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昆蟲學評論

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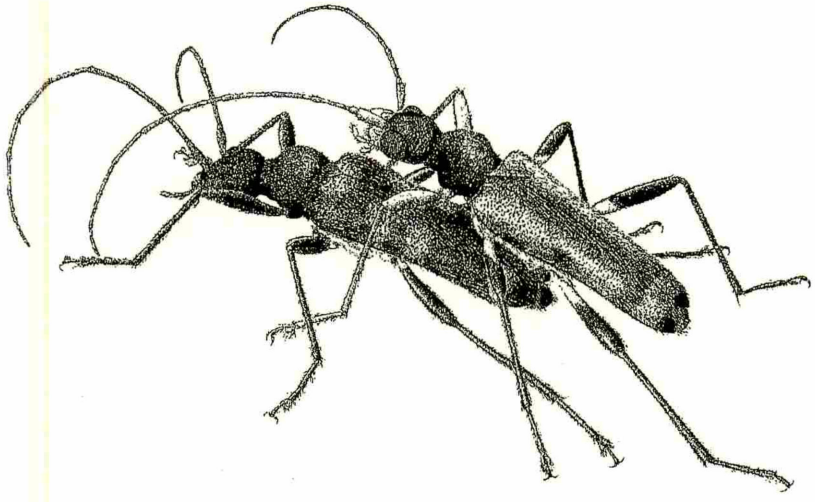

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Taxonomic Notes on *Plateumaris amurensis* WEISE and *Plateumaris weisei* (DUVIVIER) (Coleoptera: Chrysomelidae: Donaciinae)

Masakazu HAYASHI
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Abstract *Plateumaris amurensis* WEISE and *Plateumaris weisei* (DUVIVIER) were redescribed. They resemble each other but several characters are useful for their identification. The distributional range of *P. amurensis* includes East Siberia, Sakhalin, and southern Kuril. Its record from Japan (Hokkaido) were eliminated in this study.

Key words *Plateumaris amurensis*, *Plateumaris weisei*, Donaciinae, Palaearctic

The genus *Plateumaris* THOMSON is a small group of Chrysomelidae. ASKEVOLD (1991) recognized 9 Palaearctic and 17 Nearctic species in the world and arranged them into five species groups.

An eastern Palaearctic species, *Plateumaris amurensis* was described by WEISE (1898) from Amur Province, Far East Russia. Some workers considered that *P. amurensis* is a junior subjective synonym of *Plateumaris weisei* (GOECKE, 1937, 1960; JOLIVET, 1970; ASKEVOLD, 1991). Although MEDVEDEV (1992) listed *P. amurensis* from Primorskij Prov., Amur Prov., Yakut Prov., Sakhalin Is., Kuril Iss., and Japan. Recently, I had an opportunity to examine some specimens of *P. amurensis* from Khabalovsk Prov. and Sakhalin Is. on the basis of male genitalia and ovipositor. In this paper, I redescribe these two species together with illustrations and some taxonomic notes.

I gratefully acknowledge to Dr. Yuri MIKHAILOV (Novouralsk), who provided me useful materials. I also gratefully acknowledge to Dr. Masahiro ÔHARA (Hokkaido University), Dr. Shûhei NOMURA (National Scinece Museum, Tokyo) and Mr. Shigehiko SHIYAKE (Osaka Museum of Natural History) for allowing access to the referred materials.

Abbreviations of depositories:

SEHU – Systematic Entomology, Faculty of Agriculture, Hokkaido University, Sapporo, Japan (same as "the Entomological Institute, Hokkaido University" by TAKIZAWA, 1971)
NSMT – National Science Museum in Tokyo
OMNH – Osaka Museum of Natural History, Osaka, Japan.

Plateumaris amurensis WEISE
(Figs. 1–13, 39–41)

Plateumaris amurensis WEISE, 1898, Arch. Naturg., 64:179; — JACOBY & CLAVAREAU, 1904, Genera Ins., 21: 11; — REITTER, 1920, Wien. ent. Ztg., 38: 41; — GRESSITT & KIMOTO, 1961, Pacific Ins. Monogr., 1A: 23; — MEDVEDEV, 1992, Opredelitel'nasekomyh Dalnego Vostoka SSSR, St. Petersburg, 3 (2): 547.

Plateumaris consimilis: KUWAYAMA, 1967, Insect fauna of the southern Kurile islands: 160;— TAKIZAWA, 1971, Kontyû, 39: 172.

Diagnosis: Apical part of median lobe of male genitalia gradually narrowed to apex. Median process of endophallus elongate; paired dorsal sclerites small; endophallic lateral digit elongate with prominent corner at mid-lateral margin, apex rounded; basal supporting block shorter than lateral digit.

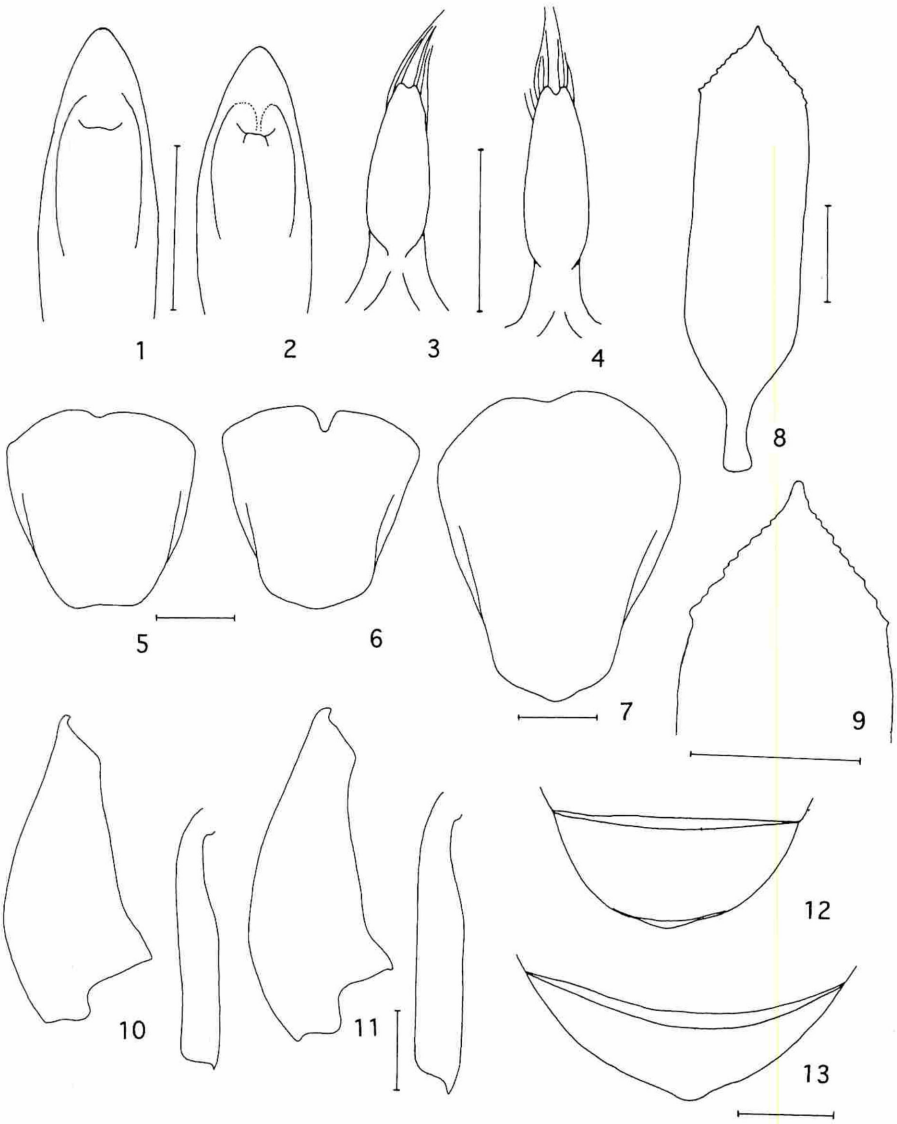
Description. Dorsal coloration coppery. Eyes small, convex; supraocular furrow indistinct; vertex pubescent with deep median line. Antennae entirely rufous sometimes apex darkly rufous; antennomere 5th longest in 2nd to 6th and about 2.5 times as long as its wide; antennomere 4th about 1.6 times as long as 2nd. Pronotum more or less quadrate; anterolateral calli present, callous sulci shallow; disc shiny, coarsely punctate, rugose and rugulose, sometimes with microsculpture in major part of disc; basal sulcus prominent with rugae and dense punctures; median line indistinct. Elytra usually sparsely rugose, shiny but densely punctulate on disc and rounded at apex. Legs usually rufous, sometimes apical area of femora dark; outer apical angles of protibiae with a spine; metafemora with a broad tooth. Pygidial apex pubescent, shallowly emarginate or sometimes truncate in male and rounded in female. Last sternite entirely coppery but apex to middle part rufous, apical shape variable in male, acute in female. Ovipositor elongate, both sides paralleled, subapical corner with teeth; apex remarkably prominent, apical angle acute, with subapical teeth coarse. Male aedeagus with median lobe acute and without a median lip at apex; cap of tegmen gradually narrowed distad, notched or sometimes rounded at apex; median ejaculatory guide gradually narrowed distad ; lateral digit broad,tapered apically, with lateral expansion in middle, rounded at apex and longer than ejaculatory guide; paired dorsal sclerites small; basal supporting block shorter than lateral digit.

Body length: ♂ 7.1–7.3 mm, ♀ 7.7 mm; body slender in male, robust in female.

Variation: Apical shape of pygidium of male is more or less variable as shown in Figs. 5–6.

Comparison: *P. amurensis* is similar to *P. weisei* in dorsal features, but several characters are useful for their identification: 1) Ovipositor is elongate with acute apex in *P. amurensis* (Figs. 8–9), moderate with obtuse apex in *P. weisei* (Figs. 21–22). 2) Metafemur with a broad tooth in the former (Figs. 10–11), with a small tooth in the latter (Figs. 23–25). 3) Apex of median lobe is narrow in the former (Figs. 1–2), broad in the latter (Figs. 14–15). 4) Lateral digit of endophallus is broad in middle and ejaculatory guide more or less elongate in the former (Fig. 39), lateral digit elongate and ejaculatory guide short in the latter (Fig. 42).

Notes MEDVEDEV (1992) listed *P. amurensis* from Japan and he considered that *P. hirashimai* is a junior subjective synonym of *P. amurensis*. However, *P. hirashimai* is a junior subjective synonym of *P. weisei* (ASKEVOLD, 1991) and I have never seen any specimens of *P. amurensis* from Hokkaido. Therefore, I eliminated Japan (Hokkaido) from its distributional records.



Figs. 1–13, *Plateumaris amurensis* WEISE: 1–2, apex of median lobe; 3–4, a cap of tegmen; 5–7, pygidium (5–6, male; 7, female); 8–9, ovipositor (8, ventral view; 9, apex); 10–11, hind leg (10, male; 11, female); 12–13, last sternite (12, male; 13, female).

Distribution: Far East Russia (Primorskij, Amur, Yakut, Sakhalin), S. Kuril (MEDVEDEV, 1992).

Specimens examined: 1♂, Ichinosawa, Saghalin, 1922, MATSUMURA leg. [SEHU]. 7♂♂1♀, Komsomolsky nat. res., Khabalovsk province, Russian Far East, 20. VI. 1998, S. GLADKIKH leg. [OMNH]

Plateumaris weisei (DUVIVIER)

(Figs. 14–38, 42)

Donacia weisei DUVIVIER, 1885, Ann. Soc. ent. Belg., 29: 116; — JACOBSON, 1892, Horae Soc. ent. Ross., 26: 435; — JACOBY & CLAVAREAU, 1904, Genera Ins., 21: 11; — REITTER, 1920, Wien. ent. Ztg., 38: 41; — GOECKE, 1937, Festschr. E. Strand., 2: 371; ——1960, Ent. Blätter, 56: 10; — JOLIVET, 1970, Coleopt. Cat., 51: 53; — MEDVEDEV, 1978, Trudy BPI, New series, 50: 83; —— 1982, Listoedy MNR: 207; —— 1992, Opredelitel' nasekomyh Dalnego Vostoka SSSR, St. Petersburg, 3 (2): 547; — BOROWIEC, 1984, Polskie Pismo ent., 53: 452; — ASKEVOLD, 1991, Mem. ent. Soc. Can., (157): 58; — BIEŃKOWSKI, 1999, Guide to the identification of leaf-beetles (Coleoptera: Chrysomelidae) of the Eastern Europe: 23.

Donacia mongorica SEMENOV, 1895, Horae. Soc. ent. Ross., 29: 267; — JACOBY & CLAVAREAU, 1904, Genera Ins., 21: 11; — REITTER, 1920, Wien. ent. Ztg., 38: 42; — GRESSITT & KIMOTO, 1961, Pacific Ins. Monogr., 1A: 22; — JOLIVET, 1970, Coleopt. Cat., 51: 52; — BOROWIEC, 1984, Polskie Pismo ent., 53: 451.

Plateumaris consimilis orientalis SHAVROV, 1948, Byull. mosk. Obshch. Isp. Prir., Ser. biol., 53: 49; — MEDVEDEV, 1992, Opredelitel' nasekomyh Dalnego Vostoka SSSR, St. Petersburg, 3 (2): 546.

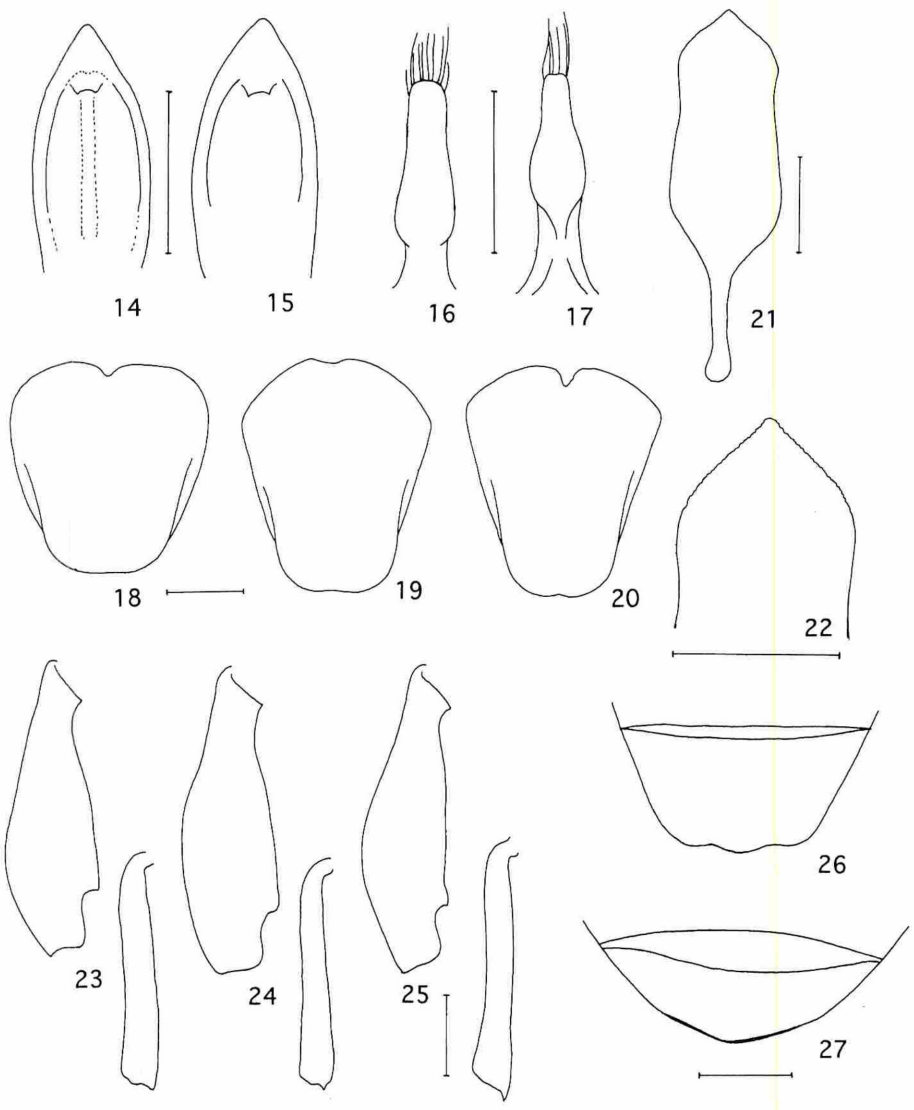
Plateumaris hirashimai KIMOTO, 1963, Frag. Coleopterol., (3): 13; — KIMOTO, 1964, J. Fac. Agri. Kyushu Univ., 13: 118; —— 1981, Bull. Osaka. Mus. Nat. Hist, (34): 25; —— 1983, Ent. Rev. Japan, 38: 14; 1986, Ent. Rev. Japan, 41: 124; —— 1986, Ins. & Nat., 21 (13): 24; — JOLIVET, 1970, Coleopt. Cat., 51: 52; — BOROWIEC, 1984, Polskie Pismo ent., 53: 451; Fossil Insect Research Group for Nojiri-ko Excavation, 1985, Atlas of the Japanese Donaciinae: 7; — KIMOTO, 1994, Leaf beetles (Chrysomelidae) of Japan, Volume adult, Tokai Univ. Press: 103.

Plateumaris morimotoi KIMOTO, 1963, Frag. Coleopterol., (3): 13; —— 1964, J. Fac. Agri. Kyushu Univ., 13: 118; — JOLIVET, 1970, Coleopterorum Catalogus, 51: 52.

Plateumaris sachalinensis MEDVEDEV, 1973, Ent. Obozr., 52: 876; — MEDVEDEV, 1978, Trudy BPI, New series, 50: 83;—— 1992, Opredelitel' nasekomyh Dalnego Vostoka SSSR, St. Petersburg, 3 (2): 547; — BOROWIEC, 1984, Polskie Pismo ent., 53: 451.

Diagnosis: Apical part of median lobe of male genitalia swollen subapically, both sides arched, gradually narrowed to apex. Median process of endophallus robust but markedly short; paired dorsal sclerites small; endophallic lateral digit elongate and more or less broad, apex bluntly rounded; basal supporting block shorter than lateral digit.

Description. Dorsal coloration coppery, sometimes metallic green, blue, or purple. Eyes small, convex; supraocular furrow indistinct; vertex pubescent with deep median line. Antennae entirely rufous sometimes darkly rufous apically; antennomere 5th longest in 2nd to 6th and about 3.5 times as long as its wide; antennomere 4th about 2.2 times as long as 2nd. Pronotum more or less quadrate; anterolateral calli present, callous sulci shallow; disc shiny, punctate, rugose and rugulose, sometimes with microsculpture in major part of disc; basal sulcus prominent with rugae and densely puncture; median line indistinct, at most shallowly furrowed. Elytra usually sparsely rugose, shiny but densely punctulate; apex rounded. Legs usually rufous, sometimes entirely coppery but base of femora and tibiae always rufous; outer apical angles of protibiae with a spine; metafemora with a tooth. Pygidium pubescent, shallowly emarginate or sometimes truncate in male, and shallowly emarginate in female at apex. Last sternite entirely coppery but partly rufous in apical half, gently waved in male or rounded in female at apex. Ovipositor broad, both sides widely emarginate, subapical corner rounded; apex slightly prominent, apical angle nearly right, more or less acute, with subapical serration finely. Apex of median lobe acute without a median lip; a cap of tegmen gradually narrowed to apex, apex



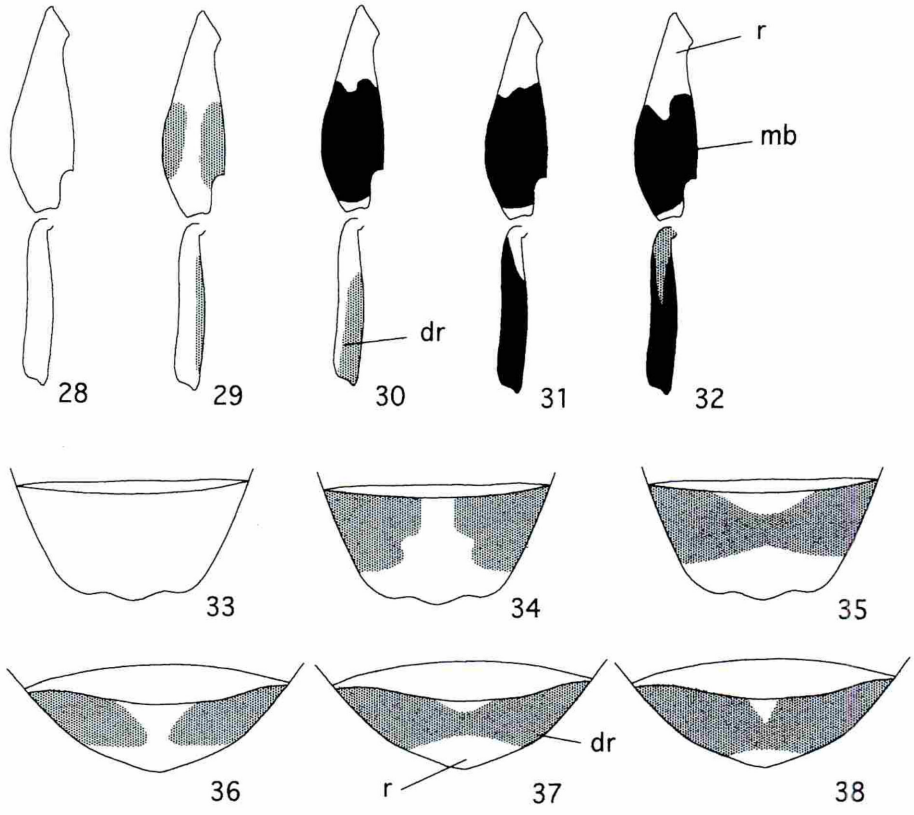
Figs. 14–27, *Plateumaris weisei* (DUVIVIER): 14–15, apex of median lobe; 16–17, a cap of tegmen; 18–20, pygidium (18, male; 19–20, female); 21–22, ovipositor (21, ventral view; 22, apex); 23–25, hind leg (23–24, male; 25, female); 26–27, last sternite (26, male; 27, female).

rounded sometimes notched. Median ejaculatory guide triangular-shaped and short; lateral digit slender, apex rounded, longer than ejaculatory guide; paired dorsal sclerites small; basal supporting block as long as lateral digit.

Body length: ♂ 6.2–7.8 mm, ♀ 6.8–8.0 mm; body slender in male, robust in female.

Variation: Variation of metafemoral shape is shown in Figs. 23–25; color variation of hind leg and last sternite is shown in Figs. 28–38 ; apical shapes of pygidium in both sexes are more or less variable as in Figs. 18–20.

Notes: After KIMOTO (1963) described *Plateumaris hirashimai* and *Plateumaris morimotoi* from Hokkaido, he (1981) considered the latter is a junior subjective synonym of the former.

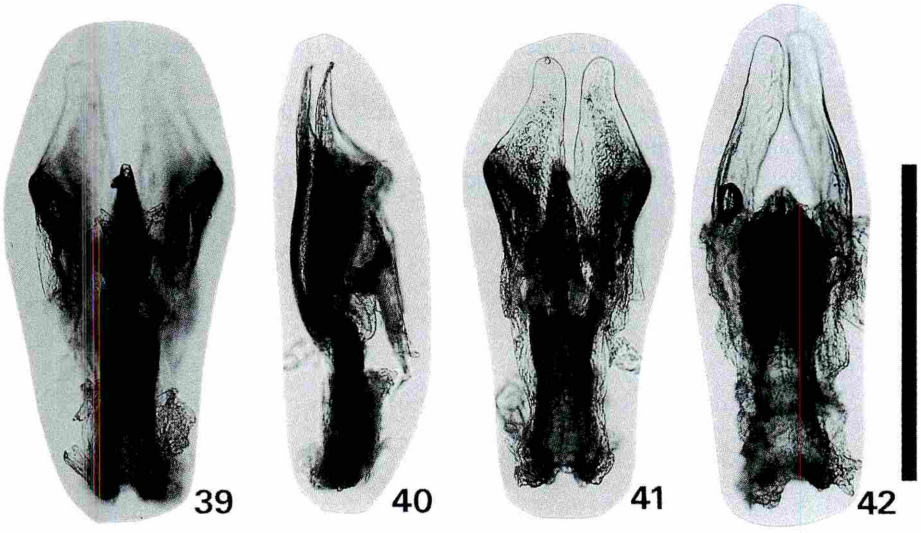


Figs. 28–38, Color variation of *Plateumaris weisei*: 28–32, hind leg (28–39, typical coloration); 33–38, last sternite (33–35, male; 36–38, female). Coloration: r, rufous; dr, dark rufous; mb, metallic black. Not to scale.

However, MEDVEDEV (1982, 1992) treated *Plateumaris mongolica* SEMENOV and *P. morimotoi* as junior subjective synonyms of *P. weisei*, and *P. hirashimai* as a junior subjective synonym of *P. amurensis*. ASKEVOLD (1991) recognized that *P. hirashimai* and *P. morimotoi* are junior subjective synonyms of *P. weisei* on the basis of endophallic features (see ASKEVOLD, 1991: figs. 168–169). Therefore, *P. hirashimai* is not a synonym of *P. amurensis*, and *P. weisei* (cf. *P. hirashimai*) is distributed in Hokkaido.

Distribution: Japan (Hokkaido), Russia (Sakhalin, Primorskij, Amur, Yakut), northern China, Mongolia, northern Europe. (GRESSITT & KIMOTO, 1961; KIMOTO, 1983; BOROWIEC, 1984; MEDVEDEV, 1982, 1992; ASKEVOLD, 1991).

Specimens examined: 1♀ [Paratype: *Plateumaris hirashimai* KIMOTO]: Akan, Hokkaido, VII. 1953, S. MASAKI leg. [NSMT]. 14♂♂7♀♀, Hyotannuma, Tenninkyo, Higashikawa-cho, Hokkaido, alt. 940m, 18. VII. 1980, I. HIURA leg. [OMNH]. 1♂, Shiretoko-Goko, Syari-cho, Hokkaido, alt. 250m, 27. VII. 1981, K. HARUSAWA [OMNH]. 14♂♂1♀, Aka-numa, Tsurui-mura, Hokkaido, alt. 5m, 23. VII. 1980, I. HIURA leg. [OMNH]. 4♂♂3♀♀, Kabutonuma, Toyotomi-cho, Hokkaido, 24. VII. 1993, M. HAYASHI leg. [OMNH]. 2♂♂1♀, Hyotannuma, Tenninkyo, Higashikawa-cho, Hokkaido, 22. VII. 1993, M. HAYASHI leg. [OMNH].



Figs. 39–42, Endophallus of *Plateumaris* spp.: 39–41, *Plateumaris amurensis*; 42, *Plateumaris weisei* (39, 42, dorsal view; 40, lateral view; 41, ventral view).

要　　約

林　成多：ヒラシマミズクサハムシ *Plateumaris weisei* (DUVIVIER) とその近縁種 *P. amurensis* WEISE の分類学的検討 ——— *Plateumaris weisei* (DUVIVIER) の新参シノニムとして扱われることの多かった *Plateumsris amurensis* WEISE を独立種として認め，両種を再記載した．雄交尾器の陰茎先端や骨片（内袋），雌の産卵管により，両種は容易に識別可能である．また，日本における *P. amurensis* の分布記録を削除した．

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—— 1992. Fam. Chrysomelidae. In. Opredelitel' nasekomyh Dalnego Vostoka SSSR. V.3. Part 2. Nauka, St.Petersburg: 533–602. (in Russian)

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Ent. Rev. Japan 56 (1): 9–10, June 30, 2001

Donacia versicolorea (BRAHM) from Kamchatka Peninsula, Far East Russia (Coleoptera: Chrysomelidae: Donaciinae)

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767–45–101, Ôhara, Sanda, 669–1515 Japan

Abstract *Donacia versicolorea* (BRAHM, 1790) is reported the first time from Kamchatka Peninsula, Far East Russia.

Donacia versicolorea (BRAHM) is a common species in Europe but very rare in eastern Palaearctic region. MEDVEDEV (1992) reviewed 25 species of Donaciinae from Far East Russia and listed *D. versicolorea* from Primorskij.

The Natural History Museum and Institute, Chiba carried out the Biological Expedition to Kamchatka Peninsula and the North Kuril Islands in 1996 and 1997. It was a part of a project entitled "The Origin and Biogeography of the Northeast Asian Biota", in co-operation with the Institute of Biology and Pedology and the Institute of Marine Biology belonging to the Far Eastern Branch of the Russian Academy of Sciences, Vladivostok. In 1997, one specimen of *Donacia* was collected at Kamchatka Peninsula by Dr. KURANISHI (Natural History Museum and Institute, Chiba) during this project. This specimen is identified with *Donacia versicolorea* (BRAHM) which newly recorded from Kamchatka Peninsula. Its record is eastern limit of this species.

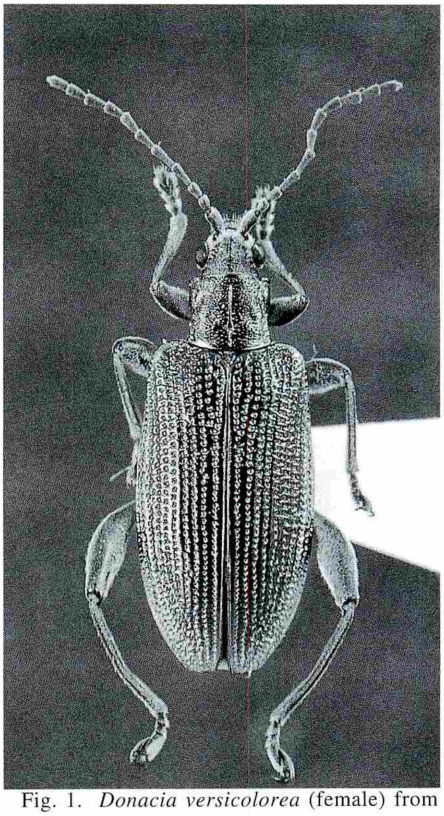

Fig. 1. *Donacia versicolorea* (female) from Kamchatka Peninsula. Body length, 8.9 mm.

I gratefully acknowledge to Dr. Akiko SAITÔ (Natural History Museum and Institute, Chiba) for allowing access to the referred material.

Donacia (*Donaciomima*) *versicolorea* (BRAHM, 1790)

(Fig. 1)

Specimen examined: 1♀, Mt. Vachkazhets, Upper part of Takhkoloch River, Basin of Plot'nikova, Kamchatka Pen., RUSSIA, 53°04'N, 157°50'E, alt. 400m, 4. VIII. 1997, R. B. KURANISHI leg. Identi-

fication lavel with: *Donacia* (*Donaciomima*) sp., '99, Det. H. TAKIZAWA. This specimen is deposited in the Natural History Museum and Institute, Chiba (CBM, with a code of ZI: CBM-ZI 80714).

Distribution: Europe; Siberia, Primorskij, Kamchatka.

Reference

MEDVEDEV, L. N., 1992. Fam. Chrysomelidae. In. Opredelitel'nasekomyh Dalnego Vostoka SSSR. V.3. Part 2. Nauka, St. Petersburg: 533–602. (in Russian)

Ent. Rev. Japan 56 (1): 11–14, June 30, 2001

Differences in the Frequency of Fights between Minor and Major Males in the Horned Beetle *Trypoxylus dichotomus septentrionalis* (Coleoptera: Scarabaeidae)

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Yamashita-cho 1–10–6, Okaya City, Nagano, 394–0005 Japan

Abstract Males of *Trypoxylus dichotomus septentrionalis* (KÔNO) is dimorphic in horn size and often fight with other males for food or females. I divided male adults into the minors (small males) and the majors (large males) and observed differences in the frequency of fights between the two morphs under laboratory conditions. On average, the majors showed fighting behavior more frequently than the minors. However, some minors showed fighting behavior as frequently as the majors. Horn length did not influence the frequency of fights in the minors.

Introduction

Males of *Trypoxylus dichotomus septentrionalis* (KÔNO) (= former *Allomyrina dichotomus septentrionalis*) are known to fight each other for food or females.

Past studies have shown that males used their horns as weapons in intraspecific fights (OBATA & HIDAKA, 1983; SIVA-JOTHY, 1987). Moreover, recent studies have shown that males of this species are divided into two morphs on the basis of horn size, minors (small males) and majors (1arge males) (SIVA-JOTHY, 1987; IGUCHI, 1998, 2000). SIVA-JOTHY (1987) pointed out that minors used an alternative tactic to avoid fighting with majors.

OBATA & HIDAKA (1983) observed that males of this species were aggressive when their feeding was interrupted. However, OBATA & HIDAKA (1983) did not notice the male morphological dimorphism of this beetle. Therefore, they did not examine any differences in fighting behavior between minors and majors. On the other hand, SIVA-JOTHY (1987) reported that majors showed fierce fighting behavior, but that minors did not fight with other males. However, SIVA-JOTHY (1987) did not observe in detail how minors behaved when their feeding was interrupted. In fact, I sometimes observed that minors fought each other for food in both laboratory and field populations. Particularly minors seemed to show fighting behavior frequently on showing hind-1eg swinging behavior (hind-1eg swinging behavior was first reported in IGUCHI, 1997).

The aim of the present study is to clarify whether minors show fighting behavior like majors. Through a laboratory experiment, I examined differences in the frequency of fights between minors and majors.

Materials and Methods

For this study, 71 final instar larvae were collected in the soil in the western part of Tatsuno-machi, Kamiina-gun, Nagano Prefecture. Each larva was reared in a glass bottle (9 cm in diameter and 16 cm in height) filled with the soil from its habitat (12 cm deep). All the bottles were placed together outdoors in Okaya City, Nagano Prefecture. Throughout this study, no more humus or soil was added, but water was sprinkled to keep the soil moist.

In this rearing experiment, 30 males emerged. For each male, the length of the head horn was measured to 0.1 mm with a slide caliper. The frequency distribution of horn length was clearly bimodal (Fig. 1). Therefore, these males were divided into minors (horn length $<$ 9 mm) and majors (horn length $\geqq$ 9 mm). Of the 30 males, 5 males became physically weak or died soon. Therefore, the other 25 males (13 minors and 12 majors) were used for the following laboratory experiment.

In the experiment, each male was reared in a plastic container (20 cm$\times$12.5 cm$\times$12 cm deep). A wood block was also put in this container, and artificial sap was put as food on the top of the wood block. A medium-sized male (8 mm in horn length) was chosen and named Male 0. The other 24 males (12 minors and 12 majors) were also named Males 1–24 respectively. I observed whether Males 1–24 fought with Male 0. For example, the fighting behavior of Male 1 was recorded in the following way:

While Male 1 is feeding and showing hind-leg swinging behavior, I picked up Male 0 and pushed his head horn against Male 1's head horn until Male 1 attacked Male 0 or left the sap site without any attacks. If Male 1 attacked Male 0, this behavior was recorded as a fight of Male 1. This experiment was repeated three times.

The same experiment was carried out for each of the 24 males under the artificial light of 20–30 lux between 19:00 and 3:00. This experiment was similar to that of OBATA & HIDAKA (1983), but they observed whether males attacked a styrofoam model instead of a living male.

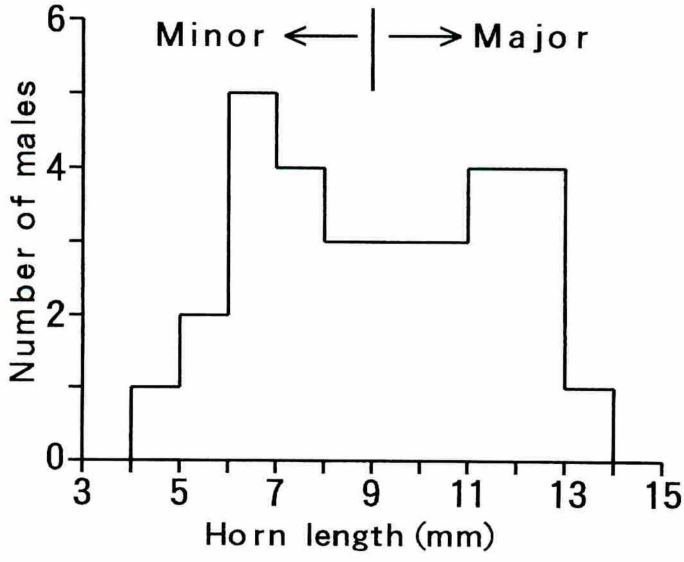

Fig. 1. Frequency distribution of horn length for 30 males obtained from a rearing experiment. The males were divided into minors (horn length $<$ 9 mm) and majors (horn length $\geqq$ 9 mm).

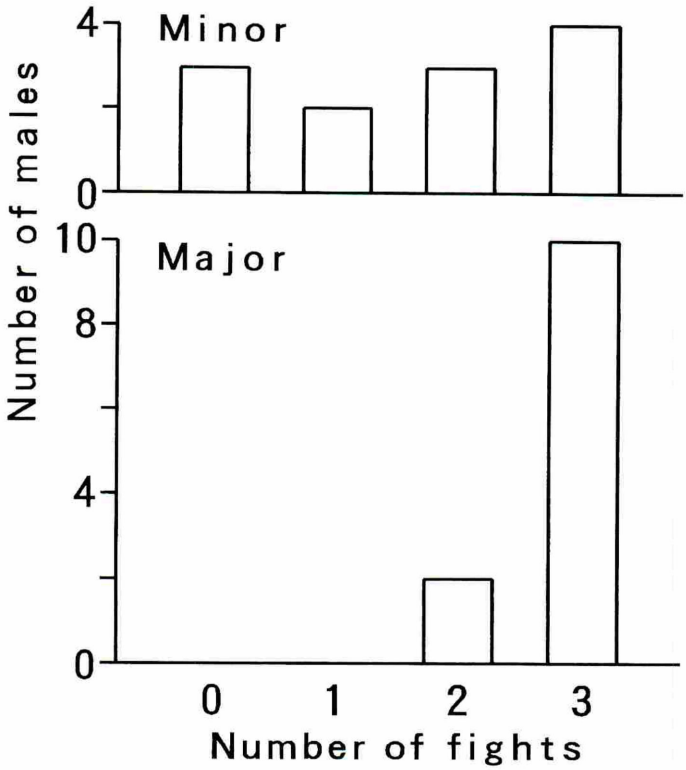

Fig. 2. Frequency distribution of fights in 12 minors and 12 majors. The horizontal axis shows how many times the minors or majors showed fighting behavior.

Results and Discussion

As shown in Fig. 2, all the 12 majors showed fighting behavior 2 or 3 times. In contrast, only 5 of the 12 minors showed fighting behavior 2 or 3 times. Consequently, majors tended to show fighting behavior more frequently than minors (Mann-Whitney U-test, $U = 23$, $P < 0.01$) and the numbers of fights were more variable in minors than in majors. (F-test, $F(12, 12) = 10.0$, $P < 0.01$).

As shown in Fig. 3, there was no significant correlation between horn length and fight number in minors (Kendall rank correlation, $\tau = 0.354$, $P > 0.1$). This result meant that horn length did not influence the frequency of fights in minors.

Except for the study of SIVA-JOTHY (1987), there was no previous study on behavioral differences between minors and majors in *T. d. septentrionalis*. SIVA-JOTHY (1987) reported that majors fought with other males violently, but that minors did not fight with other males either in the laboratory or in the field. However, he did not examine differences in the frequency of fights between minors and majors. The present results suggest that the fighting behavior of majors is not only more violent but also more frequent than minors. Nevertheless, the present results mean that even minors sometimes show fighting behavior regardless of their horn length. This was inconsistent with the observation of SIVA-JOTHY (1987). This is probably because his study focused on injury caused by intraspecific fights rather than the frequency of

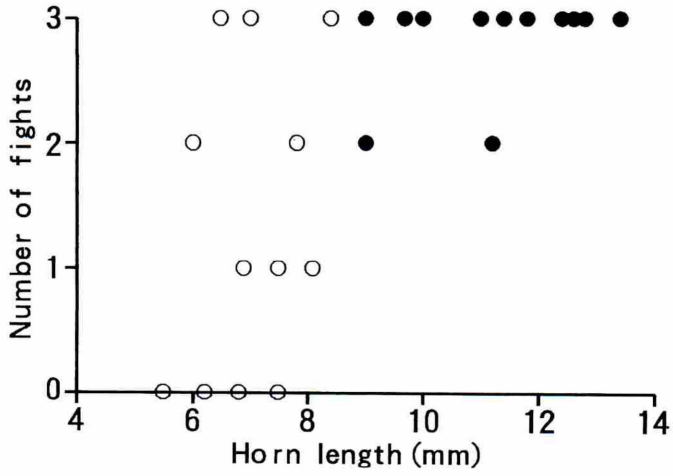

Fig. 3. Relationship between horn length and fight number in 12 minors (○) and 12 majors (●). The vertical axis shows how many times the minors or majors showed fighting behavior.

fights. Moreover, he may not have paid attention to minors showing hind-leg swinging behavior. In fact, the present study showed such fighting behavior in minors. As mentioned in the Introduction, minors showing hind-leg swinging behavior seem to be more aggressive than usual. In future studies, it is necessary to observe differences in the frequency of fights between males showing hind-leg swinging behavior and males not showing this behavior.

要　　約

井口　豊：カブトムシ雄の角長と闘争頻度について ——— カブトムシ雄を角長に基づいて大型と小型に分け，それぞれの闘争頻度を実験的に観察した．その結果，大型は小型より頻繁に闘争行動を示すことがわかった．ただし，小型の闘争頻度にはバラツキがあり，大型と同じくらい頻繁に闘争行動を示す小型も存在することがわかった．小型では，角長は闘争頻度に影響しなかった．

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New or Little-known Tenebrionid Species from Japan (Part 1)

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Abstract Five new tenebrionid species from Japan are described under the following names: *Laena ezimai* sp. nov., *L. hiranoi* sp. nov., *Misolampidius ohminesanus* sp. nov., *Tarpela tokunoshimana* sp. nov. and *Amarygmus inadai* sp. nov. A new status is given for *Laena insularis* KASZAB, 1964.

According to the Check List of Japanese Insects (1989), approximately 350 species and subspecies of tenebrionid beetles are distributed in Japan, which maintains very rich environment for insects, particularly for tenebrionid beetles. It consists of several archipelagoes, almost 3,000 km in length and varies in climates from cold temperate in Hokkaido Island to subtropical area in the Ryukyu Islands. Geographical features are also complicated, from lowlands near the seashore to the alpine zone on high mountains. When more intensive investigations are made on the Tenebrionidae, many more taxa of this group of beetles will be added to the fauna of Japan. This paper is the first part of our studies on the Japanese Tenebrionidae.

Before going further details, we wish to express our heartfelt thanks to Dr. Kiyoshi ANDO, Ehime University, Dr. Satoshi KAMITANI, Kyushu University, Ing. Stanislav BEČVÁŘ, Institute of Entomology, Czech Academy of Sciences, Messrs. Yukihiko HIRANO, Odawara City, Shigeaki KONDO, Urayasu City, Masaaki KIMURA, Naha City, the late Masao EZIMA, Minoru MURAMATSU, Yonaguni Town, Satoshi INADA, Urasoe City, for submitting important materials to us for the present study. We also thank Dr. Makoto KIUCHI, National Institute of Sericultural and Entomological Science, for taking photographs inserted in this paper. Deepest appreciation should be expressed to Dr. Shun-Ichi UÉNO, National Science Museum (Nat. Hist.), Tokyo, for his critical reading through the manuscript of this paper.

All the holotypes to be designated are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo, Japan (NSMT).

Tribe **Adeliini**

Laena ezimai sp. nov.

[Japanese name: メシマチビヒサゴゴミムシダマシ]

(Figs. 1–2)

This new species resembles *Laena rotundicollis* MARSEUL, 1876, originally described

from Nagasaki, Kyushu, but can be discriminated from the latter by the following characteristics:

Body smaller, more shortened; head subrhomboidally flattened, more strongly punctate, each puncture with a fine bent hair; clypeus more flattened, fronto-clypeal border more clearly impressed; genae feebly raised, rather noticeably, triangularly projected laterad; frons broad, with posterior portions inclined laterad; diatone about 7 times the width of transverse diameter of an eye. Eyes subovate, more strongly convex laterad, gently inlaid into head. Antennae submoniliform, becoming bolder apicad, reaching base of pronotum, ratio of the length of each segment from base to apex: 0.37, 0.2, 0.27, 0.23, 0.22, 0.23, 0.22, 0.23, 0.24, 0.23, 0.4.

Pronotum slightly wider than long, widest at apical 2/5, feebly narrowed apicad and gently so posteriad; apex sublinear; base weakly produced; sides rather steeply declined to lateral margins, which are finely, irregularly bordered and hardly visible from above; front angles rounded, hind angles obtuse; disc moderately convex, more strongly, closely punctate than in *L. rotundicollis*. Scutellum with visible part small and triangular, microsculptured and sparsely punctate.

Elytra subovate, 1.53 times as long as wide, 2.4 times the length and 1.5 times the width of pronotum, widest at the middle; dorsum moderately convex, weakly flattened in anterior part, gently depressed in areas along scutellar strioles; disc more strongly punctato-striate; intervals more noticeably convex, sparsely scattered with minute punctures, each with a fine hair; 3rd interval with a setiferous umbilicate pore at apical 1/17, 7th with one at basal 1/9, 9th with four, one at basal 1/5, second at apical 2/5, third at apical 1/5 and fourth at apical 1/9; lateral margins with grooves in apical portion; apices more strongly projected.

Abdominal sternites moderately punctate and haired; anal sternite rather closely punctate.

Legs somewhat slenderer; fore femora with upper side of anterior edge acutely spined at apical 1/3; middle femora with lower side of posterior edge spined at apical 1/4, and also with upper side of posterior edge bluntly angulate; hind femora with lower side of posterior edge spined at apical 1/5, and also with upper side of posterior edge bluntly angulate at apical 1/4; ratios of the lengths of pro-, meso- and metatarsomeres: 0.37, 0.29, 0.26, 0.25, 1.2; 0.78, 0.48, 0.39, 0.26, 1.26; 1.4, 0.7, 0.32, 1.63.

Male genitalia extremely elongated fusiform, 0.9 mm in length, 0.15 mm in width, feebly bent near basal portion in lateral view; basal piece triangularly incised at the border of lateral lobes; fused lateral lobes 0.2 mm in length, slightly elongated triangular, with rounded apex.

Body length: 4.7–5.0 mm.

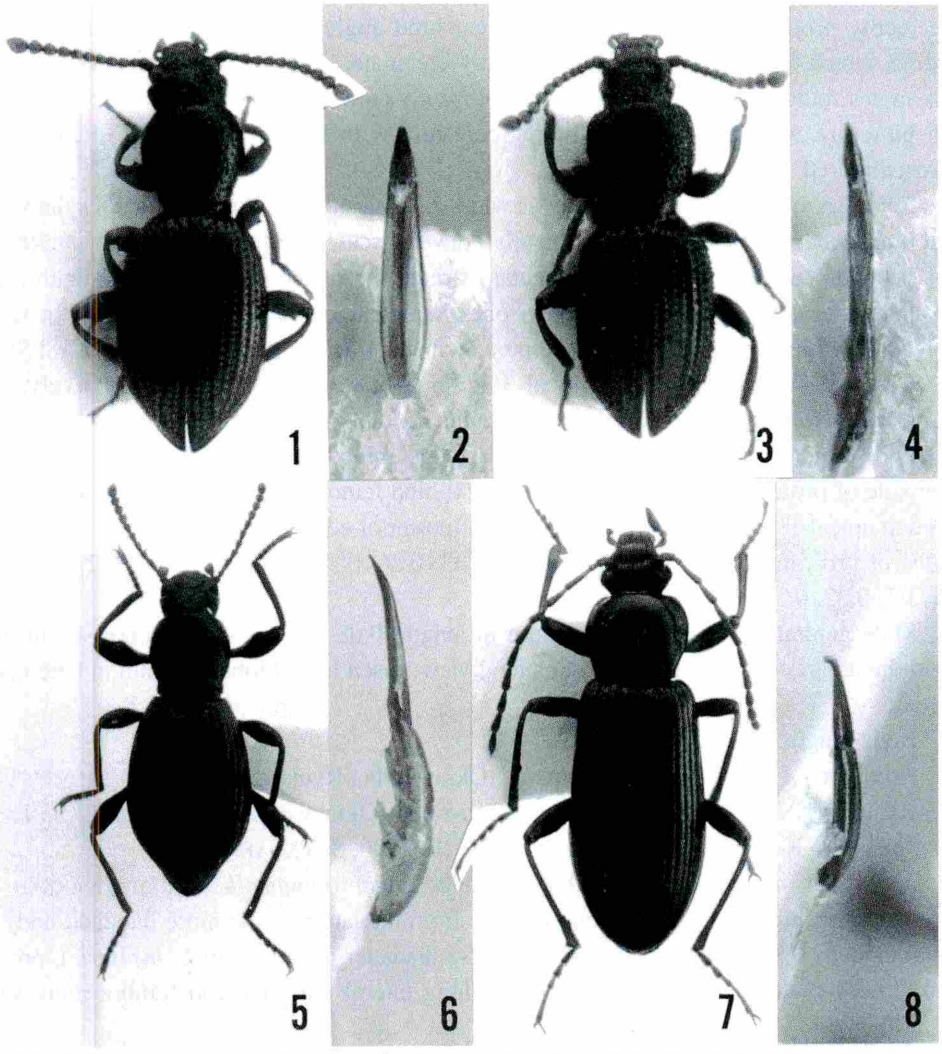
Holotype: ♂, Me-shima Is., Danjo-guntô Isls., Nagasaki Pref., Japan, 25. V. 1989, M. EZIMA leg. (NSMT). Paratypes: 4 exs., same data as the holotype.

Laena hiranoi sp. nov.

[Japanese name: オキナワチビヒサゴゴミムシダマシ]

(Figs. 3–4)

Dark reddish brown, with basal halves of antennae, abdomen and legs lighter in colour, mouth parts and hairs on surfaces yellowish; each surface moderately, somewhat vitreously shining. Elongate, distinctly constricted between fore and hind bodies, gently convex above, feebly flattened in middle.



Figs. 1–2, *Laena ezimai* sp. nov., holotype, ♂; 1, habitus; 2, male genitalia (dorsal view). Figs. 3–4, *Laena hiranoi* sp. nov., holotype, ♂; 3, habitus; 4, male genitalia (lateral view). Figs. 5–6, *Misolampidius ohminesanus* sp. nov., holotype, ♂; 5, habitus; 6, male genitalia (lateral view). Figs. 7–8, *Tarpela tokunoshimana* sp. nov.n , holotype, ♂ ; 7, habitus; 8, male genitalia (lateral view).

Head suboctagonal, weakly raised posteriad, strongly punctate, microsculptured in lateral parts, with a longitudinal impunctate part medially; clypeus transversely hexagonal, feebly inclined forwards, truncate and slightly emarginate in front, with fronto-clypeal border almost straight and impressed; genae rather strongly convex above and impunctate in middle, roundly produced obliquely anteriad; frons rather wide, weakly convex in middle; diatone about 1/7 times the width of transverse diameter of an eye. Eyes longitudinally ovate, moderately convex laterad, gently inlaid into head. Antennae somewhat moniliform, gently becoming bolder apicad, extending beyond the middle of pronotum, ratio of the length of each segment from base to aepex: 0.37, 0.2, 0.27, 0.24, 0.22, 0.25, 0.27, 0.26, 0.27, 0.3, 0.6.

Pronotum somewhat trapezoidal, 1.14 times as wide as long, widest at apical 1/3, slightly

narrowed apicad and moderately so basad, very feebly sinuous before base; apex nearly straight; base feebly produced, weakly impressed near hind angles; sides gently declined to lateral margins, which are finely rimmed and slightly crenulate, the rims barely visible from above; front angles rounded, hind angles obtuse; disc gently convex, coarsely, rather closely punctate, each puncture with a rather long hair. Scutellum with visible part small, depressed and microsculptured.

Elytra subovate, 1.6 times as long as wide, 2.2 times the length and 1.3 times the width of pronotum, widest at the middle; disc gently convex, weakly flattened in middle, impressed in areas around scutellar strioles; disc punctato-striate, the punctures strong, each with a rather long hair; intervals convex, 5th and outer ones rather ridged, haired and somewhat carinulate; 3rd interval with a setiferous umbilicate pore at apical 1/8, 7th with one at basal 1/18; 9th with five ones at basal 1/8, basal 2/8, apical 3/8, apical 2/8 and apical 1/8, respectively; lateral margins deeply impressed in apical portions; apices acutely projected.

Fore femora with upper side of anterior edge spined at apical 1/3; middle femora with lower side of posterior edge spined at apical 1/4; hind femora with upper side of posterior edge spined at apical 1/4, and also with lower side of posterior edge spined at apical 1/5; ratios of the lengths of pro-, meso- and metatarsomeres: 0.33, 0.26, 0.24, 0.22, 1.2; 0.35, 0.29, 0.24, 0.25, 1.19; 1.1, 0.32, 0.31, 1.6.

Male genitalia very slender, 0.9 mm in length, 0.08 mm in width, depressed in medio-longitudinal part, very feebly curved in lateral view; fused lateral lobes 0.2 mm in length, rather spatulate.

Body length: 4.5–4.7 mm.

Holotype: ♂, Nishimedake "Minami", Okinawa Is., Ryukyu Isls., Japan, 28. VI. 1982, S. TANAKA leg. (NSMT). Paratypes: 3 exs., Gaji-rindô, Okinawa Is., 28. VI. 1982, S. TANAKA leg.; 1 ex., Hiji, Kunigami-son, Okinawa Is., 29. III. 1980, S. TANAKA leg.

Notes This new species somewhat resembles *Laena rotundicollis insularis* KASZAB, 1964, from Amami-oshima Is., but is distinguishable from the latter by the more flattened body, with diatone wider (1/5 times the width of transverse diameter of an eye in *L. insularis*), pronotum more closely punctate and finely crenulate along lateral margins, and femora more sharply spined.

Laena insularis KASZAB, 1964, stat. nov.

Laena rotundicollis subsp. *insularis* KASZAB, 1964, Ent. Rev. Japan, 17: 5.

Notes KASZAB (1964) described a *Laena* from Amami-oshima Island as a subspecies of *L. rotundicollis* MARSEUL, 1876, subsp. *insularis*, but this form possesses a smaller (*ca.* 5 mm) body, with pronotum strongly punctate, elytra with more strongly punctato-striate, intervals noticeably convex, and legs with more blunt spines. Therefore, the Amami-oshima form should be regarded as an independent species.

M. T. CHÛJÔ (1996) described *Laena takara* from Takara-jima Island in comparison with *L. rotundicollis insularis* KASZAB, 1964, though he did not mention anything about the status of this beetle.

Tribe **Misolampini** (**Coelometopini** sensu DOYEN, 1989)

Misolampidius ohminesanus sp. nov.

[Japanese name: オオミネツヤヒサゴゴミムシダマシ]

(Figs. 5–6)

Dark reddish brown, with head, pronotum, femora and tibiae darker in colour; head and pronotum rather distinctly sericeous, scutellum and elytra feebly sericeous, legs gently shining, pro- and mesosterna somewhat alutaceous, metastenum and abdomen feebly sericeous. Rather noticeably constricted between fore and hind bodies; strongly convex above.

Head suboctagonal, gently raised basad, micro-shagreened, rather closely, irregularly punctate, shallowly depressed in postero-medial part; clypeus somewhat transversely hexagonal, feebly depressed, weakly bent in apical part, truncate at apex, fronto-clypeal border deeply sulcate and rather dilated U-shaped; genae gently raised, with rounded outer margins; frons rather wide, feebly raised on each side, deeply sulcate along the borders of eyes; diatone 2.6 times the width of transverse diameter of an eye. Eyes feebly transverse, weakly convex laterad, gently, roundly inlaid into head. Antennae slightly clavate, reaching base of elytra, ratio of the length of each segment from base to apex: 0.29, 0.2, 0.47, 0.36, 0.34, 0.34, 0.33, 0.34, 0.34, 0.31, 0.47.

Pronotum subquadrate, widest at apical 2/5, noticeably sinuous near base; apex almost straight, weakly grooved on each side; base almost straight, noticeably bordered; front angles rounded, hind angles subrectangular in dorsal view; sides steeply inclined laterad, enveloping ventral parts, finely rimmed in areas around front angles, impressed before hind angles; disc gently convex, micro-shagreened, rather frequently, irregularly scattered with small punctures, with a pair of round impressions at apical 2/5, a pair of vague oblique ones at basal 1/6, and also with a medio-longitudinal one in apical 1/4. Scutellum triangular with rounded apex, raised medially, depressed basad and apicad, micro-shagreened, impressed medio-longitudinally, scattered with microscopic punctures.

Elytra subovate, 1.62 times as long as wide, 2.5 times the length and 1.5 times the width of pronotum, widest at the middle; dorsum rather strongly convex, depressed in area behind scutellum, highest at basal 3/7; disc punctato-striate, the striae fine and not so deep, the punctures on striae rather strong, irregular in size, 1st and 2nd striae connected with each other and impressed near base; sides steeply inclined laterad, enveloping ventral body; apices roundly projected.

Male anal sternite slightly truncate at apex. Profemora with truncate spine at anterior edge; protibiae weakly curved, with interior face widened in middle; mesotibiae very feebly curved interiad; metatibiae weakly curved obliquely ventrad; ratios of the lengths of pro-, meso- and metatarsomeres: 0.39, 0.33, 0.31, 0.33, 1.2; 0.61, 0.38, 0.34, 0.33, 0.32, 1.24; 1.26, 0.62, 0.49, 1.31.

Male genitalia 2.5 mm in length, 0.3 mm in width, basal piece subfusiform, curved in middle in lateral view; lateral lobes 1.2 mm in length, strongly prolonged, gently curved in lateral view, simply and acutely pointed apicad, with basal part noticeably ridged medially, strongly depressed and gently produced laterad.

Body length: 9.5–10.5 mm.

Holotype. ♂, Mt. Hakken-zan, 1,820–1,914 m alt., Tenkawa-mura Vill., Nara Pref.,

Japan, 10. VII. 1999, K. AKITA leg. (NSMT). Paratypes: 12 exs., same data as the holotype; 1 ex., Mt. Mi-sen, 1,880 m alt., Tenkawa-mura Vill., Nara Pref., 10. VII. 1999, K. AKITA leg.

Notes. This new species is closely related to *Misolampidius okumurai* NAKANE, 1968, originally described from Mt.Wakasugi, Fukuoka Pref., Kyushu, and widely distributed in Honshu, Shikoku, Kyushu and their accessory islands. The new species can be distinguished from the latter by the smaller body, with pronotum sericeous and sparsely, finely punctate and constricted in basal portion, and the male genitalia differently sized and shaped.

The present new species occurs in limited areas at the summit of Mt. Hakken-zan and Mt. Mi-sen, the Ômine Mountains, where *M. okumurai* does not occur. On Mt. Mi-sen, *M. okumurai* occurs in the area below 1,700 m in altitude. The materials examined were collected from under barks of dead *Abies*.

Tribe **Helopini**

Tarpela tokunoshimana sp. nov.

[Japanese name: トクノシママルムネゴミムシダマシ]

(Figs. 7–8)

This new species is a member of the species-group of *Tarpela cordicollis** and resembles *T. amamiensis* KASZAB, 1964, from Amami-ôsima Island, but can be distinguished from the latter by the following characteristics:

Body smaller and slenderer; head slightly wider, more closely punctate; diatone about twice the width of transverse diameter of an eye. Antennae barely reaching the middle of elytra, ratio of the length of each segment from base to apex: 0.35, 0.2, 0.86, 0.62, 0.58, 0.62, 0.59, 0.6, 0.57, 0.55, 0.64.

Pronotum 1.12 times as wide as long, widest at apical 2/5; more noticeably narrowed before base; disc more frequently and finely punctate.

Elytra subfusiform, 1.9 times as long as wide, widest at apical 4/9; dorsum a little more convex, highest at basal 4/5; disc punctato-striate, the punctures stronger.

Legs slightly slenderer, meso- and metatibiae straight, not curved; ratios of the lengths of pro-, meso- and metatarsomeres: 0.63, 0.52, 0.4, 0.34, 1.2; 0.73, 0.69, 0.61, 0.41, 1.31; 0.8, 0.73, 0.66, 1.57.

Male genitalia elongated fusiform, gently curved in lateral view, 1.9 mm in length, 0.2 mm in width; lateral lobes fused with each other, 0.6 mm in length, with acute and rather noticeably bent apices.

Body length: 7.6 - 8.3 mm.

Holotype: ♂, Hagi-dake, Amagi-cho, Tokunoshima Is., Ryukyu Isls., Kagoshima Pref., Japan, 23. II. 1998, M. KIMURA leg. (NSMT). Paratypes: 2 exs., same data as the holotype.

Notes. This new species also resembles *T. kimurai* MASUMOTO, 1996, from Kume-jima Is., Ryukyu Isls. in having the straight meso- and metatibiae, but can be discriminated from the latter by the smaller body, interocular space with a pair of impressions, narrower diatone (3 times the width in *T. kimurai*), and different ratios of the lengths of antennal and tarsal segments.

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*The members of this species-group hitherto described are as follows: *Tarpela cordicollis* (MARSEUL, 1876), from the main islands of Japan, *T. amamiensis* KASZAB, 1964, from Amami-ôshima Island, *T. tsushimana* NAKANE, 1979, from the Tsushima Islands, and *T. kimurai* MASUMOTO, 1996, from Kume-jima Island.

Tribe **Amarygmini**

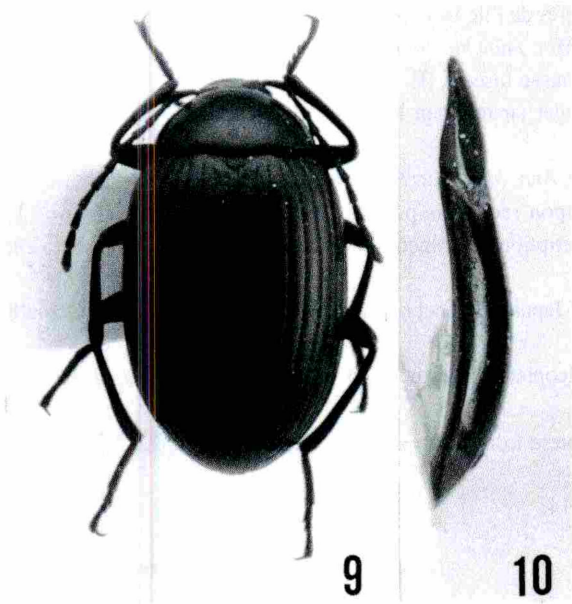
Amarygmus inadai sp. nov.
[Japanese name: シモジマルキマワリ]
(Figs. 9–10)

Piceous, head and elytra with dark coppery tinge, pronotum feebly dark greenish; head sericeous, pronotum weakly shining, elytra gently, metallically so, ventral surface somewhat alutaceous. Oblong-ovate; strongly convex above.

Head micro-shagreened and closely punctate; clypeus transversely quadrate, weakly convex in middle, fronto-clypeal sulcus fine and widely arcuate; frons somewhat trapezoidal, narrowed anteriad; diatone 0.67 times the width of transverse diameter of an eye; genae very small, weakly raised, with obtuse outer margins. Eyes large, convex laterad, roundly inlaid into head. Antennae nearly filiform, reaching the middle of elytra, ratio of the length of each segment from base to apex: 0.61, 0.2, 0.7, 0.48, 0.51, 0.57, 0.54, 0,52, 0.5, 0.44, 0.6.

Pronotum somewhat trapezoidal, twice as wide as long; apex nearly straight in dorsal view and finely bordered; base gently produced and bisinuous, with an indistinct impression on each side; sides gently declined to lateral margins, which are rounded and finely bordered; front angles subrectangular, hind angles obtuse; disc weakly micro-shagreened, moderately, finely punctate, the punctures not so dense as on head, with an impunctate area along median line. Scutellum widely triangular, slightly depressed from elytra, weakly micro-shagreened, sparsely scattered with small punctures.

Elytra 1.5 times as long as wide, 3.5 times the length and 1.44 times the width of pronotum, widest at the middle; dorsum strongly convex, highest at basal 3/8; disc punctato-striate, the striae fine but deep, the punctures small but notching intervals, rather closely arranged; intervals gently convex, very weakly microsculptured, sparsely scattered with microscopic punctures; humeri feebly swollen; apices simply rounded.



Figs. 9–10, *Amarygmus inadai* sp. nov., holotype, ♂; 9, habitus; 10, male genitalia (lateral view).

Male anal sternite with a vague medio-longitudinal impression near apex.

Legs medium-sized for the members of this genus; male metatibiae slightly curved interiad; ratios of the lengths of pro-, meso- and metatarsomeres: 0.39, 0.33, 0.29, 0.27, 1.2; 0.7, 0.56, 0.36, 0.29, 1.28; 1.9, 0.69, 0.31, 1.29.

Male genitalia elongated fusiform, rather strongly curved near basal part in lateral view, 2.6 mm in length, 0.4 mm in width; lateral lobes fused, flattened, slightly elongated triangular, 0.7 mm in length, with apices not spatulate but simply blunt.

Body length: 8.5 mm.

Holotype: ♂, Shimoji-jima Is., Miyako Group, Ryukyu Isls., Okinawa Pref., Japan, 11. IX. 1999, M. MURAMATSU leg. (NSMT). Paratypes: 1 ex., same data as the holotype; 1 ex., Shimoji-jima Is., Miyako Group, 12. IX. 1999, S. INADA leg.

Notes. This new species is a second *Amarygmus* species from Japan, and there are no species in Japan and its neighboring areas that resembles this insect. *Amarygmus callichromus* FAIRMAIRE, 1897, occurs on Ishigaki-jima Island of the Ryukyu Islands and Taiwan.

要　　約

益本仁雄・秋田勝巳：日本産のゴミムシダマシ科甲虫の新種・稀少種（第一報）――― 日本産のゴミムシダマシ科に属する５種の甲虫を新種記載し，次のように命名した．*Laena ezimai* sp. nov., *L. hiranoi* sp. nov., *Misolampidius ohminesanus* sp. nov., *Tarpela tokunoshimana* sp. nov., *Amarygmus inadai* sp. nov. また，*Laena rotundicollis* subsp. *insularis* KASZAB, 1964 を種に昇格させ *L. insularis* KASZAB とした．

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Ent. Rev. Japan 56 (1): 23–24, June 30, 2001

Further New Records of Tiger Beetle Species from China (Coleoptera: Cicindelidae)

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and

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Abstract *Neocollyris* (*Leptocollyris*) *variicornis* and *Neocollyris* (*Pachycollyris*) *tricolor* are reported the first time from China.

The authors received for study further material of tiger beetle species, which were collected by Mr. Andre GORODINSKI (Moscow) in south western China. Referring to WIESNER (1992) three of them turned out to be new, even if not unexpected state or provincial records from China. In the following the collection data are listed.

Tricondyla gestroi gestroi FLEUTIAUX, 1893

Specimens examined: 1♂, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. Vl. 2000, A. GORODINSKI leg.

Neocollyri (*Leptocollyris*) *linearis linearis* (SCHMIDT-GOEBEL, 1846)

Specimens examined: 1♀, Baoshan city env. (2000 m), Yunnan, China, 15. VII. 2000, A. GORODINSK leg.

Neocollyris (*Leptocollyris*) *variicornis* (CHAUDOIR, 1864)

Specimens examined: 2♂♂, 1♀, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. VI. 2000, A. GORODINSKI leg.

New state record from China. Previously the species was known from Nepal, Sikkim, India, Thailand, Laos, Burma and Vietnam.

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*75. contribution towards the knowledge ot Cicindendae

Neocollyris (Pachycollyris) tricolor NAVIAUX, 1991

Specimens examined: 1♀, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. VI. 2000, A. GORODINSKI leg.

New state record from China. Previously the species was known from Thailand, Laos and Burma.

Heptodonta ferrarii ferrarii GESTRO, 1893

Specimens examined: 6♂♂, 10♀♀, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. VI. 2000, A. GORODINSKI leg.

Lophyra (Spilodia) lineifrons (CHAUDOIR, 1865)

Specimens examined: 1♂, 2♀♀, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. VI. 2000, A. GORODINSKI leg.

Cylindera (Ifasina) fallacjosa (W. HORN, 1897)

Specimens examined: 3♂♂, 1♀, Lintsan city env. (2200 m), 300 km SW Kunmin, SW Yunnan, China, 15. VI. 2000, A. GORODINSKI leg.

New province record from China. Previously the species was known from Kwang Tung and from India, Bangladesh, Burma, Thailand, Laos and Vietnam.

Acknowledgement

The authors are indebted to Andre GORODINSKI, who made available the beetles.

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Ent. Rev. Japan 56 (1): 25–30, June 30, 2001

A First Record of Harpaline Genus *Coleolissus* from The Philippines with Descriptions (Coleoptera: Carabidae)

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Abstract Two new species of the genus *Coleolissus, Coleolissus* (*Coleolissus*) *philippinus* N. ITO, sp. nov. and *Coleolissus* (*Coleolissus*) *katoi* N. ITO, sp. nov., are described from the Philippines. The genus *Coleolissus* is firstly recorded from there.

The Genus *Coleolissus* BATES 1992 has been known widely from Southern Japan and China to Australia through the Indochina peninsula, Sunda Is., and New Guinea, but the Philippines is a vacant region. But two new species of the genus *Coleolissus* BATES are examined in many materials of the carabid beetles from the Philippines through the courtesy of Mr. Atsushi KATO, Higashi-osaka, and Dr. Masataka SATÔ of Nagoya Women's University, Nagoya.

In this paper I am going to describe them, under the name of *Coleolissus* (*Coleolissus*) *philippinus* and *C.* (*C.*) *katoi* as the first record of the genus *Coleolissus* from the Philippines. The former species is distinct in having the female genitalia with wide and spatulate styluses.

Concerning the measurement, see ITO's former papers.

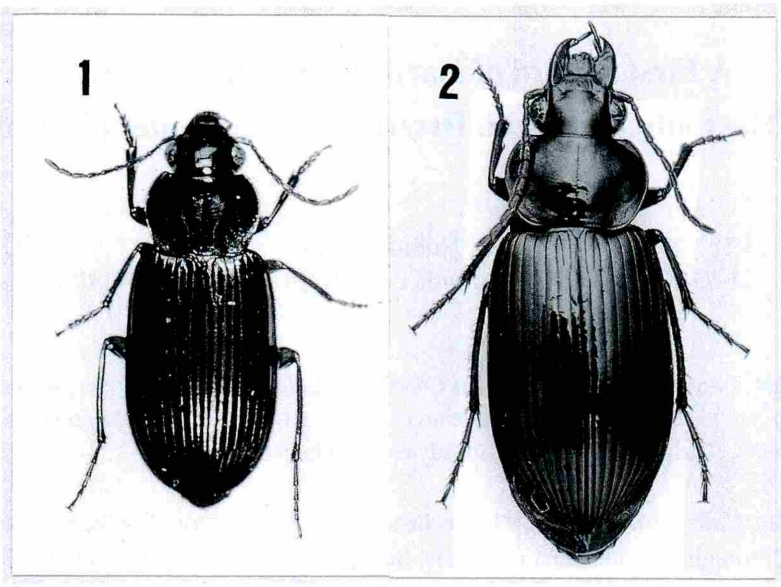
I wish to express my cordial thanks to Dr. M. SATÔ and Mr. A. KATO for their kind offer of important materials.

Coleolissus (*Coleolissus*) *philippinus* N. ITO, sp. nov.

(Figs.1, 3 and 5)

Body oblong, black, shiny, finely iridescent on elytra; palpi, antennae, tarsi and lateral margins of pronotum brown, femora and tibiae blackish brown, sutural intervals hardly brownish.

Head large, 0.72–0.74 times as wide as the pronotum width, gently elevated on vertex, very finely and sparsely punctate, the punctures coarse on frons; labrum subsquare, with almost straight apex; clypeus shallowly emarginate aically, weakly slant just behind apex, with several sharp and longitudinal rugosities in lateral portions; clypeal suture varied from moderate to very shallow in depth; frontal impressions fovea-like, fairly deep in apical half, abruptly shallowed behind from middle, vague near supraorbital grooves; interocular space rather narrow, two-thirds the width of head including eyes; eyes large, though not so prominent as usual; temples short, one-seventh of eye length; genuine ventral margin of eye very narrowly isolated from buccal fissure; mandibles moderately elongate and sharpened apically, terebral tooth of left mandible roundedly and weakly produced and retinacular tooth small and blunt, terebral tooth of right one produced in a weak hump and retinacular tooth rectangular; antennae slender, 3rd segment pubescent in apical half, slightly shorter than the 4th and twice the 2nd; 3rd segment of



Figs. 1 and 2. Habitus of the genus *Coleolissus* (*Coleolissus*) BATES spp.. 1, *Coleolissus* (*Coleolissus*) *philippinus* N. ITO, sp. nov.; 2, *C.* (*C.*) *katoi* N. ITO, sp. nov.

labial palpus weakly securiform, almost as long as the 2nd; ligula more or less wide, weakly constricted just before truncate apex, acutely protruding at apical corners; paraglossae narrow, prolonged forwards beyond ligula; mentum widely toothed at apex, epilobes narrow and parallel-sided; surface isodiametrically meshed on clypeus, obscurely and transversely so on the remaining portions.

Pronotum transversely quadrate, 1.48–1.52 times as wide as long, widest at a little behind apical two-fifths, weakly elevated; sides widely arcuate apicad and straightly oblique behind from the widest point, narrowly bordered; apex shallowly emarginate, clearly bordered throughout; base about one-tenth wider than the apex, also entirely bordered, slightly rounded at sides, shallowly emarginate between the rounded portions; apical angles narrowly rounded; basal angles roundedly angulate to narrowly rounded, much larger than rectangular; lateral furrows each narrow in apical half, thence gradually widened behind, and fused with basal fovea, which is large and shallow; front transverse impression very shallow, though a little clearer than the hind one; median line relatively deep, entire to reduced near apex and base; surface vaguely and transversely rugose, finely punctate near apex, coarsely and densely so in lateral furrows and basal foveae; microsculpture clear, mostly consisting of subsquare meshes and of isodiametric meshes in basal foveae.

Elytra subelliptical, about three-fifths longer than wide (1.57–1.62 in ratio), almost flattened on disc, rather steeply sloping baso-laterad, with dorsal punctures very sparse on disc and comparatively dense apico-externally; sides each gently arcuate in humeri, sublinear in the middle, abruptly and sublinearly convergent near apex, whose tooth is well prominent; bases very shallowly emarginate, very large and angulate at humeral angles; striae narrow, deep, and finely crenulate, scutellar striole long; intervals slightly convex on disc, becoming a little more convex apicad and basad, 3rd interval with a row of setiferous pores 7 to 9 in number along 2nd stria; marginal series narrowly interrupted medially, (9–11) + (11–12) umbilicate pores; microsculpture sparse, consisting of fine transverse lines. Macropterous.

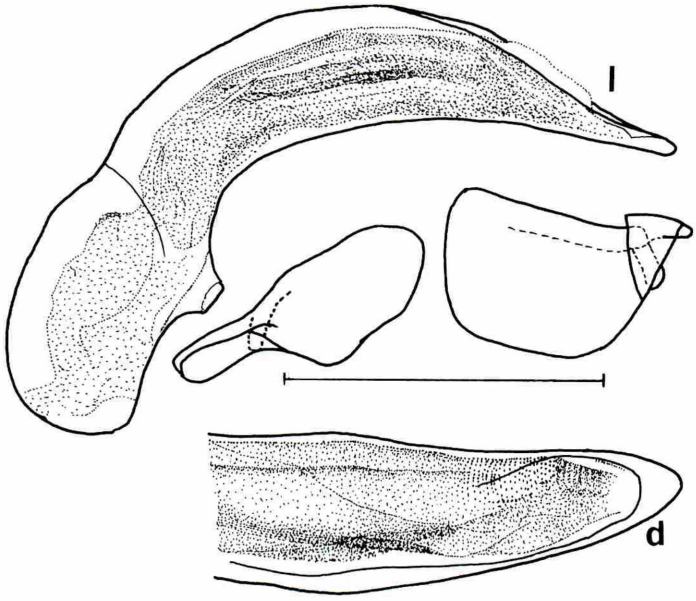


Fig. 3. Male genitalia of *Coleolissus* (*Coleolissus*) *philippinus* N. ITO, sp. nov. d, dorsal aspect; l, lateral aspect. Scale: 1 mm.

Ventral surface densely punctate on pro-, meso- and metepisterna, lateral portions of metasternum, and 1st abdominal sternites, furnished with very sparse and short pubescence medially on 2nd and 3rd abdominal sternites; metepisternum rather elongate and convergent behind, a half longer than wide; 6th abdominal sternite bisetose in both sexes at each side, in ♂ slightly emarginate and in ♀ widely arcuate at apex.

Hind femora bisetose along hind margin; fore tibiae finely sulcate only near base, bi- or trispinous apico-externally, terminal spur simple; tarsi not long, 1st mid tarsal segment of ♂ bearing adhesive squamae only at apex, hind tarsi 0.92–0.94 times in ♂ and 0.88–0.90 times in ♀ as long as the width of head, 1st segment as long as the 2nd and 3rd taken together, 2nd a half longer than the 3rd and about twice the 4th, claw segment bi- or trisetose along each ventral margin.

Aedeagus (Fig. 3) not large, weakly curved, gradually tapered apicad, thin at apex, with simple tip, instead of being knob-shaped; apical orifice widely opening, inner sac not bearing any sclerites; apical lobe transverse, gently arcuate laterally, rounded at tip; ventral surface not bordered, weakly and longitudinally elevated. Stylus (Fig. 5) almost straight, with a seta just behind tip and a minute spine at each external margin, in lateral view spatula-shaped; basal segment unisetose apico-externally; valvifer bisetose at apex.

Length: 9.4–11.0 mm. Width: 3.8–4.8 mm.

Holotype: ♂, Mt. Caula-ou, Negros Is., the Philippines, VI. 1998. Native collector leg. Paratypes: 15♂♂, 52♀♀, same data as the holotype; 39♂♂, 85♀♀, ditto, V. 1998; 1♂, Dalocan, alt. 1,050 m, Ifgao Prov., Luzon Is., the Philippines, 3. VI. 1977, M. SATÔ leg.; 1♀, Banaue, alt. 980 m, Ifgao Prov., Luzon Is., the Philippines, 2-5. VI. 1977. M. SATÔ leg.

The holotype and a part of paratypes will be preserved in the Osaka Museum of Natural History and the remaining paratypes are kept in collection of Nagoya Women's University and

author's collection.

This new species is quite peculiar among species of the subgenus in having the inner sac of aedeagus in male genitalia without any sclerites and the stylus of female genitalia not elongate. The species is easily discreminated from all species of the subgenus by the body black without greenish nor bluish reflection, the pronotum not widely rounded at basal angles, and the tarsi shorter.

Coleolissus (*Coleolissus*) *katoi* N. ITO, sp. nov.

(Figs. 2, 4 and 6)

Body robust, oblong, pitchy black, shiny, strongly iridescent on pronotum and elytra, with weakly bluish reflection on elytra; palpi, antennae and tarsi dark brown, femora and tibiae slightly brownish black.

Head rather convex, more or less wide, 0.69–0.71 times as wide as the pronotal width, very sparsely and minutely punctate; labrum subsquare, shallowly and triangularly emarginate at apex; clypeus thick, weakly protruding at apical corners, with three deep and longitudinal grooves in each lateral third; clypeal suture clearly carved lengthwise, from each end of which frontal impression arcuatly runs towards eyes, being deep near apex, abruptly shallowed behind, and obliterated near supraorbital grooves; interocular space narrow, three-fifths of the width of head; eyes large and hemispherical; temples very short and steeply contracted to neck constriction; space between genuine ventral margin of eye and buccal fissure very narrow; antennae reaching basal one-eighth of elytra, 3rd segment pubescent in apical two-thirds, as long as the 4th and about twice the 2nd; mandibles moderate in shape and robustness, terebral tooth of left mandible weakly and trapezoidally produced and that of right one hardly swollen, and retinacular tooth of left one tiny and rounded and that of right one small and blunt-triangular; 3rd segment of labial palpus dilated medially and almost equal in length to the 2nd; ligula wedge-shaped, sharp at apical angles; epilobes of mentum gradually expanded apicad; surface mostly vague in microsculpture, isodiametrically meshed only in apical area of clypeus.

Pronotum transverse, widest at apical two-fifths, three-fifths wider than long, weakly declivous apico-laterad, almost flattened on disc, rounded at sides, the roundness stronger in apical areas than in basal ones; apex shallowly emarginate; base as wide as apex; all margins entirely and clearly bordered; apical angles weakly protruding, narrowly rounded; basal angles widely arcuate; lateral furrows narrow, weakly widened basad from the middle, joining basal foveae; basal foveae wide, rounded, and somewhat deep; front transverse impression narrow and shallow, the hind one obsolete; median line fine, shallow, reduced near apex and base; surface largely smooth, moderately furnished with mixtures of minute and somewhat coarse punctures only in lateral furrows and basal foveae; microsculptures partly visible as obscure transverse meshes.

Elytra oblong-oval, 1.57–1.64 times as long as wide, three-tenths wider than the pronotal width, weakly convex, very sparsely and microscopically punctate; sides gently sloping in humeri, subparallel in the middle, clearly curved apicad from apical third, preapical sinus long and a little deep; apices produced behind, each apical tooth rather long; bases shallowly emarginate, with rounded humeral angles; striae wide, moderate in depth, and with clear

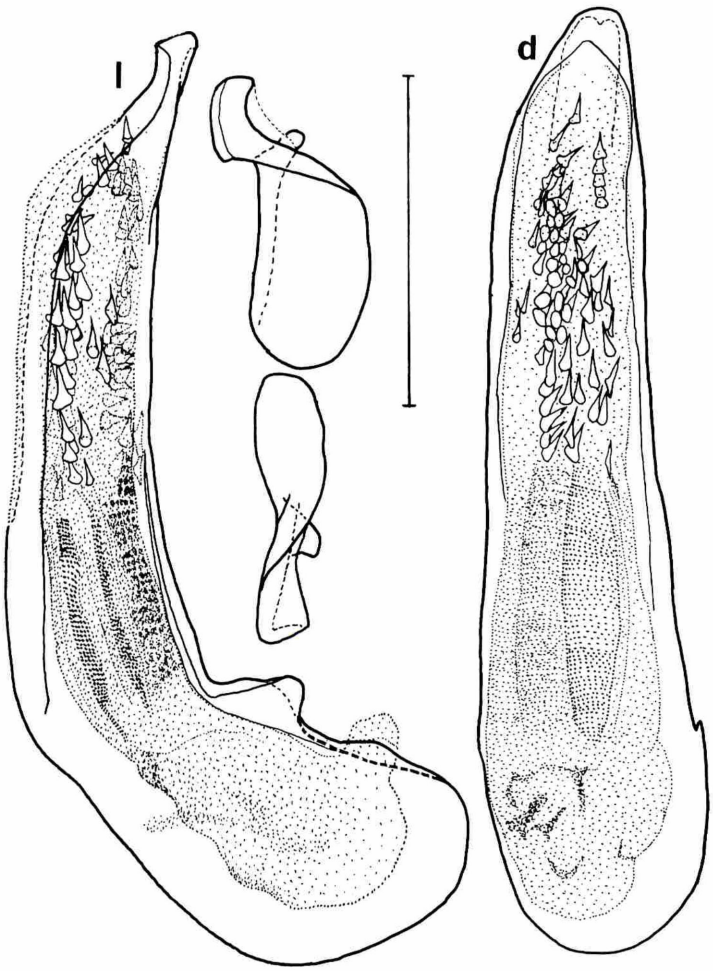


Fig. 4. Male genitalia of *Coleolissus* (*Coleolissus*) *katoi* N. Ito, sp. nov. d, dorsal aspect; l, lateral aspect. Scale: 1 mm.

crenulation, scutellary striole not long; intervals almost flat on disc, weakly raised apicolaterally, 3rd interval with a row of 9–11 umbilicate pores; microsculpture sparse, visible as fine and transverse lines. Hind wings fully developed.

Ventral surface densely and moderately on pro- and metepisterna and laterally on metasternum and sparsely so on 1st abdominal sternite; metepisternum steeply convergent behind, a half longer than wide; 6th abdominal sternite in both sexes quadrisetose along apical margin, in ♂ feebly emarginate and in ♀ arcuately produced at apex.

Hind femora bisetose near hind margin; tarsi long, 1st segment of mid tarsi in ♂ with adhesive squamae in apical half, hind tarsi in ♂ as long as and in ♀ slightly shorter than the width of head, 1st segment as long as the 2nd and 3rd taken together, 3rd segment two-sevenths shorter than the 2nd and two-thirds longer than the 4th, claw segment ventrally trisetose at each margin.

Aedeagus (Fig.4) stout, almost straight in apical part, constricted before apex which is subtriangular and obliquely directed; apical orifice widely opening and subtriangular at distal

margin, inner sac bearing with two row of many peg-shaped sclerites up and down; apical lobe transverse, rounded at front margin; ventral surface ridged at sides, with a small hook at apex. Stylus (Fig. 6) sublinear, slightly arcuate near apex, with a tiny spine at dorsal margin and two ones at ventral margin; basal segment unisetose at external apex; valvifer protruding in the middle, where a setae is situated.

Length: 12.2–12.5 mm. Width: 5.0–5.2 mm.

Holotype: ♂, Mt. Caula-ou, Negros Is., the Philippines, VI. 1998, Native collector. Paratypes: 2♀♀, same data as the holotype.

The holotype will be preserved in the Osaka Museum of Natural History and the remaining paratypes are kept in author's collection.

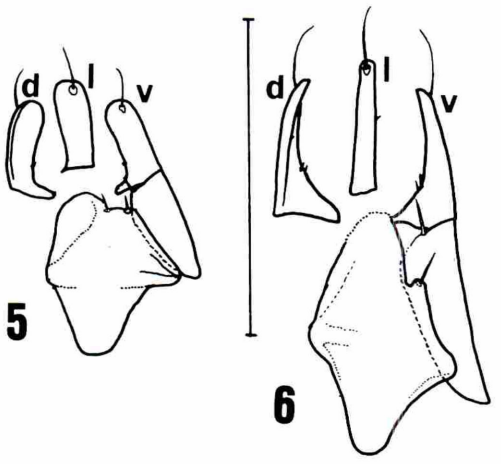


Fig. 5 and 6. Female genitalia of the genus *Coleolissus* spp. 5, *Coleolissus* (*Coleolissus*) *philippinus* N. ITO, sp. nov.; 6, *Coleolissus* (*Coleolissus*) *katoi* N. ITO, sp. nov.; d, dorsal aspect; l, lateral aspect; v, ventral aspect. Scale: 1 mm.

This species appears the characteristics of typical coleolissine species and to *Coleolissus ohkurai* N. ITO, but is different from the latter in having the body not bearing purple reflection and the elytra with longer teeth.

The specific name "*katoi*" is named after Mr. Atsushi KATO for his offering many material.

要　　約

伊藤 昇．フィリピンからの *Coleolissus* 属の初記録と２新種の記載．―― *Coleolissus* 属の種は日本及び中国南部からインドシナ半島，スンダ諸島を経てオーストラリアまで広く分布するが，フィリピンからは記録がなかった．佐藤正孝博士および加藤敦氏のご好意でフィリピンの歩行虫科の標本を多数検する機会があり，その結果本属の２新種を見出したので *Coleolissus* (*Coleolissus*) *philippinus* N. ITO, sp. nov. および *C.* (*C.*) *katoi* N. ITO, sp. nov. と命名し記載した，前者は雌交尾器のが幅広いヘラ状であり他の同亜属の極めて細長いそれとは大幅に異なる点で特異である．後者の種名は多数の標本を供与していただいた加藤 敦氏に献名した．

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Ent. Rev. Japan 56 (1): 31–34, June 30, 2001

A New Species of the Genus *Oxycentrus* from Myanmar (Coleoptera: Carabidae: Harpalini)

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Abstract *Oxycentrus* (*Oxycentrus*) *yoshidai* N. ITO, sp. nov. is described from Myanmar. This species is the third species of the genus from the locality.

Up to the date, only two species of the genus *Oxycentrus* CHAUDOIR, *Oxycentrus* (*Oxycentrus*) *melas* (SCHMIDT-GÖBEL) and *O.* (*O.*) *omaseoides* BATES have been known from Myanmar. The number is comparatively smaller than the near regions, for examples, Vietnam, Laos, Thailand and so on. Probably this fact is caused by reason that the expedition is not attempted since about eighty years ago. Recently Mr. Motoshige YOSHIDA, Yura-chou in Wakayama, had an opportunity to visit Myanmar and kindly offered me the carabid specimens for the purpose to study. After careful examination of them, I found a new species of the genus *Oxycentrus* among them.

In this paper, I am going to describe this new species under the name of *Oxycentrus* (*Oxycentrus*) *yoshidai* N. ITO, sp. nov. I wish to express my deep gratitude to him for his supports. Concerning measurement, see my previous papers. The holotype will be deposited in the Osaka Museum of Natural History, Osaka and the paratypes is preserved in author's collection.

Oxycentrus (*Oxycentrus*) *yoshidai* N. ITO, sp. nov.

(Figs. 1 and 2)

Body large in size, stout, pitchy black, shiny, with weak iridescent lustre on elytra; palpi, outer margins of labrum, antennae and tarsi brown, tibiae dark reddish brown wholly or only basally.

Head small, about tow-thirds of the pronotal width (0.58–0.62 in ratio), gently elevated, very sparsely and minutely punctate; labrum transversely subtrapezoidal; clypeus weakly swollen, truncate at apex; clypeal suture not deep, but clear; frontal impressions deeply engraved throughout, steeply slant at front sides; eyes not large, hemispherically prominent; temples abruptly convergent behind, one-sixth of the eye length; genuine ventral margin of eye adjoining buccal fissure; antennae slender, reaching basal one-ninth of elytra, 3rd weakly dilated

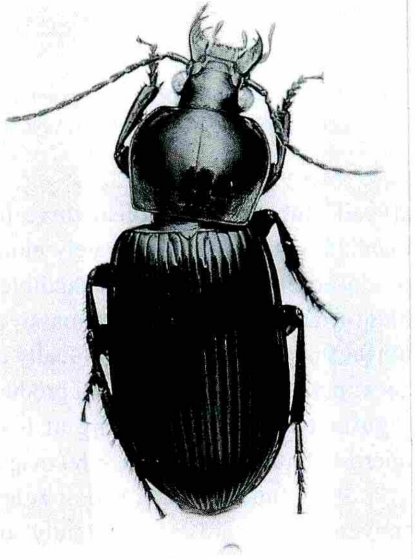

Fig. 1. Habitus of *Oxycentrus* (*Oxycentrus*) *yoshidai* N. ITO, sp. nov.

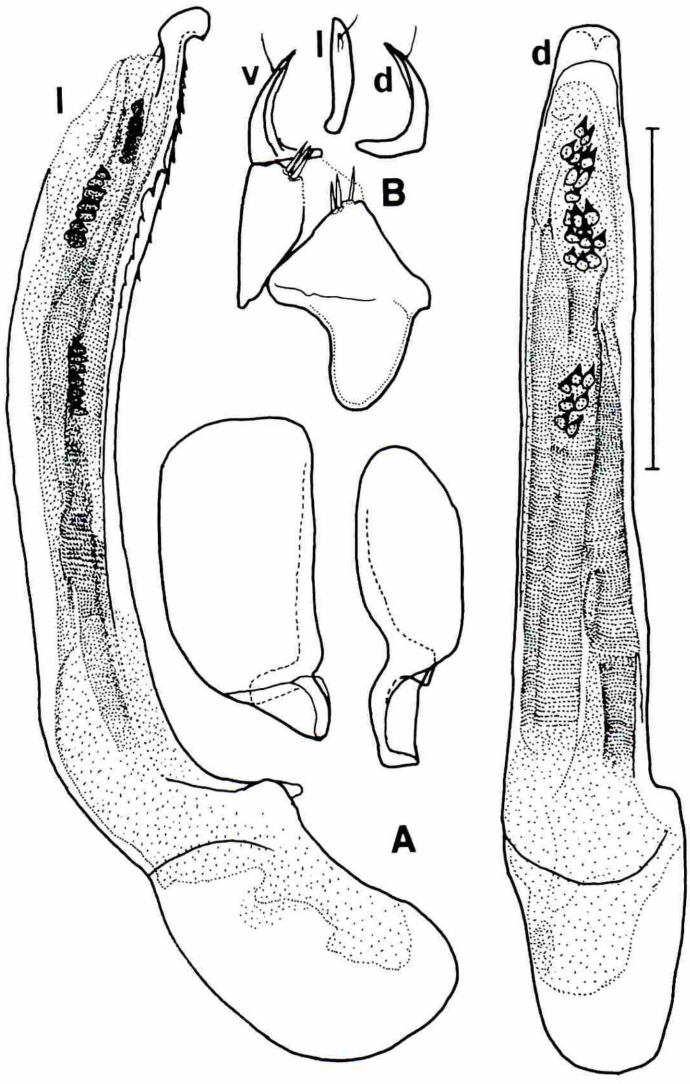

Fig. 2. Genitalia of *Oxycentrus* (*Oxycentrus*) *yoshidai* N. ITO, sp. nov. A, male genitalia; B, female genitalia; d, dorsal aspect; l, lateral aspect; v, ventral aspect. Scale:1 mm.

apicad, pubescent in apical three-fifths, four-fifths as long as the 4th and twice the 2nd; mandibles sharp and moderately elongate, terebral tooth of left mandible weakly and obtusely produced and that of right mandible hardly visible, retinacular tooth of right one small and blunt-triangular; labial palpi massive in ♂ and a little slenderer in ♀, 3rd segment slightly longer than the 2nd; ligula gradually expanded forwards, weakly and trapezoidally protruding at apex; paraglossae narrow, well produced beyond ligula; mentum transverse, median tooth large, regular-triangular, reaching at level of epilobes which are abruptly widened in front; microsculpture invisible in ×80 magnification.

Pronotum quadrate, widest at apical one-third, 1.19–1.27 times as wide as long, arcuately convergent forwards and straightly so backwards from there, widely convex; apex slightly con-

cave, with thick and entire border; base one-fourth wider than apex, subtruncate, hardly arcuate laterally, finely bordered; apical angles widely rounded; basal angles a little larger than rectangle, narrowly rounded; lateral furrows gradually expanded basad from apex, conjoining basal foveae, which are large, almost flattened and with two or three small and weak humps; front and hind transverse impressions obsolete; median line thin, shallow and reduced near apex and base; dorsal punctures present only in lateral furrows and basal foveae, rather dense and moderately coarse; microsculpture partly impressed, consisting of transverse lines in sparse and shallow rugosities and of subquadrate meshes in lateral furrows and basal foveae.

Elytra elongate, hardly arcuate at sides, three-fifths longer than wide, fairly convex, very sparsely and microscopically punctate; apical sinus shallow; apices rather produced behind, gently arcuate at sides, widely rounded at tips, narrowly separated from each other; bases hardly emarginate, very obtuse and angulate at humeral angles; striae deep, wide, finely and clearly crenulate, scutellar striole short; intervals rather well convex, 3rd interval bearing a row of 6–7 setiferous pores; marginal series of umbilicate pores divided into two groups by narrow space, the fore group of 8–11 and the hind one of 12–13 pores; microsculpture observable as vague and fine transverse lines here and there. Hind wings entirely developed.

Ventral surface mostly smooth, rather coarsely and moderately punctate on mesepisterna and finely and sparsely so on metepisterna and lateral portions of metasternum; metepisternum elongate, 1.7 times as long as wide; 6th abdominal sternite almost similar in shape and chaetotaxy between both sexes, bisetose at each side and widely and gently arcuate at apex.

Legs relatively long; hind femur bisetose; fore tibia dilated towards apex which is incised in external half, clearly culcate, bi- or trispinous along external margin near apex; tarsi dorsally with several very short and thin ciliae, mid tarsus of ♂ without adhesive squamae in 1st segment, hind tarsus not different in ratio of length to the width of head and as long as the width, 1st segment 1.14 times as long as the 2nd and 3rd taken together and twice the 2nd, 3rd a half longer than the 4th, claw segment bisetose along each ventral margin.

Aedeagus (Fig. 2-A) slender, weakly arcuate; apex thick, curved ventrad, and with a minute hook; apical orifice wide, inner sac armed with three groups of conical sclerites, before apical margin, just before there and near middle respectively; ventral surface bordered at sides, the border seriately denticulate. Female genitalia (Fig. 2-B) small; stylus gently curved outwards, with a very small spine along dorsal margin; basal segment bisetose at apico-external corner; valvifer trispinous apically.

Length: 12.7–13.0 mm. Width: 4.8–5.0 mm.

Holotype: ♂, Pegu, Myanmar, 7. XI. 1998, S. GOTO leg. Paratypes: 1 ♂, same data as the holotype; 1 ♂, Mt. Golden Rock, Myanmar, 5–6. XI. 1998, S. GOTO leg.; 1 ♀, Dawna, SE-Burma (Myanmar), 10. V. 1990.

This new species is similar to *Oxycentrus* (*Oxycentrus*) *angusticeps* N. ITO, but the body is larger in size, the pronotum is a little more strongly depressed in basal foveae and the aedeagus is more elongate and directed ventrad at apex instead of reflected dorsad.

Etymology. The specific name is dedicated to Mr. M. YOSHIDA for his continuous kind offer of material for study.

要　　約

伊藤 昇：ミャンマーからの *Oxycentrus* 属の一新種 ——— ミャンマーからの *Oxycentrus* 属は2種類のみが知られているだけで，近隣アジアに比べ極めて少ない．これは調査隊の派遣が少なく知見がない為と思われる．最近和歌山の吉田元重氏がミャンマーに行かれ著者に調査を依頼された．その中に本属の新種が含まれていたので，本稿に記載した．種名は研究の為に常々標本を提供して下さる吉田氏に因む．本種はラオスの *Oxycentrus* (*Oxycentrus*) *angusticeps* N. ITO に近縁であるが，身体がより大型である点，前胸背基部の凹みがより顕著である点，雄交尾器の先端が下方に曲がる点などで容易に区別できる．これでミャンマー産の本属は3種となった．

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Seasonal Variation in the Adult Body Size of the Genji-firefly *Luciola cruciata* (Coleoptera: Lampyridae)

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Abstract Field research on adult *Luciola cruciata* revealed that both males and females showed noticeable seasonal variation in body size. As the season advanced, male body size decreased at an almost constant rate, whereas females showed a more complicated pattern of seasonal variation in body size. The reason for the different patterns of seasonal variation in adult body size may have been due to a difference in the duration of the larval stage between males and females. The present results suggest that the data on adult body size reported so far may have included seasonal variation as well as geographic variation.

Introduction

Morphological studies hitherto handled *Luciola cruciata* MOTSCHULSKY showed noticeable geographic variation in adult body size (reviewed by OHBA, 1988 and MITSUISHI, 1991). However, there were no studies on seasonal variation in body size in this firefly except for Yuma (1981), who showed that larger larvae climbed up to the river bank to pupate earlier in the season. If seasonal variation in body size exists, it must be included in the data of the geographical variation in the previous reports. Therefore, it is important to know whether or not body size varies in the season. In the present study, I will describe patterns of seasonal variation in male and female body sizes in a field population.

Materials and Methods

The study route was located along a stream called "Denbei-segi" in Matsuo-kyo, Tatsuno-machi, Kamiina-gun, Nagano Prefecture, Japan (Fig. 1). My past research in 1994–1997 showed that more than 100 adult fireflies emerged along the route, outside which the number abruptly decreased. Therefore the route was suitable for the field observation of seasonal variation in adult body size and number.

Field investigations were carried out when fireflies were inactive between 23:00 and 3:00 on 4, 11, 18, 20, 25 June and 2 July 1998. On each night, all adults emitting light were counted first. Then, 30–100 adults, which corresponded to $\geqq$ 20% of the number of adults counted, were randomly captured with an insect net. The sex ratio of the adults captured was used to estimate the numbers of male and female adults present. This method may not indicate the exact number of each sex (HORI, *et al.*, 1978). In the present study, however, this method is sufficient to

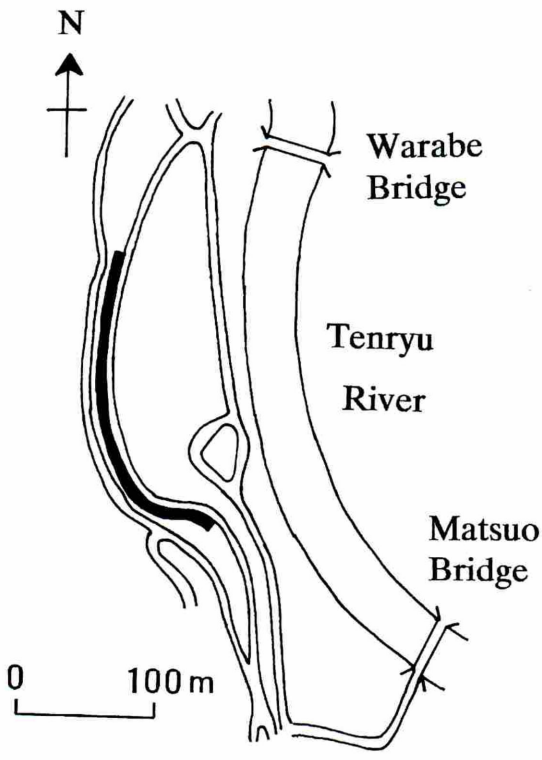


Fig. 1, Map showing the study route (thick line) in Matsuo-kyo, Tatsuno-machi, Kamiina-gun, Nagano Prefecture.

describe the pattern of seasonal trend in the number of each sex. For each adult captured, sex and body size were recorded. The body size was measured as the length of the body excluding the head, because the body length including the head length tended to produce a considerable measurement error due to its flexible position. The measurement was taken to 0.1 mm with a slide caliper.

The pattern of seasonal variation in body size was analyzed as follows. First, the data were tested for the following quadratic equation:

$$y = ax^2 + bx + c$$

where y denoted body length on a day x in June, and a, b and c were regression coefficients. Then, if a did not differ significantly from zero, the data were tested to the following regression line:

$$y = px + q$$

where x and y was defined above, and p and q were regression coefficients.

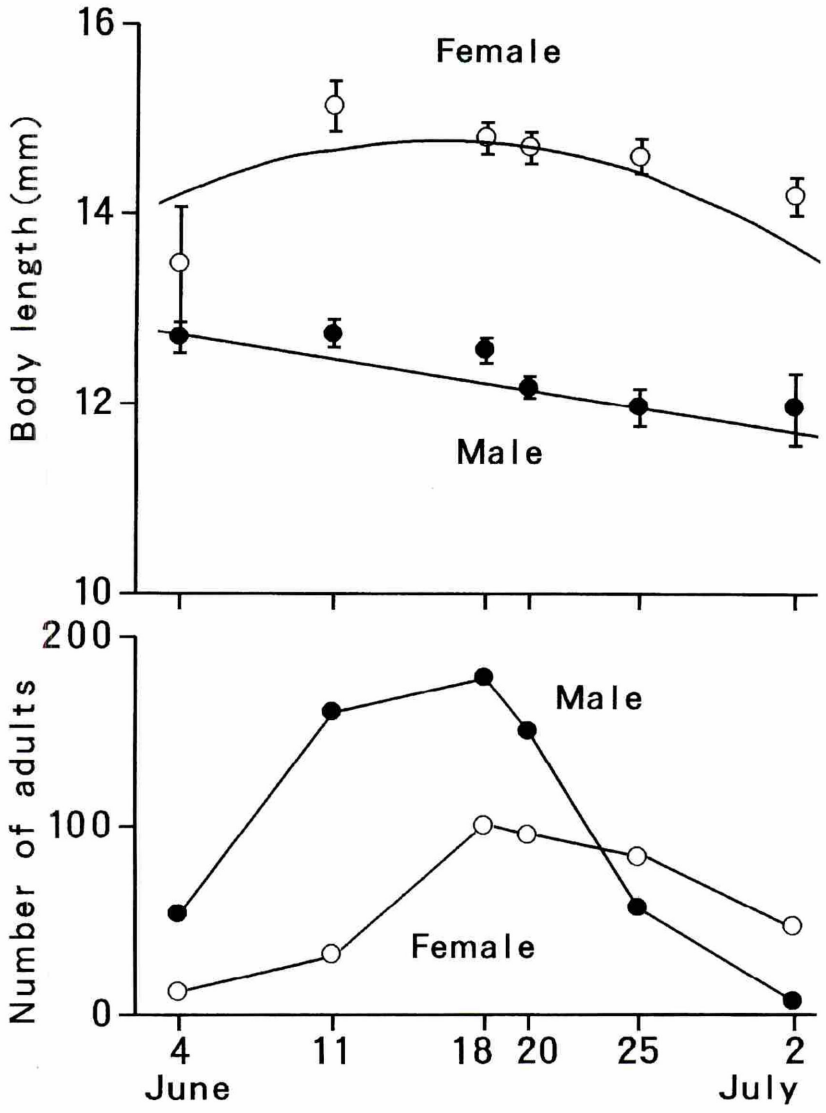
Results

As Fig. 2 shows, the observed seasonal variation in male body size was expressed as a straight line, $y = 0.036x + 12.87$. This line had a negative slope, which differed significantly from 0 ($t = 3.90$, $df = 224$, $P < 0.001$) In contrast, the female variation was expressed as a parabola having a peak in the mid season, $y = -0.0041x^2 + 0.13x + 13.75$.

The analysis of variance showed significant difference in the body size of both males and females among the 6 observation days (males: $F = 4.33$, $df = 5,220$, $P < 0.001$; females: $F = 2.52$, $df = 5,72$, $P < 0.05$). The mean body size of males varied from 12.0 to 12.7 mm and the range in variation corresponded to ca. 6 % of the mean body size of all the males (12.4 mm). On the other hand, the mean body size of females varied from 13.5 to 15.1 mm and the range in variation corresponded to ca. 11% of the mean body size of all the females (14.6 mm). The variance of body size for all the females was significantly larger than that for all the males ($F = 1.55$, $df = 177, 225$, $P < 0.01$) .

Discussion

In the present study, males and females showed different patterns of seasonal variation in



Fi g. 2. Seasonal changes in the number and body length of male and female adults in *L cruciata*. For each sample, the mean ± standard error is indicated. Body length was measured as the length of the body excluding the head. The numbers of males and females were estimated from two parameters, the total number of adults counted and the sex ratio of adults captured.

body size. As the season advanced, male body size decreased at an almost constant rate. In contrast, female body size was more variable and showed a parabolic pattern of seasonal variation. YUMA (1981) examined the body sizes of male and female larvae climbing up the bank, and revealed that as the season advanced, the body size of male larvae decreased more clearly than that of female larvae. The present results were consistent with his observation. In this firefly, males usually pupate after the 6th instar, whereas females pupate after the 7th instar as well as 6th instar (YUMA, 1986). The reason that females showed a more complicated pattern of seasonal variation in body size may have been due to presence of females that pupated in two

different larval stages.

Past studies on adult body size in *L. cruciata* (e.g. OHBA, 1988; MITSUISHI, 1991) showed noticeable geographic variation, but not on seasonal variation. However, the present study showed the noticeable seasonal variation in adult body size in this firefly. Therefore, the data on adult body size reported so far must include seasonal variation as well as geographic variation. As the results obtained by the present study, the body sizes of *L. cruciata* must be examined the geographical and seasonal points of view for comparison in the future.

要　　約

井口　豊：ゲンジボタルの体長の季節変化 ——— 野外採集したゲンジボタル成虫の体長の季節的変異を調べた．その緒果，雄の体長は季節が進むにつれてほぼ直線的に減少したのに対し，雌の体長は放物線的に変化した．過去の研究から，ほとんどの雄が6令幼虫で蛹化するのに対し，雌は6令幼虫でも7令幼虫でも蛹化することがわかっている．この幼虫期間の違いが，雌の体長の複雑な季節的変異を生んでいると推察できる．本研究において，雄と雌の体長は顕著な季節的変異を示した．これまで報告されたゲンジボタル成虫の体長に関するデータには，地理的変異だけではなく，季節的変異も含まれている可能性がある．

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   —1952. The generic names of the beetle family Staphylinidae with an essay on genotypy. Bull. U.S. natn. Mus., 200: i-iv+1-483.
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