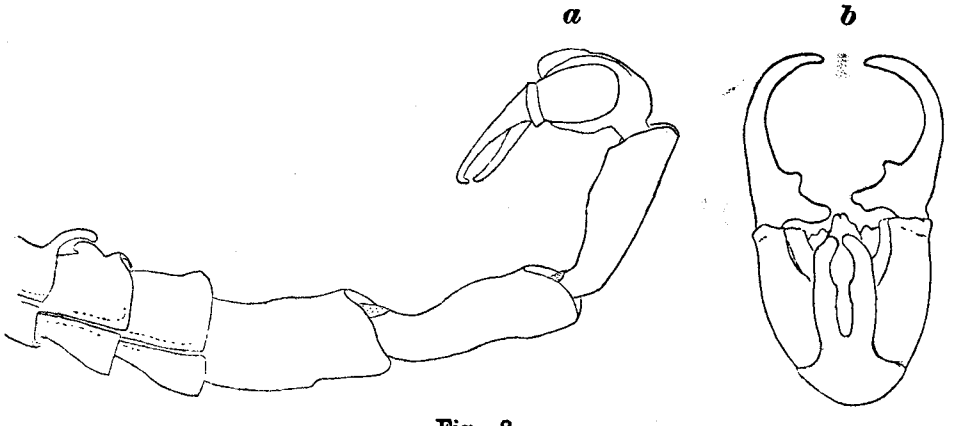

Fig. 8.
Neopanorpa magna n. sp.

maxillary palpi each with a blackish tip. Thorax above with a black median band.

Apex of each abdominal segment blackish; in the male the hind border of 3rd segment produced into a curved slender prolongation, resting on the tubercle of 4th segment; 6th about twice as long as 5th, cylindrical, at the apex obliquely truncated; 7th longer than 6th, narrower, broadened towards the apex, a little curved at the base, at the apex obliquely truncated; 8th as long as 7th, narrowed and curved at the base, at the apex obliquely truncated. Gonostyli with the basal segment short, distal segment long, slender, strongly curved in the apical half. Hypandrium short, the branches long, nearly reaching the cheliferous joint, approximated each other at the apex, at the inner edge slightly dilated in the middle, distally with dense strong hairs. Epiandrium broad, short, at the apex with a shallow incision. Wings very narrow, at the apex elliptical; at the basal half slightly tinged with yellow, the venation blackish brown; submedian band and the marginal spots variable, the pterostigmatical band with basal and distal branches, the apical band being well defined.

Fore-wing—10–21 mm.

Hab.—Formosa; 1 ♂ Arisan 12–IX, 1926 (S. AKASAKA) 1 ♂ Pianan 11–VII, 1926 (T. KANO); 1 ♂ Funkiko, Arisan 6–V, 1926 (author); 1 ♀ Tattaka 20–VII, 1925 (author).

BITTACIDÆ

Bittacus maculatus n. sp.

Head and rostrum pale brown, a region enclosing the ocelli blackish, the

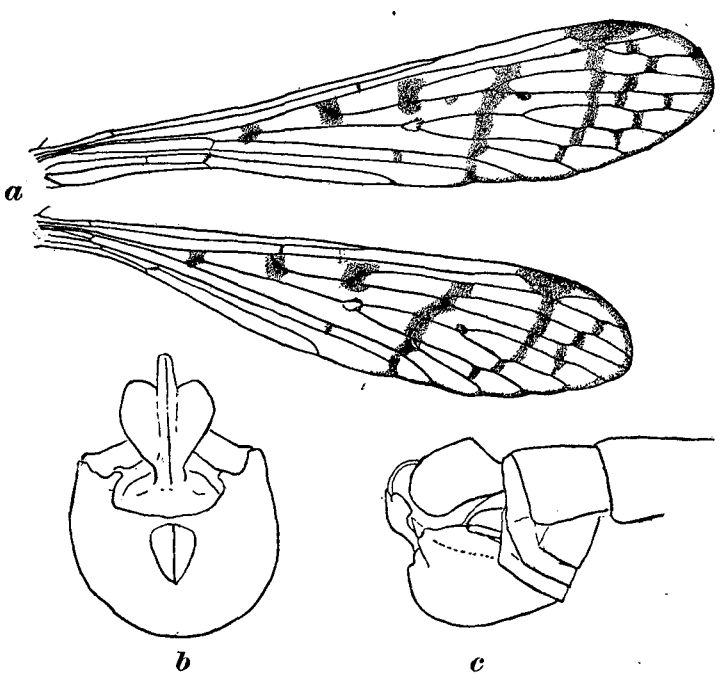

Fig. 9. *Bittacus maculatus* n. sp.

palpi yellowish. Thorax above dark brown, with a yellowish medio-dorsal band; at the sides pale yellowish. Abdomen brown. Surgonopods of the male without a cleft at each tip. Basal segments of the genital stipes blackish brown, slightly swollen towards each tips, large. Lateral lobe of the aedeagus with a distal incision (Text-fig. 9, c). Wings narrow, with an elliptical apex; subcostal cross-vein in the fore-wing at the half way between the origin of Rs and its first fork, or nearer to the origin, in the hind-wings being the nearest to the origin; cubital cross-vein a little before the fork of media; 1A joins the margin a little beyond the cubital cross-vein; no cubito-anal cross-vein; pterostigma connected with radial sector by two cross-veins; membrane with a yellowish tinge, having pale sooty brown spots and striae as shown in Text-fig. 9, a.

Fore-wing—18 mm.

Hab.—Formosa; 2 ♂, 2 ♀ Koshun V, 1918 (J. SONAN). In the collection of the Government Research Institute of Taihoku. All dried specimens.

Bittacus striatus n. sp.

This species is closely allied to the preceding species, but may be distinguished in the following points:

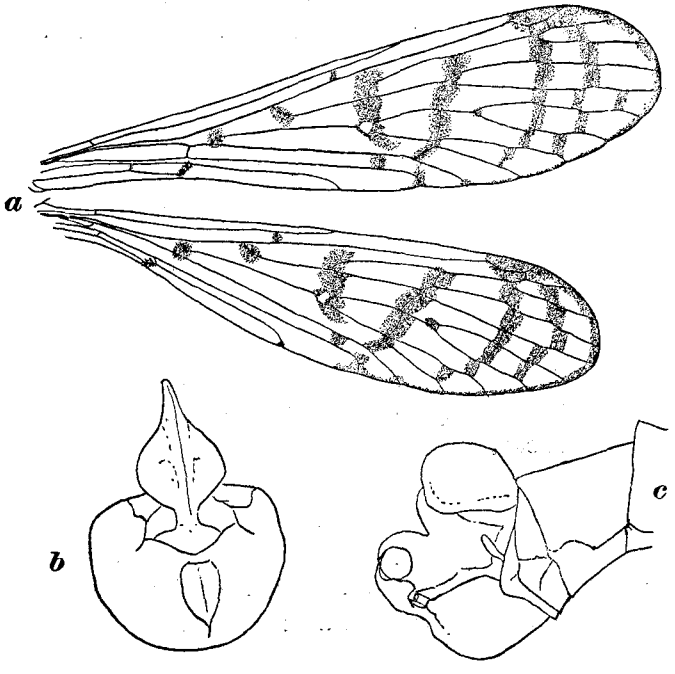

Fig. 10.

Bittacus striatus n. sp.

Wings broad, at the apex rounded; subcostal cross-vein in the fore-wing nearer to the fork of Rs than to its origin, in the hind-wing nearer to the origin; cubital cross-vein is beyond the level of the fork of media; 1A joins the wing-border considerably before the cubital cross-vein; pterostigma also connected with the radial sector by two cross-veins; membrane deep yellowish; a shade at the fork of Rs extending below beyond the fork of media and forming a streak; distal series of cross-veins arranged in a gently curved line, and their shade forming a streak; other markings as in the preceding species. Surgonopods shorter, broader, having no cleft. Basal segments of the genital styles narrower. Lateral lobes of the aedeagus (Text-fig. 10, c) with a distally elongated thread along the penis.

Fore-wing—17–18 mm.

Hab.—Formosa; 1 ♂ Kobayashi, Rato 29–VII, 1923 (Prof. T. SHIRAKI); 1 ♀ Taipin 23–VII, 1918 (J. SONAN). Both dried specimens in the collection of the Government Research Institute in Taihoku.

Bittacus formosanus n. sp.

Antennae irregularly plumose, hairs about as long as or longer than the antennal segment itself; brown, basal joints yellowish brown. Head yellowish brown, the area enclosing the ocelli blackish, rostrum and maxillary palpi dark

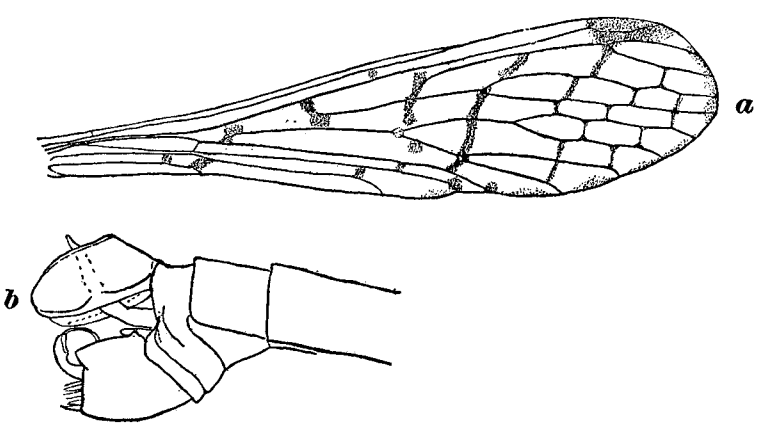

Fig. 11.
Bittacus formosanus n. sp.

brown. Thorax above dark brown with paler medio-dorsal band, at the sides pale yellowish brown. Legs yellowish brown, at the tip of each joint blackish, fore-femur with a distal half blackish. Abdomen yellowish brown with the hind border of each tergite brown. In the male surgonopods rather long, without any cleft at each tip. Basal segment of gonopods not so large as in other species, at

the distal end with some long stiff hair. Basal part of the wing narrow, broadened towards the apex which is rounded, strongly bent at the end of R_5, the hind margin sinuated at the ends of Cu_1 and Cu_2. Subcostal cross-vein in the fore-wing nearer to first radial fork than to the origin of Rs, but in the hind wing a little nearer to the origin of Rs, cubito-anal cross-vein near the end of 1A, 1A joins the margin at a little before the cubital cross-vein. Pterostigma about 4 times longer than broad, connected with the radial sector by two cross-veins, membrane yellow, with numerous dark brown spots and streaks, respectively, along the cross-veins, at the forks of veins, and at the wing margins, as shown in Text-fig. 11, a.

Fore-wing—10–22 mm.

Hab.—Formosa; 1 ♂ Taipin 23–VII, 1918 (J. SONAN); 1 ♂ Kobayashi 28–VIII, 1923 (Prof. T. SHIRAKI), in the coll. of Government Research Institute (*dried specimens*); 1 ♀ Suiriko 6–VIII, 1925 (M. KATO); 1 ♀ Rengechi, 11–X, 1926 (author).

摘　　要

本邦産長翅目の新種及び既知二種の雄の記載

種が明瞭に決定されてないと、如何なる研究も出來ないのは申すまでもない事である。私の今後の研究の必要上記載の不完全なもの及び新種の記載をして置く。

Panorpodes pulchra ISSK. (n. sp.)　スカシシリアゲモドキ

翅は無色透明、体は黒褐色、頭及び腹端は橙黄の美麗色なり。九州及四國産。

Panorpa peterseana ISSK. (n. sp.)　ミダレシリアゲムシ

P. multifasciaria MIY. に似るも、翅に條紋なく、其基部前緣に沿へる條は全くなく、第九腹板の延長してなせる叉狀の附屬器は、甚しく長し。臺灣産。大家ペーテルゼン氏に敬意を表し命名す。

Panorpa ochraceocauda ISSK. (n. sp.)　ツマキシリアゲムシ

黑色、腹部末端は赤黃色、翅は無色透明、紫色の光澤あり、緣紋部に一点又は一短線あるのみにて他に斑紋なし。臺灣産。

Panorpa concolor E. PETERS.　ウスイロシリアゲムシ

雄は第六腹節後方より上向せる刺狀突起を出す、翅は黃色半透明、緣紋部に弱き一褐点あるのみ。臺灣産。

Panorpa leucoptera UHLER　フタスヂシリアゲムシ

雄は第三腹節背面に長き棒狀附屬物と、第九腹板の叉狀部の分岐点に、二剛毛の合一せる一對の附屬物あり。本州産。MACLACHLAN 氏の雄の記載は他種を本種と思ひてなせるものならん。

Panorpa okamotona Issk. (n. sp.) オカモトシリアゲムシ

脈 R_{2+3} と R_{3+4} との間にある徑室の上で R_2 と R_3 が分れるのがシリアゲムシ屬の常であるが、本種のみは徑室をはるかに離れてから、この二脈が分離してゐる、翅は濃い黃色。朝鮮産。朝鮮の長翅目の論文を公にされし岡本半次郎博士に敬意を表し名附けたり。

Neopanorpa makii Issk. (n. sp.) マキシリアゲムシ

N. formosana Nav. に似るも、腹部末端の附屬物短きと、第九腹板の叉狀延長部の形とにより區別さる。本種を始めて採集せる牧茂一郎氏を記念せんがため名附けたり。臺灣産。

Neopanorpa magna Issk. (n. sp.) タイワンオホシリアゲムシ

この屬中の例外とも見做すべき大形種で、雄の腹部は太く、翅長を超ゆ。臺灣産。

Bittacus maculatus Issk. (n. sp.) ホシガガンボモドキ

翅は黃色にして、九圓の如き斑紋を有す。臺灣産。

Bittacus striatus Issk. (n. sp.) スヂガガンボモドキ

前種に似るも、翅の中央部の点は、互に連結して、線をなす。臺灣産。

Bittacus formosanus Issk. (n. sp.) タイワンガガンボモドキ

翅の末端部廣く尖る、灰黃色、脈の分岐点及横脈は褐色にて緣とらる。臺灣産。

尙此他に新種と決定せるもの數種あり。改めて發表せん。

DESCRIPTIONS OF NEW SPECIES OF JAPANESE ELATERIDÆ

By

Y. Miwa

After the studies of eight subfamilies (*Agripninae, Hemirrhipininae, Chalcolepidiinae, Oxynopterinae, Dicrepidiinae, Pachyderinae, Canoderinae* and *Elaterinae*) of the Japanese Elateridae, we have found 23 genera, 138 species, one variety and 4 aberrations. Among these species 19 are new to science, including one new aberration, and the present paper is intended to describe these members.

In this study I must appreciate the kind help of Prof. Dr. S. Matsumura