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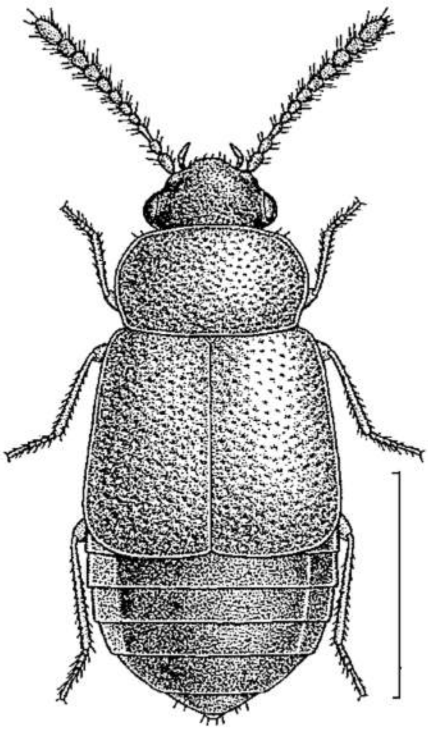

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This volume is dedicated to Professor Yasuaki WATANABE or "Nabe-san", so called by his colleagues and close friends, from which is derived the above subtitle.

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A Brief Biography of Yasuaki WATANABE

Shûji OKAJIMA

Yasuaki WATANABE was born in Ôi-machi, Shinagawa-ku, Tokyo, on the 12th of November, 1932. He was the second son of Bunhachi and Sunobu WATANABE. From his early days at elementary school, WATANABE frequently spent his summer vacation in his parents' home town, Amarume-machi, Higashitagawa-gun, Yamagata Prefecture. In this small country town, good natural environment still survived, and WATANABE spent most of his time on fishing or collecting insects. At junior high and high school, WATANABE was a member of a biology club, pursuing his interest in insects, and even in those days he was fascinated by scarabaeid beetles. His mentor, Ienori FUJIYAMA, and a senior friend, Tadao AOKI, encouraged his interest.

In April, 1952, WATANABE was admitted to the Faculty of Agriculture, Tokyo University of Agriculture (TUA). He began his life-long study of the taxonomy and biogeography of the family Staphylinidae, Coleoptera, in the Entomological Laboratory, chaired by Tsunamitsu ADACHI and Hiromasa SAWADA.

After graduating from university, in May, 1956, WATANABE became employed as an assistant professor in the Entomological Laboratory of TUA. He was promoted to a lecturer in 1967, an associate professor in 1973, professor of the undergraduate school in April, 1990, and professor of the graduate school in October, 1990. While engaged in teaching and administrative duties, he carried on his own researches. In 1989 he obtained his doctorate from the Faculty of Agriculture, TUA. His dissertation was entitled "A taxonomic study on the subfamily Omaliinae from Japan (Coleoptera, Staphylinidae)". WATANABE's publications during his employment at TUA are remarkable. He published more than 120 entomological papers, which include the description of four genera, one subgenus, more than 250 species with two subspecies of staphylinid beetles and one species of lucanid beetle.

WATANABE was involved in Japanese entomological societies and organizations as well as in his university commitments. He was appointed as a secretary of the Kantou branch of the Entomological Society of Japan (ESJ) several times, elected to the council of ESJ and the Japanese Society of Systematic Entomology many times and, in 1993, was elected as the president of the Japanese Society of Coleopterology. WATANABE also worked as an associate researcher at the National Science Museum, Tokyo during the fiscal years of 1990 and 1993, where he revised the systematics of staphylinid specimens in the museum.

WATANABE is not only a good researcher but also an excellent supervisor of his students. He had the capacity for good guidance and trained many active entomologists. He enjoyed every work of his, but above all, looking down his favourite German stereo-microscope at staphylinid specimens. He looked happy whenever he was watching beetles; it seems that he was inspired by the beauty of the insects. Besides his laboratory work, WATANABE loved field collecting, and devoted much of his energy to building up the collection of staphylinid beetles in his laboratory.

WATANABE has a great love for beauty, especially art, and seems to be a romanticist. In his private time, he appreciates western classic music and visual arts, particularly paintings and kabuki – one of the traditional Japanese dramas.

At the end of March, 2002, WATANABE retires from the university. He will be missed by all who have had the privilege to work with him.

CONTENTS

Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 1–24, Mar. 31, 2002

Checklist of Writings (1948–2001) by Yasuaki WATANABE

Yasuaki WATANABE

1948

1. A collecting trip to the Hakone Volcanoes. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-gakkô, Shizen-kagakubu-seibutsuhan), **1**(2): 20–24. (In Japanese.)
   箱根採集記．さいかち（東京都立第一商業学校自然科学部生物班），**1**(2): 20–24.
2. How do butterflies pass the winter season? (A review of T. IWASE's "In what shape do butterflies hibernate?" (1947). *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-gakkô, Seibutsubu), **1**(3): 4–6. (In Japanese.)
   蝶はいかにして冬を越すか．（磐瀬太郎，1947, 蝶はどんな姿で冬を越すか：蟲・自然，(16): 2–4を引用・解説）．さいかち（東京都立第一商業学校生物部），**1**(3): 4–6.
3. Study of soil insects (1). *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-gakkô, Seibutsubu), **1**(3): 13–15. (In Japanese.)
   土壌昆虫の研究（第1回）．さいかち（東京都立第一商業学校生物部），**1**(3): 13–15.
4. On the occasion of the second anniversary after the revival of our biological club. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **2**(2): 1. (In Japanese.)
   生物部復活2周年に際して．さいかち（東京都立第一商業高等学校生物部），**2**(2): 1.
5. Evaluating this year's cultural festival. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **2**(2): 2. (In Japanese.)
   文化祭を省みて．さいかち（東京都立第一商業高等学校生物部），**2**(2): 2.
6. On the relationship between insects and flowers. (Citation from S. MATSUMURA's "Insects and Flowers: Introduction to the Entomology" (1948) and from F. OHMACHI's "Flowers and Insects: An Essay on Japanese Insects (1948)." *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **2**(2): 7–10. (In Japanese.)
   花と昆蟲に就いて．（松村松年（1948），昆蟲と花：昆蟲學概論，201–208，および大町文衛（1948），花と昆虫：日本昆虫記，252–260の双方より引用・解説）．さいかち（東京都立第一商業高等学校生物部），**2**(2): 7–10.

1949

7. Insects attracted to sap. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **3**(1): 5–7. (In Japanese.)
   樹液に集る昆虫．さいかち（東京都立第一商業高等学校生物部），**3**(1): 5–7.
8. A collecting trip to the Nikkô area. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **3**(1): 8–11. (In Japanese.)
   日光方面採集紀行（1）．さいかち（東京都立第一商業高等学校生物部），**3**(1): 8–11.
9. Birds appeared in "Man'yô-shû" [an article for students]. *Saikachi* (Tokyo-toritsu-daiichi-

shôgyô-kôtôgakkô, Seibutsubu), **3**(1): 17. (In Japanese.)
萬葉の鳥．さいかち（東京都立第一商業高等学校生物部），**3**(1): 17.

10. Ecology of insects [an article for students]. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtô-gakkô, Seibutsubu) , **3**(1): 20. (In Japanese.)
昆虫の生態．さいかち（東京都立第一商業高等学校生物部），**3** (1): 20.
11. Scarabaeid beetles [an article for students]. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **3**(1): 22. (In Japanese.)
黄亀子虫．さいかち（東京都立第一商業高等学校生物部），**3**(1): 22.
12. Insects found on Hachiyama [an article for students]. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), **3**(1): 23. (In Japanese.)
鉢山の昆虫．さいかち（東京都立第一商業高等学校生物部），**3**(1): 23.

1950

13. Preface to Number 6 of Saikachi. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), (6): 1. (In Japanese.)
巻頭言．さいかち（東京都立第一商業高等学校生物部），(6): 1.
14. Notes on japygids. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), (6): 20–25. (In Japanese.)
ハサミコムシ(*Japyx*)に就いて．さいかち（東京都立第一商業高等学校生物部），(6): 20–25.
15. Ozegahara Moor, a sanctuary threatened by development of a power station [an article for students]. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), (7): 5–6. (In Japanese.)
秘境尾瀬ケ原一電源開発か文化財保存か！　さいかち（東京都立第一商業高等学校生物部），(7): 5–6.
16. Water and insects. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), (7): 6–7. (In Japanese.)
水と昆虫．さいかち（東京都立第一商業高等学校生物部），(7): 6–7.
17. A collecting trip to Mt. Kinpô-zan of Yamagata Prefecture. *Saikachi* (Tokyo-toritsu-daiichi-shôgyô-kôtôgakkô, Seibutsubu), (7): 16–17. (In Japanese.)
山形県金峯山採集記．さいかち（東京都立第一商業高等学校生物部），(7): 16–18.

1953

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北海道に於いて*Philydrodes subtilis* SHARPを採集する．おとしぶみ（東京農業大学農友会昆虫部），**11**(2): 15.
19. A trip to Towada and the skirts of the Hakkôda-san Mountains. *Otoshibumi* (Nodai Entomological Society), **11**(2): 22–28. (In Japanese.)
十和田・八甲田山麓をめぐりて．おとしぶみ（東京農業大学農友会昆虫部），**11**(2): 22–28.

1956

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日本産*Eucibderus*属と*Phytolinus*属(Staphylinidae). おとしぶみ（東京農業大学農友会昆虫部), **12**(1): 16–18.
21. On the habitats and phototaxis of *Deleaster yokoyamai* ADACHI. *Otoshibumi* (Nodai Entomological Society), **12**(1): 50. (In Japanese.)
ハラビロハネカクシの産地と趨光性. おとしぶみ（東京農業大学農友会昆虫部), **12** (1): 50.

1959

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1961

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28. A revision of the genus *Elonium* LEACH in Japan (Col., Staphylinidae). *J. agric. Sci. Tokyo Nogyo Daigaku*, **7**: 43–45. [Coauthored with Y. SHIBATA.]
29. On *Tachinus impunctatus* SHARP and two new allied species from Japan (Col., Staphylinidae). *J. agric. Sci. Tokyo Nogyo Daigaku*, (commem. Iss. 70th Aniv.): 35–40. [Coauthored with Y. SHIBATA.]
30. On the genus *Psephidonus* from Japan. *Proc. 21st Annual Meeting of Ent. Soc. Japan 1961* 14. (In Japanese.) [Coauthored with Y. SHIBATA.]
日本産*Psephidonus*属について. 日本昆虫学会第21回大会講演要旨1961, 14. [柴田泰利と共著.]

1962

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Staphylinidae). *J. agric. Sci. Tokyo Nogyo Daigaku*, **7**: 95–96. [Coauthored with Y. SHIBATA.]

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日本産*Erichsonius*属について．日本昆虫学会第22回大会講演要旨1962, 17.［柴田泰利と共著.］

1963

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36. On the genus *Erichsonius* of Japan with description of a new species (Col., Staphylinidae). *New Entomologist, Ueda*, **12**(2): 1–4.
37. Insect fauna of the Island of Torishima. Meteorological data and a report of Marcus and Torishima Islands, 169–174, with 3 pls. Japan Meteorological Agency, Tokyo. (In Japanese.)
鳥島の昆虫相．南鳥島・鳥島の気象累年報および調査報告，1963, 169–174, 附3図版．気象庁．
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39. A revision of the genus *Eusphalerum* from Japan (Coleoptera, Staphylinidae). *Proc. 23rd Annual Meeting Ent. Soc. Japan 1963*, 16–17. (In Japanese.)
日本産*Eusphalerum*属の再検討（鞘翅目，ハネカクシ科）．日本昆虫学会第23回大会講演要旨1963, 16–17.

1964

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41. A check list of the beetles of the family Staphylinidae in Niigata Prefecture (1). *Insects of Niigata Prefecture, Kurokawa*, (8): 7–26. (In Japanese.)
新潟県産ハネカクシ科目録（第1報）．新潟県の昆虫，（第8輯）：7–26.
42. Notes on two unrecorded species of the family Staphylinidae from Japan. *Yamagata Konchû Dôkôkai-kaishi, Kaminoyama*, **2**(1): 1–3. (In Japanese, with English title.)
日本未記録のハネカクシ2種．山形昆虫同好会会誌，**2**(1): 1–4.
43. On the genus *Tachinus* (Coleoptera, Staphylinidae) from Japan. *Proc. 24th Annual Meeting Ent. Soc. Japan 1964*, 1. (In Japanese.) [Coauthored with Y. SHIBATA.]

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1965

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46. The staphylinid-beetles from Rishiri and Rebun Isls., Hokkaido, Japan, with descriptions of three new species. *Kontyû, Tokyo*, **33**: 317–323. [Coauthored with Y. SHIBATA.]
47. Revisional notes on two *Mycetoporus*-species (Coleoptera, Staphylinidae) described by the late Dr. Tadao KANO. *Bull. natn. Sci. Mus., Tokyo*, **8**: 351–354. [Coauthored with Y. KUROSAWA.]
48. On a new genus and species of staphylinid beetle found on the Island of Yaku-shima (Coleoptera, Staphylinidae). *Proc. 25th Annual Meeting Ent. Soc. Japan 1965*, 2. (In Japanese.) [Coauthored with Y. SHIBATA.]
屋久島より採集された新属新種について（鞘翅目，ハネカクシ科）．日本昆虫学会第25回大会講演要旨1965, 1.［柴田泰利と共著.］
49. On a new genus and species of the tribe Quediini. *Proc. 25th Annual Meeting Ent. Soc. Japan 1965*, 2. (In Japanese.)
Quediini（ツヤムネハネカクシ）族に含まれる1新属1新種について．日本昆虫学会第25回大会講演要旨1965, 2.

1966

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52. On the genus *Omalium* (Coleoptera, Staphylinidae) and its allies from Japan. *Proc. 26th Annual Meeting Ent. Soc. Japan 1966*, 17. (In Japanese.)
日本産*Omalium*属およびその近縁属について（鞘翅目，ハネカクシ科）．日本昆虫学会第26回大会講演要旨1966, 17.

1967

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48–49. (In Japanese.)
人情家だった八木先生. *New Entomologist, Ueda*, **16**: 48–49.

1968

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ハネカクシ漫歩（2）洞窟のハネカクシ. 甲虫ニュース, (4): 4–5.
56. On *Quedius abnormalis* and its allies. *Proc. 28th Annual Meeting Ent. Soc. Japan 1968*, 2–3. (In Japanese.)
ミヤマツヤムネハネカクシとその近縁種について. 日本昆虫学会第28回大会講演要旨 1968, 2–3.

1969

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御蔵島の昆虫相. 農学集報（東京農業大学）, **14**: 1–48. [澤田玄正と共著.]
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*Paraleaster*属について（鞘翅目, ハネカクシ科）. 日本昆虫学会第29回大会講演要旨 1969, 3.

1970

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61. More cave species of the genus *Quedius* (Coleoptera, Staphylinidae) from Southwest Japan. *Bull. natn. Sci. Mus., Tokyo*, **13**: 9–20. [Coauthored with S.-I. UÉNO.]
62. Descriptions of a new genus and a new species of Quediini from Japan (Coleoptera: Staphylinidae). *Kontyû, Tokyo*, **38**: 70–74.
63. Obituary notice – Keijiro TAKAHASHI. *Coleopterists' News, Tokyo*, (9): 6. (In Japanese.)
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1971

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三宅島の昆虫相．農学集報（東京農業大学），**17**: 1–58.［相馬州彦と共著.］
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A New Species of *Histiostoma* (Acari, Histiostomatidae) Associated with *Lathrobium* sp. (Coleoptera, Staphylinidae) in Japan

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Abstract A new species of histiostomatid mite, *Histiostoma watanabei* sp. nov., is described from Japan based on deutonymphs found on *Lathrobium* sp. (Coleoptera, Staphylinidae). This species is similar to *H. striatosimile* MAHUNKA from Ghana, but distinguished from it by much wider body shape, different pattern of sculpture on idiosomal dorsum, shorter solenidion σ on genu II, and different position of coxal seta *3b* and genu I seta *mG*.

Key words: *Histiostoma watanabei*, Histiostomatidae, new species, phoretic mite, *Lathrobium*, Staphylinidae, Japan.

Histiostomatidae is a mite family of the suborder Astigmata, now comprising about 460 named species arranged in 58 genera in the world. They are mostly known only from the hypopial deutonymphs which are generally found phoretic on insects and other arthropods. In Japan, the histiostomatid fauna has been very poorly investigated; only five species of the genera *Histiostoma* and *Bonomoia* are so far known from Japan (SASA, 1953; OSHIMA, 1980; TAGAMI *et al.*, 1994; KUROSA, 2000). I have found more than 150 species of the family in Japan, most of which are considered to be new to science. One of those new species is described and illustrated herein on the basis of deutonymphs found attached to *Lathrobium* sp. (Coleoptera, Staphylinidae).

The present paper is dedicated to Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture. I wish to express my cordial thanks to Prof. Yoshiaki NISHIKAWA (Otemon Gakuin University) for giving me the valuable material for this study, and to Prof. Y. WATANABE for informing me of the taxonomic position of the host beetle of the new species. Thanks are also due to Dr. Kazumi TAGAMI (Tsukuba University) for his help in consulting literature.

In this paper, nomenclature follows GRIFFITHS *et al.* (1990) for idiosomal setae and GRANDJEAN (1939) for leg setae. Unlike previous authors, all the features that seem useful for species discrimination, particularly the size and position of leg setae and solenidia, will be described in detail. Lengths of legs are measured along the longitudinal axis of each leg from the basalmost point of femur to the apex of tarsus excluding ambulacrum. Length of each leg segment is measured in ventral view from the midpoint of basal border of sclerotized part to the midpoint of apical border. All measurements are given in micrometers (μm). The RLI index (ratio of length (or distance) of any structure to idiosomal length×100) (KUROSA, 1987) is used for the convenience of description.

Histiostoma watanabei KUROSA, sp. nov.

(Figs. 1–10)

Deutonymph. Body obovate in outline, 1.32–1.36 times as long as wide, lateral margins sometimes weakly sinuate posteriorly; length of idiosoma 257–302, width of idiosoma 192–238.

Gnathosoma (Fig. 6):— Gnathosoma elongate, including palpi 47–51 in length (RLI 16–18), nearly as long as tibia I, extending much beyond anterior margin of propodosoma, parallel-sided or somewhat widened in basal 1/3, 3.8–4.5 times as long as wide (10–14); palpi short (7.4–9.4), hardly separated from each other, each bearing a minute basal seta and a fairly long (77–88; RLI 27–31) terminal solenidion, which is 1.6–1.8 times as long as gnathosoma; distance between bases of solenidia 5.0–5.7.

Dorsum (Fig. 1):— Surface excluding posteromedian portion of propodosoma and wide median portion of hysterosoma sculptured with irregular punctures and short striations nearly parallel to anterior or lateral margins, which tend to merge into continuous lines. Propodosoma:— length of exposed part 44–57 (RLI 17–18); anterior margin rather evenly arcuate, often somewhat angulate medially, but never forming distinct rostrum; faint membraneous structure visible anterior to propodosoma; setae *sci* and *sce* located fairly apart from anterior margin of propodosoma, short; *sci* rather well anterior to *sce*. Hysterosoma:— anterior margin transversely striated; setae short like those on propodosoma, c_2 located close to anterolateral angles, h_3 arising from posterior margin, c_3 and *cp* displaced to venter; cupule *ia* discernible laterad of c_1, ovoid; cupule *ip* and opisthosomal gland opening not recognized probably due to cuticular sculpture.

Venter (Fig. 6):— Coxal fields and lateral portions of idiosomal venter densely and finely punctured. Structure bearing gnathosomal collar small; ventral plate 24–30 (RLI 9.0–9.5) in width, its anterior margin bisinuate with a distinct median tooth; anterior margin of dorsal plate ca. 10–14 anterior to posteriormost point of anteromedian emargination of ventral plate, not protruding beyond anterior margin of prodorsum. Apodemes I short, meeting together at an angle of 60° or slightly smaller degrees, forming anterior median apodeme; this junction 18–24 (RLI 7.3–8.7) posterior to base of gnathosoma. Anterior median apodeme rather long, free posteriorly. Anterior apodeme II moderately oblique, faintly joined to apodeme III; posterior apodeme II distinct though not well sclerotized. Apodemes III each strongly and evenly arcuate, meeting together medially; anteriormost point of apodemes III 25–31 (RLI 9.7–11.4) anterior to level of anteriormost point of trochanter III; associated with apodemes III, more internal, weak thickening is usually visible. Posterior median apodeme distinct though almost obliterated in anterior 1/4. Apodemes IV straight and strong, meeting together medially at a right or slightly obtuse angle and posterior median apodeme;

Figs. 1–5. *Histiostoma watanabei* KUROSA, sp. nov., deutonymph; 1, habitus (legs and gnathosoma omitted), dorsal view; 2–5, left legs (basal 1/3–1/4 of each leg omitted), dorsal view; 2, leg I; 3, leg II; 4, leg III; 5, leg IV. Scale: 100 μm for 1; 50 μm for 2–5.

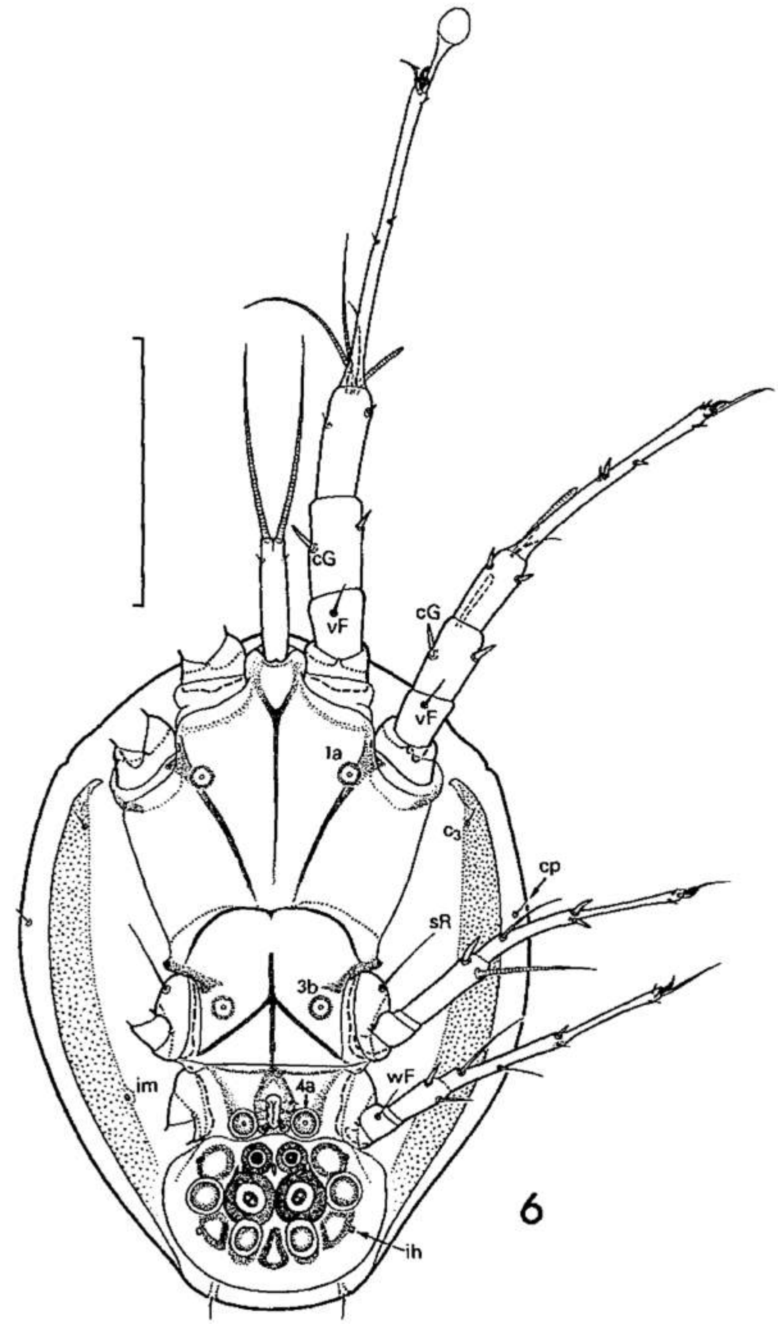
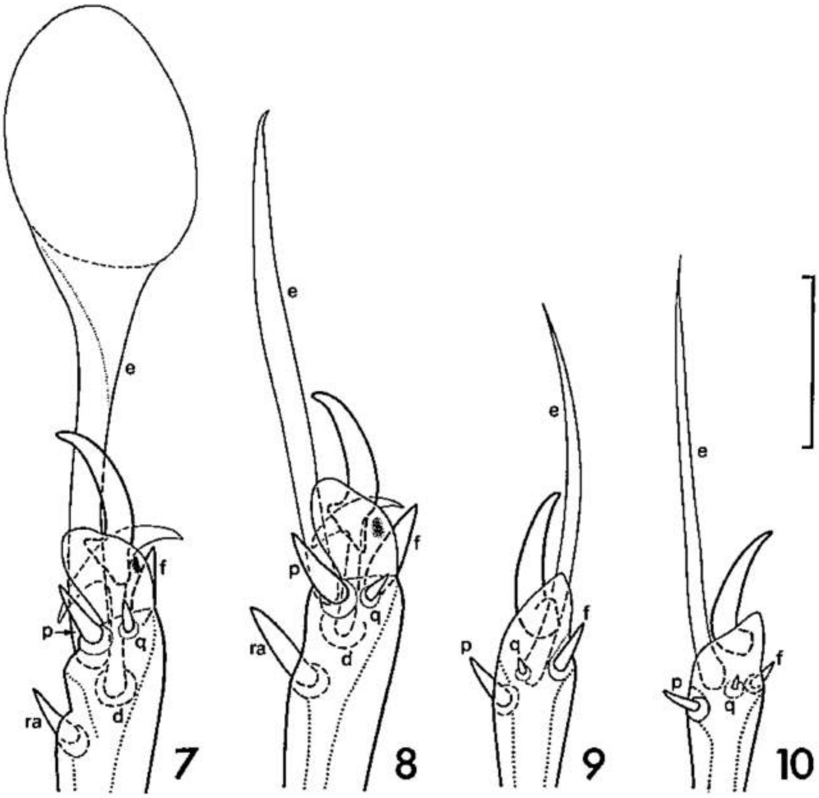


Fig. 6. *Histiostoma watanabei* KUROSA, sp. nov., deutonymph, habitus, ventral view. Scale: 100 μm.



Figs. 7–10. *Histiostoma watanabei* KUROSA, sp. nov., deutonymph, apical portion of tarsus and ambulacrum of right legs, ventral view; 7, leg I; 8, leg II; 9, leg III; 10, leg IV. Scale: 10 μm.

this junction 25–30 (RLI 9.4–10.2) anterior to level of anteriormost point of trochanter IV. Coxal field II a little widened backwards; posterior half of coxal fields III rather clearly defined from lateral membraneous portions, the borders parallel to each other; marginal thickening of coxal field III near anteromesal angle of trochanter III terminating posteromesally some distance in front of seta *3b*, but extending anterolaterally to posterior extremity of posterior apodeme II, where it forms a conspicuous, more or less pointed, lateral protrusion. Distinct, inversely trapezoidal plate present between trochanters IV, its anterior margin weakly emarginate and moderately sclerotized. Coxal setae in the form of normal conoid, rather large (transverse diameter of each alveolus: *1a* 7–9, *3b* 6–9, *4a* 9–11); *1a* partially covering anterior apodeme II; *3b* located fairly apart from apodeme IV; posteriormost points of alveoli for setae *4a* 26–32 (RLI 10.1–11.5) posterior to level of anteriormost point of trochanter IV. Attachment organ medium-sized (RLI of width 32–34); anterior suckers 11–14 in diameter; median suckers 21–25 in transverse diameter, adjoining. Cupule *im* laterad of trochanter

IV, *ih* on lateral margin of posterolateral cuticular sucker.

Legs (Figs. 2–5, 7–10):— Legs extremely long (RLI: I 83–87, II 65–69,III 48–50, IV 46–49); setae relatively short; empodial claws small. For detailed measurements of leg structures, see Table 1. Leg I: femur somewhat widened distad in dorsoventral view; seta *vF* ventral in position when leg I is directed forwards, shorter than width of tibia; border line between femur and genu somewhat inclined in ventral view; genu longer than femur, nearly parallel-sided; seta *cG* nearly on mid-level of genu, rather short; *mG* located at 2/3–3/4 from base of genu, shorter than *cG*; solenidion σ small (length 5–9), usually difficult to detect; tibia a little longer than genu, slightly widened distad in dorsoventral view; seta *gT* located at about 2/3 from base of tibia, *hT* somewhat distal to *gT*, both small; solenidion ϕ 0.51–0.58 as long as tarsus, extending to seta *la*; tarsus very long and slender, 0.49–0.54 as long as total length of leg I, sometimes weakly arcuate laterad; solenidion ω_1 and famulus ε displaced onto apex of tibia, adjoining base of ϕ; ω_1 relatively short, 0.23–0.25 as long as tarsus, slightly thickened distally; famulus ε 0.28–0.31 as long as tarsus; solenidion ω_3 nearly basal in position, considerably long, 0.42–0.45 as long as tarsus, somewhat thicker than ϕ; order in length of solenidia and famulus on leg I $\phi > \omega_3 > \varepsilon > \omega_1 > \sigma$; setae *la* and *wa* small, located at about middle of tarsus, *wa* somewhat distal to, and a little longer than *la*; *ra* subterminal in position; *f*, *p* and *q* minute; *e* spoon-shaped; *d* pedunculate, abruptly widened and recurved apically, appearing Y- or T-shaped in dorsoventral view. Leg II: femur, genu and their setae as stated for leg I except that *vF* is nearly as long as width of tibia; genual solenidion σ 0.61–0.67 as long as tibia, somewhat thickened distally; tibia slightly widened distad; setae *gT* and *hT* located at about 3/4 from base of tibia, subequal in length; solenidion ϕ 0.59–0.68 as long as tibia, fine; tarsus long and slender, 0.50–0.54 as long as total length of leg II; solenidion ω 0.36–0.43 as long as tarsus; seta *la* located at about middle of tarsus, somewhat lanceolate; *ba* slightly proximal to *la*; *wa* some distance distal to *la*; *ba* and *wa* slightly shorter than *la*; *ra*, *d*, *f*, *p* and *q* as in leg I; *e* 0.20–0.32 as long as tarsus, ensiform. Leg III: seta *sR* relatively long, usually only a little shorter than basal width of trochanter; tibia nearly parallel-sided; seta *kT* subapical in position, as long as width of tibia or a little shorter, not reaching base of tarsal seta *r*; solenidion ϕ fairly long, 1.2–1.3 times as long as tibia, reaching tarsal seta *w*; tarsus fairly long, 0.55–0.58 as long as total length of leg III; basal half of tarsus sometimes weakly arcuate; seta *r* located at some distance from base of tarsus, not reaching base of *d*; *s*, *d* and *w* located at about middle of tarsus; *d* and *w* on the same level, subequal in length; *s* very slightly proximal to *d* and *w*, minute; distal half of tarsus attenuate; setae *f*, *p* and *q* minute; *e* tapering, 0.26–0.28 as long as tarsus. Leg IV: seta *wF* a little longer than width of tibia; tibia parallel-sided or slightly widened distad; seta *kT* nearly as long as width of tibia; solenidion ϕ a little longer than *kT*; tarsus 0.64–0.71 as long as total length of leg IV; seta *r* subbasal in position, terminating at some distance from base of *d*; *w* much shorter than *r*, not reaching *s*; *d* and *s* located at about middle of tarsus, *s* slightly proximal to *d*; distal half of tarsus attenuate; setae *f*, *p* and *q* minute; *e* tapering, 0.25–0.30 as long as tarsus.

Table 1. Measurements (in μm) of leg structures of *Histiostoma watanabei* KUROSA, sp. nov., deutonymph. Mean values and ranges (in parentheses) of six specimens with idiosoma 272–302 (mean 294) in length.

Structure	Leg I	Leg II	Leg III	Leg IV
Total length	255.2 (236–270)	195.9 (180–213)	147.5 (137–158)	142.8 (130–151)
Seta *sR*	—	—	29.4 (27–32)	—
Seta *vF*	13.6 (13–15)	16.3 (13–19)	—	—
Seta *wF*	—	—	—	14.4 (12–15)
Genu	42.9 (39–45)	33.6 (32–35)	—	—
Seta *cG*	14.8 (13–17)	15.3 (14–16)	—	—
Seta *mG*	10.1 (9–11)	9.7 (9–10)	—	—
Solenidion σ	6.6 (5–9)	24.7 (23–26)	—	—
Tibia	50.7 (47–53)	39.5 (36–43)	40.6 (37–44)	25.8 (24–28)
Seta *gT*	5.8 (5–7)	8.8 (8–10)	—	—
Seta *kT*	—	—	11.6 (11–13)	10.9 (10–12)
Seta *hT*	6.8 (6–7)	8.0 (7–9)	—	—
Solenidion ϕ	72.9 (68–79)	25.5 (24–28)	50.1 (44–53)	14.8 (13–18)
Tarsus	135.8 (125–143)	100.2 (92–103)	83.2 (77–87)	95.7 (89–101)
Solenidion ω_1	32.0 (29–34)	—	—	—
Solenidion ω_3	60.3 (54–64)	—	—	—
Solenidion ω	—	38.3 (36–40)	—	—
Famulus ε	39.9 (38–43)	—	—	—
Seta *la*	4.7 (4–5)	11.7 (11–12)	—	—
Seta *wa*	6.4 (5–8)	8.2 (8–9)	—	—
Seta *w*	—	—	9.0 (8–10)	21.1 (19–23)
Seta *ra*	4.6 (4–6)	6.4 (6–8)	—	—
Seta *r*	—	—	29.9 (26–35)	37.0 (33–41)
Seta *ba*	—	8.1 (7–9)	—	—
Seta *d*	13.6 (12–16)*	11.1 (9–14)*	9.3 (8–10)	7.8 (7–9)
Seta *e*	39.0 (34–43)	28.8 (21–35)	22.7 (22–25)	26.3 (25–29)
Seta *f*	5.1 (4–6)*	6.0 (5–7)*	3.3 (3–4)*	2.6 (2–3)*
Seta *p*	4.0 (3–5)*	5.2 (4–7)*	3.7 (3–4)*	3.1 (3–3)*
Seta *q*	2.1 (2–3)*	2.3 (2–3)*	1.2 (1–2)*	1.2 (1–2)*
Seta *s*	—	—	2.7 (1–4)*	4.0 (3–5)
Claw	9.3 (9–10)	10.0 (9–10)	9.1 (9–10)	7.7 (7–8)

Extremely shortened genua III and IV are not measured. Lengths of spine-like setae and claws are measured in dorsoventral view from the basalmost point to the tip without regard to their inclination and curvature. Structures marked with asterisk (*) are frequently difficult to measure with accuracy because of their small size and/or indistinctness; therefore approximate values are given instead.

Adult. Unknown.

Type material. Holotype and 23 paratype deutonymphs, *ex* body surface of an undescribed species of *Lathrobium* (s. str.) (Coleoptera, Staphylinidae), found in the ground near a small mountain stream, NNE of the Tatsumi-tôge (alt. 610 m), Saji-son, Yazu-gun, Tottori Pref., western Honshu, Japan, 23–VI–1981, Y. NISHIKAWA leg. Most specimens are in rather heavily depressed state. The holotype is the smallest of five specimens mounted on one slide labeled No. 2392–14. Holotype and four paratypes are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo (NSMT), Japan. The remaining paratypes are currently retained in my private collection, but will be deposited in NSMT later. The host beetle of the type materials, labeled "Host of mites, No 2392, Kurosa 1981", is preserved in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture, Atsugi-shi, Kanagawa, Japan.

Etymology. This species is named after Prof. Y. WATANABE (Tokyo University of Agriculture, Japan), an old friend of mine and eminent taxonomist of staphylinid beetles, in particular of the genus *Lathrobium*.

Remarks. Of the many known members of the genus *Histiostoma*, *H. striatosimile* MAHUNKA, 1975, from Ghana, seems to have the closest resemblance to the present new species in having the large-sized body, extremely long legs, elongate gnathosoma, idiosomal dorsum with remarkable sculpture, considerably long solenidion ω_3 on tarsus I, rather short terminal setae e on tarsi III and IV, relatively long seta sR on trochanter III, and in the conformation of coxal apodemes. *Histiostoma watanabei* is, however, clearly different from *H. striatosimile* in the following features: 1) body shape is much wider; 2) punctations and short striations on idiosomal dorsum are arranged not so linearly; 3) coxal seta $3b$ is located fairly apart from apodeme IV; 4) seta mG on genu I is located not so apically; 5) solenidion σ on leg II is shorter, never reaching base of solenidion ϕ. In view of the above differences, these two species are not considered to be very closely related.

In addition to the above-mentioned 24 specimens of *H. watanabei*, three deutonymphs of two other species of *Histiostoma* were found together on the same host insect. These species are also new to science and will be described on another occasion.

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A New Species of Oribatid Mite (Acari, Banksinomidae) from Ohme, West of Tokyo, Japan

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Abstract A new oribatid mite is described from Ohme, west of Tokyo, Central Japan under the name *Banksinoma watanabei*. It is a second species of the genus known from Japan and is most closely similar to *B. lanceolata* (Michael).

The oribatid mites of the family Banksinomidae are composed of seven genera and more than 70 species, which are distributed mostly in the Holarctic Region and partly in the Paleotropical Region. In Japan, only two species belonging to two genera have been known: *Banksinoma japonica* Fujikawa, 1978, and *Gemmazetes kushiroensis* Aoki, 1992, both of which are found not so often.

During the soil faunal survey of a large forest area of Ohme district in the western part of Tokyo, I found an unknown oribatid mite belonging to the family Banksinomidae. A careful taxonomical study revealed that it is a second Japanese member of the genus *Banksinoma*. It is described in the present paper as a new species.

Banksinoma watanabei sp. nov.

(Figs. 1 A–D)

Measurement. Body length: 310 (320) 327 μm, width: 183 (192) 200 μm.

Prodorsum. Rostrum sharply pointed at tip. Prodorsal setae almost smooth; their relative length $ro : le : in = 1 : 1.26 : 0.87$. Ratio of their length to mutual distance: $ro/ro\text{–}ro = 3.80$, $le/le\text{–}le = 3.00$, $in/in\text{–}in = 1.65$: exobothridial seta 1/1.8 of interlamellar seta. Costulae short, distinctly shorter than prodorsal length and a little shorter than interlamellar seta, strongly convergent anteriorly, leaving a small interspace between their tips (Fig. 1 B). No distinct sculpture found on or around costulae. A pair of weak arches present between interlamellar setae and anterior margin of notogaster. Sensillus bearing a rather long, slender and twisted pedicel and a clavate head with a small point at tip (Fig. 1 A).

Notogaster. Notogaster oval, a little longer than wide (L/W=1.2), anterior margin weakly arcuate. Eleven pairs of notogastral setae fine and smooth except for weakly barbed humeral setae (c_1 and c_2) and anterior median setae (*la*); their RLN (relative length to notogaster): 9–18; setae c_2 the longest and c_1 the shortest; their mutual

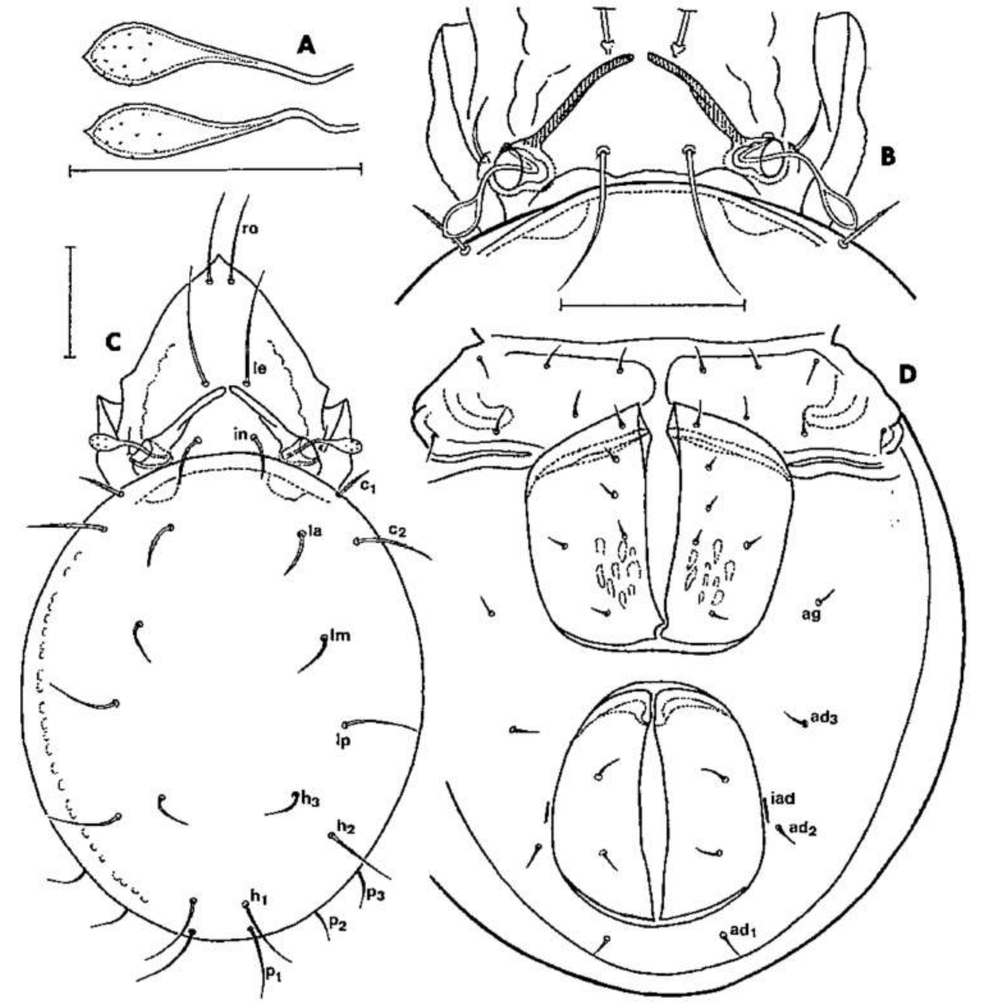

Fig. 1. *Banksinoma watanabei* sp. nov.; A, sensilli; B, posterior part of prodorsum; C, dorsal side of body; D, ano-genital region. (Scale bars: 50 μm.)

distances: c_2–c_2=h_3–h_3>h_1–h_1=c_1–c_1>*lm*–*lm*>p_2–p_2>*la*–*la*>p_3–p_3>*lp*–*lp*>p_1–p_1> h_1–h_1; setae h_1 apparently longer than h_1–h_1. Setal line c_2–*la*–*la*–c_2 almost straight.

Ventral side. Apodemata I, II, SJ and IV developed as complete transverse lines; *apo. 1* and *apo. 2* as well as *apo. sj* and *apo. 4* connected medially by sternal ridge. Setal formula of epimerata: 3–1–3–3. Lateral portion of *apo. 4* showing a double structure. Genital opening large, a little wider than long, while anal opening is a little longer than wide. Six genital setae except one seta (g_5) inserted closer to median margin than to lateral margin of genital plate; setae g_4 and g_5 inserted nearly on the same level. Distance between anal setae an_2 and anterior margin of anal plate longer than that between an_1 and poterior margin of the plate. Mutual distance an_1–an_1 nearly equal to an_2–an_2. Aggenital setae located nearly on the same level of genital setae g_6. Three adanal setae ad_1–ad_3 equally spaced; seta ad_2 inserted close to and just in front of ad_2.

Type series. Holotype (NSMT–Ac 11257): Kurosawa in Ohme City, Tokyo, Central Japan, 27–XI–2001, J. AOKI. 12 paratypes (NSMT–Ac 11258–11263): the same data as holotype. The type series is deposited in the collection of the National Science Museum, Tokyo.

Etymology. This new species is named after Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture and his great achievement in the taxonomy of the Coleoptera.

Remarks. The new species is most closely similar to *Banksinoma lanceolata* (MICHAEL, 1885) from Europe and North America in having the rostrum with a pointed apex, strongly convergent costulae, smooth prodorsal surface around costulae and double chitinous structure of the apodemata IV, but it is distinguishable from the latter by the sensilli, each of which bears a rounded head with only a short pointed apex (with a long, fine apex in *B. lanceolata*), three pairs of anterior notogastral setae barbed (only one pair of setae c_1 barbed in *B. lanceolata*), and smooth lamellar and interlamellar setae (weakly barbed in *B. lanceolata*). The single known Japanese species of the genus, *B. japonica* FUJIKAWA, 1978, from Hokkaido is easily distinguished from the new species by the lamellae widely separated from each other.

Acknowledgement

The present study was carried out in the forest of a Buddhist organization "Shinnyo-en" (head of Diplomacy Department: Mr. S. NISHIKAWA) as a part of biological group survey (head: Dr. K. IWATSUKI) under the financial support of A. A. P. Co., Inc. (president: Mr. E. ASAI). I express my gratitude to the persons mentioned above, who gave me the opportunity to find this interesting species of oribatid mite.

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Two New Species of the Genus *Ligidium* (Isopoda, Ligiidae) from Sichuan Province, Southwest China

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Abstract Two species of the genus *Ligidium*, terrestrial isopod crustaceans, collected in Sichuan Province, Southwest China are described. Both the species are proved to be new to science. One of them belongs to the subgenus *Nipponoligidium*, whereas the other species belongs to the subgenus *Ligidium*.

Dr. Shun-Ichi UÉNO and Dr. Shûhei NOMURA of the National Science Museum, Tokyo, made investigations of the fauna of the western part of Sichuan Province, China, in 1996, and collected some isopod crustaceans in the subalpine forest, which were handed over to me for identification. Among the specimens, I found two new species of the genus *Ligidium* of the family Ligiidae. The holotype of both the new species are deposited in the collection of the National Science Museum, Tokyo.

In the present paper, which is dedicated to Dr. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture, the new species will be described under the names *Ligidium* (*Ligidium*) *watanabei* and *Ligidium* (*Nipponoligidium*) *sichuanense*.

Ligidium (*Ligidium*) *watanabei* sp. nov.

(Figs. 1–2)

Description. Body oblong-ovate, 2.0 times as long as wide. Color brown on dorsal surface. Pleonal somite narrower than pereonal somite. Eyes mediocre, each eye with about 90 ommatidia. Posterior-lateral area of pereonal somite 1 with a bundle of short bristles (Fig. 1 I). Posterior margin of pleotelson weakly pointed. Antennule (Fig. 1 B):— first segment rectangular with 3 long setae at distal end; second segment as long as the first, with 3 setae at distal end; third segment small, with 2 setae at the tip. Antenna (Fig. 1 C):— relatively short, reaching the second pereonal somite; flagellum composed of 6–8 segments; terminal segment with 3–5 aesthetascs at the tip. Right mandible (Fig. 1 D):— pars incisiva 3-headed; lacinia mobilis 10–12-headed; 4 hairy bristles; processus molaris wide. Left mandible (Fig. 1 E):— pars incisiva 3-toothed; lacinia mobilis 3-toothed; 4–5 hairy bristles; processus molaris wide. Maxillula (Fig. 1 F):— outer lobe with 10 teeth at the tip. Inner seven teeth simple and relatively

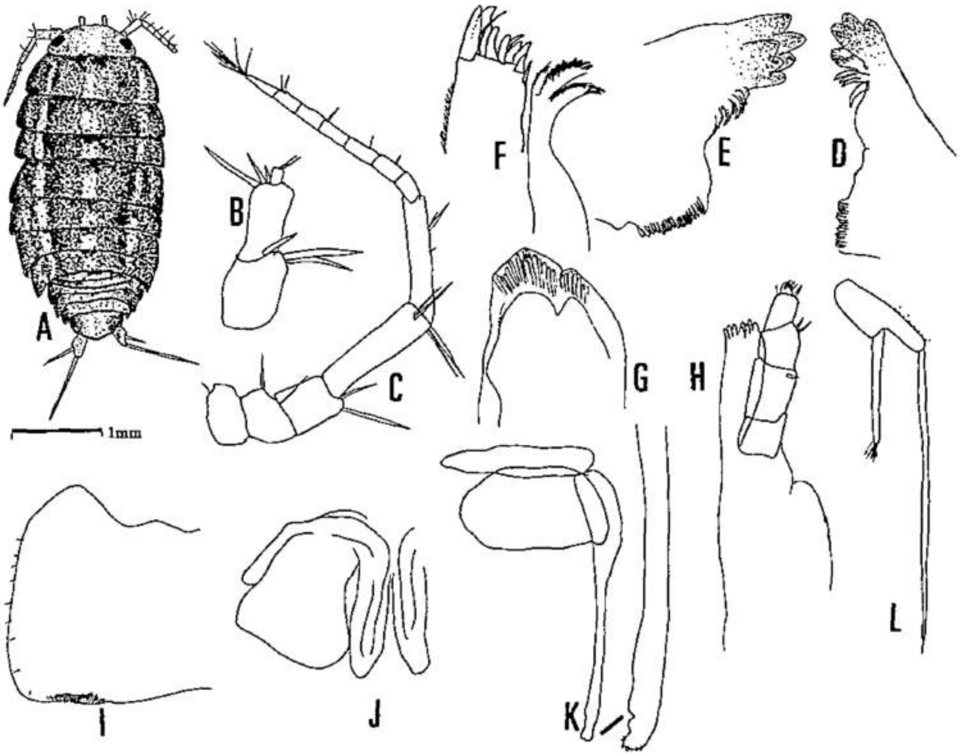

Fig. 1. *Ligidium* (*Ligidium*) *watanabei* sp. nov. —— A, Dorsal view; B, antennule; C, antenna; D, right mandible; E, left mandible; F, maxillula; G, maxilla; H, maxilliped; I, lateral part of pereonal somite 1; J, penes and pleopod 1; K, pleopod 2; L, uropod. (All: holotype male.)

short, 8th slender, 9th and 10th longer and stouter than the others; inner lobe with 3 setae. Maxilla (Fig. 1 G):— semicircular. Maxilliped (Fig. 1 H):— endite rectangular, with 8 plumose setae; palp distinctly separated into 5 segments; epipodite ellipsoidal and small. Pereopod 1 (Fig. 2 A):— a little shorter than the posterior 6 pairs; basis 2.6 times as long as wide, with 3 setae on inner margin; ischium almost 2/3 as long as basis, with 2 setae on inner margin and 2 relatively long setae at outer distal angle; merus 3.2 times as long as wide, with 8–10 setae on inner margin and 2 setae at outer distal angle; carpus 2.5 times as long as wide, with 6–7 setae on inner margin and 2 setae at outer distal angle; propodus tapered toward the tip and 3.2 times as long as the widest area, with 4 setae on inner margin and a seta in outer distal area. Pereopod 2 (Fig. 2 B):— basis 2.5 times as long as wide, with 3 short setae on inner margin; ischium 1.8 times as long as wide, with 3 setae on inner margin and 2 setae at outer distal angle; merus 90% as long as ischium, with 4 setae on inner margin and 2 setae at outer distal angle; carpus 1.7 times as long as wide, with 5–6 setae on inner margin;

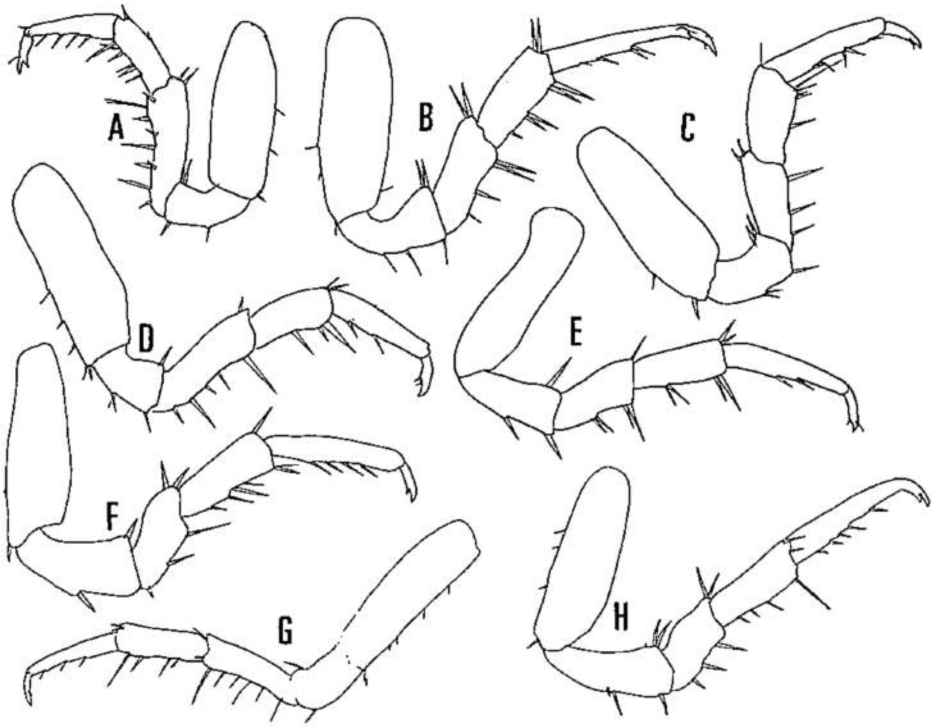

Fig. 2. *Ligidium* (*Ligidium*) *watanabei* sp. nov. —— A–B, Pereopods 1–2; C–F, pereopods 4–7; G, pereopod 3; H, pereopod 7. (A–F: Holotype male; G–H: paratype female.)

propodus 6 times as long as wide, with 4–5 setae on inner margin. Pereopod 4 (Fig. 2 C):— basis 2.6 times as long as wide, with 2 setae on inner margin; ischium a half the length of basis, with 3 setae on inner margin and 2–3 setae at outer distal angle; merus almost as long as ischium, with 3 setae on inner margin and 2 setae at outer distal angle; carpus a little longer than merus, with 3–4 setae on inner margin and a seta at outer distal angle; propodus 1.3 times as long as carpus, with 4–5 setae on inner margin. Pereopod 5 (Fig. 2 D):— basis 2.4 times as long as wide, with 4 setae on inner margin; ischium 2/5 as long as basis, with 2–3 setae on inner margin and a seta at outer distal angle; merus 2/3 as long as basis, with 5 relatively long setae on inner margin and a seta at outer distal angle; carpus 2/3 as long as merus, with 3 relatively long setae on inner margin and 2 setae at outer distal angle; propodus 1.3 times as long as carpus, with 2 setae on inner margin. Pereopod 6 (Fig. 2 E):— basis 3.7 times as long as wide; ischium 3/5 as long as basis, with 2 setae on inner margin and 1 or 2 setae at outer distal angle; merus 3/4 as long as ischium, with two groups of setae, each 2 in number on inner margin and a seta at outer distal angle; carpus a little longer than merus, with two groups of each 2 setae on inner margin and 2 setae at outer distal angle; propodus 1.3 times as long as carpus, with 2 setae on inner margin. Pereopod 7 (Fig. 2 F):— basis 3.4 times as long as wide, with a seta at inner distal angle; ischium 2.3 times as long as wide, with a seta in the middle part of inner margin and a seta at outer distal angle; merus 1.5 times as long as wide, with 2 long setae on inner margin and 2 setae at outer distal angle; carpus 2.4 times as long as wide, with 6–7 setae on inner margin and a seta at outer distal angle; propodus 5 times as long as wide, with 4 setae on inner margin; dactylus 0.3 times as long as propodus. Penes (Fig. 1 J):— straight and relatively short. Pleopod 2 (Fig. 1 K):— endopod long, slightly swollen at the apical part, with 5–7 small teeth at the tip, exopod rectangular, with slight hairs. Uropod (Fig. 1 L):— basis with a series of 8–9 spinules on inner distal margin; endopod long, 2.9 times as long as basis; exopod 2/5 as long as endopod.

Female. Generally similar to male except for copulatory apparatus and shorter ischium of all the pereopods.

Etymology. The specific name is dedicated to Prof. Yasuaki WATANABE of Tokyo University of Agriculture, who promoted the taxonomy, biogeography and ecology of soil insects in southern China.

Remarks. The present new species is most closely allied to *Ligidium* (*Ligidium*) *hyponorum* CUVIER from Europe but is separated by the following features: 1) shorter exopod of uropod, 2) longer endopod of the same, 3) presence of denticle in the apical area of endopod of male second pleopod, 4) smaller eyes and less numerous ommatidia, 5) shorter dactylus organ, 6) wider dental area of the posterior-lateral angle of pereopod 1. It is also allied to *L.* (*Ligidium*) *mimense* NUNOMURA reported from Dali, Yunnan Province, another species of the same subgenus from China, but is separated from the latter by the following features: 1) slenderer body shape, 2) longer uropods, 3) shape of male second pleopod, particularly of the straight apical part, 4) more plumose setae on maxillipedal endite, 5) numerous teeth on outer lobe of maxillula. This species is also allied to the Japanese species *L.* (*Ligidium*) *paulum* NUNOMURA, but is separated by the following features: 1) larger body size, 2) shape of endopod of male second pleopod, 3) shorter endopod of uropod, 4) numerous teeth at the tip of outer lobe of maxillula, 5) straight penes, and 6) numerous ommatidia of eyes. Unfortunately, only a single male specimen has been collected.

Material examined. Tiemenggou, Gao'ershi Shan, Yajiang Xian, W. Sichuan, China, alt. 3,770 m, Sept. 30, 1996, coll. Shûhei NOMURA, 1♂ (holotype, 3.5 mm in body length) and 5♀♀ (1♀ allotype, 5.1 mm in body length and 4♀♀ paratypes, 4.4–4.8 mm in body length). Holotype (NSMT Cr–2741), allotype (NSMT Cr–2742) and 2 paratypes (NSMT Cr–2743) are deposited at the National Science Museum, Tokyo, and 2 paratypes (TOYA Cr–12911~12912) are at the Toyama Science Museum.

Ligidium (*Nipponoligidium*) *sichuanense* sp. nov.

(Figs. 3–4)

Description. Body ovate lanceolate, 1.9 times as long as wide. Color brown with paler irregular patterns on dorsal surface in alcohol. Pleonal somite narrower than pereonal somite. Posterior margin of pleotelson round. Antennule (Fig. 3 B):— 3-segmented; first segment almost square with 1 long bifid seta at distal end; second segment rectangular, with 4 setae on distal margin; terminal segment small. Antenna (Fig. 3 C):— relatively short, reaching the second pereonal somite; peduncle composed of 5 segments and flagellum with 12 segments. Eyes mediocre, each eye with about 80–90 ommatidia. Right mandible (Fig. 3 D):— pars incisiva 3-toothed; lacinia mobilis 5–6-toothed; 4 hairy bristles; processus molaris wide. Left mandible (Fig. 3 E):— pars incisiva 3-toothed; lacinia mobilis 3-toothed; 3 hairy bristles; processus molaris wide. Maxillula (Fig. 3 F):— outer lobe with 7–8 teeth; inner lobe with 3 setae. Maxilla (Fig. 3 G):— semicircular. Maxilliped (Fig. 3 H):— endite rectangular, with 4 setae on distal margin; palp with 5 distinct suture lines; segment 1 rectangular; segment 2 wider than the first, with many hairs on outer margin; segment 3 wider than segment 2, with 2 long setae on outer margin and 4–5 setae in inner distal area; segment 4 narrower and shorter than segment 3, with 3–4 setae on inner margin and 2 setae at outer distal angle; segment 5 small, with 6–8 setae on distal margin. Pereopod 1 (Fig. 4 A):— basis 2.3 times as long as wide, with 2 setae on inner margin; ischium almost square; merus a half the length of basis, with 1 longer and 5–6 shorter setae on inner margin; carpus a little shorter than merus, with 4 teeth on inner margin including long one and 2 setae at outer distal angle; propodus with 4 setae on inner margin. Pereopod 2 (Fig. 4 B):— as long as pereopod 1; basis 3.0 times as long as wide, with 2 setae at inner distal angle; ischium 2/5 as long as basis; merus 2/3 as long as basis, with 8–9 setae on inner margin and a seta in outer distal area; carpus a little shorter than merus, with 5 setae on inner margin including long distal one; propodus as long as carpus, with 5–6 setae on inner margin. Pereopod 3 (Fig. 4 C):— a little longer than the two preceding pereopods; basis 2.9 times as long as wide, with 3 setae at inner distal angle and 3–6 setae on both margins; ischium 2/5 as long as basis, with 2 setae on inner margin and a seta on sternal margin; merus 3/5 as long as basis; carpus 2/3 as long as merus, with 5–6 setae on inner margin and 4–5 setae on distal margin; propodus almost as long as merus, with 5 setae on inner margin and a seta at outer distal angle. Pereopod 4 (Fig. 4 D):— almost as long as pereopod 3; basis 3.0 times as long as wide, with 6–7 setae at inner distal angle and 3–5 setae on both margins; ischium 2/5 as long as basis, with two groups of each 2 setae on inner margin and 3 setae at outer distal angle; merus 3/5 as long as basis, with 7–8 relatively long setae on inner margin and a seta at outer distal angle; carpus 70% as long as merus, with 3 stouter setae on inner margin, a long seta at inner distal angle, a stout seta at the middle part of distal margin, and 4 setae at outer distal angle; propodus as long as merus, with 4 setae on inner margin and a seta at outer distal angle. Pereopod 5 (Fig. 4 E):— almost as long

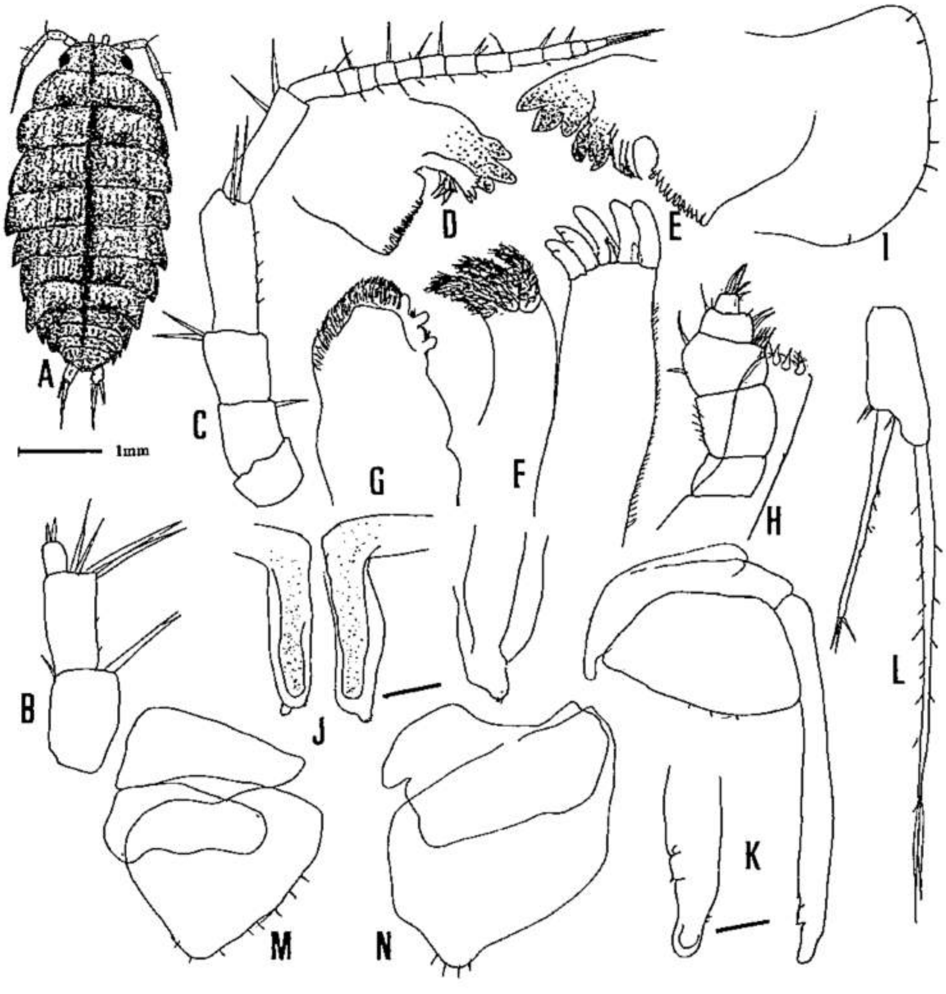

Fig. 3. *Ligidium* (*Nipponoligidium*) *sichuanense* sp. nov. —— A, Dorsal view; B, antennule; C, antenna; D, right mandible; E, left mandible; F, maxillula; G, maxilla; H, maxilliped; I, lateral part of pereonal somite 1; J, penes; K, pleopod 2; L, uropod; M–N, pleopods 1–2. (A–L: Holotype male, M–N: paratype female.)

as pereopod 4; basis rather stout, 2.7 times as long as wide, with 2 setae at inner distal angle and 2–3 short setae on both margins; ischium 38% as long as basis, with two groups of each 2 setae on inner margin and a seta at outer distal angle; merus a little longer than ischium, with 3–4 setae on inner margin and 5–6 setae including a long one at outer distal angle; carpus a little longer but narrower than merus with 5–6 setae on inner margin, 2 long setae at inner distal angle, a seta on distal margin and 3 long setae at outer distal angle; propodus 1.3 times as long as carpus, with 6 setae on inner

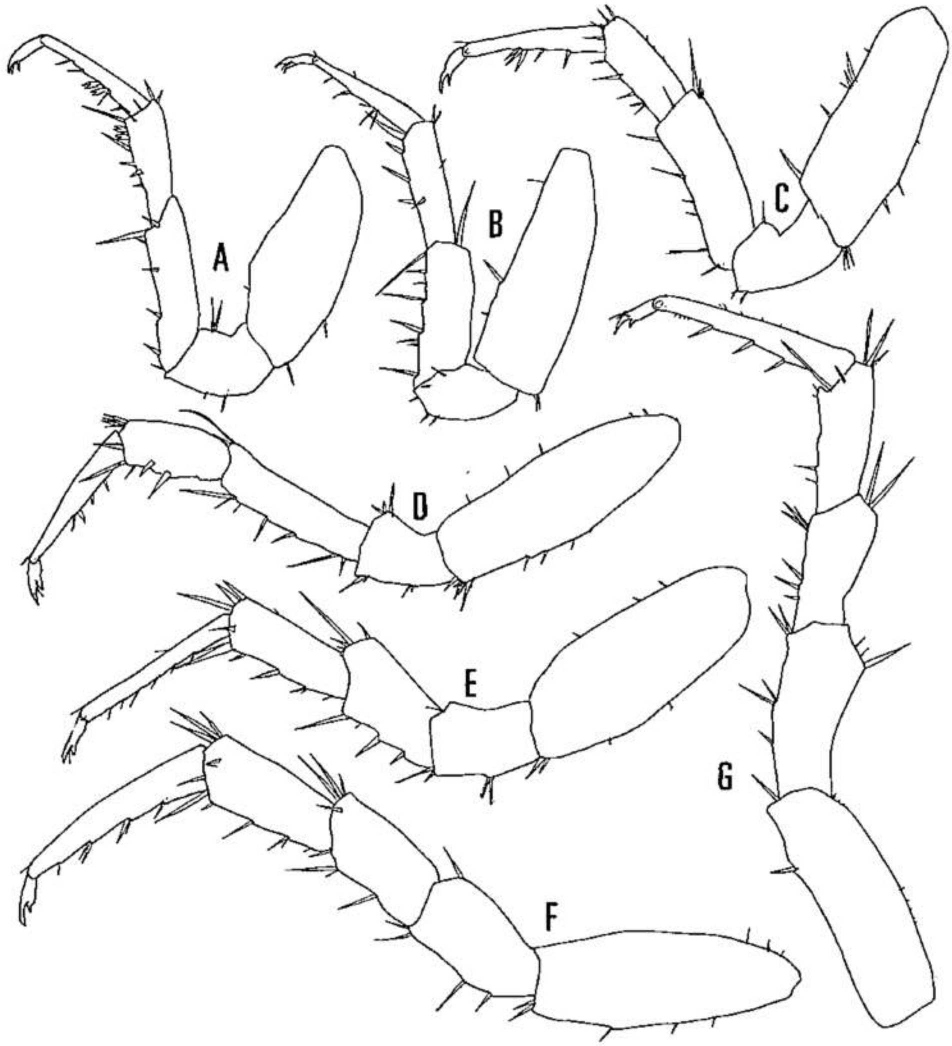

Fig. 4. *Ligidium* (*Nipponoligidium*) *sichuanense* sp. nov. —— A–G, Pereopods 1–7. (All: holotype male.)

margin. Pereopod 6 (Fig. 4 F):— obviously longer than pereopod 5; basis 2.8 times as long as wide, with 3 setae on both margins and 2 setae at inner distal angle; ischium a half the length of basis, with 4 setae on inner margin and a seta on outer margin; merus as long as ischium, with 3–4 setae on inner margin and 4 setae at outer distal angle; carpus a little longer than merus, with 5 setae on inner margin, a long seta at inner distal angle and 3 relatively long setae in outer distal area; propodus 1.5 times as long as carpus, with 6–7 setae on inner margin. Pereopod 7 (Fig. 4 G):— basis 3.0 times as long as wide, with a seta at inner distal angle; ischium 0.7 times as long as basis, with 4 setae on inner margin and 4–5 setae in outer distal area; merus 2/3 as long as ischium, with 5–6 setae on inner margin and 2 setae at outer distal angle; carpus a little longer than merus, with 4–5 short setae on inner margin, 2–3 long setae on distal margin and 3 long setae in outer distal area; propodus 4/5 as long as basis, with 3 stout setae on inner margin and 5–6 short setae on outer margin. Penes (Fig. 3 J):— straight and black in color, with 3 minute spinules at the tip. Pleopod 1:— endopod right-angled triangular, with 3 relatively long setae at the tip; exopod rectangular, with 9–10 short setae on outer margin. Pleopod 2 (Fig. 3 K):— endopod long, straight; apical part rounded with a stout spur near the tip; exopod rectangular, with slight hairs. Uropod (Fig. 3 L):— relatively long, occupying about 18–20% of body length; basis 2.4–2.6 times as long as wide, with 3 setae on distal margin; endopod long, 2.6 times as long as wide, exopod 1.5 times as long as basis and 55% as long as endopod.

Female. Generally similar to male except for copulatory apparatus.

Etymology. Sichuan is the name of a province, in which lies the type locality.

Remarks. The present new species is most closely allied to *Ligidium* (*Nipponoligidium*) *denticulatum* SHEN reported from Kunming and eastern areas of Yunnan Province, but is separated by the following features: 1) shorter dactyl organ on pereopods, 2) stouter spur on male pleopod 2, 3) shape of penes, in particular bearing a small tubercle at the tip, 4) presence of long setae on the fifth peduncular segment of antenna, 5) less numerous setae on outer lobe of maxillula, and 6) presence of 3 minute spinules at the tip of penes. This species is also allied to *Ligidium* (*Nipponoligidium*) *inerme* NUNOMURA reported from Dabei, Gaoligon Shan, Yunnan Province, but is separated from the latter by the following features: 1) presence of spur on male second pleopod, 2) shorter exopod of male second pleopod, 3) presence of long setae on the fifth peduncular segment of antenna, 4) presence of bifid setae on pereopod 1, 5) less numerous setae on outer lobe of maxillula, 6) presence of 3 minute spinules at the tip of penes, and 7) less numerous ommatidia of eye.

Material examined. 1♂ (holotype, 5.0 mm in body length) and 4♀♀ (1♀ allotype, 5.4 mm in body length and 3♀♀ paratypes, 2.1–5.6 mm in body length), Jiuding Shan, Chaping-shan Mts., Mao Xian, C. Sichuan, alt. 3,820 m, Sept. 22, 1996. coll. Shûhei NOMURA and 1♂ (paratype, 4.9 mm in body length), Dagou, Jiuding Shan, Jingzhoucheng, Chaping-shan Mts., Mao Xian, C. Sichuan, alt 1,810 m, Sept. 21, 1996. coll. Shûhei NOMURA. Holotype (NSMT Cr–2744), allotype (NSMT Cr–2745) and 2 paratypes (NSMT Cr–2746) are deposited at the National Science Museum, Tokyo, and 3 paratypes (TOYA Cr–12913~12915) are deposited at the Toyama Science Museum.

Acknowledgement

I wish to express my sincere gratitude to Dr. Shun-Ichi UÉNO and Dr. Shûhei

NOMURA, National Science Museum, Tokyo, for their kindness in collecting the material used in this paper and critically reading the manuscript.

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A New Species of the Genus *Monotarsobius* from Nagasaki, Kyushu, Japan

(Taxonomic Study of the Order Lithobiomorpha (Chilopoda) in Asia. VI)

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Abstract A new species, *M. watanabei* sp. nov. of the genus *Monotarsobius* is described from Nagasaki Prefecture, Kyushu, Japan. This new species is characterized by having small size of body, no accessory claws of the 15th leg, usually 4 ocelli, 19 antennal segments, arrangement of coxal pores 1, 1, 2, 2 and spinulation pattern of legs.

Twelve species of the *Monotarsobius* centipedes with tibial accessories on the 15th legs in male have so far been reported from Japan: *M. nihamensis* Murakami, 1960, *M. tuberculatus* Murakami, 1965, *M. sasanus* Murakami, 1965, *M. nasuensis* Shinohara, 1987, *M. takahagiensis* Ishii, 1991, *M. abukumensis* Ishii, 1991, *M. sunagawai* Ishii, 1993, *M. yasunorii* Ishii et Tamura, 1994, *M. montanus* Ishii et Tamura, 1994, *M. chibenus* Ishii et Tamura, 1994, *M. primrosus* Ishii et Tamura, 1994, and *M. carinipes* Ishii, 1997.

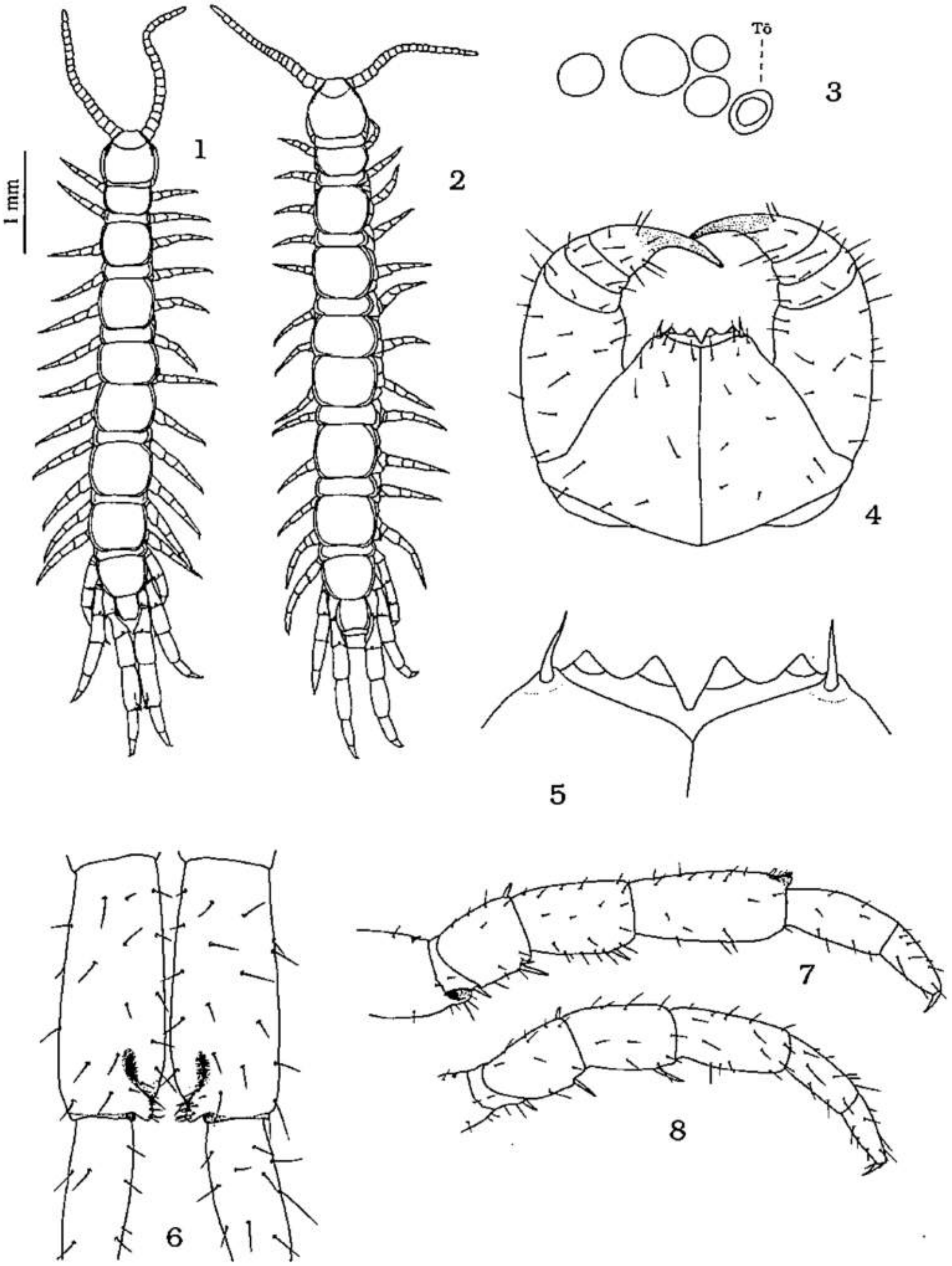
Some small centipedes with tibial accessories on the 15th legs in male and belonging to the genus *Monotarsobius* were found from around Ômura Bay of Nagasaki, Kyushu. The centipede distinctly differs in several taxonomical characters from the other congeners, and therefore, it will be described as a new species. The holotype and paratypes of the new species are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

I wish to express my thanks to Dr. Hiroshi Tamura, Dr. Shun-Ichi Uéno and Prof. Yasuaki Watanabe for their kind advice and support. This paper is dedicated to Prof. Yasuaki Watanabe in commemoration of his retirement from Tokyo University of Agriculture.

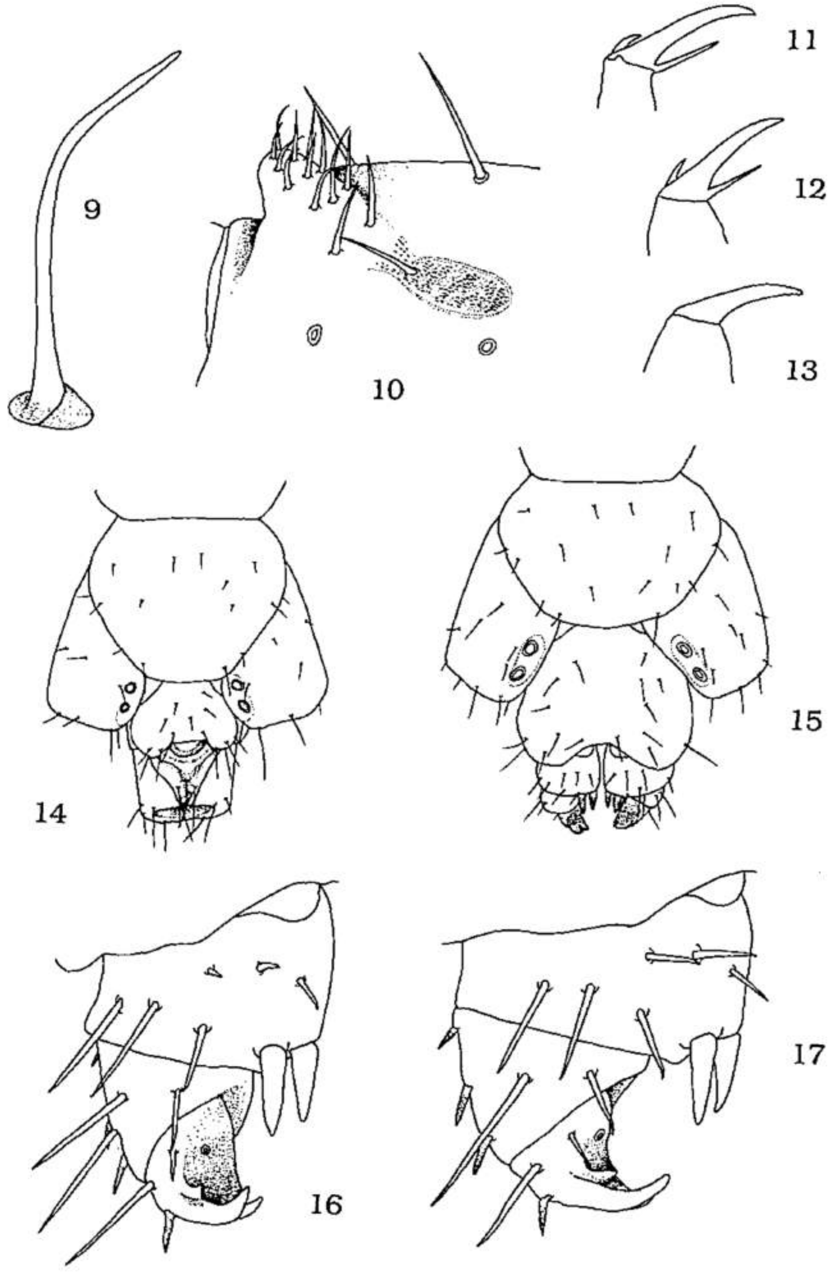
Monotarsobius watanabei sp. nov.

(Figs. 1–17)

Body color yellow or brownish yellow. Measurement:— male: body length 4.30–4.90 mm (mean 4.70 mm, n=5), head width 0.46–0.57 mm (0.53 mm), 3rd tergal width 0.46–0.57 mm (0.51 mm), 10th tergal width 0.55–0.65 mm (0.61 mm); female: body



Figs. 1–8. *Monotarsobius watanabei* sp. nov. —— 1, Habitus, adult male, dorsal side; 2, habitus, adult female, dorsal side; 3, ocelli, right side, Tö – organ of Tömösvary; 4, forcipules, ventral side; 5, forcipular teeth, ventral side; 6, dorso-internal process on tibia of 15th leg; 7, 15th leg, lateral side; 8, 14th leg, lateral side.



Figs. 9–17. *Monotarsobius watanabei* sp. nov. —— 9, Spinal seta; 10, dorso-internal process with spinal seta-group and a shallow hollow on tibia of 15th right leg; 11, 13th pretarsus; 12, 14th pretarsus; 13, 15th pretarsus; 14, 15th trunk and anal segments in male, ventral side; 15, 15th trunk and anal segments in female, ventral side; 16, right female gonopod, ventral side; 17, right female gonopod, dorso-internal side.

Table 1. Spinulation on legs of *Monotarsobius watanabei* sp. nov.

Leg	Dorsal				Ventral			
No.	t	P	F	T	t	P	F	T
1			(a)	a				m
2			ap	a(p)				m
3			ap	ap			a(m)	m
4–9			ap	ap			am	m
10			(a)p	ap			am	m
11			p	ap			am	m
12			p	p		(p)	(a)m	m
13		mp	p	p		(m)p	m	m
14	(a)	mp	p		m	(a)mp	m	
15	a	mp			m	amp	m	

Symbols t, P, F and T are trochanter, prefemur, femur and tibia, respectively; a, m and p indicate anterior, median and posterior, respectively.

length 5.04–5.60 mm (5.31 mm, n=3), head width 0.48–0.61 mm (0.55 mm), 3rd tergal width 0.50–0.57 mm (0.54 mm), 10th tergal width 0.60–0.7 mm (0.64 mm).

Male (Fig. 1). Head bearing 3 or 4 ocelli on each side; anterior 3 ocelli arranged in a horizontal row, 4th ocellus lying behind the lateralmost one of the anterior row (Fig. 3). Antenna usually consisting of 19 (left)+19 (right) segments, rarely 17+19, 19+17. Organ of Tömösvary nearly of the same size as anterior ocellus and situated on dorsal side. Forcipular coxosternite provided with 2+2 teeth; medial pair of the teeth broader and slightly protruding than lateral ones; parodontal spines slender, long (Figs. 4, 5).

Whole tergites of trunk without triangular post-processes. Tergite I somewhat trapeziform with feebly concave posterior border. Posterior border of tergites VIII, X, XII and XVI feebly concave. Sternite XV semicircular (Fig. 14). Second genital sternite without setae.

Tarsi of 1st to 13th legs fused, but those of 14th and 15th legs separated into tarsi I and II. Fourteenth and 15th legs slightly thickened (Figs. 7, 8). In 15th leg, tibia and femur devoid of dorsal groove, dorso-internal distally with a small process bearing short spinal seta-group and base of the process with a shallow hollow (Figs. 6, 9, 10). Accessory claws of pretarsus well-developed in 1st to 13th legs (Fig. 11), but shorter in 14th leg (Fig. 12) and completely lacking in 15th leg (Fig. 13). Coxal pores of 12th to 15th legs arranged in a row usually 1, 1, 2, 2 in number. Spinulation of legs as in Table 1.

Female (Fig. 2). Sternite XV of trunk semicircular (Fig. 15). Coxal pores of 12th to 15th legs usually 1, 1, 2, 2 in number. Genital coxa of gonopod with two conical spurs of almost equal size (Fig. 16). Secondary genital segment with three dorsal spines (Fig. 17). Genital claw trifurcated and bearing a dorsal spine.

Type series. Holotype: ♂, Hachimansha of Kamiba, Hariojima, Saseho City, Nagasaki, *Castanopsis–Quercus* forest, 23–V–1988, K. ISHII leg. Paratypes: 2♂♂, 2♀♀, same locality and collector as for the holotype. Other specimens examined: 1♂, same locality and collector as for the holotype; 1♂, 1♀, Benzaiten of Onegoto, Higashisonogi-gun, Nagasaki, *Machilus thunbergii* forest, 23–V–1988, K. ISHII leg.

Remarks. This new species resembles *M. nihamensis* MURAKAMI (1960, pp. 290, 291, fig. 1, tables 1–2) but differs from it in having 3 or 4 ocelli, 19 antennal segments, no accessory claws of the 15th leg, and 12–13 VaT, 1–4 VpP and 1–5 DpP spines on legs lacking.

Etymology. The present new species is dedicated to Professor Yasuaki WATANABE.

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Collembola of the Central Region of the Ou Mountains, Northeast Japan

III. A New Species of the Genus *Dagamaea* (Collembola, Isotomidae) from Mt. Yakeishi

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Abstract A new collembolan species of the genus *Dagamaea* is collected from Mt. Yakeishi, southwestern Iwate Pref., Northeast Japan; *Dagamaea morei* sp. nov. The new species closely resembles *D. tenuis* (FOLSOM, 1937), but is distinguishable from the latter by the number of dorsal blunt sensilla on Ant. IV and lateral blunt sensilla on Abd. V+VI.

This study is the third report on Collembola of the central region of the Ou Mountains, Northeast Japan (see TAMURA, 2001 a, b).

The genus *Dagamaea* belonging to the family Isotomidae is characterized by the elongate body with a short furca arising from Abd. IV and having Abd. V+VI completely fused. The genus was first erected by YOSII in 1965, for *Dagamaea japonica* as the type species. CHRISTIANSEN and BELLINGER (1998) examined specimens of the type species and noted that the species must be considered synonymous with *D. tenuis* (FOLSOM, 1937) from Massachusetts, USA, the latter species being first described as *Isotomodes tenuis* and later incorporated into the genus *Dagamaea* according to the definition of the genus proposed by YOSII (1965). Further, YOSHII (1995) added *D. fragilis* collected from caves in Fukuoka, Southwest Japan, to the genus. The present species is the third one of the genus.

The author wishes to thank Mr. N. SASAKI for his kind help in carrying soil samples taken in the field.

This paper is dedicated to Professor Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

Dagamaea morei sp. nov.

(Figs. 1–11)

Color white, but slightly mottled with scattered black pigment granules on dorsal and lateral sides of Abd. IV–VI (Fig. 2). Body 700–900 μm long (829 μm in the holotype; 819 μm in the mean of 10 specimens examined), cylindrically elongate. Setae all simple. Dorsal setae on Th. II and III arranged in three rows (Fig. 3) and on Abd. I–III in four rows (Fig. 4).

Head:— Head diagonal, 182 μm long in the holotype. Antenna shorter than head, ratio of antenna to head 0.77; length ratio of Ant. I : II : III : IV as 1 : 1.5 : 1.3 : 2.1. Ant. IV dorsally with 11 blunt sensilla and a minute organite "or". Ant. III subapically with two small sensory rods in a shallow groove, accompanied by two curving sensory setae (Fig. 5). Eyes absent (Fig. 1). Labral setae 4/5, 5, 4 (Fig. 6). Postantennal organ 31 μm long, narrowly elliptical, with a slight constriction at middle (Fig. 7).

Thorax:— Legs without tenent hairs; hind unguis 22 μm in the holotype, without inner teeth; unguiculus shorter than a half of unguis (Fig. 8).

Abdomen:— Abd. V and VI completely fused and anus opening posteriorly (Figs. 1, 2). Mass of Abd. V+VI laterally with 4 blunt sensory setae in a transverse row at about middle on each side (Fig. 2). Tenaculum quadridentate; corpus with a seta (Fig. 9). Furca 84 μm long in the holotype; length ratio of manubrium : dens : mucro as 4 : 2 : 1 (Figs. 10, 11). Manubrium ventrally with 7+7 setae and dorsally with 2+2 setae. Dens ventrally with 4+4 setae, of which the proximal pair are distinctly long and dorsally with 4+4 setae. Mucro composed of two subequal distinct teeth.

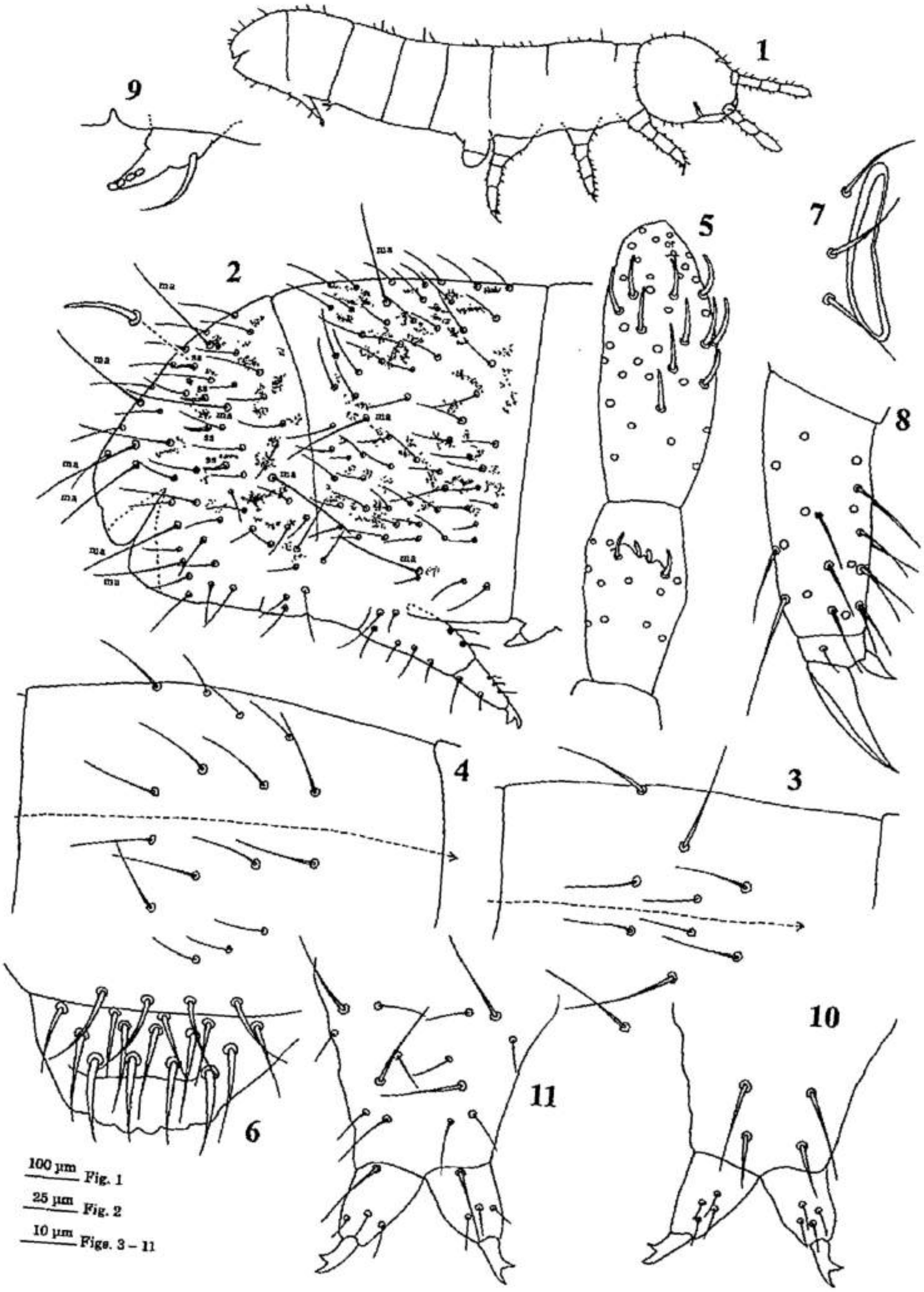
Holotype: ♀, litter layer of a forest dominated by *Fagus crenata* and covered with *Sasa kurilensis*, near Ginmeisui Spring, 1,100 m alt. on the southern slope of Mt. Yakeishi, located at Isawa, southwestern Iwate Pref., 15–X–1999, H. TAMURA leg. Paratypes: 3 ♀, same data as for the holotype. Holotype and a paratype are deposited in Iwate Prefectural Museum at Morioka, and a paratype is in Aomori Prefectural Museum (Kyodokan) at Aomori. The remaining one paratype is kept in the collection of the author.

Other specimens examined. Six, same data as for the holotype.

Remarks. This species closely resembles *D. tenuis* (FOLSOM, 1937) in general morphology, particularly in having 2+2 setae on the dorsal surface of the manubrium and 2+2 and 3+3 setae on the posterior surface and lateral flap of the ventral tube, respectively. The former is, however, separable from the latter by differences in the number of dorsal blunt sensory setae on Ant. IV and of lateral sensory setae on the mass of Abd. V+VI (in *tenuis*, Ant. IV with about 12 sensory setae and Abd. V+VI with 1+1 lateral sensilla).

Etymology. This species is named in honor of "MORE". He was a clear-headed leader of the tribe Emishi, which occupied the area called Hitakami 1200 years ago, the Hitakami district possessing Mt. Yakeishi, the type locality of the present new species, at its westernmost part.

Figs. 1–11. *Dagamaea morei* sp. nov. —— 1, Habitus; 2, Abd. IV–VI, showing pigment granules and lateral sensory setae on Abd. V+VI; ma=macrochaeta; ss=sensory seta; 3, chaetal arrangement on Th. II and III; 4, ditto on Abd. I–III; 5, Ant. III and IV; circles indicate dorsal chaetal sockets; 6, labrum; 7, postantennal organ; 8, hind leg; circles mean chaetal sockets on opposite side; 9, tenaculum; 10, furca, dorsal; 11, ditto, ventral.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100 µm Fig. 1
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A New Species of the Genus *Sphyrotheca* (Collembola, Sminthuridae) from the Wu-yan-ling Nature Protective Area, East China[1)]

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Abstract A new species of sminthurid Collembola, *Sphyrotheca watanabei* sp. nov., is described and illustrated from the Wu-yan-ling Nature Protective Area, Tai-shun County, Zhejiang Province, East China. It seems to be related to *S. multifasciata*, but it is easily separated from the latter by the peculiar vertical setae of head.

Key words: Collembola; Sminthuridae; new species; *Sphyrotheca*; China.

In the course of Sino-Japanese cooperative study on the soil fauna of subtropical forests in China, a new species of the genus *Sphyrotheca* was found from the Wu-yan-ling Nature Protective Area, Tai-shun County, Zhejiang Province, East China.

Up to the present, four species of the genus *Sphyrotheca* have been known from China (ZHAO *et al.*, 1997), of which *S. multifasciata* and *stachii* were reported by STACH (1964) and by CHEN and WU (1996), respectively, both from Nanjing, Jiangsu Province in East China. The remaining two were *S. spinimucronata* reported by ITOH and ZHAO (1993) from Yunnan Province in Southwest China, and *S. formosana* by YOSII (1965) from Taiwan. The new species is named *Sphyrotheca watanabei* sp. nov. and described here in commemoration of Professor Yasuaki WATANABE's retirement from Tokyo University of Agriculture.

1) This study is supported by a Grant-in-aid for Field Research of the Monbusho International Scientific Research Program, Japan (1989–1990, No. 01041032).

Sphyrotheca watanabei sp. nov.

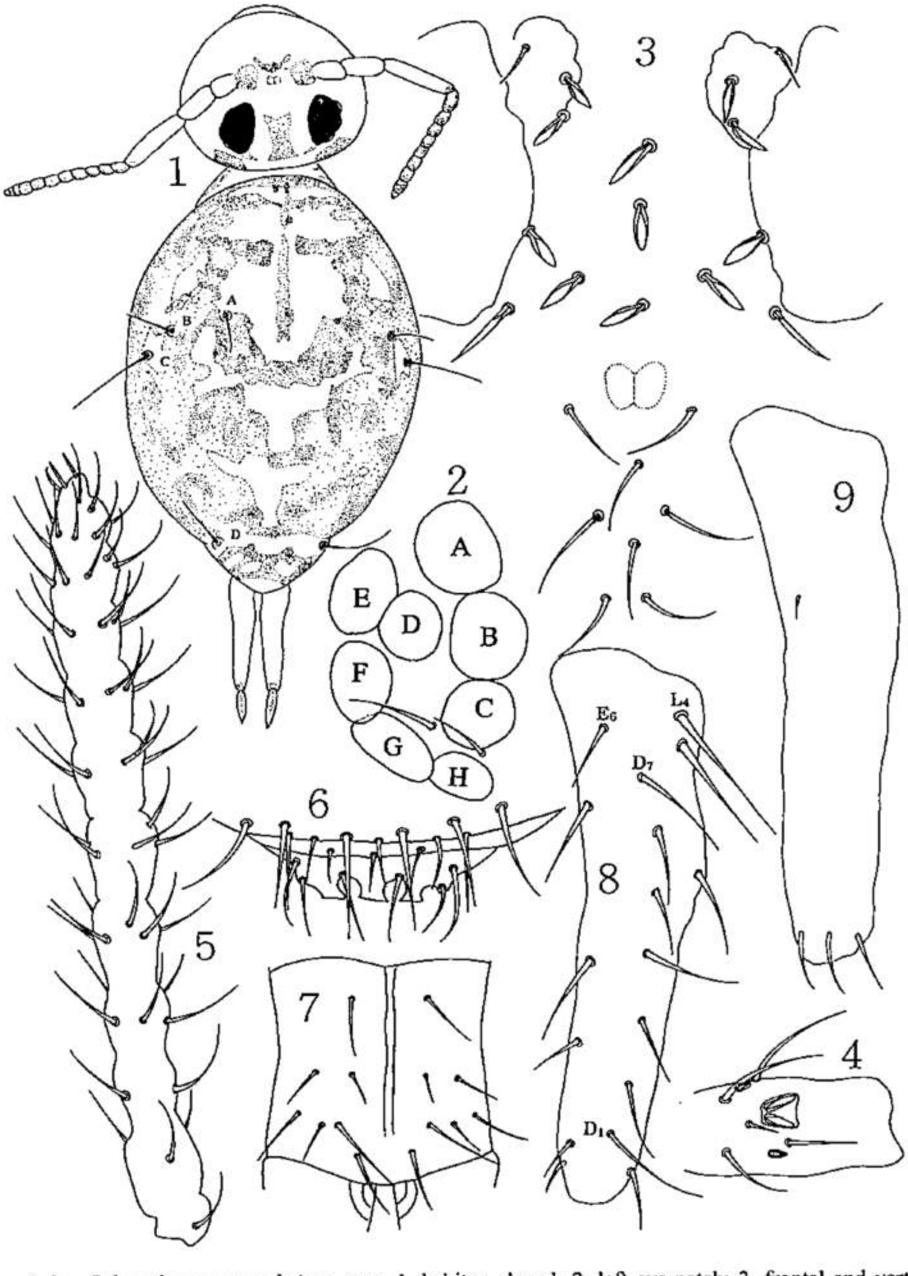
(Figs. 1–19)

Background yellow, with purple-pigmented pattern as shown in Fig. 1; head with a broad median band on vertex and a pair of patches on basal fields of antennae and posterior fields of eyes; anterior half of face also with scattered pigmentation; dorsum with a median longitudinal streak and some transverse bands, of which the middle one is U-formed. Ant. IV and III pigmented, while proximal parts pale. Legs, ventral tubes and furca also pale, but mucro and middle 1/3 parts of tibiotarsus weakly pigmented.

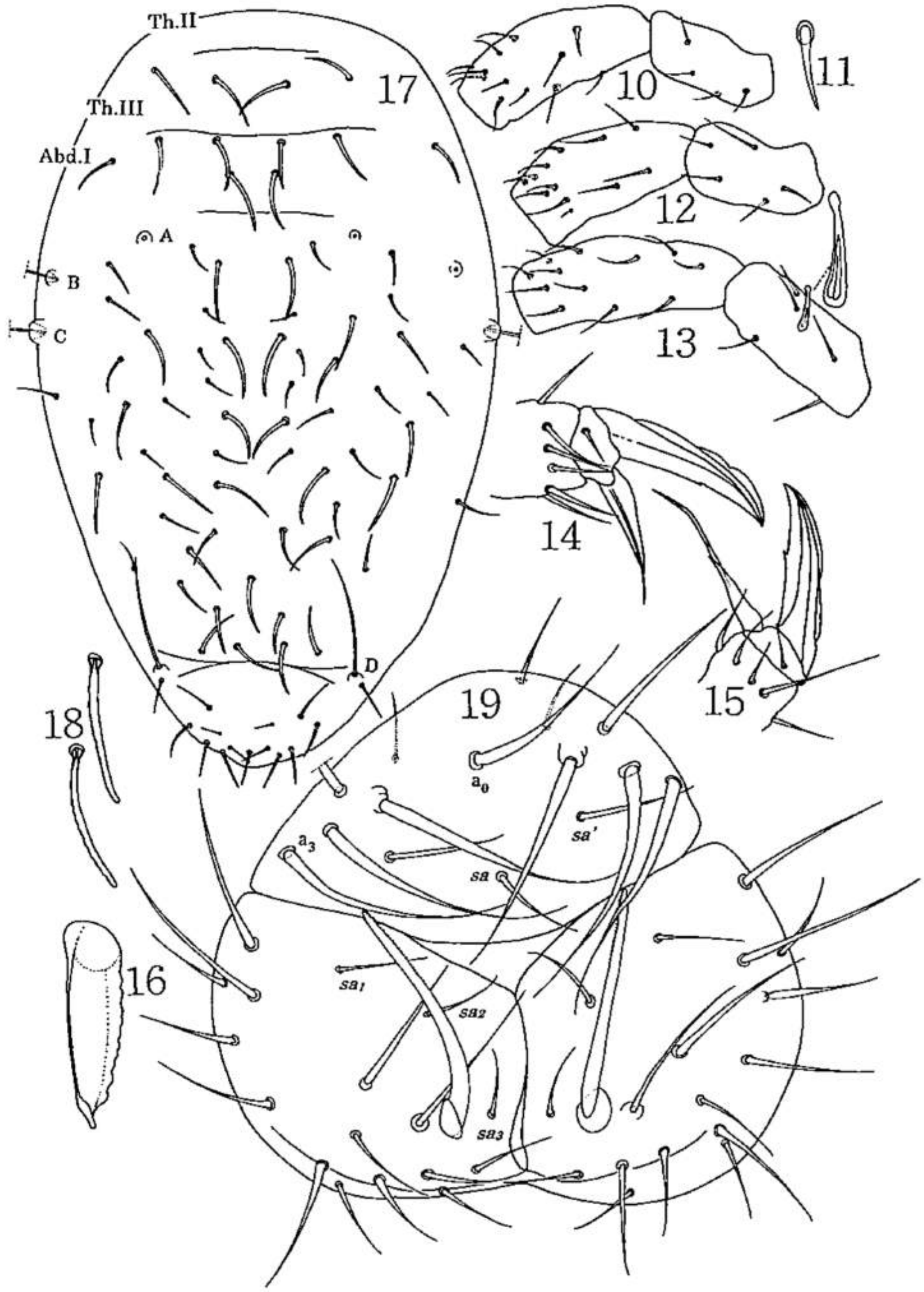
Head:— Eye-patch with 8 eyes and 2 simple setae (Fig. 2). Inter-orbital tubercles well developed, bearing 3 setae, of which the anterior two are modified to spatulate rods elongated as scales (Fig. 3). Vertical setae of head also spatulate and arranged as in Fig. 3, being typical of the genus. A pair of setae on anterior corner of eye patches also spatulate, but less modified than those of vertical ones. Facial field with 8 simple setae arranged as in Fig. 3. Antenna shorter than body. Ant. IV subdivided into 10 subsegments, each bearing whorled setae (Fig. 5). Ant. III distally with two small cuneiform sensilli lying in a shallow depression; ant. III-organ typical of the genus, with two blunt rods in a shallow common groove (Fig. 4). Labral setae as 6/5, 5, 4; lateral pair of second row longer than the others (Fig. 6).

Thorax:— Thoraces II and III separated by a faint groove of integument. Mesothrax dorsally with 2+2 blunt setae and laterally without thoracal vesicles. Fore and mid trochanters bearing 4 and 5 simple setae, respectively (Figs. 10 & 12). Hind trochanter with 5 simple and a conical setae, the latter ending in a swollen bulb (Fig. 13). Femur with 12 setae of which one on fore leg is modified as a hook (Fig. 11). Pretarsus with an anterior and a posterior setae. Fore unguis slightly curving, with tunica and an inner tooth at distal half. Hind unguis of the same shape, with an inner tooth at a little distal portion to the middle. Unguiculus lanceolate, without a corner tooth. Axial filament acuminate; fore unguiculus thick, extending to outer tip of unguis, but hind one almost as long as inner side of unguis (Figs. 14 & 15).

Abdomen:— Integument coarsely granulated all over body. Dorsal chaetal arrangement as in Fig. 17; body setae curving, unilaterally rugose and blunt-ending (Fig. 18). Bothriotricha A and B short, C and D long (Fig. 1). Rami tenaculum tridentate; anterior corpus with 4 apical setae. Ventral tube with warty sacs and 1+1 subapical setae. Furca well developed. Manubrium dorsally with 7+7 smooth setae and ventrally nude (Fig. 7). Dens dorsally bearing 7 simple setae (D_1–D_7), externally 6 setae (E_1–E_6) and internally 4 setae (L_1–L_4) arranged as in Fig. 8; D_1, D_4 and D_7 longer than other D-setae; E_4–E_6 longer than E_1–E_3; L_{3-4} longer than L_{1-2}. Dens ventrally with 4 setae arranged as 3···1 (Fig. 9). Mucro boat-shaped, apically incised, inner margin coarsely serrated with 10–12 teeth, while outerly almost smooth (Fig. 16). Mucronal seta absent. Anogenital segment as in Fig. 19; upper anal flap with thick and long a_{0-3} setae being subequal and sa-seta about as long as sa′-seta; lateral flaps with subequal a_{1-4} setae and sa_3-seta being a little shorter than sa_1 and sa_2; anal appendage on a high



Figs. 1–9. *Sphyrotheca watanabei* sp. nov.; 1, habitus, dorsal; 2, left eye-patch; 3, frontal and vertical setae; 4, sense organ of Ant. III; 5, Ant. IV; 6, labrum; 7, manubrium; 8, dens, dorsal; 9, ditto, ventral.



Figs. 10–19. *Sphyrotheca watanabei* sp. nov.; 10, trochanter and femur of fore leg; 11, modified seta upon femur of fore leg; 12, trochanter and femur of mid leg; 13, ditto of hind leg; 14, hind claw; 15, fore claw; 16, mucro, dorso-lateral; 17, chaetal arrangement on dorsum; 18, setae on Abd. I; 19, anogenital segment of female.

papilla, which is large, thick, apically blunt and faintly feathered at inner distal third.

Body length: 0.95 mm (female), 0.78 mm (male).

Proportion: Body length : antenna, 9 : 4; antennal segment I : II : III : IV, 6 : 11 : 19 : 34; antenna : head diagonal, 17 : 15; manubrium : dens : mucro, 56 : 47 : 17; unguis : unguiculus of hind leg, 30 : 17.

Type series. Holotype: female, allotype: male, Bai-yun-ao, 1,300 m above sea level, Wu-yan-ling Nature Protective Area, Tai-shun County, Zhejiang Province, by beating branches of evergreen and deciduous broadleaved trees, 11–IX–1990, R. ITOH leg. Paratypes: 2 females, same data as for the holotype. The specimens used in the present study, including the holotype and allotype, are to be deposited in the collection of the Shanghai Institute of Entomology, Academia Sinica, while one paratype will be retained in the Biological Laboratory, Showa University.

Remarks. This new species is close to *Sphyroteca multifasciata* and *S. stachii* in the form of body setae and the ventral chaetotaxy of dens. It is, however, very clearly discriminated from the latter two by the peculiar vertical setae on the head, which look like scales.

Etymology. The specific name is dedicated to Prof. Yasuaki WATANABE, Tokyo University of Agriculture, for his great contribution to the Sino-Japanese cooperative study and the taxonomy of the Staphylinidae, Insecta.

Acknowledgments

The authors wish to express their gratitude to the late Prof. Emeritus Gentaro IMADATÉ, Tokyo Medical and Dental University, who was the chief coordinator of the Sino-Japanese cooperative study on the soil fauna of subtropical forests in China. We also express our hearty thanks to Prof. Emeritus Hiroshi TAMURA, Ibaraki University, for his helpful advice and reading the manuscript.

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Watanabeopetalia gen. nov., a New Genus of the Dragonflies (Odonata, Cordulegastridae, Chlorogomphinae)

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Abstract A group of cordulegastrid dragonflies, subfamily Chloropetalinae Carle, 1995, is redescribed, redefined, and downgraded to the rank of a tribe. A new genus *Watanabeopetalia* is established for *Orogomphus atkinsoni* and two other species mainly based on the peculiar structures of the male genitalia and the female valvula vulvae.

The classificatory arrangement of the beautiful dragonflies of *Chlorogomphus* auct. has long been misunderstood in its relationship with the Cordulegastrinae. Recently, Carle (1995) published his opinion about higher classification, raised this group to an independent family, Chlorogomphidae, and recognized two subfamilies in it, Chlorogomphinae and Chloropetalinae, the latter of which was newly established.

According to the result of my own study on *Chlorogomphus* auct., this group doubtless exhibits several autapomorphies (*e.g.*, female with valvula valvae and without ovipositor, etc.). However, the features of the male genitalia, morphological characters of larvae, and the analysis of mitochondrial DNA indicate that the group should not form a good family. It had better be regarded as a subfamily of the family Cordulegastridae, and, Carle's new subfamily, Chloropetalinae, should be downgraded to a tribe. Furthermore, I have noticed that Carle's "Chloropetalinae" includes two quite different groups. I am therefore going to redefine and redescribe this group of dragonflies in the present paper.

Before going further, I wish to express my deep gratitude to Prof. Dr. Yasuaki Watanabe of the Laboratory of Entomology, Tokyo University of Agriculture, for his constant advice in the course of my present study, and to Drs. Shun-Ichi Uéno of the National Science Museum, Tokyo, and Masatoshi Takakuwa of the Kanagawa Prefectural Musum of Natural History, Odawara, for their kindness in reading the original manuscript. My cordial thanks are also due to Drs. D. A. L. Davies, Cambridge, David Goodger of the Natural History Museum, London, and Masaaki Tomokuni of the National Science Museum, Tokyo, for their kindness in offering valuable materials or supplying literature, and to Mr. Itsuro Kawashima of Yokosuka for preparing splendid illustrations inserted in this paper.

Depositories of the specimens used in this study are as follows:

KPMNH: Kanagawa Prefectural Museum of Natural History.

BMNH: The Natural History Museum, London.
NSMT: The National Science Museum, Tokyo.

Subfamily Chlorogomphinae

Tribe **Chloropetalini** stat. nov.

Chloropetalinae CARLE, 1995, Odonatologica, Rotterdam, **24**: 389 (type genus: *Chloropetalia* CARLE).

This tribe is mainly characterized as follows: 1) head broad, antefrons distinctly much developed, 2) thorax with broad yellow band on mesepimeron, 3) triangles of both wings similar in shape to each other, 4) male superior appendage flat in apical half and with lateral carinae.

(* CARLE included *Chlorogomphus dyak* LAIDLAW in this tribe, but it was evidently misplaced and therefore not dealt with in this paper).

CARLE (1995) did not notice that this tribe (=his subfamily) includes two distinct groups; one is *Chloropetalia* and the other is *Watanabeopetalia* gen. nov. These genera are characterized as shown below.

Key to the Genera of Chloropetalini

1. Male: apical segment of penis asymmetrical, with dorsal part spiral, without long projections at posterior corner. Female: vertex with a pair of lateral tubercles; valvula vulvae divergent, without median keel, with apex U-shaped. . . . .
. . . . *Chloropetalia*

— Male: apical segment of penis symmetrical, with a pair of long projections at posterior corners. Female: vertex without tubercles; valvula vulvae pentagonally projected posteriad, with a median longitudinal keel, with apex W-shaped. . . . .
. . . . *Watanabeopetalia* gen. nov.

Genus *Chloropetalia* CARLE

Chloropetalia CARLE, 1995, Odonatologica, **24**: 389 (type species: *Chlorogomphus selysi*).

Included species: *C. selysi*, *kimminsi*, *owadai*.

Medium-sized. Head broad; labium whitish yellow, elongate elliptical; labrum black, elongate elliptical with slight excavation at the middle of lower edge, usually with a V-shaped yellow patch at the middle; anteclypeus small; postclypeus developed, particularly on each lateral side; antefrons well developed, roundly protruded anteriad, flat at lateral sides, with dorsal part projected dorsad, and longitudinally notched at the middle, almost as wide as postclypeus, about 4 times as high as median part of postclypeus; vertex small, hemispherical, with a pair of lateral tubercles in female; eyes barely separated; occiput rising as a triangular pyramid.

Pterothorax with ante-humeral stripes; mesokatepisternum with oblong yellow patches; metakatepisternum with yellow patches; mesepimeron and metepimeron with yellow band. Legs black.

Wings short, narrow and hyaline, each with a small golden yellow patch at base; all triangles almost equilaterally triangular and similar in shape to each other; median space with 1 cross vein, rarely 2; anal-loop rather small, 7–14-celled in male, 13–18-celled in female.

Abdomen slender, slightly attenuate at 2nd to 4th segments in male, rather expanded in apical three segments in female; 8–9th (sometimes also 10th) with narrow apical yellow rings in male.

Male superior appendage rather flattened in about apical half, with ventral spines at basal 1/3. Inferior appendage bilobed, with a small mid-dorsal projection in lateral view, with two spines at dorsal apex.

Female cerci long, about 0.8 times as long as 10th abdominal segment. Valvula vulvae less developed, with a pair of small lobes projected outwards, without median keel. Ventral lobe of 10th segment slightly shorter than paraproct, with a deep median longitudinal groove running from base to apex.

Penis:— Vesicle roundly protruded ventrad, with a longitudinal V-shaped groove in medio-ventral area; apical segment of penis very peculiar in shape, particularly in dorsal part, with ventral plate short, with a pair of pincer-shaped projections at the apex, with dorsal part very slender, with right and left lobes fused at their bases, twisted clockwise, with an aperture near apex of right side, with pincer-shaped apex having inner serration.

Diagnosis. This genus is characterized mainly in the asymmetrical male apical segment of penis, though it is symmetrical in other members of the suborder Anisoptera. On the other hand, this genus doubtless belongs to the subfamily Chlorogomphinae judging from other external characters.

Chloropetalia selysi (Fraser, 1929)

(Figs. 1–14)

Chlorogomphus selysi Fraser, 1929, Mem. Ind. Mus., **9**: 158; 1936, Fn. Brit. India, Odon., **3**: 22. —— Kimmins, 1966, Bull. Brit. Mus. nat. Hist., (Ent.), **18**: 213.
Chloropetalia selysi: Carle, 1995, Odonatologica, **24**: 389.

Male. Abdomen (incl. appendages) 53.9–57.8 mm in length; hindwing 37.4–40.7 mm in length, with maximum width 12.5–12.9 mm.

Head:— Labium yellow; mandibles reddish yellow; labrum black with small V-shaped yellow mark in middle; anteclypeus brown with black sides; postclypeus yellow with lower edge black; antefrons black with yellow sides, and also with ventral 1/3 and anterior ridge broadly yellow; distance between eyes 0.3 mm; vertex hemispherical, rather enlarged; occiput black, rising as a triangular pyramid, with long hairs at posterior margin.

Thorax:— Prothorax black, with ventral lobe and anterior and posterior margins yellow, with a pair of vestigial spots near lateral borders. Pterothorax black, with yellow markings: ante-humeral stripe narrow, gently broadened to apex; mesinfraepisternum with a rectangular yellow patch at ventral part; mesepimeron with a broad yellow band; metepisternum with two yellow patches at the middle and near upper margin, the latter of which is larger than the former and triangular (some specimens also with a small patch in ventral area); metinfraepisternum with a spot at the post-ventral area; metepimeron largely yellow. Outer side of each coxa, protrochanter and basal 1/4 of profemur yellow.

Wings hyaline, short, with a small golden yellow spot at each base; each median space with 1 cross vein; triangles 1–3-celled, that of the forewing (basal: costal: distal) = 1 : 1.35 : 1.28, that of hindwing (basal : costal : distal) = 1 : 1.14 : 1.17; anal loop 7–11-celled; antenodals of forewing 10–12, postnodals of forewing 19–21, antenodals of hindwing 11–15; postnodals of hindwing 14–19; pterostigma 2.4–2.7 mm in length in forewing, 2.6–3.1 mm in hindwing.

Abdomen:— Black with yellow markings; 1st segment with yellow spots along ventral edge and post-ventral edge; 2nd with a band running from ventral area to posterior area which is jointed with a spot on the auricle, and with a pair of rectangular marks in mid-dorsal area; 3rd with a triangular patch in apico-ventral area; a pair of mid-dorsal rectangular marks on 3rd (same marks sometimes present on 4th); 3rd to 7th with a pair of semicircular dorsal markings near each apical border; 8–10th largely black though a small yellow ring is present on 8th apical border; 7–8th sternites narrowly marginated yellow.

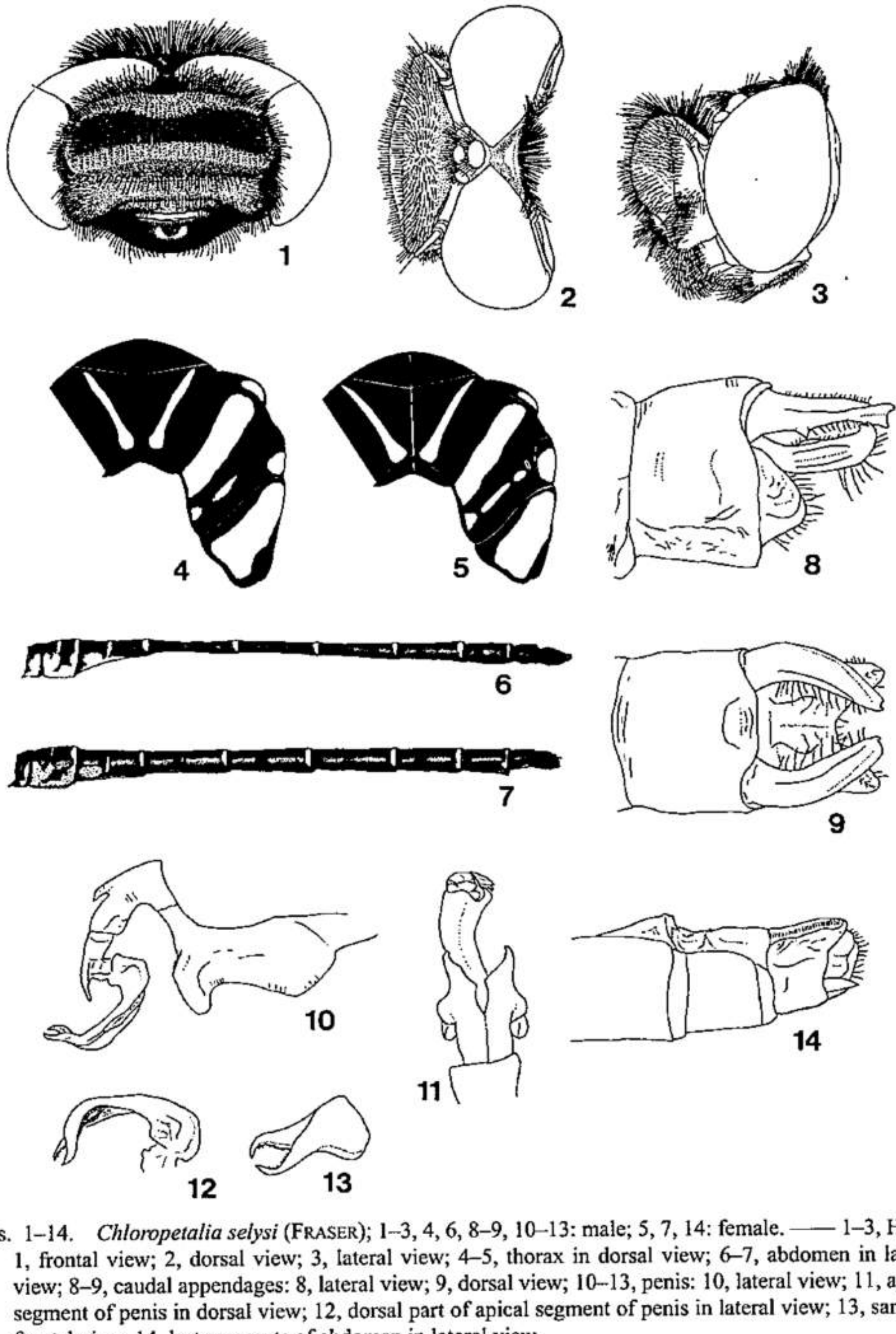
Caudal appendage black. Superior appendage in lateral view gently attenuate to apex, with a ventral spine at basal 1/3, with a small triangular emargination at apex; that in dorsal view curved inwards, with each apex triangularly projected at inner angle. Inferior appendage in dorsal view parallel-sided, broadly, semicircularly emarginate at apex; that in lateral view thin at base, abruptly expanded and parallel-sided at middle, with a small projection at the mid-dorsal part, with two spines at dorsal apex.

Accessory genitalia:— Anterior lamina obliquely projected inwards, broad at base, attenuately curved at middle, with apex narrow and strongly hooked posteriad. Hamulus posterioris slender, curved anteriad in apical 1/2, bristled at apex.

Penis:— Vesicle narrowly roundly protruded ventrad, with a longitudinal U-shaped groove at medio-ventral part; ventral plate of apical segment deep brown, short (0.64 times as long as dorsal part), deeply divaricate, rather expanded outwards at the middle, with apex slender pincer-shaped; dorsal part of apical segment narrowly beaky in lateral view, with rather large earlobed projections at posterior corners, with a deep median longitudinal groove twisted at the apical half, with an aperture at apical 1/4 of right side, with apex bent downwards and pincer-shaped with developed inner serration.

Female. Abdomen (incl. appendages) 54.6–55.1 mm in length. Hind wing 41.2–41.8 mm in length, 14.8–14.9 mm in maximum width.

Maculate pattern similar to that of male.



Figs. 1–14. *Chloropetalia selysi* (FRASER); 1–3, 4, 6, 8–9, 10–13: male; 5, 7, 14: female. —— 1–3, Head: 1, frontal view; 2, dorsal view; 3, lateral view; 4–5, thorax in dorsal view; 6–7, abdomen in lateral view; 8–9, caudal appendages: 8, lateral view; 9, dorsal view; 10–13, penis: 10, lateral view; 11, apical segment of penis in dorsal view; 12, dorsal part of apical segment of penis in lateral view; 13, same in frontal view; 14, last segments of abdomen in lateral view.

Head:— Broader than in male; antefrons flat; eyes more widely separated (distance: 0.5 mm); vertex with a pair of small tubercles externally; triangular projection on occiput small.

Wings largely hyaline, each with a basal golden yellow maculation which is sometimes spread along costal area; median space with 1 cross vein; triangles 2–3-celled, that of forewing (basal : costal : distal) = 1 : 1.34 : 1.2, that of hindwing (basal : costal : distal) = 1 : 0.95 : 1.1; anal loop 13-celled; antenodals of forewing 10–12, postnodals of forewing 20–23, antenodals of hindwing 11–14; postnodals of hindwing 15–18; pterostigma 2.8 mm in length in forewing, 3.1 mm in hindwing.

Abdomen:— Yellow maculation slightly developed.

Cerci long, about 0.8 times as long as 10th abdominal segment (two specimens examined are depressed at abdominal ends, so that it is difficult to restore the living state). Valvula vulvae with a pair of broad triangular lobes. Ventral lobe of 10th segment slightly shorter than paraproct, with a deep median longitudinal groove running from base to apex.

Distribution. N. India.

Materials examined. 3♂, 2♀, Santali Rd., Mangpu, Darjeeling, N. India, 24–V–1926, leg. C. M. I (BMNH); 1♂, Darjeeling, N. India, native collector (KPMNH).

Type depository. BMNH.

Chloropetalia kimminsi (FRASER, 1940), comb. nov.

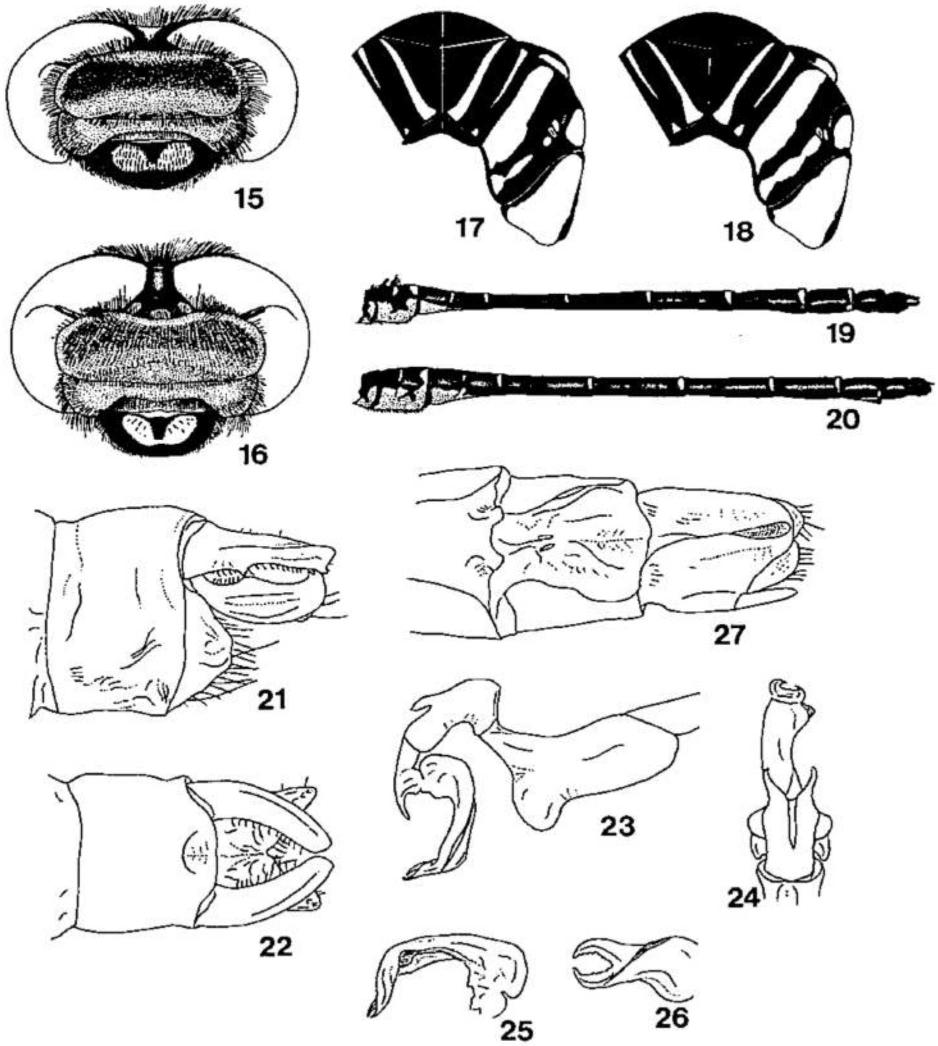
(Figs. 15–27)

Chlorogomphus kimminsi FRASER, 1940, Proc. r. ent. Soc. Lond., (B), **9**: 55. —— KIMMINS, 1966, Bull. Brit. Mus. nat. Hist., (Ent.), **18**: 199.

Male. Abdomen (incl. appendages) 56.7 mm in length; hindwing 40.6 mm in length, with maximum width 12.4 mm.

Head:— The single specimen examined is partly crushed. Labium whitish yellow; mandibles brown; labrum black with a broad V-shaped yellow mark on middle part; anteclypeus greenish yellow with each blackish sides; postclypeus greenish yellow without black markings; antefrons greenish yellow, with dorsal half of frontal part and basal 2/3 of dorsal part black; distance between eyes 0.2 mm; vertex crushed; occiput yellow, rising as a triangular pyramid, with long hairs at posterior margin.

Thorax:— Prothorax black, with ventral lobe and anterior and posterior margins yellow, with a pair of small spots at the middle, and with a pair of elliptical spots near lateral margins. Pterothorax black, with yellow markings: ante-humeral stripe narrow and straight, gently broadened to apex; humeral stripe at ventral 3/4 slender and curved anteriad, with a small spot near upper margin; mesinfraepisternum with a yellow rectangular patch at ventral part; mesepimeron with a broad yellow band; metepisternum with a yellow patch at ventral part, middle and near upper margin, respectively; metinfraepisternum with a large triangular spot at post-ventral part; metepimeron largely yellow; metapoststernum black, tinted pale yellow on right side. Legs black; outer side



Figs. 15–26. *Chloropetalia kimminsi* (FRASER); 15, 17, 19, 21–26: male; 16, 18, 20, 27: female. —— 15–16, Head in frontal view; 17–18, thorax in dorsal view; 19–20, abdomen in lateral view; 21–22, caudal appendages: 21, lateral view; 22, dorsal view; 23–26, penis: 23, lateral view; 24, apical segment of penis in dorsal view; 25, dorsal part of apical segment of penis in lateral view; 26, same in frontal view; 27, last segments of abdomen in ventral view.

of each coxa, protrochanter and basal 1/4 of profemur yellow.

Wings hyaline, short, with a small pale orange spot at each base; each median space with 1 cross vein; triangles 3-celled, that of the forewing (basal : costal : distal) = 1 : 1.33 : 1.33, that of hindwing (basal : costal : distal) = 1 : 1.15 : 1.26; anal loop 8–9-

celled; antenodals of forewing 12, postnodals of forewing 22–23, antenodals of hindwing 15–16; postnodals of hindwing 17–18; pterostigma 2.5 mm in length in forewing, 2.8 mm in hindwing.

Abdomen:— Black with yellow markings; 1st segment with yellow patches at ventral and post-ventral parts; 2nd marginated by ventral broad 凹-shaped band, and with a pair of spots in the mid-dorsal and post dorsal areas, respectively; 3rd with apico-ventral triangular patch, and with a pair of elliptical spots in mid-dorsal area; 3rd to 8th each with a pair of dorsal semicircular markings near apico-dorsal borders though the pair touch each other; 9–10th black; 7–8th sternites narrowly marginated yellow.

Caudal appendage black. Superior appendage in lateral view gently attenuate to apex, with ventral spines at basal 1/3, with apex shallowly roundly emarginate; that in dorsal view curved inwards, truncated at the apex, apex touching each other. Inferior appendage in dorsal view parallel-sided, triangularly emarginate at apex; that in lateral view thin at base, abruptly expanded and parallel-sided at the middle, with a small projection at mid-dorsal part, with two spines at dorsal apex, with a lateral broad longitudinal groove.

Accessory genitalia:— Anterior lamina obliquely projected inwards, broad at the base, rapidly attenuate at apical 1/3, with apex hooked posteriad; hamulus posterioris beaky, gently curved anteriad, bristled at apex.

Penis:— Vesicle roundly protruded ventrad, with a longitudinal U-shaped groove at medio-ventral part; ventral plate of apical segment deep brown and short (0.55 times as long as dorsal part), deeply divaricate, rather expanded outwards at basal 3/5, with apex shaped as pincers broadened in basal 1/2; dorsal part of apical segment narrowly beaky in lateral view, with earlobed projections at posterior corners, with a deep median longitudinal groove twisted in apical half, with aperture at apical 1/4 of right side, with an apex rather broad, bent downwards and pincer-shaped with fine inner serration.

Female. Abdomen (incl. appendages) 57.7 mm in length. Hind wing 44.7 mm in length, 14.7 mm in maximum width.

Maculate pattern similar to that of male.

Head:— Broader than in male; antefrons flat; eyes more widely separated (distance: 0.7 mm); vertex with a pair of apico-lateral projections externally; triangular projection on occiput small.

Wings largely hyaline, each with a pale golden yellow basal maculation; median space with 1–2 cross veins; triangles 2–3-celled, that of forewing (basal : costal : distal) = 1 : 1.5 : 1.34, that of hindwing (basal : costal : distal) = 1 : 1.03 : 1.08; anal loop 13–14-celled; antenodals of forewing 13, postnodals of forewing 21–22, antenodals of hindwing 16–17; postnodals of hindwing 17; pterostigma 2.7 mm in length in forewing, 3.1 mm in the hind.

Abdomen:— Yellow band much developed, particularly in 2nd segment. Cerci long, slender and about 3/4 times as long as 10th abdominal segment. Valvula vulvae with a pair of broad triangular lobes. Ventral lobe of 10th segment as long as paraproct, with a deep median longitudinal groove running from base to apex.

Distribution. Nias Island, off western Sumatra, Indonesia.

Materials examined. 1♂, 1♀, Nias. Is., off western Sumatra, Indonesia (BMNH).

Type depository. BMNH.

Notes. Only the type specimens are known. CARLE (1995) failed in taking this species in his revision, but it doubtless belongs to this genus. Judging from the absence of *Chloropetalia* from the mainland of Sumatra, the occurrence of the present species on Nias Island is very interesting and may be regarded as a relict.

Chloropetalia owadai (ASAHINA, 1995), comb. nov.

(Figs. 28–39)

Chlorogomphus owadai ASAHINA, 1995, Bull. natn. Sci. Mus., Tokyo, (A), **21**: 222.

Male. Abdomen (incl. appendages) 61.8–65.8 mm in length; hindwing 41.4–42.1 mm in length, with maximum width 12.5–13.6 mm.

Head:— Labium yellow; mandibles reddish yellow; labrum black with a small V-shaped yellow mark on the middle part (sometimes vestigial or evanescent); anteclypeus brown with black sides; postclypeus yellow with lower edge, ventral part black, with a pair of circular black spots at median part; antefrons black with lower edge and anterior ridge yellow; distance between eyes 0.2 mm; vertex hemisphere, rather enlarged; occiput black, rising as a triangular pyramid, with long hairs at posterior margin.

Thorax:— Prothorax black, with ventral lobe and anterior and posterior margins yellow. Pterothorax black, with yellow markings; ante-humeral stripe narrow, broadened to apex; mesinfraepisternum with a rectangular yellow patch at ventral part; mesepimeron with a broad yellow band; metepisternum with two yellow patches at the middle and near upper margin; metinfraepisternum with a triangular spot at the post-ventral part; metepimeron largely yellow. Legs black; outer side of each coxa yellow.

Wings hyaline, short, with an orange spot at each base; median space with 1 cross vein; triangles 3-celled (rarely 2), that of the forewing (basal : costal : distal) = 1 : 1.36 : 1.3, that of hindwing (basal : costal : distal) = 1 : 1.2 : 1.3; anal loop 11–14-celled; antenodals of forewing 12–14, postnodals of forewing 22–25, antenodals of hindwing 14–18; postnodals of hindwing 19–25; pterostigma 2.8–3.3 mm in length in forewing, 3.1–3.6 mm in hindwing.

Abdomen:— Black with yellow markings; 1st segment with small yellow spots along ventral and post-ventral edges; 2nd with a band running from antero-ventral area (including auricles) to posterior margin through ventral margin, and with a spot in mid-dorsal area; 3rd with a triangular patch in apico-ventral area; 3rd to 7th each with a pair of dorsal rectangular markings near apical border; 8–10th entirely black, but sometimes with a small yellow marking on 8th; 7–8th sternites narrowly marginated by yellow band.

Caudal appendage black. Superior appendage in lateral view gently attenuate to apex, with ventral spines at basal 1/3, with apex triangularly emarginate; that in dorsal view gently curved inwards, truncated at the apex. Inferior appendage in dorsal view parallel-sided, broadly, triangularly emarginate at apex; that in lateral view thin at the base, abruptly expanded and parallel-sided at the middle, with a small projection at the mid-dorsal part, with two spines at dorsal apex.

Accessory genitalia:— Anterior lamina obliquely projected inwards, broad at base, rapidly attenuate at the middle, with apex narrow and hooked posteriad; hamulus posterioris slender, curved anteriad in apical half, bristled at apex.

Penis:— Vesicle roundly protruded ventrad, with a deep longitudinal U-shaped groove at medio-ventral part; ventral plate of apical segment deep brown, short (0.62 times as long as dorsal part), obliquely bent upwards at the apical 1/3, deeply divaricate, rather expanded outwards towards the middle, with apex pincer-shaped, semi-transparent inside. Dorsal part of apical segment narrowly beaky in lateral view, with earlobed projection at posterior corner, deep median longitudinal groove twisted in apical half, with an aperture at apical 1/4 of right side, with apex obliquely bent and pincer-shaped with very fine inner serration.

Female. Abdomen (incl. appendages) 59.5–65.1 mm in length. Hindwing 45.0–46.9 mm in length, 14.5–15.7 mm in maximum width.

Maculate pattern similar to that of male.

Head:— Broader than in male; antefrons flat; eyes more widely separated (distance: 0.6 mm); vertex with a pair of apico-lateral projections externally; projection on occiput small.

Wings largely hyaline, each with an orange basal maculation; median space with 1 cross vein; triangles 3–5-celled, that of forewing (basal : costal : distal) = 1 : 1.43 : 1.3, that of hindwing (basal : costal : distal) = 1 : 1.03 : 1.15; anal loop 13–18-celled; antenodals of forewing 13–15, postnodals of forewing 21–27, antenodals of hindwing 13–19; postnodals of hindwing 18–23; pterostigma 3.0–3.5 mm in length in forewing, 3.5–3.8 mm in hindwing.

Abdomen:— Yellow band of 2nd segment developed, nearly covering ventral half.

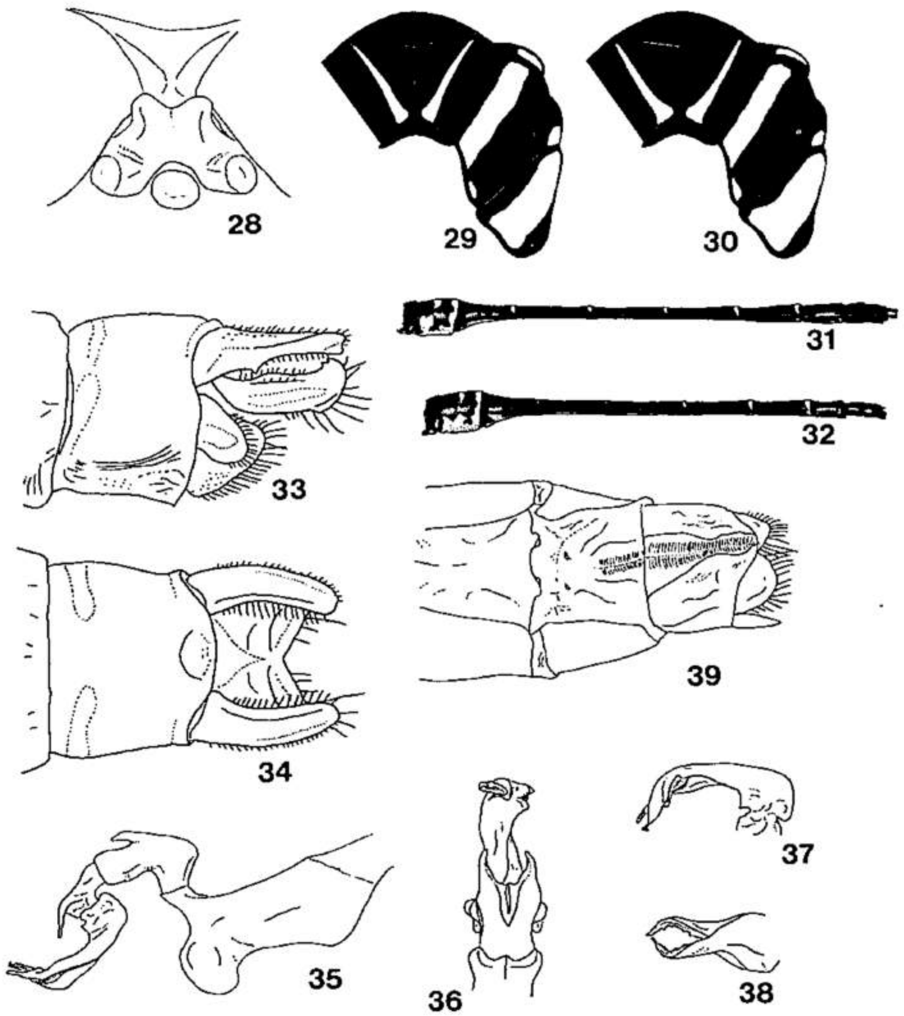
Cerci long, about 4/5 times as long as 10th abdominal segment. Valvula vulvae not developed, with a pair of triangular lobes outwardly. Ventral lobe of 10th segment slightly shorter than paraproct, with a deep median longitudinal groove running from base to apex.

Distribution. N. Vietnam.

Materials examined. Mt. Pia Oac, Cao Bang Prov., N. Vietnam: 1♂, 1♀, 23–V–1998, K. MATSUMOTO & H. KARUBE leg.; 1♂, 28–V–1998, H. KARUBE leg.; 1♂, 2♀, 21–V–1999, H. KARUBE leg.; 1♀, 22–V–1999, H. KARUBE leg. (KPMNH).

Type depository. NSMT.

Notes. ASAHINA (1995) described this species without any comment on its affinity, but it undoubtedly belongs to *Chloropetalia* in having the characteristic male genitalia, and so on.



Figs. 28–39. *Chloropetalia owadai* (Asahina); 28–29, 31, 33–38: male; 30, 32, 39: female. —— 28, Vertex in dorsal view; 29–30, thorax in dorsal view; 31–32, abdomen in lateral view; 33–34, caudal appendages: 33, lateral view; 34, dorsal view; 35–38, penis: 35, lateral view; 36, apical segment of penis in dorsal view; 37, dorsal part of apical segment of penis in lateral view; 38, same in frontal view; 39, last segments of abdomen in ventral view.

According to my observation on Mt. Pia Oac, this species was rarely found in the midway to the summit and usually flew along the road in the late afternoon.

Watanabeopetalia gen. nov.

Type species: *Orogomphus atkinsoni* SELYS, 1878.

Included species: *W. atkinsoni*, *uenoi*, *usignata*.

Medium-sized. Head broad and flat. Labium whitish yellow, elongate elliptical. Labrum brown to pale brown, elliptical with a slight excavation at the middle of lower edge; anteclypeus small; postclypeus developed, particularly at lateral sides which are projected ventrad; antefrons distinctly developed, almost as wide as postclypeus, about 3.5 times as high as median part of postclypeus, hardly protruded anteriad, with lateral sides rather concave, with dorsal part projected dorsally, with a vestigial longitudinal median notch; vertex small, hemispherical in both sexes; eyes barely separated; occiput of male rising as a triangular pyramid.

Pterothorax:— Ante-humeral stripes with dorsal end expanded; mesokatepisternum and metakatepisternum without yellow patches; mesepimeron and metepimeron with yellow band. Legs black.

Wings narrow, hyaline, with a very small golden yellow patch at each base; triangles equilateral triangular and similar in shape to each other; each median space with 1 cross vein, rarely 2; anal-loop 7–12-celled in male, 12–21-celled in female.

Abdomen slender, slightly attenuate at 2nd to 4th segments in male (tapered in *W. atkinsoni*, and broadened towards apical segment in *W. uenoi*).

Male superior appendage flattened though with developed lateral keel, with ventral spines at basal 1/3. Inferior appendage bilobed, without mid-dorsal projection, with two apical spines at dorsal apex, with apex truncated in lateral view. Valvula vulvae developed, pentagonally projected, with a median keel; lobes of 10th ventral plate longer than 10th paraproct.

Penis:— Similar to that of Chlorogomphini in general. Vesicle squarely protruded ventrad, with a longitudinal V-shaped shallow groove in medio-ventral area; dorsal part of apical segment slender triangular in ventral view, expanded at the base, very slender in apical half, with a pair of distinct dorsal carinae in apical half, with a pair of projections at posterior corners, which are about 2/3 times as long as dorsal part; ventral plate developed, with each lobe very slender and curved upwards near apex.

Diagnosis. The structure of the male genitalia of this genus clearly shows a close relationship to the members of the tribe Chlorogomphini, but it is distinguishable from them by two points: 1) absence of lateral keel, 2) presence of deeply divided and very slender lobes of ventral plate. On the other hand, the female valvula vulvae of this new genus is strongly protruded posteriad, while that of Chlorogomphini is provided with a broad semicircular lobe with median notch. From the result of the preliminary analysis of mitochondrial DNA of the Chlorogomphinae, the genera of the tribe Chloropetalini show a close relationship to one another and form a sister group.

Watanabeopetalia atkinsoni (SELYS, 1878), comb. nov.

(Figs. 40–52)

Orogomphus atkinsoni SELYS, 1878, Bull. Acad. r. Belg., (2), **46**: 682; 1891, Annli. Mus. civ. Stor. nat. Genova, (2), **10**: 482. —— KIRBY, 1890, Cat. Odon., 79. —— WILLIAMSON, 1907, Proc. U. S. natn. Mus., **32**: 278, 279. —— LAIDLAW, 1914, Proc. zool. Soc. Lond., **1914**: 61; 1915, Rec. Ind. Mus., **11**: 197.
Chlorogomphus atkinsoni: FRASER, 1929, Mem. Ind. Mus., **9**: 73, 160–162; 1936, Fn. Brit. India, Odon., **3**: 26. —— ASAHINA, 1961, *Kontyû, Tokyo*, **29**: 240; 1986, Chô-Chô, Fukuoka, **9** (1): 11. —— KUMAR & PRASAD, 1981, Rec. zool. Surv. India misc. Publs. occ. Pap., (20): 25, 54. —— LAHIRI, 1987, Rec. zool. Surv. India misc. Publs. occ. Pap., (99): 163.
Chlorogomphus olympicus FRASER, 1933, *Mem. Ind. Mus.*, **9**: 257. *Syn. nov.*

Male. Abdomen (incl. appendages) 56.1–58.9 mm in length; hindwing 39.0–40.8 mm in length, with maximum width 11.7–12.8 mm.

Head:— Labium whitish yellow; mandibles reddish yellow; labrum brown; anteclypeus greenish with black sides; postclypeus brown with median part greenish; antefrons flat, slightly projected in the middle area, greenish yellow with a transverse black band (variable, sometimes interrupted or vestigial) at the median part, and with basal 3/4 of dorsal part black; distance between eyes 0.2 mm; vertex hemispherical; occiput black, rising as a triangular pyramid, with long hairs.

Thorax:— Prothorax black, with anterior margin yellow. Pterothorax black, with yellow markings: ante-humeral stripe tapered ventrad, expanded at dorsal apex; mesepimeron with a broad yellow band; metepisternum with a yellow patch near upper margin; metepimeron largely yellow. Legs black.

Wings hyaline (tinted brown all over in matured specimens), short, each with a very small golden yellow spot at base; each median space with 1 cross vein though rarely 2; triangles 2-celled, rarely 1, that of the forewing (basal : costal : distal) = 1 : 1.38 : 1.28, that of hindwing (basal : costal : distal) = 1 : 1.27 : 1.36; anal loop 7–10-celled; antenodals of forewing 9–12, postnodals of forewing 15–23, antenodals of hindwing 11–14; postnodals of hindwing 14–20; pterostigma 2.1–2.8 mm in length in forewing, 2.6–3.4 mm in hindwing.

Abdomen:— Slender, though constricted at 2nd and 3rd segments, 5–6th broadened, then constricted again at 8–10th. Black with yellow markings; 1st with vestigial band in post-ventral and ventro-posterior areas, and with a spot in mid-dorsal area; 2nd with a band in ventral area, with a spot at auricles, with a pair of dorsal patches at the middle and posterior borders, the latter of which extends ventrad; 3rd with two pairs of dorsal patches at the middle and posterior border (sometimes 4th with a pair of yellow dorsal patches at the middle); 4th to 8th each with a pair of dorsal semicircular markings near apical border; 8–10th black, but sometimes each with a narrow yellow ring.

Caudal appendage black. Superior appendage in lateral view flat in apical half, with ventral spines at about basal half, with apex slightly and triangularly emarginate; that in dorsal view parallel in basal half, gently curved inwards near apex, truncated at the apex. Inferior appendage in dorsal view parallel-sided, triangularly emarginate at apex; that in lateral view thin at the base, gently broadened and parallel-sided at the middle, with apex truncated, with two teeth at dorsal apex.

Accessory genitalia:— Anterior lamina obliquely projected inwards, small and slender, with apex narrow and slightly hooked; hamulus posterioris slender, curved and hooked inwards.

Penis:— Vesicle black, squarely protruded ventrad, with a shallow longitudinal V-shaped groove at medio-ventral part; dorsal part of apical segment deep brown in apical half, whitish at base; that in ventral view slender triangular, spherically expanded at the base, very slender in apical half and with a pair of distinct dorsal carinae in apical half and with a pair of long projections at posterior corners which are about 2/3 times as long as dorsal part; ventral plate deep brown, developed, slightly shorter than apex of dorsal part, with lobes very slender and parallel-sided, curved upwards near apex.

Female. Abdomen (incl. appendages) 58.7–59.5 mm in length. Hindwing 43.7–43.8 mm in length, 14.8–14.9 mm in maximum width.

Maculate pattern similar to that of male.

Head:— Rather broader than in male; antefrons without black area, flatter; eyes more widely separated (distance: 0.4 mm); projection on occiput yellow and covered with whitish hairs.

Wings largely hyaline, each with a very small golden yellow basal maculation; each median space with 1 cross vein; triangles 2–3-celled, that of forewing (basal : costal : distal) = 1 : 1.36 : 1.21, that of hindwing (basal : costal : distal) = 1 : 1.01 : 1.11; anal loop 12–16-celled; antenodals of forewing 10–12, postnodals of forewing 20–21, antenodals of hindwing 13–16; postnodals of hindwing 16–18; pterostigma 2.7 mm in length in forewing, 3.0 mm in hindwing.

Abdomen:— Slender, constricted at 2nd–3rd segments, broadened at 5–6th, then constricted again at 8–10th. A pair of medio-dorsal yellow patches of 3rd segment developed; 4th with a medio-dorsal yellow patch; a pair of dorsal semicircular markings near apical border enlarged.

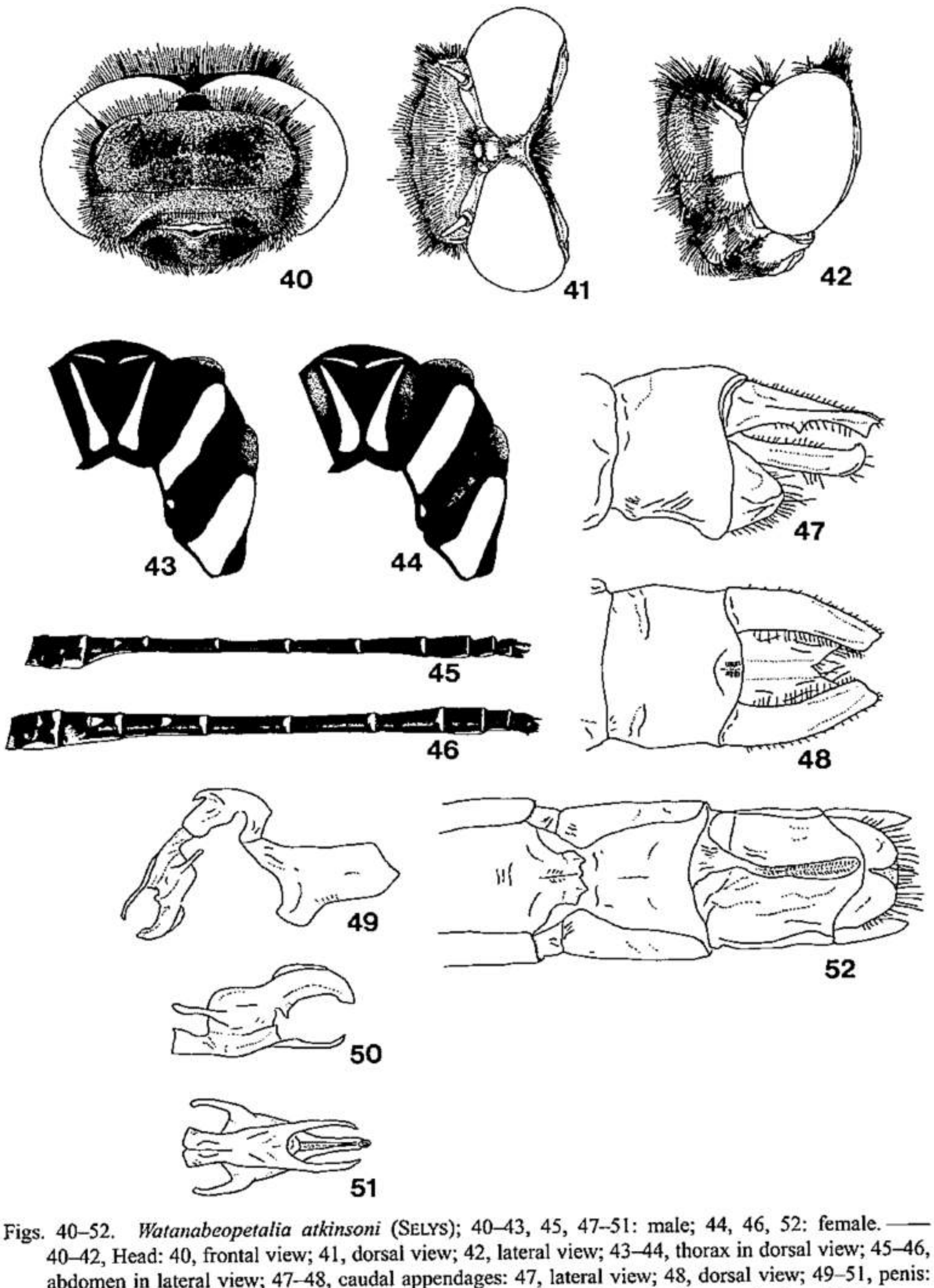
Cerci long, about 4/5 times as long as 10th abdominal segment. Valvula vulvae developed, pentagonally projected with W-shaped apex, with a median keel; lobes of 10th ventral plate longer than 10th paraproct.

Distribution. N. India and Nepal.

Materials examined. 1♂, Khasi Hills, Assam, N. India, native collector; 1♂, Darjeeling, N. India, native collector; 1♀, Bhimtal, NW. Punjab, India (at light at 9 p.m.), 20–IV–1974, native collector; 12♂, 1♀, Thanaphedi, Kathmandu, Nepal, 12~14–V–1993, H. KARUBE leg. (all in KPMNH).

Type depository. Brussels Museum.

Notes. *Chlorogomphus olympicus* FRASER is a problematical species. I have had an opportunity to examine the type specimen deposited in The Natural History Museum, London. In my opinion, it is a junior synonym of *W. atkinsoni*, since no distinguishing characters from *W. atkinsoni* were detected. In his original description, FRASER pointed out that the "yellow marking of abdominal segments 9–10, and almost entire triangles, and bright grass green face" are characteristic of *C. olympicus*. How-



Figs. 40–52. *Watanabeopetalia atkinsoni* (Selys); 40–43, 45, 47–51: male; 44, 46, 52: female. —— 40–42, Head: 40, frontal view; 41, dorsal view; 42, lateral view; 43–44, thorax in dorsal view; 45–46, abdomen in lateral view; 47–48, caudal appendages: 47, lateral view; 48, dorsal view; 49–51, penis: 49, lateral view; 50, apical segment of penis in lateral view; 51, same in ventral view; 52, last segments of abdomen in ventral view.

ever, these character states seem to fall in the range of individual variation of *W. atkinsoni*. Besides, no differences are found in the male caudal appendages and genitalia between *W. atkinsoni* and *C. olympicus*.

Watanabeopetalia uenoi (ASAHINA, 1995), comb. nov.

(Figs. 53–62)

Chlorogomphus uenoi ASAHINA, 1995, Bull. natn. Sci. Mus., Tokyo, (A), **21**: 221.

Male. Abdomen (incl. appendages) 59.7–62.7 mm in length; hindwing 41.8–44.2 mm in length, with maximum width 12.3–13.3 mm.

Head:— Labium whitish yellow; mandibles reddish yellow; labrum black with a broad V-shaped brown mark at the middle; anteclypeus pale brown; postclypeus pale brown with median part greenish; antefrons flat, slightly projected in middle area, pale brown though greenish in the dorsal half of median part, and blackish above; distance between eyes 0.2 mm; vertex hemispherical; occiput black, rising as a triangular pyramid, with long hairs.

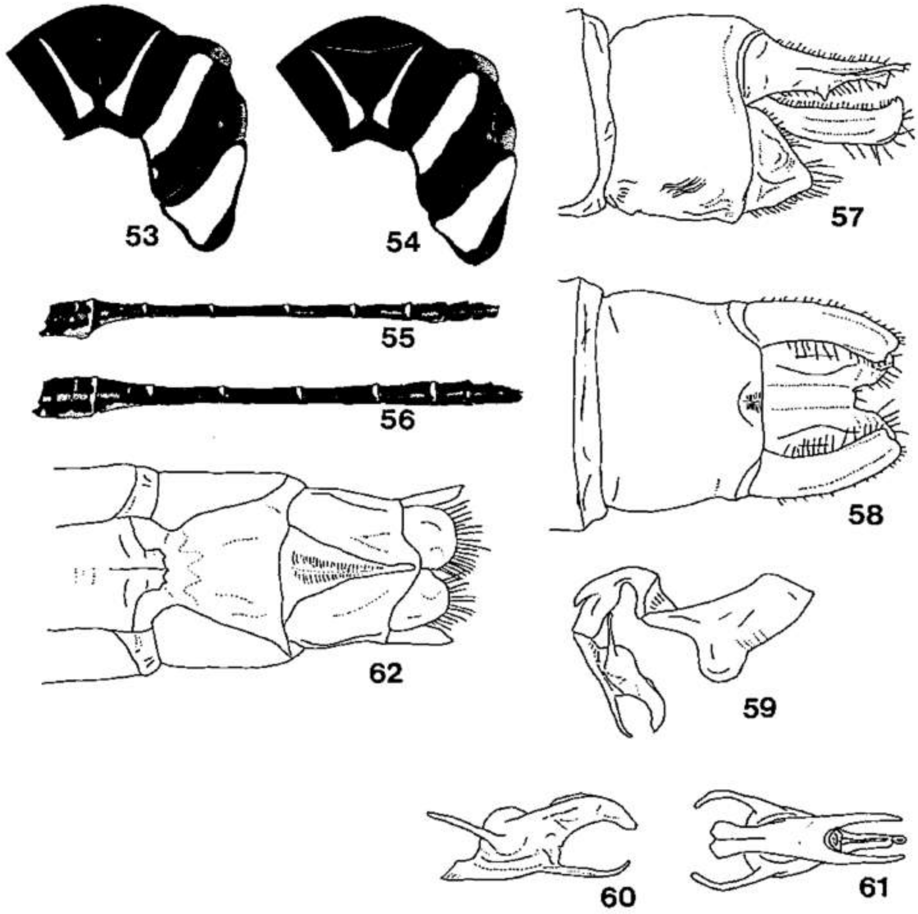
Thorax:— Prothorax black, with anterior margin yellow. Pterothorax black, with yellow markings; ante-humeral stripe tapered ventrad, enlarged at dorsal apex; mesepimeron with a broad band; metepisternum with a vestigial patch near upper margin; metepimeron largely yellow. Legs black.

Wings hyaline (tinted pale brown all over in matured specimens), short, with a very small orange spot at each base; each median space with 1 cross vein, rarely 2; triangles 2-celled (rarely 3 or 4), that of forewing (basal : costal : distal) = 1 : 1.44 : 1.34, that of hindwing (basal : costal : distal) = 1 : 1.27 : 1.37; anal loop 8–12-celled; antenodals of forewing 12–17, postnodals of forewing 19–28, antenodals of hindwing 15–20; postnodals of hindwing 17–23; pterostigma 2.6–2.7 mm in length in forewing, 2.8–2.9 mm in hindwing.

Abdomen:— Black with yellow markings; 1st segment with a vestigial spot in post-ventral area; 2nd marginated by band from ventral to posterior borders, with a spot at auricles, with a pair of dorsal patches at the middle; 3rd with a spot in antero-ventral area, a pair of dorsal patches at the middle and posterior borders, respectively; 4th to 7th each with a pair of dorsal rectangular markings near apical border; 8th with a small yellow spot in post-ventral area; 9–10th black.

Caudal appendage black; superior appendage in lateral view flat in apical half, with ventral spines at about basal half, with apex triangularly emarginate; that in dorsal view gently curved inwards, truncated at the apex and shallowly triangularly emarginate at the middle of apex. Inferior appendage in dorsal view slightly tapered towards apex, triangularly emarginate at apex, of which the median part is squarely emarginate; that in lateral view thin at the base, gently broadened towards apex which is rounded, with two teeth at dorsal apex.

Accessory genitalia:— Anterior lamina obliquely projected inwards, slender, with



Figs. 53–62. *Watanabeopetalia uenoi* (ASAHINA); 53, 55, 57–61: male; 54, 56, 62: female. —— 53–54, Thorax in dorsal view; 55–56, abdomen in lateral view; 57–58, caudal appendages: 57, lateral view; 58, dorsal view; 59–61, penis: 59, lateral view; 60, apical segment of penis in lateral view; 61, same in ventral view; 62, last segments of abdomen in ventral view.

apex rather expanded and slightly hooked; hamulus posterioris slender, curved and hooked inwards.

Penis— Vesicle black, squarely protruded ventrad, with a shallow longitudinal U-shaped groove at medio-ventral part; dorsal part of apical segment black in apical half, whitish at the base; that in ventral view slender triangular, spherically expanded at the base, very slender in apical half, with a pair of dorsal carinae in apical half, and with a pair of long projections at posterior corners which are about 3/4 times as long as dorsal part and curved inwards; ventral plate black, developed, slightly shorter than apex of dorsal part, with each lobe very slender, parallel-sided and curved upwards near apex.

Female. Abdomen (incl. appendages) 59.1–63.4 mm in length. Hindwing 47.3–49.4 mm in length, 14.9–15.6 mm in maximum width.

Maculate pattern similar to that of male.

Head:— Rather broad as compared with male; antefrons flatter, eyes more widely separated (distance: 0.4 mm).

Wings largely hyaline, with pale amber tint in matured specimens, each with a small golden yellow basal maculation; each median space with 1 cross vein (rarely 2); triangles 3–4-celled (rarely 2), that of forewing (basal : costal : distal) = 1 : 1.48 : 1.34, that of hindwing (basal : costal : distal) = 1 : 1.09 : 1.19; anal loop 17–21-celled; antenodals of forewing 13–19, postnodals of forewing 27–31, antenodals of hindwing 18–23; postnodals of hindwing 20–25; pterostigma 2.6–2.8 mm in length in forewing, 2.9–3.1 mm in hindwing.

Abdomen:— Broadened apicad; a pair of mid-dorsal yellow patches much developed; 2nd segment with a pair of J-shaped yellow lines at medio-lateral part; 4th with a mid-dorsal yellow patch.

Cerci long, about 0.8 times as long as 10th abdominal segment. Valvula vulvae developed, pentagonally projected with shallow W-shaped apex, with a distinct median keel; lobes of 10th ventral plate longer than 10th sternite.

Distribution. N. Vietnam.

Materials examined. 2♂, Sapa, Lao Cai Prov., N. Vietnam, 9–VI–1996, H. KARUBE leg.; 2♂, 2♀, Mt. Pia Oac, Cao Bang Prov., 23~27–V–1998, N. Vietnam, H. KARUBE leg.; 3♂, 2♀, same, 19~21–V–1999, N. Vietnam, H. KARUBE leg. (KPMNH); 3♂, same, 15–V–1998, N. Vietnam, S. NOMURA leg. (NSMT).

Type depository. NSMT.

Notes. ASAHINA (1995) did not mention the affinity of this species in his original description. Actually, it is related to *W. atkinsoni*, but is easily distinguished from it by the following respects: 1) body robuster, particularly in abdomen, 2) body colour blackish, 3) antefrons brownish, without black band, 4) superior appendages more strongly curved, 5) apex of inferior appendage squarely emarginate, 6) female valvula vulvae smaller.

Watanabeopetalia usignata (CHAO, 1999), comb. nov.

Chloropetalia usignata CHAO, 1999, Wuyi sci. J., **15**: 8.

A Chinese species only known from the type specimens. I cannot describe detailed characteristics of this species, because I have been unable to find an opportunity to examine the type specimens. Judging from the original description, however, this species doubtless belongs to the genus *Watanabeopetalia*.

Distribution. China (Sichuan Sheng, Shaanxi Sheng).

Type depository. Biological Control Research Institute, Fujian Agricultural University.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 87–95, Mar. 31, 2002

A New Species of *Isoperla* (Plecoptera, Perlodidae, Isoperlinae) from Japan

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Abstract A new species of stoneflies of the genus *Isoperla* is described from Japan under the name of *I. kappa* sp. nov. This new species resembles *I. nipponica* in general appearance, but can be distinguished from the latter by the feature of male aedeagus as well as by having the brown submentum in the adult. This new species is described on the adult and egg. A redescription of *Isoperla nipponica* OKAMOTO, 1912, is also provided.

The genus *Isoperla* BANKS, 1906, is the largest within the subfamily Isoperlinae consisting of about 140 species in the Northern Hemisphere. Thirteen species have hitherto been known from Japan. OKAMOTO (1912) described *I. nipponica* from Aomori and Tokyo together with three other new species in his first monograph of the Japanese stoneflies. That species is widely recorded from Japan, and the nymph was described several times and was also shown in the illustrated guide by KAWAI (1985). The adults and nymphs are recorded in dozens of ecological papers, and the species can be regarded as one of the commonest species of the genus in Japan. Recently, I discovered a species from Honshu and Shikoku, Japan, which resembles *I. nipponica* in coloration but differs in several peculiarities. It was found on grasses and stones near shallow mountain streams. *Isoperla nipponica* and this species are easily distinguished from the other Japanese congeners by the yellow coloration with dark markings on the head and pronotum.

Though characteristics of the male aedeagi and eggs are now considered to furnish one of the most important diagnostic features for classifying the members of the genus, no descriptions were published for the previously known species from Japan. I therefore reexamined the type specimen of *I. nipponica*, and am going to redescribe its adults and eggs based on the newly collected materials. I will also describe the related species as new to science, and its diagnostic features are given on the adults.

Materials and Methods

Adult stoneflies collected by myself from 1996 to 2001 in Japan are used for this study. The specimens were fixed with Karle's solution and then transferred to 80% alcohol to keep good condition for the study. In case the given specimens are males, genitalia were everted by gently squeezing live males between fingers just before preservation. In addition to my personal collection, I used T. SHIMIZU's and H. MARUYAMA's personal collections. The following abbreviations are used to denote depositories: T. SHIMIZU's personal collection (TS), Chiba, Japan; H. MARUYAMA's personal collection (HM), Kagoshima, Japan; the depository is omitted for my own personal collection.

The specimens and male genitalia were anatomically studied by using an OLYMPUS SZX9 stereo-dissecting microscope. Illustrations of specimens were drawn by using a drawing tube for OLYMPUS SZX series. Magnification of illustrations was indicated by scale bars (line=1 mm). Micrographs of spinula-patch of male aedeagus were taken by SONY DXC–H10/OL 3CCD color video camera with OLYMPUS AX70 light microscope. SEM micrographs of eggs were prepared on dried up material without cleaning, coated with platinum for 30 seconds, and studied with a PHIRIPS XL30CP.

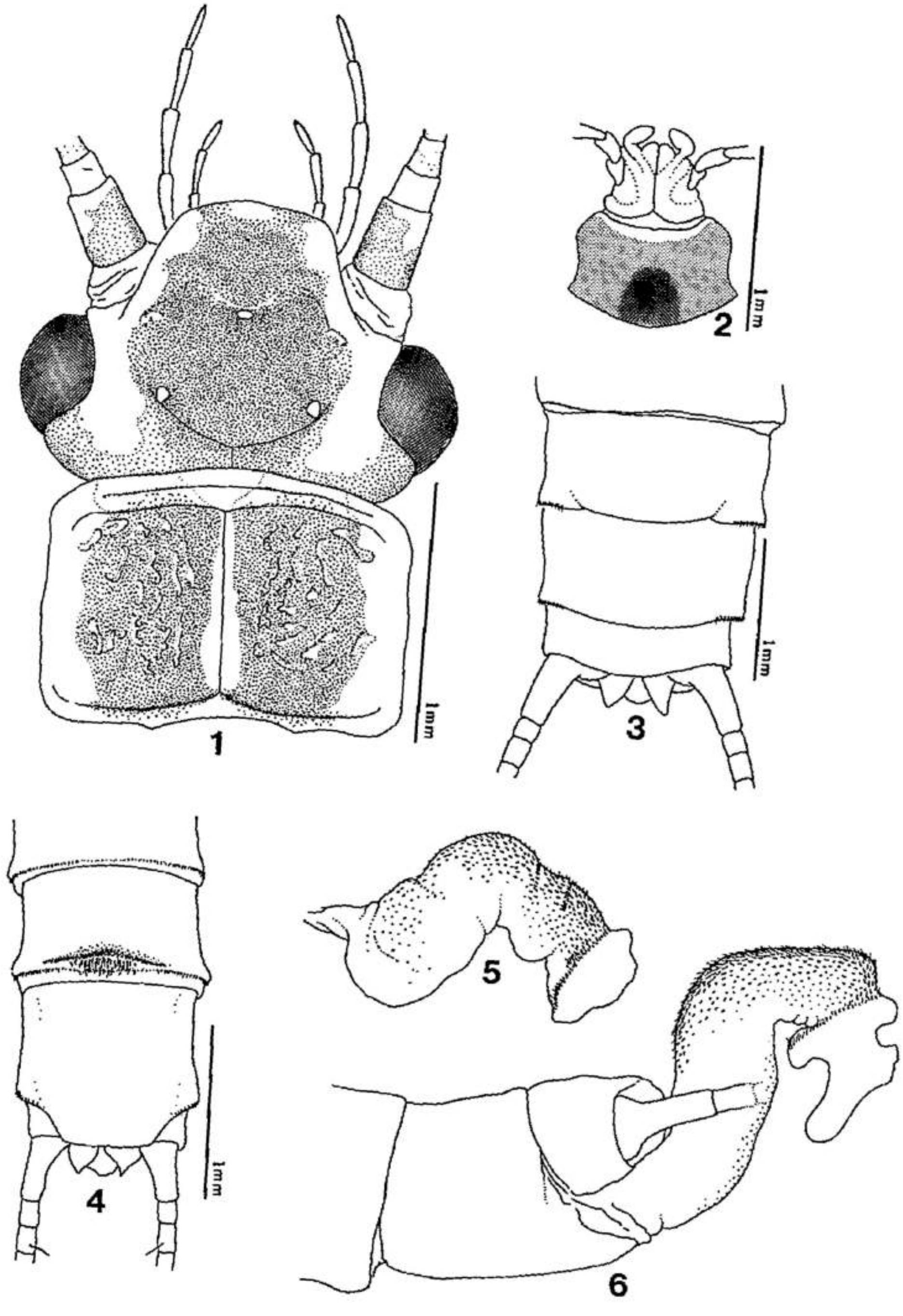
Isoperla kappa ISHIZUKA, sp. nov.

(Figs. 1–6, 16, 17)

Male. Macropterous; forewings 10.0–10.5 mm, hind wings 7.8–8.5 mm; body 10.0–11.0 mm; antennae 6.5–7.0 mm; cerci 5.5 mm. General color yellow with dark brown markings on head, thorax and abdomen. Head with three black ocelli, almost as wide as pronotum. Dorsum of head with a large dark brown area extending from anterior margin of frons to posterior margin and with a transverse brown area along posterior margin; M-line pale. Antennae long and slender; scapes generally brown, yellow in distal portions; pedicels yellow; flagella yellow in proximal segments and becoming gradually darker toward apical segments; maxillary and labial palpi light brown; submentum brown. Pronotum generally yellow, quadrangular, slightly wider than long, widely pigmented on a paired longitudinal dark brown bands, rugose and vermicular in the pigmented areas. Wings hyaline; veins brown. Mesonotum and metanotum brown and darker in middle. Legs yellow; coxae and trochanters yellow; dorsal surfaces of femora light brown; tibiae dorsally light brown in about basal 1/5; tarsi light brown. Dorsum of abdomen dark brown, while tenth tergite with yellow area. Eighth sternite with an undeveloped hairy lobe. Ninth sternite prolonged posteriorly. Tenth tergite entire. Paraprocts short, broad at base, tapering to acute tip, and covered with fine hairs. Aedeagus entirely membranous, tubular, and almost covered with fine spines; apex generally naked, expanded into four lobes, of which the ventro-proximal lobe bears irregular rows of stout setae. Cerci brown, becoming gradually darker toward apex.

Female. Macropterous; forewings 11.5–13.0 mm, hindwings 9.5–10.0 mm;

Figs. 1–6. Adults of *Isoperla kappa* sp. nov. —— 1, Head and pronotum; 2, submentum; 3, female subgenital plate; 4, male terminalia, ventral aspect; 5, male aedeagus, lateral aspect; 6, male aedeagus and terminalia, lateral aspect.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body 11.0–13.0 mm; antennae 7.0–8.0 mm; cerci 5.0–6.50 mm. General coloration and external morphology similar to those of males. Subgenital plate undeveloped, forming rounded hind margin.

Egg. Brown, oval, and circular in cross section. Collar well developed, crown-shaped. Chorionic ridges narrow, elevated, forming distinct hexagonal cells. Micropyles arranged on top of ridges near bottom 1/3 from opposite collar end.

Remarks. This species is similar to *I. nipponica* in having similar coloration, undeveloped male lobe, and rounded female subgenital plate. It is clearly separated from *I. nipponica* by the following features: 1) the darkly pigmented submentum of adult, in contrast to the yellow one in *I. nipponica*, and 2) the spinulate aedeagus, which is mostly membranous and naked in *I. nipponica*. Furthermore, this species has more widely pigmented areas than the latter in the head and thorax, *e.g.*, the elevated areas before hind ocelli are colored dark in this species and yellow in the latter, though the coloration is sometimes variable.

Etymology. The specific name is derived from the Japanese noun "Kappa" which is a legendary monster loved by Prof. WATANABE. The monster is traditionally said to live around riverside and is supposed to be the guardian spirits of rivers. I hope this new species with the name of this lovable goblin will be added to Prof. WATANABE's collection of the Kappas.

Type series. Holotype: ♂, Minokoshi-tôge, Higashiiya-mura, Tokushima Pref., Japan, 10–VII–1993, H. MARUYAMA leg. Paratypes: 4♂♂, 2♀♀, same data as the holotype; 2♂♂, Kanna-gawa, Namihira, Ueno-mura, Gunma Pref., 12–V–2001, A. ISHIZUKA leg.; 2♀♀, Ôyanagawa, Kajikazawa-chô, Yamanashi Pref., 29–V–1993, T. HATTORI leg. All the type specimens are deposited in the Laboratory of Insect Resources, Tokyo University of Agriculture.

Distribution. Japan (Honshu and Shikoku).

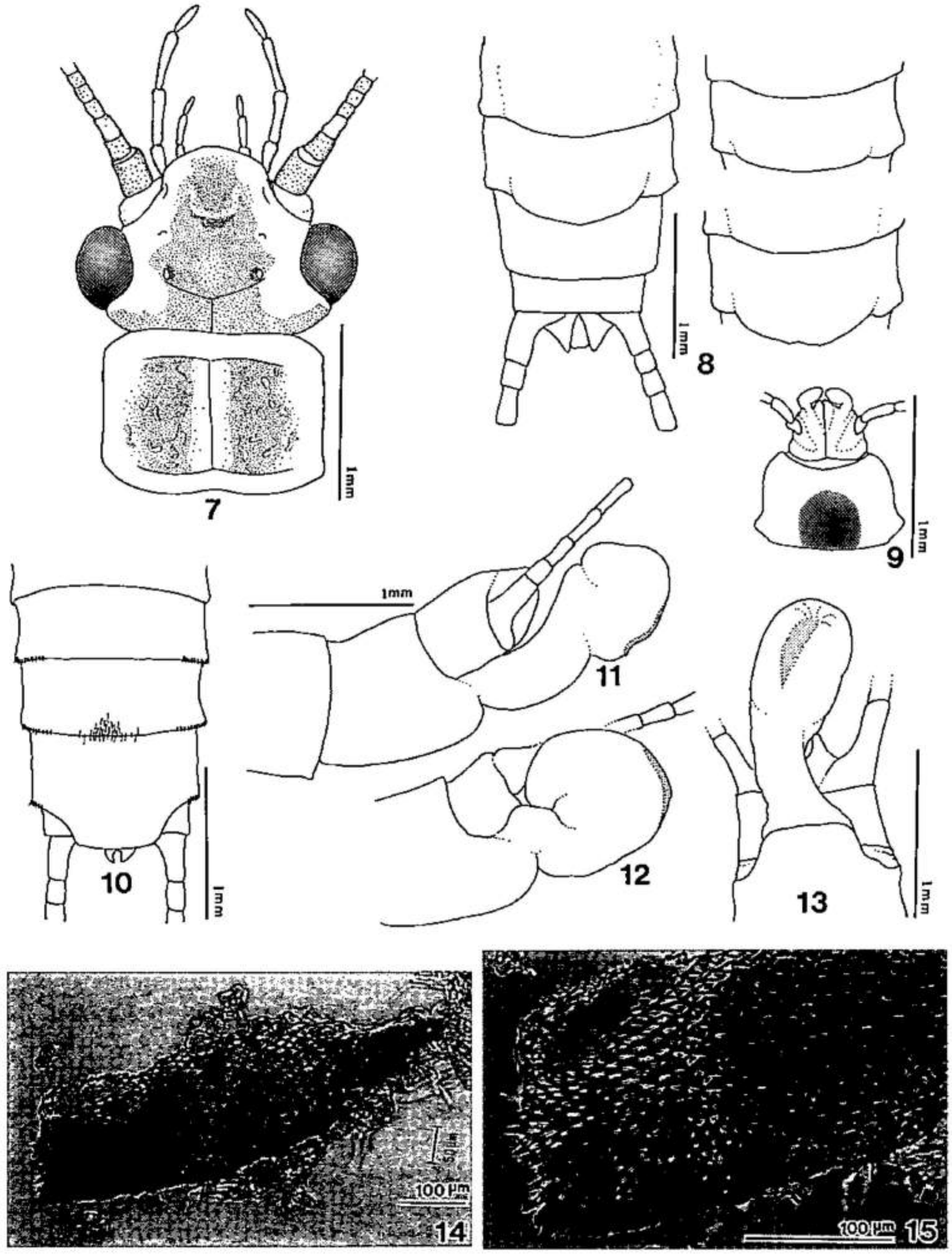
Isoperla nipponica OKAMOTO, 1912

(Figs. 7–15, 18–19)

Isoperla nipponica OKAMOTO, 1912, Trans. Sapporo nat. Hist. Soc., **4**: 127–129, figs. 15, 16. Type, male and females from Aomori and Tokyo. —— UÉNO, 1935, Animal Life of the Azusa River, 34. —— CLAASSEN, 1940, Mem. Cornell Univ. agric. Exp. Stn., **232**: 204. —— KOHNO, 1941, Kontyû, Tokyo, **15**: 88, figs. 2, 3; 1957, Mushi no Kuni, Mitsukaidô, (special): 12. —— ILLIES, 1966, Tierreich, **82**: 402. —— KAWAI, 1967, Fauna Japon., Tokyo, 119, fig. 67 b; 1976, Nara Hydrobiol., **5**: 25; 1985, Illustr. Guide Jpn. Aquat. Ins., 137. —— INADA, 1996, Biol. Inland Wat., **11**: 68, fig. 18.

Isoperla shibakawae: UÉNO, 1929, Mem. Coll. Sci. Kyoto imp. Univ., (B), **4**: 113–114, fig 7, nymph. Notes in KOHNO, 1941 b, Kontyû, Tokyo, **15**: 88. (In Japanese.)

Male. Macropterous; forewings 8.5–10.0 mm, hind wings 7.5–8.0 mm; body 8.0–10.0 mm; antennae 6.5–7.5 mm; cerci 3.5–5.5 mm. General color yellow and bearing dark brown markings on head, thorax and abdomen. Head with three black ocelli, almost as wide as pronotum. Dorsum of head with a dark brown area extending from anterior margin of frons to posterior margin, and with transverse brown area along pos-



Figs. 7–15. Adults of *Isoperla nipponica* OKAMOTO. —— 7, Head and pronotum; 8, female subgenital plate and its variation; 9, submentum; 10, male terminalia, ventral aspect; 11, 12, male aedeagus and terminalia, lateral aspect; 13, male aedeagus and terminalia, ventral aspect; 14, 15, spinula-patch of aedeagus.

terior margin; interocellar area paler; M-line pale. Antennae long and slender; scapes and pedicels brown; flagella brown, and paler in proximal segments; maxillary and labial palpi light brown; submentum yellow with a dark brown area in middle. Pronotum generally yellow, quadrangular, slightly wider than long, widely pigmented on a paired longitudinal dark brown bands, rugose and vermicular in the pigmented areas. Wings hyaline; veins brown. Mesonotum and metanotum brown and darker in middle. Legs yellow; coxae and trochanters yellow; dorsal surfaces of fomora light brown; tibiae dorsally light brown in about basal 1/5; tarsi light brown. Dorsum of abdomen dark brown, while tenth tergite with yellow area. Eighth sternite bearing an undeveloped lobe with distinct hairs. Ninth sternite prolonged posteriorly. Tenth tergite entire. Paraprocts short, broad at base, tapering to acute tip, and covered with fine hairs. Aedeagus entirely membranous and tubercular in base; apex roundly expanded and bearing a spinulose patch in apico-posterior margin, the spines slender in proximal area. Cerci brown, becoming gradually darker toward apex.

Female. Macropterous; forewings 10.0–12.0 mm, hindwings 9.0–10.0 mm; body 9.0–11.0 mm; antennae 6.5–9.0 mm; cerci 4.0–7.5 mm. Similar in general coloration and external morphology to males. Subgenital plate variable in shape, slightly expanded posteriorly and usually rounded at hind margin but sometimes with a shallow emargination in middle.

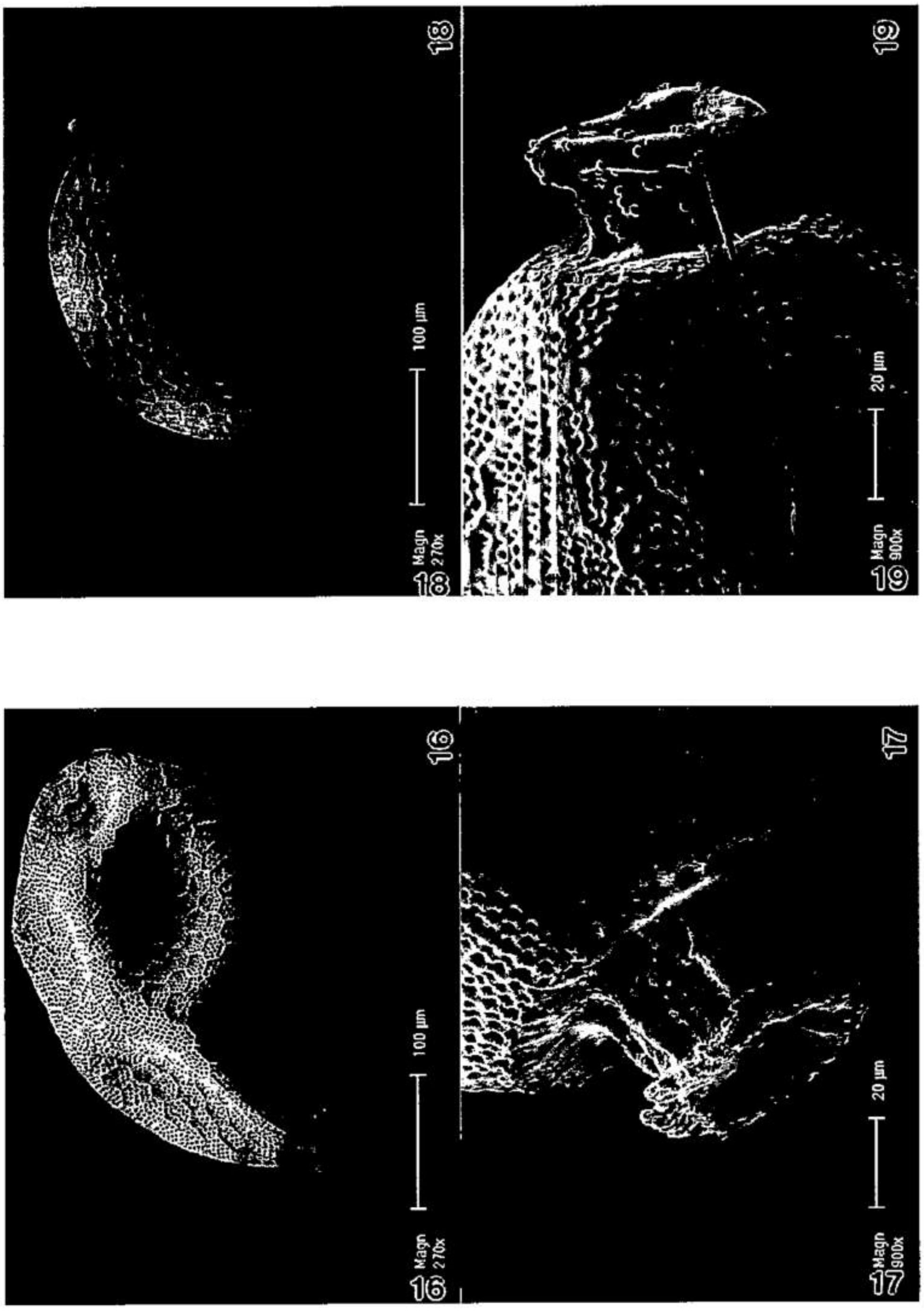
Egg. Brown, oval, and circular in cross section. Collar well developed, crown-shaped. Chorionic ridges narrow, elevated, forming distinct hexagonal cells. Micropyles not observed.

Remarks. OKAMOTO (1912) did not describe any diagnostic features, but the syntypes deposited in the Hokkaido University collection show the coloration described above of the present species. Though UÉNO (1935) recorded it from central Honshu and KAWAI (1967) illustrated the female, they did not provide any diagnostic features, either. INADA (1996) illustrated the coloration and external feature of the terminaliae, and the coloration agrees with that of the present species. The nymph of this species was described by UÉNO (1929) as that of *I. shibakawae* OKAMOTO, as was pointed out by KOHNO (1941) and KAWAI (1985), but I have been unable to determine if *Isoperla kappa* and *I. nipponica* show any differential features in their nymphal stage or not. Hence it is unclear whether this species was really dealt with by most of the previous authors, particularly in view that it is commoner than *I. kappa*.

Biological notes. This species is one of the commonest species of the Japanese *Isoperla*. They were often collected from streams on mountains in the late spring to the early summer.

Material examined. Japan: 1♂, 2♀♀ (syntypes: collection of Systematic Entomology, Hokkaido University), Towada (Aomori Pref.), late in VII–1905; 2♀♀, Arasawa and Kanayama-sawa, Isawa-machi, Iwate Pref., 9–VI–1997, T. SHIMIZU leg. (TS);

Figs. 16–19. Eggs of *Isoperla* spp. —— 16, 17, *I. kappa* sp. nov.: 16, whole ova; 17, detail of collar; 18, 19, *I. nipponica* OKAMOTO: 18, whole ova; 19, detail of collar.


18
Magn 270x
100 µm
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19
Magn 900x
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16
Magn 270x
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Magn 900x
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2♀♀, ditto, 4–VIII–1997, A. ISHIZUKA leg.; 3♂♂, 1♀, Oyoko-gawa (upstream), Usugi, Mogami-chô, Yamagata Pref., 25–V–1994, T. KISHIMOTO leg. (TS); 2♂♂, 2♀♀, Koshiranuno-sawa, Kawairi, Yamato-chô, Fukushima Pref., 13–VI–1996, T. SHIMIZU leg. (TS); 1♂, 1♀, Minamimata-gawa, Minamimata, Shibata-shi, Fukushima Pref., 14–VI–1996, T. SHIMIZU leg. (TS); 1♂, Nishimata-zawa, Hanasaku, Katashina-mura, Gunma Pref., 26–V–1990, T. SHIMIZU leg. (TS); 10♂♂, 6♀♀, Kanna-gawa, Namihira, Ueno-mura, Gunma Pref., 12–V–2001, A. ISHIZUKA leg.; 1♀, Fuppu-gawa, Yorii-machi, Saitama Pref., 1–V–2000, K. ISHII leg.; 1♂, Imohara-gawa, Imohara, Ichihara-shi, Chiba Pref., 20–IV–1992, T. SHIMIZU leg. (TS); 3♂♂, 1♀, Iwashita, Sudama-chô, Yamanashi Pref., 3–V–1990, T. SHIMIZU leg. (TS); 1♂, Kamanashi-gawa (alt. 850 m), Hakushu-chô, Yamanashi Pref., 30–V–1993, T. HATTORI leg. (TS); 2♂♂, 1♀, Tatsuba-gawa, Hara-mura, Suwa-gun, Nagano Pref., 4–VII–1998, A. ISHIZUKA leg.; 1♂, ditto, 24–VII–1999, A. ISHIZUKA leg.; 3♂♂ Okumoto Hill, Anamizu-chô to Wajima-shi, Ishikawa Pref., 27~31–V–1996, T. SHIMIZU leg. (TS); 3♂♂, Takakuradani, Imajô-shi, Fukui Pref., 24 & 26–V–1995, T. SHIMIZU leg. (TS); 1♂, 6♀♀, Hidaka-gawa, Ryûjin, Ryûjin-mura, Wakayama Pref., 11–VI–1997, H. YOSHITAKE leg. (TS); 1♂, Izumitani-gawa, Nozoe, Sekigane-chô, Tottori Pref., 3–V–1992, T. SHIMIZU leg. (TS); 1♂, 18♀♀, Ôtoyo-chô, Kôchi Pref., VII–1996, M. TAKAI leg. (HM); 1♂, 1♀, Otoko-ike, Kuro-dake, Shônai-chô, Ôita Pref., 20–V–1993, N. KUHARA leg. (TS).

Distribution. Japan (Hokkaido, Honshu, Shikoku and Kyushu).

Acknowledgments

I wish to express my hearty thanks to Prof. Yasuaki WATANABE and Visiting Prof. Shun-Ichi UÉNO of the Laboratory of Insect Resources, Tokyo University of Agriculture, for their kind guidance and advice on my work. Dr. Takao SHIMIZU, Funabashi, and Dr. Shigekazu UCHIDA of Aichi Institute of Technology, Nagoya, also gave me kind advice and useful information, and lent me a number of specimens of the Japanese *Isoperla*. Special thanks are also due to Mr. Hiroki MARUYAMA, Kagoshima, for his helpful information and donation of specimens used in this study.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 97–101, Mar. 31, 2002

A Taxonomic Study of the Genus *Pseudotrioza* (Homoptera, Psylloidea, Triozidae), with Description of a Remarkable New Species from West Sumatra

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Abstract The psylloid genus *Pseudotrioza* Y. MIYATAKE is redescribed with a diagnosis. A new species is described from Sumatra under the name of *P. watanabei*, which is dedicated to Prof. Yasuaki WATANABE on the occasion of his retirement from Tokyo University of Agriculture. A key is given to the three known species of the genus.

Two species of the genus *Pseudotrioza* Y. MIYATAKE have so far been known from Taiwan and the Philippines. This small genus is characterized by the forewing venation which is not triozine, the two apical spurs on the hind tibia, the male forceps strongly modified and the female dorsal valve which is quite broad.

In 1992, I had an opportunity to collect a remarkable *Pseudotrioza* species in Sumatra. After a careful examination, it has become clear that this species is new to science and is described below under the name of *Pseudotrioza watanabei*. It is named in honor of Professor Yasuaki WATANABE on the occasion of his retirement from the Laboratory of Insect Resources, Tokyo University of Agriculture. A diagnosis of the genus *Pseudotrioza* and a key to the species will be given.

The holotype of the new species is deposited in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture. The paratypes are preserved in the author's collection.

Genus ***Pseudotrioza*** MIYATAKE, 1972

Pseudotrioza MIYATAKE, 1972, 27. —— YANG, 1984, 229. Type species: *Pseudotrioza hiurai* MIYATAKE, 1972.

Diagnosis. Head nearly as long as wide, with shallow cleft on median suture. Forewing very long and slender, acute at the apex; veins slender, with short M+Cu petiole, venation not triozine. Hind wing very slender, with short M+Cu or R+M common petiole. Legs long and slender; hind tibia with a large basal tooth, 1 outer and 1 inner apical spurs. Male genitalia small; proctiger with caudal lobe; forceps strongly modified; aedeagus with variously formed lobes or processes on various portions, pointed at the apex. Female genitalia short; dorsal valve strongly widened, apical portion of dorsal valve with numerous stiff setae on the inner side, and with long setae on the outer side.

Key to the Species of the Genus *Pseudotrioza*

1. Hind wing with short M+Cu common petiole; male forceps short and stout; female dorsal valve slender and pointed at the apex . . . . . . *P. malloticola* YANG.
— Hind wing with short R+M common petiole; male forceps long and slender; female dorsal valve stout and widely rounded at the apex . . . . 2.
2. Genal cones divergent; male forceps bilobed; male aedeagus angulate in apical portion, pointed at the apex . . . . *P. hiurai* MIYATAKE.
— Genal cones divergent in apical half; male forceps without lobe; male aedeagus obliquely reflected in apical portion, slender and elongated at the apex . . . . *P. watanabei* sp. nov.

Pseudotrioza hiurai MIYATAKE, 1972

Pseudotrioza hiurai MIYATAKE, 1972, 28.

Specimens examined. Paratypes, Tagburos, alt. 5 m, 13 km N. of Puerto Princesa, Palawan, 15–XII–1969, on *Buchanania* sp. (?), Y. MIYATAKE leg. [Osaka Museum of Natural History].

Distribution. Philippines (Palawan).

Host plant. *Buchanania* sp. (?) [Anacardiaceae].

Pseudotrioza malloticola YANG, 1984

Pseudotrioza malloticola YANG, 1984, 229.

Specimen examined. 1♂, Liukuei, Kaohsiung, Taiwan, 11–III–1999, on *Mallotus philippinensis*, K. MATSUMOTO leg.

Distribution. Taiwan (Pintung, Kaohsiung).

Host plant. *Mallotus philippinensis* MUELL.-ARG. [Euphorbiaceae].

Pseudotrioza watanabei sp. nov.

(Figs. 1–9)

Coloration. General color yellowish green to green, sometimes yellow. Head yellowish green. Vertex yellowish green to green. Antenna pale yellow, 10th segment and apices of 3rd to 6th segments black. Thorax green, without maculation. Forewing transparent, sometimes flavous. Hind wing clear. Legs yellow to pale green. Abdomen green; male subgenital plate with black spot; tip of female dorsal valve pale yellow.

Structure. Head moderate, as wide as or slightly narrower than thorax, nearly

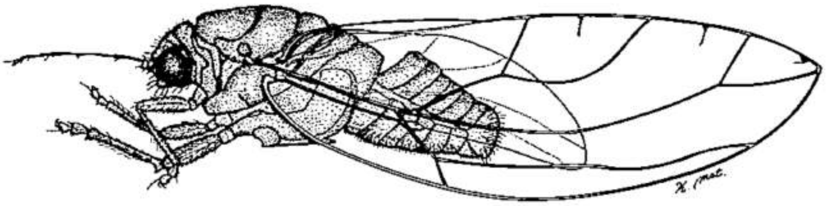
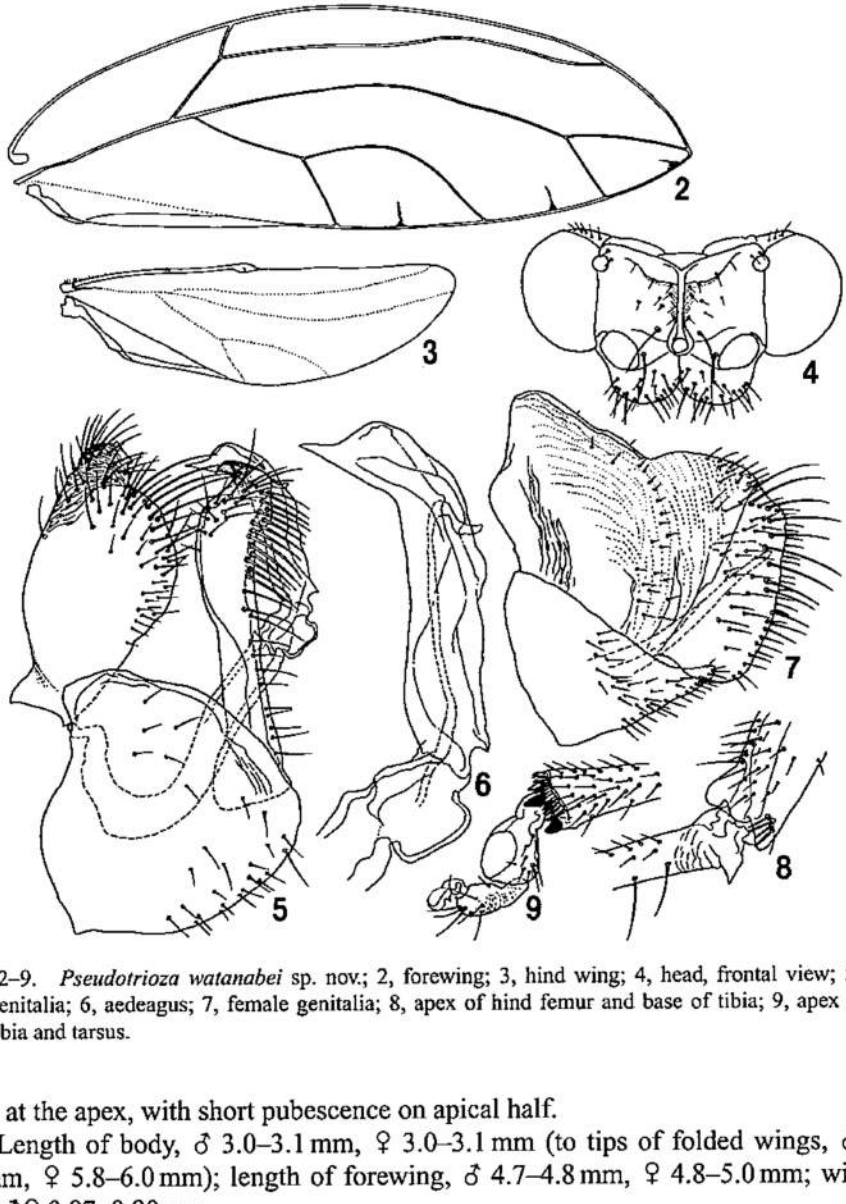


Fig. 1. *Pseudotrioza watanabei* sp. nov.; ♀, lateral view.

deflexed. Vertex about a half as long as wide, with a shallow depression on each side of median line, thinly with short pubescence. Genal cones wide and stout, about a half as long as vertex, widely rounded at the apex, with short pubescence. Antenna long and slender, 1.5 times as long as width of head; 3rd, 7th and 8th segments each with a short seta at the apex; 4th and 6th segments each with 2 short setae at the apex; 10th segment with 1 long and 1 short setae at the apex; 4th, 6th, 8th and 9th segments each with a rhinarium near the apex; relative length of each segment as 1.2: 0.9: 10.0: 3.1: 2.6: 2.5: 2.6: 2.4: 1.6: 1.4.

Thorax slightly arched, without pubescence. Forewing long and slender, 3.1 times as long as wide, acute at the apex; venation not triozine, M and Cu with a short common petiole; Rs much longer, slightly sinuate; M long and arched; M_{1+2} ending near the apex of wing; cubital cell larger than medial cell, trapeziform, about twice as long as high. Hind wing long and slender, about 3/5 as long as forewing, 3.4 times as long as wide, narrowly rounded at the apex; venation not triozine; Rs and M with a short common petiole; costal margin with 10–12 straight setae on basal portion, a hooked frenulum on medial portion and a strong retinaculum at the apex; cubital cell longer than high. Legs long and slender, with long or short pubescence; hind femur with 4 bristles near the apex; hind tibia with a large basal tooth, with 1 outer and 1 inner apical spurs and with a small spur at the apex; meracanthus short and stout, pointed at the apex.

Abdomen (excl. genitalia) short, about a half as long as thorax, with short pubescence on ventral surface. Male genitalia large, 1/3 as long as the rest of abdomen; proctiger stout, with caudal lobe strongly produced caudad, truncated and arched caudad at the apex, with long setae on caudal margin, and with pubescence on apical half; forceps very long and slender, longer than proctiger, anterior and posterior margins nearly parallel in lateral aspect, sinuate apically, with a large tooth at the apex, with stiff long bristles on apical half of caudal margin, with long setae on apical portion and caudal margin; aedeagus stout, 2nd segment shorter than 1st segment, apical 1/3 arched cephalad, acute at the apex; subgenital plate slightly longer than high, rounded on caudal margin, with short pubescence. Female genitalia large, about a half as long as the rest of abdomen; dorsal valve stout, dorsal margin strongly sinuate, wider apicad, truncate at the apex, with long and short setae apically; apex thickly with short stiff setae on inner side; ventral valve shorter than dorsal valve, tapered apicad, sub-



Figs. 2–9. *Pseudotrioza watanabei* sp. nov.; 2, forewing; 3, hind wing; 4, head, frontal view; 5, male genitalia; 6, aedeagus; 7, female genitalia; 8, apex of hind femur and base of tibia; 9, apex of hind tibia and tarsus.

acute at the apex, with short pubescence on apical half.

Length of body, ♂ 3.0–3.1 mm, ♀ 3.0–3.1 mm (to tips of folded wings, ♂ 5.7–5.8 mm, ♀ 5.8–6.0 mm); length of forewing, ♂ 4.7–4.8 mm, ♀ 4.8–5.0 mm; width of head ♂♀ 0.87–0.90 mm.

Holotype. ♂, Subulsalam, Ache, W. Sumatra, Indonesia, 8–III–1992, at light, K. MATSUMOTO leg. *Paratypes.* 1♂, 4♀ (1♂, 1♀ on slides), same data as for the holotype.

Distribution. Indonesia (W. Sumatra).

Host plant. Unknown.

Acknowledgements

I wish to express my deep gratitude to Prof. Yasuaki WATANABE of the Laboratory of Entomology, Tokyo University of Agriculture, for his constant guidance, and to Prof. Yorio MIYATAKE of Osaka Aoyama Junior College, for his kind advice on the present study.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 103–106, Mar. 31, 2002

A New Harpactorine Assassin Bug, *Agyrius watanabeorum* (Heteroptera, Reduviidae) from Thailand

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Abstract A new species of harpactorine reduviid genus *Agyrius* is described from northern Thailand under the name of *A. watanabeorum*. This is the northernmost distributional record for the genus.

Since STÅL (1863) erected the genus *Agyrius*, three species have been described from the equatorial regions of Southeast Asia under this genus of the harpactorine assassin bug (MALDONADO CAPRILES, 1990): *A. podagricus* STÅL, 1863 from Sarawak, *A. bicolor* (DISTANT, 1903) from Malaya, and *A. othello* BREDDIN, 1903 from Borneo. Three individuals recently obtained from a deep forest of northern Thailand are regarded as belonging to a fourth species of the genus. It is described herein with illustrations.

Before going further, I respectfully dedicate the present paper and the specific name of the new species to Prof. Yasuaki WATANABE and his wife Michiko in commemoration of his retirement from our university.

Agyrius watanabeorum sp. nov.

(Figs. 1–6)

Type series. Holotype: ♂, Nong Hoi, 970–1,000 m alt., Mae Rim, Chiang Mai, Thailand, 18–VIII–2001, T. ISHIKAWA leg. Paratypes: 1 ♀, Nong Hoi, Mae Rim, Chiang Mai, Thailand, 1~2–V–2000, T. TSURU leg.; 1 ♀, same locality as for the holotype, 2–V–2000, K. OKAJIMA leg. The type specimens are housed in the Laboratory of Insect Resources, Tokyo University of Agriculture.

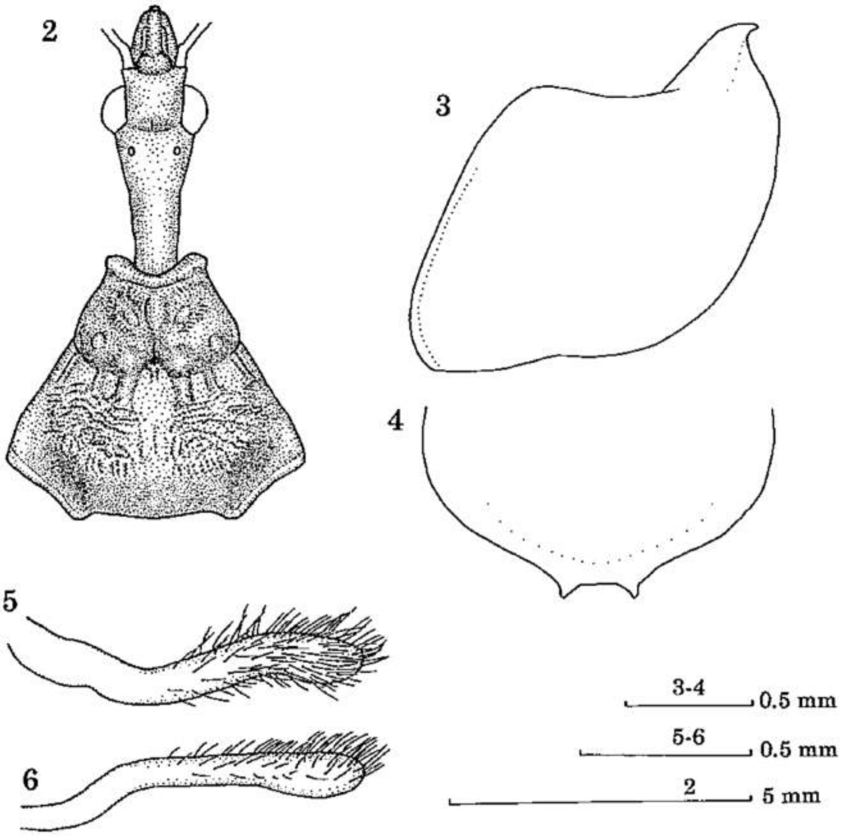
Description (holotype). Measurement (in mm). Body length 14.5. Head length 3.5, width across eyes 1.4; length of anteoculus 1.1, of postoculus 1.6; antenna length 8.4; rostrum length 4.3. Length of pronotum 3.2, width across humeri 3.8; length of anterior lobe 1.3, of posterior lobe 1.9. Hemelytron length 9.3. Length of foreleg femur, tibia, and tarsus 4.2, 4.2 and 0.5, of midleg 4.2, 5.0 and 0.7, and of hindleg 5.4, 7.3 and 0.7, respectively.

Coloration (Fig. 1). Body generally reddish. Antennal segments I and II and tarsi brownish yellow. Tibiae becoming gradually paler apicad, with dark apical parts.

Fig. 1. *Agyrius watanabeorum* sp. nov., holotype.

Antennal segments III and IV and abdomen except laterotergites darkened. Hemelytra reddish, narrowly hyaline behind level of Pcu+A vein; membranes blackish.

Structure. Body elongate elliptical, sparsely covered with short pubescence. Head (Fig. 2) a little longer than pronotum, 2.5 times as long as width across eyes, tumid between antennal insertions; anteoculus shorter than postoculus (7 : 10). Antennal segment I covered with fine, curved hairs; segment II sparsely covered with fine, suberect hairs intermixed with long, erect hairs in apical 1/4; latter hairs longer than width of segment II; segments III and IV densely covered with short, suberect or decumbent hairs intermixed with long, erect hairs; latter hairs longer than width of each segment; proportional lengths of segments I to IV 16 : 10 : 4 : 11. Rostrum sparsely covered with short, erect hairs; proportional lengths of segments I to III 17 : 14 : 5.



Figs. 2–6. *Agyrius watanabeorum* sp. nov. —— 2, Head and pronotum, dorsal view; 3, genital capsule, lateral view; 4, apical part of genital capsule, dorsal view; 5–6, left paramere, dorsal and lateral views.

Pronotum (Fig. 2) shorter than humeral width (17 : 20); anterior lobe shorter than posterior lobe (13 : 20), impunctate, irregularly inflated, with deep median sulcus posteriorly; posterolateral margins slightly concave; posterior margin weakly convex; posterior angles rounded; a pair of dorsomedial carinae on anterior part of posterior lobe well developed, about 1/3 as long as the lobe and about 1/3 as high as its width; dorsolateral carinae well developed, as long as or slightly shorter than dorsomedial ones. Scutellum with distinct Y-shaped carina. Hemelytra with corial cell longer than its width (5 : 2); base of cubital cell narrower than that of postcubital cell (7 : 10). Forefemur four times as wide as its maximum width, as long as foretibia, densely covered with fine, erect hairs on ventral surface.

Abdomen twice as long as its maximum width, wider than width of hemelytra, with gently curved lateral margins. Genital capsule (Figs. 3–4) evenly curved ventrad in lateral view, apicodorsally with a pair of small, subtruncated projections; each projection narrower than distance between two projections. Parameres (Figs. 5–6) somewhat compressed dorsoventrally, weakly sinuate, rounded apically, dorsally covered with suberect hairs variable in length; longest hairs of them as long as maximum width of parameres.

Female. Almost the same in general habitus as male. Body 16.5–17.0 mm long; abdomen slightly shorter than twice its maximum width.

Remarks. This new species is most similar in general aspect to *A. podagricus* STÅL, from which it can be distinguished by the well developed dorsolateral carinae on the posterior pronotal lobe, the reddish head, and the reddish legs in almost all parts (in *A. podagricus*, the carinae are 1/4 as long as the lobe and about 2/5 as high as its width, and the color of the head and legs is blackish except for basal halves of femora). Besides, the new species is apparently different from the other two members of the genus, *A. bicolor* (DISTANT) and *A. othello* BREDDIN, in coloration of the body which is blackish with yellowish abdomen and hemelytra.

Distribution. Northern Thailand. This is the northernmost record within the distributional range of the genus *Agyrius*.

Acknowledgments

I specially thank Prof. S. OKAJIMA (Tokyo University of Agriculture, Kanagawa: TUA) and Dr. M. TOMOKUNI (National Science Museum, Tokyo) for giving me valuable suggestions. I am also grateful to Dr. B. KRANZ (TUA) for reading the manuscript, and to Messrs. K. OKAJIMA and T. TSURU (TUA) for kindly providing the material examined in this study.

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The Developmental Stages of *Adrisa magna* (Heteroptera, Cydnidae)

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Abstract Egg and nymph of *Adrisa magna*, one of the largest cydnine bugs, are described and illustrated. A key to each instar is provided. Brief comment on their life cycle in the field at Tokyo, Japan is also given.

The members of the genus *Adrisa* are one of the largest cydnine bugs at least in the Oriental Region. Adult of the Japanese representative of the genus, *Adrisa magna* (UHLER) is up to 19 mm from head to anal end. In Japan, their distributional range is restricted to the zone of evergreen forest in the southeastern part of the Japanese mainland, and it seems not so common, though the species is widespread in Southeast Asia.

In this paper, I will describe and illustrate the whole developmental stages of *A. magna* and give brief notes on their biology. The nymphs examined in this study were reared in an incubator 16L 8D, 25°C. I also observed their ecology in the field in the campus of Tokyo University of Agriculture at Setagaya, Tokyo from 1993 to 1996.

Before going further, I wish to express my hearty thanks to Professor Yasuaki WATANABE, Dr. Shuji TACHIKAWA and Dr. Utako KUROSU, Tokyo University of Agriculture, for their guidance in the course of this study. This paper is dedicated with gratitude to Professor Yasuaki WATANABE on the occasion of his retirement from the University.

Description

Egg

Ellipsoidal, about 2.0 mm in length, about 1.5 mm in diameter, bright light yellowish white, a little rough on the surface. No egg-opener. The eggs are deposited on the ground and scattered.

Nymph

Key to the Instars

1(4) Points on dorsum of abdomen unrecognizable.
2(3) Only one seta around spiracle. . . . . 1st instar.
3(2) Two setae around spiracle . . . . 2nd instar.
4(1) Points on dorsum of abdomen recognizable.
5(6) Foretibia with four rows of setae . . . . 3rd instar.
6(5) Foretibia with five rows of setae.
7(8) Posterior wing-pads undeveloped . . . . 4th instar.
8(9) Posterior wing-pads conspicuously developed . . . . 5th instar.

First instar

Body about 2.6mm in length. Head, thorax, and dorsal abdominal plates nearly blackish brown. Connexiva lighter dark brown. Abdomen mostly dark reddish brown. Eyes dark red. Antennae dark blackish brown, except pale junctions. Legs pale yellowish brown. A seta present around spiracle. Foretibia bearing four rows of setae. Rostrum about 1.5 mm in length.

Ratio of the 1st to 4th antennal segments approximately 1 : 1.7 : 1.7 : 3. Ratio of the median lengths of pro-, meso- and metanota about 2.7 : 1.1 : 7. Ratio of head length/width about 5 : 6.

Second instar

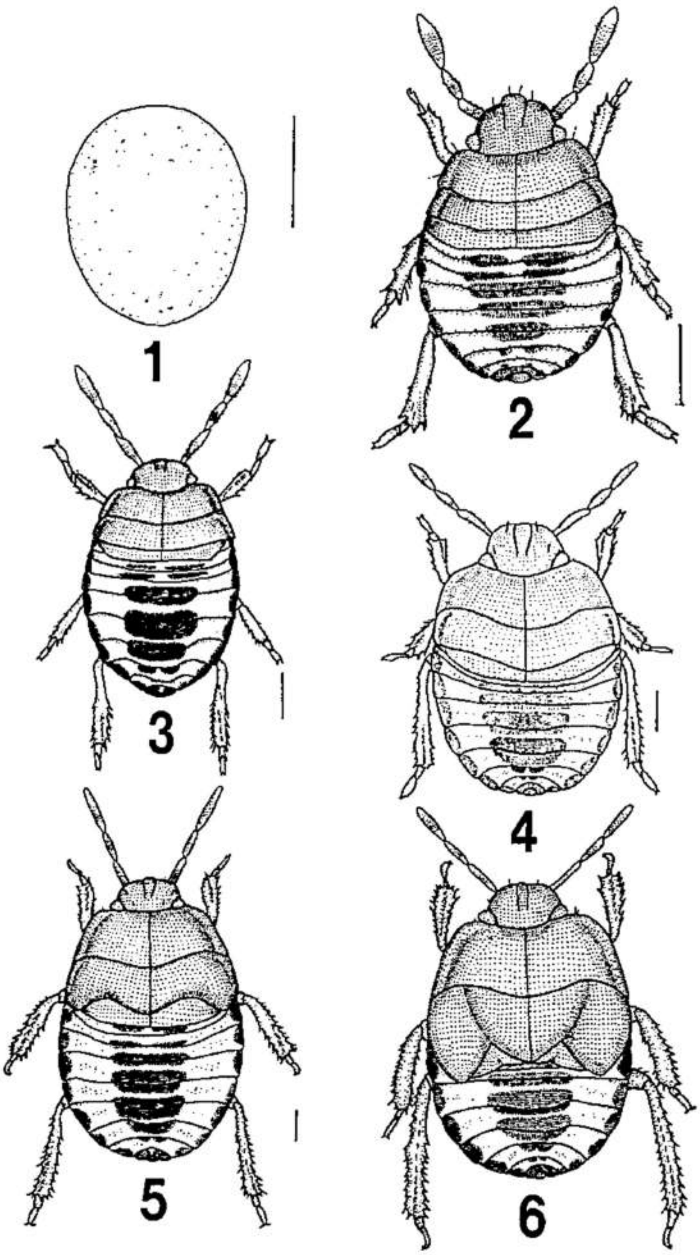
Body about 3.6 mm in length. Head, thorax and dorsal abdominal plates mostly brownish black. Connexiva pale brown. Eyes dark red. Antennae dark brown, except each segment junction whitish. Second to 4th antennal segments with many hairs. Legs dark brown. Two setae present around spiracle. Foretibia bearing four rows of setae. Rostrum about 2.3 mm in length.

Ratio of the 1st to 4th antennal segments about 1 : 1.7 : 1.4 : 2.1. Ratio of the median lengths of pro-, meso- and metanota approximately 4 : 2.8 : 1. Ratio of head length/width about 8 : 9.

Third instar

Body about 6.8 mm in length. Head, thorax and dorsal abdominal plates mostly brownish black. Connexiva pale brownish black. Eyes dark red. Antennae dark brown, except each segment junction whitish and 4th segment pale light brown. Second to 4th antennal segments with many hairs. Legs dark brown. Tibial setae of fore leg arranged in four rows. Two setae present around spiracle. Rostrum about 3.1mm in length.

Ratio of the 1st to 4th antennal segments about 1 : 2 : 2.3 : 2.5. Ratio of the median lengths of pro-, meso- and metanotum approximately 6.5 : 5 : 1. Ratio of head length/ width 11 : 12.



Figs. 1–6. Developmental stages of *Adrisa magna* (UHLER). —— 1, Egg; 2, first instar nymph; 3, second instar nymph; 4, third instar nymph; 5, fourth instar nymph; 6, fifth instar nymph. Scales: 1.0 mm (for Fig. 1) and 0.5 mm (for Figs. 2–6).

Fourth instar

Body about 8.7 mm in length. Head, thorax and dorsal abdominal plates mostly brownish black. Abdomen pale brown. Connexiva brown. Eyes reddish black. Antennae dark brown, except for the apical part of the 3rd and the basal part of the 4th, which are whitish; anterior margin of the 4th pale light brown. Legs brown. Two setae present around spiracle. Foretibia bearing five rows of setae. Anterior wing-pads recognizable. Rostrum about 3.9 mm in length.

Ratio of the 1st to 4th antennal segments about 1 : 2.2 : 1.8 : 1.8. Ratio of the median lengths of pro-, meso- and metanota approximately 8 : 7 : 1. Ratio of head length/width 1 : 1.

Fifth instar

Body about 11.6 mm in length. Head, thorax, dorsal abdominal plates and connexiva brownish black. Abdomen reddish brown. Eyes reddish black. Antennal segments: the 1st and 2nd blackish brown or brownish black, the 3rd dark brown, the 4th dark brown with the anterior margin pale brown. Legs brown. Two setae present around spiracle. Foretibia with five rows of setae. Posterior wing-pads conspicuously developed. Rostrum about 5.1mm in length.

Ratio of the 1st to 4th antennal segments about 1 : 2.1 : 1.6 : 1.8. Ratio of the median lengths of pro-, meso- and metanota approximately 38 : 35 : 1. Ratio of head length/width 17 : 16.

Biology

The eggs are deposited one by one on the soil. The nymphs grow up on fallen seeds of feeding trees. The feeding trees are the Japanese varnish tree, *Firmiana simplex* W. F. WRIGHT, Japanese pagoda tree, *Sophora japonica* L., Japanese raisin tree, *Hovenia dulcis* THUMB., and the soap nut tree, *Sapindus mukorossi* GAERTH. Adults also eat same fallen seeds. At Setagaya, Tokyo, the hibernated adults begin to move in middle April or early May. In the middle of June, the adult females mate with males and deposit their eggs. The nymphs continue to grow up after the new adults of the younger generation emerge from August. Nymphal period is about sixty days. New adults hibernate under fallen leaves in woods from the middle to the end of October.

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Watanabeothrips yasuakii (Thysanoptera, Thripidae), a New Genus and Species from Thailand with Remarkable Sexual Dimorphism in Setal Shape

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Abstract A new genus and species of the subfamily Thripinae, *Watanabeothrips yasuakii*, is described from Thailand. The genus is probably related to *Trichromothrips* PRIESNER, but the species shows remarkable sexual dimorphism in the shape of the setae. The female has most body setae on the dorsal surface, as well as the fore wing veinal setae, fan-shaped (expanded and flattened), though the male has these setae normally pointed.

Introduction

Sexual dimorphism is frequent in the members of the suborder Terebrantia, including smaller body size, occasional presence of stout setae on the ninth abdominal tergum, and presence of sternal glandular areas in males. In a number of genera, such as *Drepanothrips* UZEL, *Eremiothrips* PRIESNER, *Cricothrips* TRYBOM, *Scirtothrips* SHULL and *Trichromothrips*, the ninth abdominal tergum in males has a pair of elongate posteroangular processes called "drepanae" (PRIESNER, 1932, 1964; BHATTI, 1972, 1988, 1990; ZUR STRASSEN, 1975; BOURNIER & BOURNIER, 1988). A pair of strongly sclerotized median processes on the ninth abdominal tergum of male is present in *Yoshinothrips* KUDÔ (KUDÔ, 1985). Similarly, the males of three European species of *Kakothrips* WILLIAMS have a pair of lateral projections or tubercles on the eighth abdominal tergum (PRIESNER, 1964; PELIKAN, 1965; cf. figure in MOUND *et al.*, 1976), somewhat similar to the processes found in the phlaeotripine *Bactrothrips* KARNY, *Megalothrips* UZEL, etc. Presumably these abdominal processes are of importance in competitive behaviour between males. In males of *Tusothrips* BHATTI, the ninth abdominal tergum has a prominent median dorsal upraised process terminally bearing a pair of dark fusiform setae (BHATTI, 1978 a; OKAJIMA, 1990).

The males of many genera belonging to the family Thripidae have glandular areas that are usually present behind the antecostal suture, mostly in the middle of the sternum. In most cases, there is a single circular or ellipse glandular area on some intermediate sterna. In a few cases, however, multiple glandular areas (range from three to numerous) are present in certain genera (BHATTI, 1980).

The males of *Merothrips* HOOD belonging to the family Merothripidae uniquely possess a glandular area spanning a major part of the dorsal surface of head (MOUND & O'NEILL, 1974) which is a vertex gland having an exocrine function possibly involved with pheromone secretion (MORITZ, 1984). Males of most genera of the family Aeolothripidae have elongated first abdominal segment (PRIESNER, 1964), which is heavily sclerotized and strengthened with two longitudinal apodemes dividing it into three sections, but not in *Mymarothrips* BAGNALL and *Indothrips* BHATTI (BHATTI, pers. comm.). The males of many species of *Coleothrips* HALIDAY (now included in the genus *Aeolothrips* HALIDAY) have a pair of claspers on the ninth abdominal segment and sublateral appendices on some terga (PRIESNER, 1948). The males of *Mymarothrips* have the sensorium on the third to seventh antennal segments encircling the apex and extending back nearly to base, whereas in the females the sensorium is largely confined to the shelf-like ridge near the apex of these segments (FAURE, 1940). Some species of the genus *Heterothrips* HOOD belonging to the family Heterothripidae possess a pair of strongly developed and sclerotized finger-like processes on the ninth abdominal tergum (BAILEY, 1954).

The most striking sexual dimorphism is present in *Indothrips* (BHATTI, pers. comm.) in which the females and males look very different in the shape of head, colour of legs and fore wing, and chaetotaxy of antenna, so much so that the two sexes can be easily mistaken for different genera. The male has the third to fifth antennal segments with slender, pale setae, whereas the female has strong, dark setae. Whole the second antennal segment and the dorsal portion of head are densely covered with microtrichia in male, but the female lacks microtrichia on the dorsum of head and the second antennal segment has microtrichia only ventrally in distal half. The female has a prominent anteocular projection of head, which is 0.23 times as long as the total median length of head, and 0.6 times the width of head at eyes and at cheeks; in the male the head completely lacks anteocular production. The mid and hind legs of female have femora and proximal one-fourth of tibiae dark brown, whereas the male has completely yellow legs. The fore wing of female is shaded brown along posterior margin in distal half, but in male the fore wing has a complete brown cross band in the third quarter of wing.

Some other secondary sexual characters in the Thripinae have less obvious functions. For example, in *Megalurothrips distalis* (KARNY), the male has a series of lanceolate setae on the second to eighth abdominal sterna (SAKIMURA, 1972), and the males of other members of this genus have the antennae longer than in the females. Even more extreme sexual dimorphism in the antennae is found in species of the genera *Plesiothrips* HOOD (HOOD, 1915), *Craspedothrips* ZUR STRASSEN (BHATTI, 1978 b, 1995), *Sorghothrips* PRIESNER (BHATTI, 1970) and *Mycterothrips* TRYBOM (PRIESNER, 1964, MOUND *et al.*, 1976).

The sexual dimorphism found in the new genus and species described below is remarkable in many ways. Such a type of setal dimorphism, with spatulate setae on many parts of the body and appendages in female (Figs. 1, 3, 5–7) and the usual pointed and needle-like setae in the male (Figs. 2, 4), is not known in any members of the order Thysanoptera. Moreover, several other features also show sexual dimorphism, such as colour of some parts of the body, ensiform setae on the second antennal segment in female (Fig. 5), female with a naked (amicrotrichiate) patch subbasally on fore wing (Fig. 6), longer costal setae in male relative to the width of wing, the fourth pair of setae (B4) reduced on the second and third abdominal terga in male, the sixth pair of setae (B6) on the eighth abdominal tergum longer and apically strongly incurved in female, the eighth and ninth terga in female reticulate, male with a pair of long drepana on the ninth tergum (Fig. 8) and numerous glandular areas on the third to eighth abdominal sterna. Setal dimorphism such as this has not been previously described in any thysanopteran species, and its function is unknown and requires further study.

In this paper, I describe a new genus and species of the family Thripidae under the name of *Watanabeothrips yasuakii*, which is associated with bamboo in Thailand. It shows remarkable sexual dimorphism mentioned above.

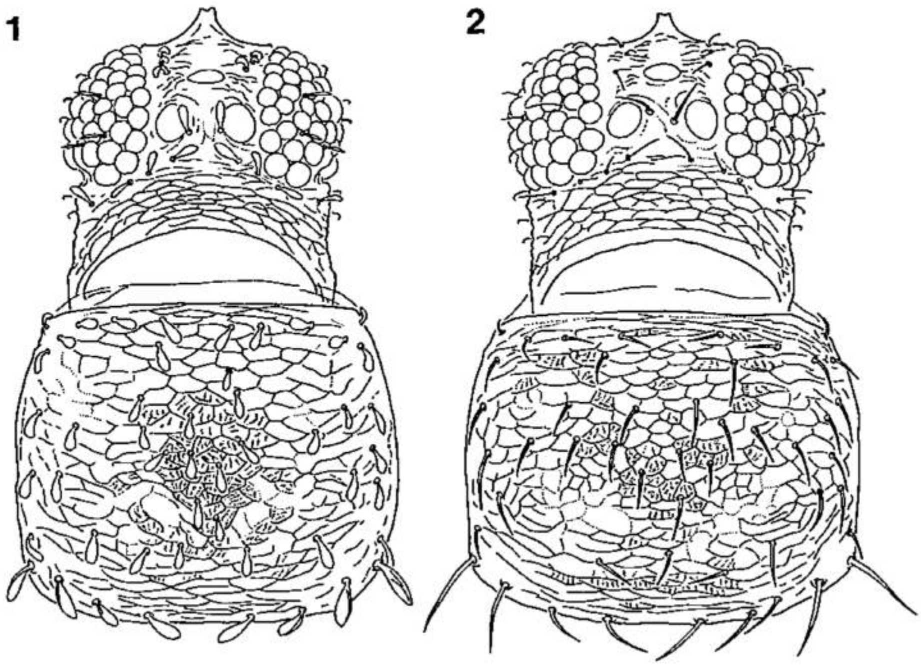
Type depository. The holotype and most of paratypes designated in this paper are preserved in the Laboratory of Insect Resources, Faculty of Agriculture, Tokyo University of Agriculture.

Genus ***Watanabeothrips*** nov.

Small-sized thrips, with fully developed wings. Body setae on dorsal surface as well as veinal setae on fore wing fan-shaped or lanceolate in females, normally pointed in males. Head prominent, reticulated dorsally, with three pairs of ocellar setae, setae III situated lateral (or anterolateral) to anterior ocellus; postocellar setae usually situated between posterior ocelli; with four pairs of postocular setae in a transverse row; cheeks weakly emarginate, slightly incut just behind eyes. Eyes bulged, with some coloured facets scattered ventrally. Ocelli largely developed. Antennae eight-segmented (rarely seven-segmented due to abnormal fusion of segments VII and VIII); segments III and IV each with a forked sense-cone; segments III to VI with microtrichia. Pronotum distinct, reticulated, with two pairs of posteroangular setae somewhat longer than other setae. Spinula absent, mesofurca weakly developed. Metascutal median setae arising behind anterior margin. Wings fully developed, covered with microtrichia, fringe cilia wavy. Abdominal terga unsculptured medially, without ctenidia; tergum VIII without comb; tergum X of female undivided; tergum IX of male with well developed drepana; sterna II to VIII each with three pairs of posteromarginal setae; sterna III to VIII of male each with several small discal glandular areas scattered irregularly.

Type species: *Watanabeothrips yasuakii* sp. nov.

This genus may be closely related to the genus *Trichromothrips* PRIESNER, 1930, but it can easily be distinguished by the following features: Head with three pairs of ocellar setae, situated outside of ocellar triangle; prominent setae on dorsal surface fan-shaped in females; mesospinula absent; abdominal sternum II with three pairs of



Figs. 1–2. Head and pronotum of *Watanabeothrips yasuakii* gen. et sp. nov., dorsal view; 1, female; 2, male.

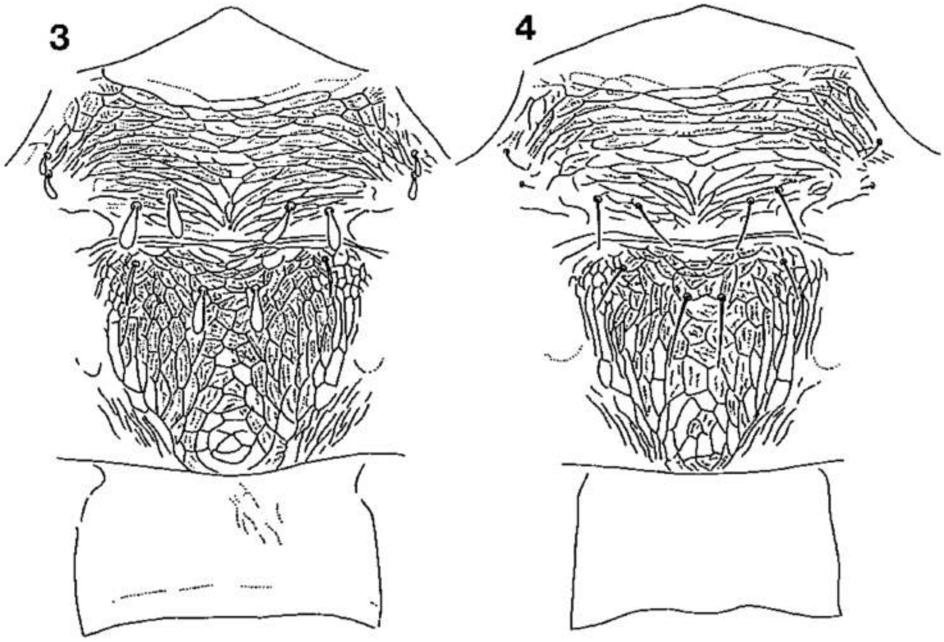
primary setae. Rather similar broadly expanded fan-shaped setae are also known on the body and wings of *Rhamphiskothrips rhipistos* MOUND, 1990 from Australia. However, this species is known only from a single female that has the antennal sense cones simple, the abdominal terga with a posteromarginal tooth-like craspedum and the setae on the seventh abdominal sternum arising in front of the posterior margin.

Watanabeothrips yasuakii sp. nov.

(Figs. 1–8)

Female. Body length: 1.5–1.6 mm. Colour largely yellow; pronotum bicoloured, brown at middle, yellow at lateral one-fourth; mesonotum and metascutum almost concolourous with pronotum, brown with lateral margins yellow; abdominal terga II to VII each with an anteromedian brown shade; segments VIII to X shaded with pale brown; antennal segment II shaded with pale brown, segments III to V with apical third to fourth shaded with brown, segment VI pale brown with basal third yellow, segments VII and VIII pale brown; fore wing shaded with brown, with base and subapical portion pale; prominent setae pale.

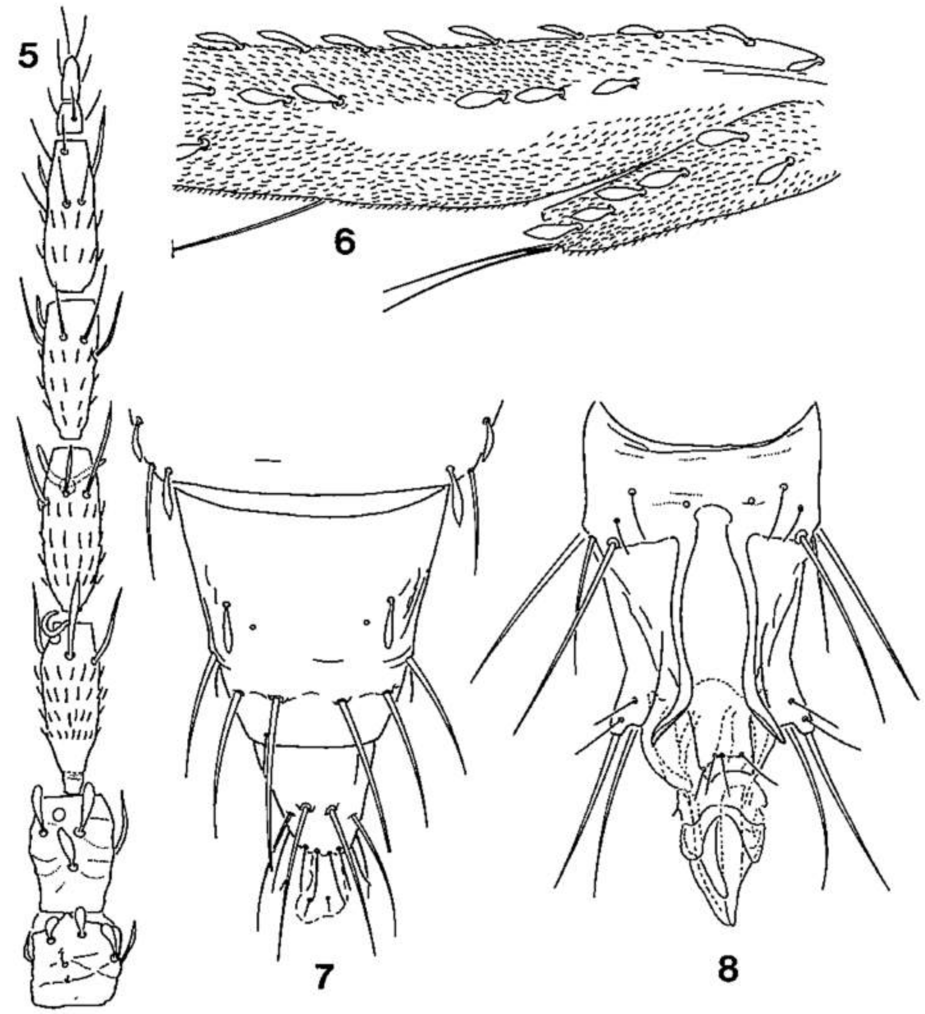
Head (Fig. 1) broadest across eyes, almost as long as broad, 0.94 times as long as



Figs. 3–4. Meso- and metanota of *Watanabeothrips yasuakii* gen. et sp. nov., dorsal view; 3, female; 4, male.

broad across eyes in holotype, dorsal surface distinctly sculptured with transverse reticulation, anteocellar weakly concave medially; three pairs of ocellar setae, a pair of postocellar setae and four pairs of postocular setae fan-shaped; ocellar setae I to III arranged in a longitudinal row along inner margin of eyes; postocellar setae in contact with posterior ocelli. Eyes well developed, 0.63 times as long as median head length in holotype, with some stout setae between ommatidia, each with 6 coloured facets. Antennae (Fig. 5) 2.45 times as long as median head length in holotype; dorsal setae on segments I and II fan-shaped; segments III to VI each with 4, 4, 4 and 2 rows of microtrichia, respectively; forked sense-cones on segments III and IV small.

Pronotum (Fig. 1) oblong, broader than head, broader than long, 1.18 times as broad as long in holotype, generally sculptured with polygonal reticulation, the reticles with fine internal wrinkles, with about 50 setae, all of them fan-shaped, usually with two pairs of posteromarginal setae. Mesonotum (Fig. 3) sculptured with transverse reticulation, with two pairs of small lateral setae and two pairs of large posteromarginal setae. Metascutum (Fig. 3) distinctly sculptured with polygonal reticulation, the reticles with internal fine wrinkles, with a pair of pointed lateral setae and a pair of fan-shaped median setae. Fore wing (Fig. 6) with six (or seven) basal setae and two apical setae on fore vein; microtrichia absent subbasally in median portion. Legs slender.



Figs. 5–8. *Watanabeothrips yasuakii* gen. et sp. nov., dorsal view; 5, left antenna, female; 6, basal portion of left fore wing, female; 7, distal end of abdomen, female; 8, ditto, male.

Abdominal terga II to VIII weakly sculptured laterally, with setae B1 and B2 short and pointed; primary setae on sterna II to VII arising along posterior margin, accessory setae absent; B6 setae on tergum VIII long and apically incurved; B1 and B2 setae on tergum IX much longer than segment X, not pointed at apex (Fig. 7). Ovipositor 2.19 times as long as median length of pronotum in holotype.

Measurements of holotype female in μm. Distended body length 1590. Head median length 122, width across eyes 130, across cheeks behind eyes 115, across base 122; eye length 77. Pronotum median length 137, width 162; fore wing length 750.

Ovipositor length 300. Length (width) of antennal segments III to VIII as follows: 55 (17.5); 50 (18); 44 (17); 50 (16); 9 (7.5); 14 (5). Length of setae: Postocellars 15; pronotal anteroangulars 22–25; metascutal medians 10–13; on tergum IX, B1 88–92, B2 80–82, B3 72–74; on tergum X, B1 93–94, B2 about 80.

Male. Body length: 1.2–1.3 mm. Colour darker than in female; head and thorax shaded with brown; abdomen shaded with brown, but yellowish laterally. Abdominal terga II to VIII sculptured laterally with anastomosing striae; setae B4 reduced on terga II and III; sterna III to VIII each with a series of 15–20 small discal glandular areas; tergum IX with drepana well developed (Fig. 8).

Measurements of a paratype male in μm. Distended body length 1250. Head median length 96, width across eyes 125, across cheeks behind eyes 105, across base 108; eye length 60. Pronotum median length 123, width 160; fore wing length 730. Drepana length 95–97. Length (width) of antennal segments III to VIII as follows: 50 (16); 43 (17); 40 (15); 46 (15); 9 (8); 17 (5). Length of setae: Postocellars 19–20; pronotal posteroangulars 30–35; metascutal medians about 20; major setae on tergum IX 75–90.

Holotype female. Thailand, Chiang Rai, on dead leaves and branches, 4–IX–1992, S. OKAJIMA.

Paratypes. Thailand. 6 females and 1 male, nr. Kanchanaburi, on bamboo, 30–VIII–1991, S. OKAJIMA & T. NONAKA; 5 females and 1 male, nr. Chiang Mai, Phrow, on bamboo, 22–VIII–1992, T. NONAKA & S. OKAJIMA; 1 female, nr. Chiang Mai, Fang, on bamboo, 23–VIII–1992, S. OKAJIMA; 9 females and 20 males, nr. Chiang Mai, Doi Inthanon, on bamboo, 29–VIII–1992, T. NONAKA & S. OKAJIMA; nr. Chiang Mai, Pha Hean, on bamboo, 3–IX–1992, 2 females and 13 males, T. NONAKA, 1 female and 1 male, S. OKAJIMA; 6 males, nr. Chiang Mai, Ka Jan, on bamboo, 3–IX–1992, S. OKAJIMA.

Distribution. Thailand.

This species is dedicated to Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture. He gave me valuable advice and continuous encouragement since 1969, when I entered Tokyo University of Agriculture and joined the Laboratory of Entomology.

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I wish to express my cordial thanks to Prof. Jitendra S. BHATTI, University of Delhi, India, and to Dr. Toshifumi NONAKA, Tokyo, for their kind help in various ways. This study could not have been completed without the cooperation of Prof. BHATTI, particularly his information and expert suggestions.

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Two *Bolacothrips* Species (Thysanoptera, Thripidae) from Japan

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Abstract Two *Bolacothrips* species from Japan are presented. A new species collected on *Miscanthus sinensis* ANDRESS [Poaceae] from Honshu is described and illustrated under the name of *Bolacothrips yasuakii*, and *B. striatopennatus* (SCHMUTZ, 1913) is newly recorded from the Ryukyu Islands. Previously, only one species of this genus, *B. evittatus* (SAKIMURA, 1958), has been recorded from Japan.

Key words: Thysanoptera, Thripidae, *Bolacothrips*, *Miscanthus sinensis*, Japan.

Introduction

In Japan, the genus *Bolacothrips* UZEL, 1895, has hitherto been known only from one species, *B. evittatus* (SAKIMURA, 1958), collected on *Saccharum officinarum* [Poaceae] on Okinawa Is. Recently, the present authors collected two *Bolacothrips* species from Honshu and the Ryukyu Islands (Okinawa Is. and Ishigaki Is.), Japan, which were clearly distinguished from *B. evittatus*. According to BHATTI (1984), the species from the Ryukyu Islands appears to be conspecific with an Oriental species, *B. striatopennatus* (SCHMUTZ, 1913). The other species from Honshu seems to be a new species, though it is somewhat similar to *B. striatopennatus* and an African species, *B. faurei* BHATTI, 1984.

In this paper, the species from Honshu is described and illustrated under the name of *B. yasuakii*, and *B. striatopennatus* is newly recorded from Japan. The holotype and most of the paratypes to be designated in this paper are preserved in the Insect Systematics Laboratory, Natural Resources Inventory Center, National Institute for Agro-Environmental Sciences, Tsukuba, Japan. The depository of the specimens examined is abbreviated as follows: NHM – Natural History Museum, London.

Key to the Japanese Species

1. Body bicoloured; fore wing not banded; abdominal sternum II with three pairs of posteromarginal setae .... *B. evittatus* (SAKIMURA).
— Body never bicoloured; fore wing more or less banded; abdominal sternum II with two pairs of posteromarginal setae .... 2.
2. Accessory setae situated caudad of B4 setae on abdominal tergum II, B1 setae on tergum I minute .... *B. yasuakii* sp. nov.
— Accessory setae situated mesad or anteriad of B4 setae on abdominal tergum II, B1 setae on tergum I longer than half of tergum........ *B. striatopennatus* (SCHMUTZ).

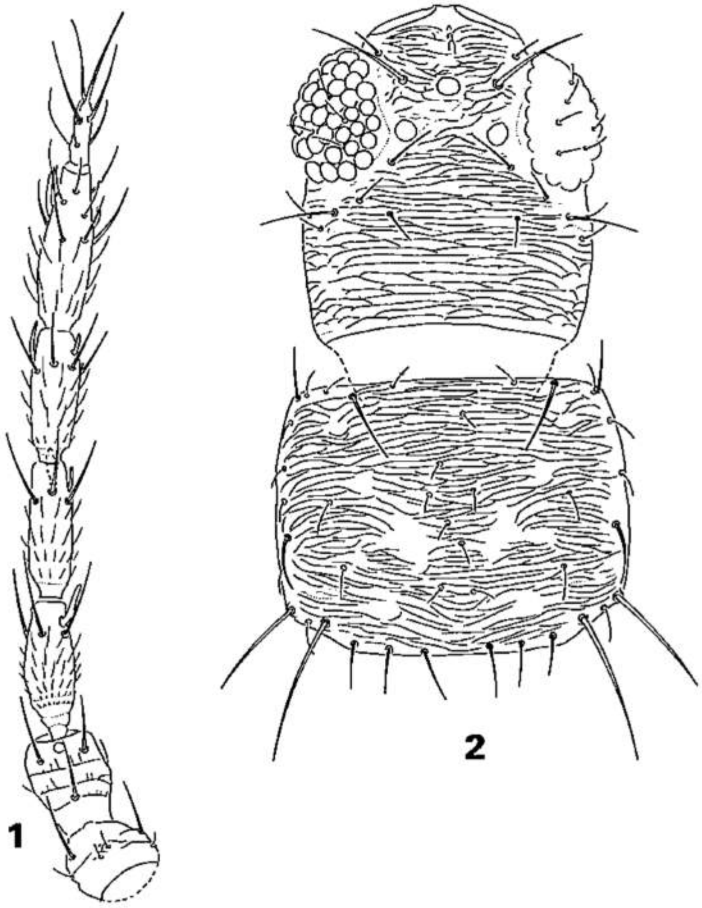
Description

Bolacothrips yasuakii sp. nov.

(Figs. 1–10)

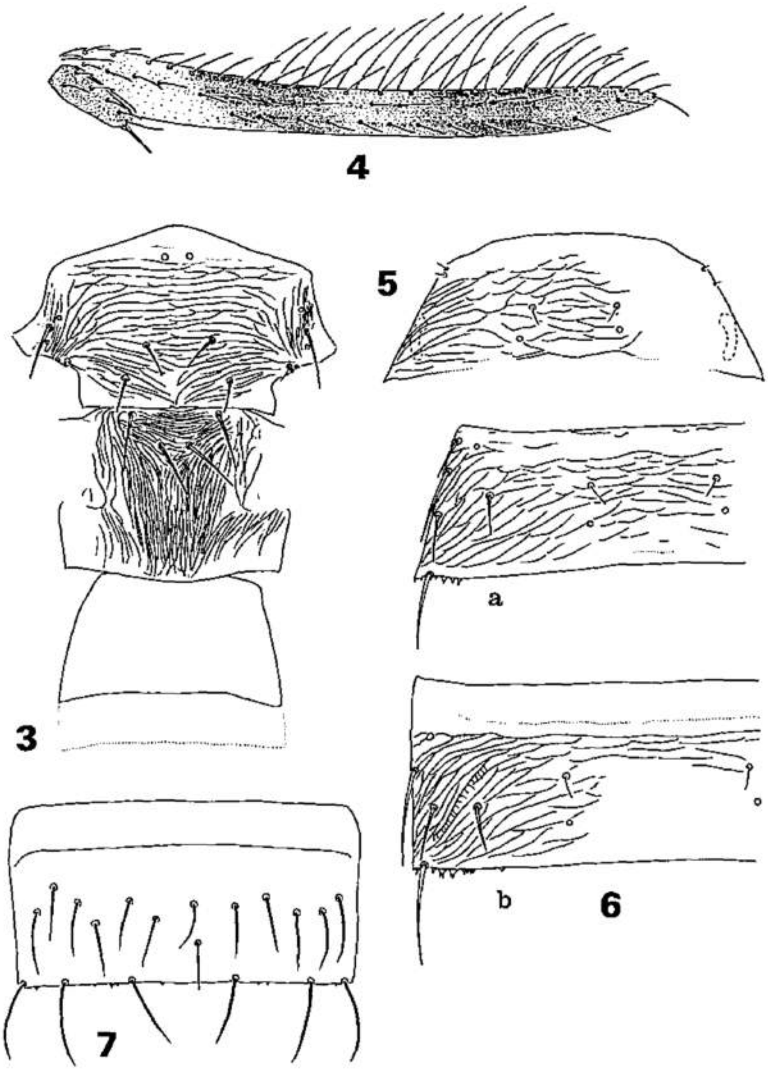
Female. Distended body length 1.6–1.8 mm. Colour never bicoloured, almost uniformly pale yellow to yellow; antennal segments I to III uniformly yellow; segment IV usually uniformly yellow, often slightly shaded at apex; segment V yellow with distal half or more pale brown to brown; segments IV to VII dark brown; metascutum shaded, each side of mesonotum and metascutellum often slightly shaded; fore wings (Fig. 4) with two indistinct bands which are sometimes indistinctly continued, bands more distinct before mounting treatment; scale slightly shaded in basal third; all legs yellow; prominent body setae slightly shaded.

Head (Fig. 2) about 0.9–1.0 times as wide as long, 0.9 times in the holotype, dorsal surface sculptured with transverse anastomosing striae, convex behind compound eyes and slightly rounded at cheeks, prolonged in front of compound eyes; one to four small swellings distinctly or indistinctly present on prolongation along median line. Compound eyes without facetal pigments. Ocellar setae pair I absent; pair II situated anterolaterad of compound eyes; pair III situated at the side of anterior ocellus and much longer than pair II, 0.6–0.8 times as long as length of compound eyes and 0.9–1.3 times as long as their distance, 0.8 times and 1.3 times in the holotype. Postocular setae of six pairs; pair II situated behind pair I; pair V situated slightly behind setal row; pair IV the longest, 0.7–0.8 times as long as ocellar setae pair III, 0.7 times in the holotype. Antennae (Fig. 1) seven-segmented: segments III and IV with simple sense-cones; segment II with one or two rows of microtrichia on dorsal surface; segments III to VI with three to five rows of microtrichia on both dorsal and ventral surfaces; segment VI the longest and with nine setae. Length/width of segments III to VII as follows (in the holotype): 2.4–3.2 (2.9), 2.2–3.1 (2.6), 2.3–2.9 (2.4), 2.9–3.4 (3.2), 2.4–3.3 (3.1). Maxillary palps two-segmented.



Figs. 1–2. *Bolacothrips yasuakii* sp. nov. (female); 1, right antenna; 2, head and prontoum.

Pronotum (Fig. 2) 1.2–1.4 times as wide as long, 1.3 times in the holotype, distinctly sculptured with transverse anastomosing striae, with 17–21 discal setae, 19 setae in the holotype; anterior margin with eight to nine setae, a pair of setae elongate and 0.2–0.3 times as long as pronotal median length, 0.3 times in the holotype; two pairs of posteroangular setae elongated, pair I (=inner setae) 1.2–1.6 times as long as pair II (=outer setae) and 0.5–0.6 times as long as pronotal median length, 1.4 times and 0.6 times in the holotype; posterior margin with three pairs of setae, pair I slightly elongate and 0.2–0.3 times as long as pronotal median length, 0.2 times in the holotype. Mesonotum (Fig. 3) distinctly sculptured with transverse anastomosing striae and with a pair of campaniform sensillae near anterior margin; a pair of median setae situated far from posterior margin. Metascutum (Fig. 3) sculptured with longitudinal



Figs. 3–7. *Bolacothrips yasuakii* sp. nov. (female); 3, mesonotum and metanotum; 4, right fore wing; 5, abdominal tergum I (sculpture of right side omitted); 6, abdominal tergum (a: tergum II; b: tergum V) (right side omitted); 7, abdominal sternum VI (sculpture omitted).

striae, except in front of median setae and without campaniform sensillae; a pair of median setae situated far from anterior margin and 0.3–0.4 times as long as metascutal median length, 0.4 times in the holotype. Costal vein of fore wings with 22–25 setae (Fig. 4); first vein with various chaetotaxy, eight (4+4, 5+3) to nine (5+4) basal and four (1+1+1+1), five (1+3+1, 2+2+1 or 1+1+2+1), six (1+1+3+1, 1+2+2+1,

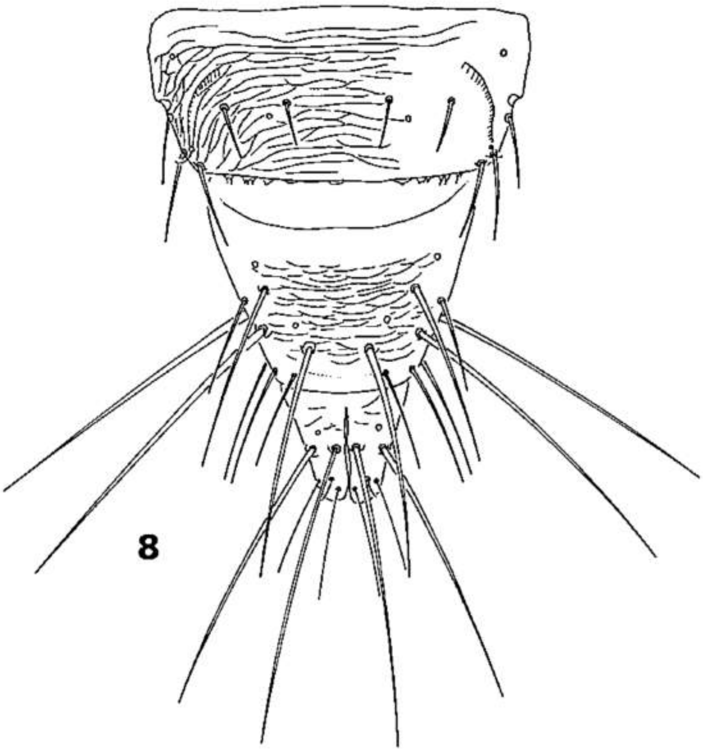


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Fig. 8. Abdominal terga VIII to X of *Bolacothrips yasuakii* sp. nov. (female) (sculpture of right side of tergum VIII omitted).

1+4+1 or 5+1) or seven (1+1+2+2+1) distal setae, eight (4+4) basal and five to six (1+4+1 in right and 1+3+1 in left) distal setae in the holotype; second vein with 11–13 setae; scale with usually five (rarely four or six) veinal setae and one discal setae; posterior fringe cilia wavy. Meso- and metasternal furca without spinula.

Abdominal terga V to VIII (Figs. 5 b, 8) each with ctenidia on each side, ctenidia situated posteromedial to spiracle on tergum VIII; terga II to VII almost smooth posteromedially; B1 setae on tergum I minute, 9–14 μm, length of spiracle 22–34 μm (Fig. 5); tergum II (Fig. 5 a) with four setae arranged in a straight row on lateral margin, accessory setae situated caudad of B4 setae; posteromarginal comb of tergum VIII reduced medially; tergum IX with two pairs of campaniform sensillae, 1.3–1.5 times as long as tergum X, 1.5 times in the holotype; tergum X divided and with a pair of campaniform sensillae; sterna (Fig. 7) with discal setae in slightly irregular row, number of discal setae on sterna II to VII as follows (in the holotype): 2–4 (3), 8–11 (8), 9–14 (9), 9–13 (13), 11–13 (13), 9–12 (9); sternal posteromarginal setae two pairs on sternum II whereas three pairs on sterna III–VII, B1 setae on sternum VII inserted on posterior margin; laterotergites sculptured with longitudinal anastomosing striae, and without discal setae and microtrichia. Ovipositor 1.4–1.5 times as long as pronotal median length, 1.5 times in the holotype.

Measurements of holotype female in μm. Distended body length 1,764. Head length 178, width across the cheeks 156; compound eye dorsal length 76, width 46, ocellar setae pair III length 60, distance between ocellar setae pair III 45, postocular setae IV 42. Pronotum length 147, width 187; anteromarginal setae length 45, posteroangular setae pair I length 81, pair II length 60, posteromarginal setae pair I length 26, metascutal length 81, metascutal median setae length 31. Fore wing length 804. B1 setae on abdominal tergum I length 12, Length of spiracle on tergum I 29, tergum IX length 92, tergum X 68. Ovipositor length 218. Antenna total length 299, segments III–VII length (width) as follows: 53 (18), 47 (18), 46 (19), 61 (19), 25 (8).

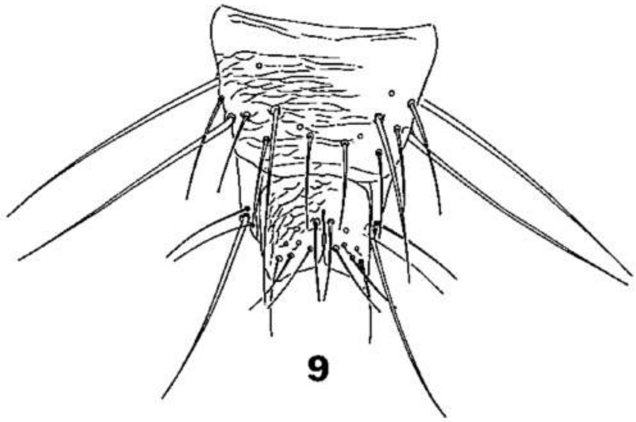
Male. Macropterous. Distended body length 1.4–1.5 mm. Colour and other structures very similar to those of female, but antennal segment V yellow to slightly shaded, swellings on prolongation of head more indistinct or reduced. Length/width of antennal segments III to VII as follows: 2.6–3.3, 2.5–2.9, 2.4–2.6, 3.1–3.3, 2.8–3.0. Length of spiracle on abdominal tergum I 20–27 μm; tergum IX (Fig. 9) with two pairs of campaniform sensillae; tergum X divided and with a pair of campaniform sensillae; sterna III to VII (Fig. 10) each with a transverse large glandular area which is concave to posterior margin; number of discal setae on sterna II to VIII as follows: 2–5, 7–11, 9–11, 9–11, 9–10, 8–11, 7–9.

Measurements of paratype male in μm. Distended body length 1,373–1,524. Head length 146–162, width across cheeks 134–149; compound eye dorsal length 68, width 35–43, ocellar setae pair II 15–23, pair III 46–64, distance between ocellar setae pair III 26–41, postocular setae pair IV 32–39. Pronotum length 128–132, width 152–177; anteromarginal setae length 40–46, posteroangular setae pair I length 72–85, pair II length 55–70, posteromarginal setae pair I 21–33, metascutal length 68–76, metascutal median setae length 22–32. Fore wing length 595–726. B1 setae on abdominal tergum I length 8–13, glandular area on abdominal sterna III to VII width as follows: 110–131, 112–131, 107–131, 99–120, 94–110. Antenna total length 270–278, segments III to VII length (width) as follows: 46–51 (15–18), 44–48 (15–18), 41–47 (16–18), 54–58 (18), 22–23 (8).

Holotype ♀, Japan, Ibaraki Pref., Yawara-mura, side of the river Kokai-gawa, on leaves of *Miscanthus sinensis* ANDERSS [Poaceae], 14–X–1999, M. MASUMOTO leg.

Paratypes. 5♀♀, 1♂, collected together with the holotype; 16♀♀, 1♂ collected from the same place and plant as holotype, 17–X–1999, M. MASUMOTO leg.; 14♀♀, 10♂♂ collected from the same place and plant as holotype, 18–X–1999, M. MASUMOTO leg.; 3♀♀, 1♂ collected from the same place and plant as holotype, 8–X–2000, M. MASUMOTO leg.; 6♀♀, 2♂♂ collected from the same place and plant as holotype, 14–X–2000, M. MASUMOTO leg.; 2♀♀, collected from the same place and plant with holotype, 28–X–2000, M. MASUMOTO leg.

Non-paratypic specimens. 1♀, Japan, Chiba Pref., Ichikawa City, lower reaches of



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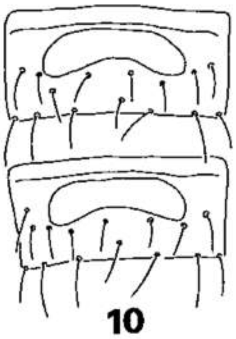

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Figs. 9–10. *Bolacothrips yasuakii* sp. nov. (male); 9, abdominal terga IX to X (sculpture of the right side of terga omitted); 10, abdominal sterna VI to VII (sculpture omitted).

the river Tone-gawa, on grass, VI–1983, R. TERAKOSHI leg.; 1♀, Japan, Fukushima Pref., Iizaka-chô, on *Miscanthus sinensis* ANDRESS, 8–X–2000, T. TSUTSUMI leg.

Distribution. Japan: Honshu (Chiba, Ibaraki and Fukushima).

Remarks. This new species is somewhat similar to both *B. striatopennatus* and *B. faurei*. However, *B. yasuakii* can be distinguished from *B. striatopennatus* by the following characteristics (in *B. striatopennatus*): antennal segment II with microtrichia (without microtrichia), median setae on abdominal tergum I minute (well developed, more than 26 μm), four setae on lateral margin of abdominal tergum II arranged in a straight row (not arranged in a straight row, accessory setae situated mesad or anteriad of B4 setae), each side of abdominal terga I–IV not shaded, both sexes macropterous (female often and male always brachypterous). It can also be distinguished from *B. faurei* by the following characteristics (in *B. faurei*): median setae on abdominal tergum I longer (vestigial), spiracle on abdominal tergum I longer (16 μm in female, 9–11 μm in male), antennal segment VI uniformly dark brown (basal half yellow) and antennal segment VI with nine setae (with 11 setae). The specific name is dedicated to Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

Bolacothrips striatopennatus (SCHMUTZ, 1913)

Thrips striatopennata SCHMUTZ, 1913, 1002–1003.
Bolacothrips orientalis PRIESNER, 1935, 359. (Synonymized by BHATTI, 1983, 490.)
Bolacidothrips orizae MOULTON, 1942, 10. (Synonymized by BHATTI, 1983, 490.)
Bolacothrips striatopennatus (SCHMUTZ, 1913): BHATTI, 1983, 490–500, 506; 1990, 216–217.

Bolacothrips striatopennatus is widely distributed from India to Taiwan and Guam (BHATTI, 1983, 1990), and is newly recorded herewith from Japan. This species is very similar to *B. yasuakii*, but the differences between them are pointed out under the latter species and key.

Specimens examined. <Japan> 1♀(Macropterous), Okinawa Pref., Ishigaki-jima Is., nr. Nagura, Takeda, on grass, 13–I–1991, S. OKAJIMA leg.; 1♀ (Macropterous), Okinawa Pref., Ishigaki-jima Is., nr. Nagura, Takeda, on dead leaves and branches, 29–VIII–1989, S. OKAJIMA leg.; 1♀ (Brachypterous), Okinawa Pref., Okinawa-hontô Is., Kunigami-son, Mt. Yonaha-dake, on dead leaves and branches, 3–III–1990, T. NONAKA leg.; 3♀♀ (2 macropterous, 1 brachypterous), 1♂ (brachypterous), Okinawa Pref., Yonaguni-jima Is., Mt. Unebe-dake, on Poaceae, 6–IV–1999, T. TSUTSUMI leg. <Indonesia> 1♀ (Macropterous), Java, Axonopus, Bogor-Gdns, 25–X–1973, L. A. MOUND leg. (NHM). <India> 1♂ (Brachypterous), Coimbatore, grass clumps, VI–1973, J. S. BHATTI leg. (NHM).

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Proposal of Eighteen New Genera and Subgenera of the Subtribe Carabina (Coleoptera, Carabidae)

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Abstract Eighteen new genera and subgenera of the subtribe Carabina, most of which were revealed by the molecular phyloanalyses, are described as follows: *Baptaulonocarabus* subgen. nov., *Zhongdianocarabus* gen. nov., *Batangocarabus* gen. nov., *Litangocarabus* gen. nov., *Deqenocarabus* gen. nov., *Zheduocarabus* gen. nov., *Sinoleptocarabus* gen. nov., *Tibetorinocarabus* gen. nov., *Mianningocarabus* gen. nov., *Sangocarabus* gen. nov., *Rhytidocarabus* gen. nov., *Glossocarabus* gen. nov., *Coreocarabus* gen. nov., *Watanabeocarabus* gen. nov., *Durangocarabus* gen. nov., *Coccocarabus* gen. nov., *Protomegodontus* gen. nov. and *Yezacoptolabrus* subgen. nov.

In the past several years, I have participated in a joint research with the object of investigating the process of evolution and phylogeny of the subfamily Carabinae by using a molecular biological method, and a special publication was recently issued into which nearly all the available data were compiled (Osawa, Su & Imura, 2002). The 6th chapter of the same publication, mainly contributed by myself, provides a new idea on the classificatory system of the subtribe Carabina in due consideration of the molecular phylogeny, and I have referred to the necessity of establishing at least nineteen new genera and subgenera. The aim of the present paper is to describe eighteen of these new supraspecific categories before publishing a new system, details of which are now in the course of preparation.

There has been no consensus of opinion of the authors whether the Carabina should be regarded as a single genus or divided into a number of distinctive genera. Most of the current taxonomists have preferred to follow the former system and placed many, sometimes more than a hundred of, subgenera under the grand genus *Carabus* Linné. In view of the molecular phylogeny, however, the Carabina should be regarded as an assemblage of many lineages phylogenetically discriminated from one another, since the molecular genealogical trees clearly show that this subtribe was split into so many clusters emerged within a short period at the beginning of its radiation, called *BIG BANG* (cf. Su *et al.*, 1996, p. 176, fig. 1 a; Imura, Kim *et al.*, 1998, p. 21, fig. 1; Imura, Su *et al.*, 1998, p. 227, fig. 1; Osawa *et al.*, 1999, p. 90, fig. 12; Osawa *et al.*, 2002). The genus should not simply be the species-group nor a mere assemblage of superficially resembling taxa, but must be a monophyletic category composed of the species that have been derived from a common ancestor. My conclusion is that a well-defined independent clade on the molecular genealogical trees should be regarded as a full genus, even though not so highly differentiated in the external morphology. Some of the supraspecific categories to be described in the following lines are defined under such a concept. Anyway, I shall henceforth divide the Carabina into a number of distinctive genera, which means that a greater part of currently used subgenera will be raised to the generic rank.

The abbreviations used in the present paper are as follows: OL – ostium lobe; BL – basal lateral lobe; ML – median lobe; PRE – prepraeputial lobe; PAR – parapraeputial lobe; PP – praeputial pad; AL – apical lobe; PD – podian lobe; AGG – aggonoporius.

Before entering into the description, I wish to express my deep appreciation to Drs. S. OSAWA, Z.-H. SU, I. A. BELOUSOV, E. VAN DEN BERGHE, D. OBYDOV, Prof. P. CAVAZZUTI, Mr. & Mrs. R. BUSINSKÝ, Messrs. B. BŘEZINA, S. FRANCO, W. HEINZ, I. KABAK and H. SCHÜTZE for their kind cooperation in various ways. Cordial thanks are also due to Dr. Shun-Ichi UÉNO for his warmest guidance and kindness in reviewing the manuscript of this paper.

1. ***Baptaulonocarabus*** IMURA, subgen. nov.

Type species: *Carabus truncaticollis* ESCHSCHOLTZ, 1833.

According to KIM *et al.* (2000), the species belonging to *Leptocarabus* GÉHIN (*sensu* IMURA & MIZUSAWA, 1996) is clearly distinguished into three groups (Lineages 1 to 3) on the molecular phylogenetic trees. Lineage 1, to be named *Sinoleptocarabus* in the 7th section of the present paper, is not a true component of *Leptocarabus* but belongs to the *Rhigocarabus* lineage (OSAWA *et al.*, 2002). Lineage 3 is *Leptocarabus* in a strict sense, containing five Japanese species. The second one (Lineage 2), mainly constructed by the species distributed in northeastern Eurasia, is further divided into four to five subgroups. In my new system now under preparation, I am going to regard the Lineage 2 as the genus *Aulonocarabus* REITTER, under which several subgenera will be settled. *Carabus truncaticollis* ESCHSCHOLTZ is a single component constituting an independent branch in the Lineage 2, and could be regarded as a distinct subgenus. Since no higher name has hitherto been given for this species, here I propose *Baptaulonocarabus* nov., which means colored- or dressed *Aulonocarabus*.

Morphology. Small-sized carabid beetle discriminated from *Aulonocarabus* (s. str.) in having a smaller body often with a metallically colored dorsal surface and primary intervals of the elytra not forming strongly raised costae. Basic structure of the male genital organ almost as in *Aulonocarabus* (s. str.): OL vestigial or at most weakly inflated; endophallus with BL faintly recognized, ML absent, PRE flat, PAR recognizable though not so large, PP moderately inflated and symmetrical with a pair of pigmented patches on dorsal wall, AL and PL weakly inflated, and AGG unremarkable.

Range. Northeastern Eurasia and northwestern North America.

Notes. Although our knowledge is still very poor on the molecular phyloanalytical data of the allied species, it is assumed that the present new subgenus is not monotypical but may contain such species as *gaschkewitschi* MOTSCHULSKY, *kabakovi* LAFER, *kolymensis* LAFER and *mouthiezianus* DEUVE.

2. *Zhongdianocarabus* IMURA, gen. nov.

Type species: *Carabus handelmazzettii* MANDL, 1955.

As has been elucidated by OSAWA *et al.* (2002, fig. 5-19 a–c), the species that have been classified into *Rhigocarabus* REITTER are involved in a fairly large group on the molecular genealogical tree, which is further diversified into at least eleven different lineages. This group also includes several other species morphologically identified as *Leptocarabus* GÉHIN, *Hypsocarabus* SEMENOV and *Oreocarabus* GÉHIN, suggesting that what we call *Rhigocarabus* is not strictly monophyletic but apparently paraphyletic. Since the branching points among each lineage are considerably deep with relatively low bootstrap confidence levels, they should be discriminated from one another at the generic level. *Carabus* (s. lat.) *handelmazzettii* was originally described by MANDL as a member of the subgenus *Eucarabus* GÉHIN, and has been treated by current taxonomists as belonging to *Rhigocarabus*. On the molecular genealogical tree presented by OSAWA *et al.* (2002, fig. 5-19 c), however, it forms a distinct cluster without showing any close affinity to the other species of "*Rhigocarabus*". A new genus is therefore proposed for MANDL's species.

Morphology. Medium to small-sized carabid beetle with the external features almost agreeing with those of *Rhigocarabus*, though the head and pronotum are much more strongly rugoso-punctate. Male genital organ of the type species as shown in Fig. 1: OL simple and very small; endophallus (illustrated for the first time) with BL absent, ML disproportionately large and subtriangularly protruded, PRE also large and asymmetrical (left lobe larger than the right), PAR well-developed and rather abruptly tapered towards apices, AL inflated though not so large, PL faintly recognizable, and lateral sides of AGG protruded to form a pair of short terminal plates though not strongly sclerotized.

Range. Northwest Yunnan, China.

Notes. As mentioned above, the result of molecular analysis strongly suggests that so-called *Rhigocarabus* is not monophyletic but should be split into several distinctive genera even though rather homogeneous in the external morphology. In contrast, endophallic structure is strikingly variable according to species, and it is indispensable to examine their fully everted features in discussing the classification of this series. Though long ignored as synonyms of *Rhigocarabus*, such higher names as *Araeocarabus* REITTER for *roborowskii*, *Syzygocarabus* SEMENOV for *cateniger* and *Tachycarabus* SEMENOV for *pusio* must be revived as full genera. In addition, establishment of several new higher categories, including the present one, is necessary which will be described in the following lines of this paper. Since the molecular analysis of the type species (*morawitzianus* SEMENOV) remains to be made, one of these genera may be synonymized to *Rhigocarabus* (s. str.) in the future. In my view, however, it is most probable that *morawitzianus* forms an independent clade on the genealogical tree, and *Rhigocarabus* is restricted to SEMENOV's species and its direct relatives. For the analyzed species concerned, the present new genus is monotypical, containing the nominotypical *handelmazzettii* with subsp. *virginalis* IMURA. The new generic name means a *Carabus* of Zhongdian [中甸] in Northwest Yunnan, from where the type species was described.

3. *Batangocarabus* IMURA, gen. nov.

Type species: *Eucarabus itzingeri* BREUNING, 1934.

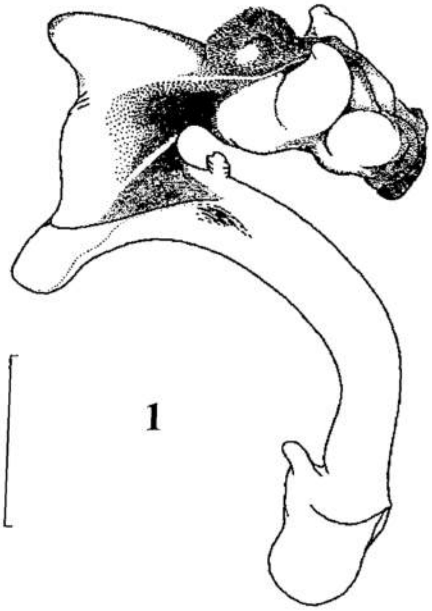
Carabus (s. lat.) *itzingeri* was described by BREUNING as belonging to *Eucarabus*, and currently regarded as a member of *Rhigocarabus* by most taxonomists. As shown by OSAWA *et al.* (2002, fig. 5-19 c), this species forms an independent clade in the molecular genealogical tree and here I propose a new genus for it. It may be roughly related to *Zhongdianocarabus* nov. at the branching point, but the bootstrap confidence level is too low (28%) to prove their phyletic affinity.

Morphology. Small-sized carabid beetle with unusually hypertrophic head. External features almost as in *Rhigocarabus*, though the head and pronotum are vaguely but densely punctate. Male genitalia of the type species as shown by IMURA (1997, p. 55, figs. 5–8): OL extraordinarily large and bilobed at tip; endophallus with BL absent, ML large and subtriangularly pointed, PRE not so large and symmetrical, PAR and PP conspicuously protruded and pointed at tips, AL moderately inflated, PL recognizable though small, lateral sides of AGG protruded to form a pair of short terminal plates with pigmentation.

Range. West Sichuan, Northwest Yunnan, East Xizang, China and North Myanmar.

Notes. So far as hitherto analyzed taxa are concerned, the present new genus only contains two different races of the type species, namely, *rugulosior* DEUVE and *choguy* IMURA. In my view, however, such species as *batangicus* DEUVE (West Sichuan) and *kozaburoi* IMURA (North Myanmar) are surmised to be another components of *Batangocarabus* nov. The new generic name means a *Carabus* of Batang [巴塘] near the western periphery of Sichuan, which is the type locality of the type species.

Figs. 1–4. Fully everted endophalli (right lateral view) of the type species of newly proposed genera. —— 1, *Zhongdianocarabus handelmazzettii* (MANDL) (Zhongdian, NW. Yunnan); 2, *Litangocarabus indigestus* (SEMENOV) (Litang, W. Sichuan); 3, *Zheduocarabus zheduoshanensis* (CAVAZZUTI) (Mt. Zheduo Shan, Kangding, WC. Sichuan); 4, *Tibetorinocarabus laotse qinghaiensis* (DEUVE) (Yushu, S. Qinghai). Scale: 2 mm.



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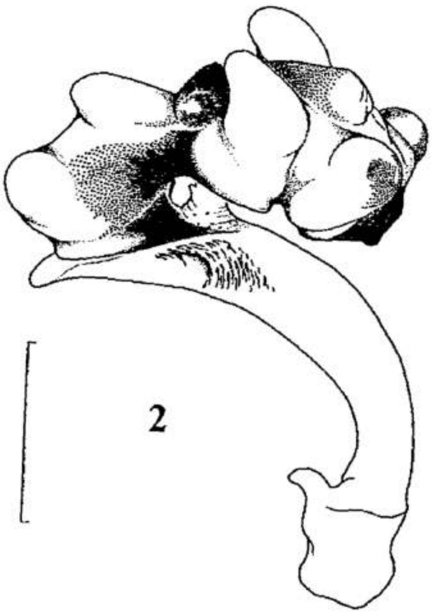

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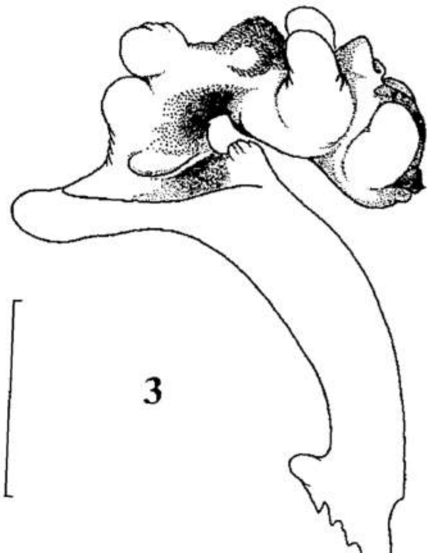

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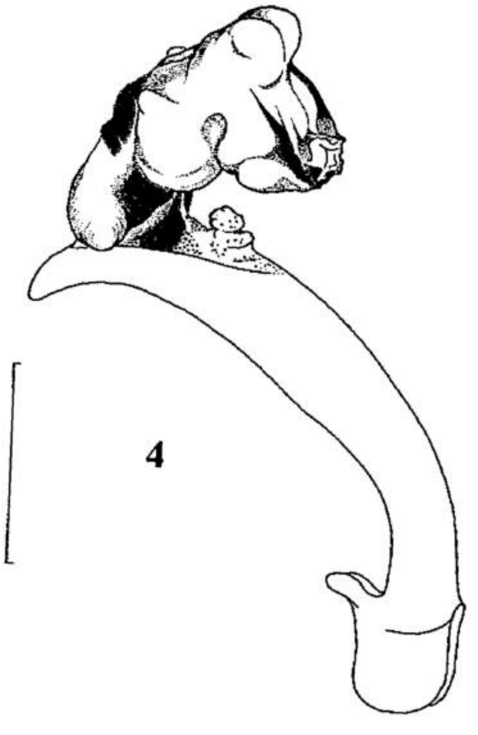

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4. *Litangocarabus* IMURA, gen. nov.

Type species: *Carabus indigestus* SEMENOV, 1898.

A Sichuanese species, *indigestus* SEMENOV, forms a unique branch on the ND5 tree (OSAWA *et al.*, 2000, fig. 5-19 c) and is also discriminated at the generic level in the present sense.

Morphology. Small-sized carabid beetle with the external appearance similar to that of *Rhigocarabus* in a strict sense, though macrocephalism is unremarkable and the thiridium of the male antennae is prominently concave. Male genitalia of the type species as shown in Fig. 2: OL medium-sized and weakly bilobed at tip; endophallus (never illustrated before) with right BL shifted to distal portion and strongly inflated, ML robust and well-protruded though smaller than BL, PRE not so large and asymmetrical (right lobe larger than the left), PAR well-developed, PP asymmetrical with a small hump at the left side of its apical base, AL moderately inflated, PL vaguely recognizable, inflexed side evidently inflated and subtriangularly pointed a little before the middle, and AGG protruded bilaterally to form a pair of short terminal plates though not strongly sclerotized.

Range. West Sichuan, China.

Notes. So far as the analyzed species are concerned, the present new genus is considered monotypical. The new generic name comes from Litang [理塘] of West Sichuan, from where the type species was described.

5. *Deqenocarabus* IMURA, gen. nov.

Type species: *Carabus rhododendron* DEUVE et IMURA, 1991.

Carabus (s. lat.) *rhododendron* was described by DEUVE and IMURA from Mt. Baimaxue Shan situated at the northwestern corner of Yunnan as a member of the subgenus *Oreocarabus* GÉHIN. On the molecular phylogenetical tree, however, it forms an independent branch (OSAWA *et al.*, 2002, fig. 5-19 c), and a new genus is proposed under the name *Deqenocarabus* nov.

Morphology. Small-sized carabid beetle with the morphological features of the type species as described by DEUVE and IMURA (1991). Supplementary descriptions of the male genitalia are given as follows: OL medium-sized and weakly bilobed at tip; endophallus with BL unremarkable, ML large and strongly protruded, PRE very large, wider than median portion of endophallus and almost symmetrical, PAR well-developed, PP asymmetrical with a small hump at the left side near apical base, AL rather small, PL faintly inflated, inflexed side weakly inflated a little before the middle, AGG weakly protruded to form a pair of short terminal plates.

Range. Northwest Yunnan, China.

Notes. The present new genus may have a remote affinity with *Litangocarabus* nov., since the two genera share several common characteristics in the endophallic structure and are roughly related with each other on the ND5 tree. However, the bootstrap confidence level at the branching point between them is too low (28%) to prove their true affinity. The new genus is monotypical, at least for the time being. *Deqeno-carabus* nov. is derived from the regional name (Dêqên [德钦] in Northwest Yunnan) where the type locality of the type species is located.

6. *Zheduocarabus* IMURA, gen. nov.

Type species: *Carabus zheduoshanensis* CAVAZZUTI, 1999.

Carabus (s. lat.) *zheduoshanensis* was recently described by CAVAZZUTI (1999) from Mt. Zheduo Shan of West-Central Sichuan. Although originally placed in the subgenus *Rhigocarabus*, it forms a highly isolated branch among the thirteen clusters of the so-called *Rhigocarabus* series on the molecular genealogical tree (OSAWA *et al.*, 2002, fig. 5-19 c). A new genus is therefore erected to accept this unique species.

Morphology. Small-sized carabid beetle with moderately hypertrophic head and remarkably carved thiridium of the male antennae. Male genitalia of the type species as shown by CAVAZZUTI (1999, p. 224, fig. 4) and in Fig. 3: OL not so large and rather low; BL small and weakly inflated on both sides, ML large, hemi-ovoid, and not sharply protruded, PRE large and asymmetrical (left lobe larger than the right), PAR well-developed with obtusely rounded tips, PP asymmetrical as in *Deqenocarabus* nov., AL moderately inflated, neither PL nor inflation on inflexed side recognized, and AGG weakly protruded on both sides to form a pair of short terminal plates.

Range. West-Central Sichuan.

Notes. The present new genus somewhat resembles *Zhongdianocarabus* nov. in configuration of the male genitalia, *e.g.*, wide and robust lateral view of the aedeagal apex, well-developed ML, large and asymmetrical PRE, less specialized inflexed side of endophallus, and so on. However, the molecular genealogical tree reveals that there is no direct affinity between these two genera. Though the new genus is monotypical at present, another Sichuanese species, *jiulongensis* DEUVE, may belong to the same genus, as deduced from closer similarity in the endophallic structure and closely situated distributional range. The new generic name means a *Carabus* of Zheduo Shan.

7. *Sinoleptocarabus* IMURA, gen. nov.

Type species: *Carabus yokoae* DEUVE, 1988.

As has been pointed out by KIM *et al.* (2000), and briefly commented in the first section of the present paper, the two "*Leptocarabus*" species occurring in Central China form an independent cluster related neither to *Aulonocarabus* nor to *Lepto-carabus*, and appear to fall in the phyletic series of so-called *Rhigocarabus*. It is therefore necessary to discriminate these two Chinese species by establishing a new genus.

Morphology. From the morphological viewpoint, the new genus is discriminated from the superficially resembling genus *Leptocarabus* (composed in the present sense of five species, namely, *procerulus* CHAUDOIR, *kumagaii* KIMURA et KOMIYA, *arboreus* LEWIS, *hiurai* KAMIYOSHI et MIZOGUCHI and *kyushuensis* NAKANE) by the following key:

1(2) Submentum asetose or at most bisetose in *L. arboreus*; metacoxa not always trisetose (anterior setae absent in certain species or geographical races); elytral sculpture triploid; sternal sulci distinctly impressed; aggonoporius more or less developed to form a pair or terminal plates; Japan and South Sakhalin. . . . . *Leptocarabus*.

2(1) Submentum setiferous, always with two to five setae; metacoxa trisetose; elytral sculpture heptaploid; sternal sulci completely lost[1]; aggonoporius undeveloped, not to form terminal plates (for endophallic morphology, see IMURA, 1995, p. 123, fig. 11; IMURA, 1998, p. 44, figs. 15–17; IMURA & SU, 2000, p. 4, fig. 2); Central China . . . . *Sinoleptocarabus* nov.

Range. Central China (West Hubei, South Shaanxi, Northeast Sichuan and South Gansu).

Notes. The present new genus comprises two allied species, *yokoae* and *marcilhaci*, both described by DEUVE. The generic name means a *Leptocarabus* of China.

8. ***Tibetorinocarabus*** IMURA, gen. nov.

Type species: *Orinocarabus laotse* BREUNING, 1943.

This new genus contains a sole species, *laotse* BREUNING, which was originally described as a member of *Orinocarabus* KRAATZ, and was subsequently transferred to *Oreocarabus* (cf. DEUVE, 1991, '94, '97; IMURA & MIZUSAWA, 1996) or to *Hypsocarabus* (cf. BŘEZINA, 1999). On the molecular phylogenetical tree, it forms an independent branch derived from near the root of a large cluster of so-called *Rhigocarabus* (OSAWA *et al.*, 2002, fig. 19 c). A new genus is therefore proposed to accept BREUNING's species.

Morphology. Medium- to small-sized carabid beetle similar in facies to certain species of *Orinocarabus*, though definitely different from the latter in naked submentum. Male genitalia of the type species as shown in Fig. 4: OL small, irregularly shaped and not bilobed at tip; endophallus rather disproportionately smaller than aedeagus, with BL prominently inflated on both sides, whose left lobe is larger than the right, ML absent, PRE symmetrical, unilobed and weakly inflated, PAR situated much behind PP, very small and weakly protruded, PP large and weakly bilobed at tip, AL weakly inflated, PL recognizable though small, lateral sides of AGG slightly protruded to form a pair of short terminal plates.

Range. North-Central Sichuan, South Gansu and East Qinghai, China.

Notes. So far as the analyzed species are concerned, the present new genus is

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1) In his original description of *Carabus (Leptocarabus) yokoae*, DEUVE (1988, p. 324) stated that the abdominal sternites of the same species are furrowed ("ventrites abdominaux sillonnés"). So far as I have examined over a hundred specimens of *yokoae*, however, the sternal sulci are completely lost, and this status is considered to be one of the good diagnostic characters of the new genus.

monotypical. The new name means an *Orinocarabus* of Tibet.

9. *Mianningocarabus* IMURA, gen. nov.

Type species: *Carabus confucius* BREUNING, 1933.

This new genus is composed solely of *confucius* BREUNING, which has been placed in *Rhigocarabus* by current authors (cf. DEUVE, 1991, '94, '97; IMURA & MIZUSAWA, 1996; BŘEZINA, 1999). However, it belongs to a much more distinctive lineage than has been expected, judging from the molecular phylogenetic tree shown by OSAWA *et al.* (2002, fig. 5-19 c).

Morphology. Small-sized carabid beetle showing a close resemblance to *Litangocarabus* nov., at least superficially. Male genitalia as shown in Fig. 5, different in configuration from those of *Litangocarabus* in the following points: 1) relative length of aedeagus smaller, 2) OL disproportionately large, with the tip conspicuously bilobed; 3) right BL smaller and not shifted to distal portion; 4) ML larger and much more strongly protruded; 5) PRE flatter and narrower; 6) PP symmetrical, with a pair of small humps at the apical base; 7) inflexed side of endophallus less prominently inflated.

Range. South-Central Sichuan, China.

Notes. Despite a close resemblance in external features to *Litangocarabus*, the new genus may be more closely related to *Tachycarabus* SEMENOV (containing in the present sense at least four species, that is, *pusio* SEMENOV, *pseudopusio* DEUVE, *buddaicus* SEMENOV and *gigolo* HEINZ et BŘEZINA), since they are connected with 70% of the bootstrap confidence level on the ND5 tree. The new name comes from Mianning [冕宁] in South-Central Sichuan, from where the type species was described.

10. *Sangocarabus* IMURA, gen. nov.

Type species: *Carabus maleki* Deuve, 1991.

Carabus (s. lat.) *maleki* was originally described by DEUVE as a member of the subgenus *Rhigocarabus*. On the molecular genealogical tree (OSAWA *et al.*, 2002, fig. 5-19 c), it surely belongs to a large phyletic series of so-called *Rhigocarabus*, but forms an isolated single branch far remote from any other lineages in the same series.

Morphology. Small-sized carabid beetle with the characteristic configuration of the male genitalia as shown in Fig. 6: OL completely lost; endophallus (illustrated for the first time) with right BL weakly inflated, ML barely recognizable, PRE weakly and symmetrically inflated, PAR moderately inflated, PP large and strongly protruded dorso-anteriorly, AL weakly inflated, PL slightly so, inflexed side of endophallus faintly inflated near the middle, AGG rather vestigial though pigmented at tip.

Range. North-Central Sichuan, China.

Notes. So far as the analyzed species are concerned, the present new genus is monotypical. The new generic name *Sangocarabus* is derived from the Chinese word, Sang [壌], which is the head letter of Sanggarpar in North-Central Sichuan from where the type species was described.

11. *Rhytidocarabus* IMURA, gen. nov.

Type species: *Carabus scabripennis* CHAUDOIR, 1850.

Viewed from the molecular phylogeny, the species that have been classified into *Tomocarabus* REITTER (*sensu* IMURA & MIZUSAWA, 1996) are apparently polyphyletic, and should be divided into at least eleven distinctive lineages (OSAWA *et al.*, 2002, fig. 5-19 a). The present new genus is one of them constructed by a Turkish species, *scabripennis* CHAUDOIR. Morphologically, this taxon has been considered to be nothing but a member of *Tomocarabus*, but it forms an independent branch on the ND5 tree (OSAWA *et al.*, 2002, fig. 5-19 d).

Morphology. Small-sized carabid beetle closely allied to *Tomocarabus*, though sculptural pattern of the elytra is triploid. Male genitalia of the type species as shown in Fig. 7: OL bifurcate and tapered towards apices, endophallus with BL weakly inflated only at the right side, ML absent, PRE flat, PAR small but rather conspicuously protruded, PP large and symmetrical with marked pigmentation, AL small and weakly inflated, PL slightly protruded, a hump-like inflation densely covered with small scales situated on inflexed side of endophallus a little before the middle, both sides of which are inflated hemispherically, AGG not strongly sclerotized though pigmented.

Range. Asia Minor.

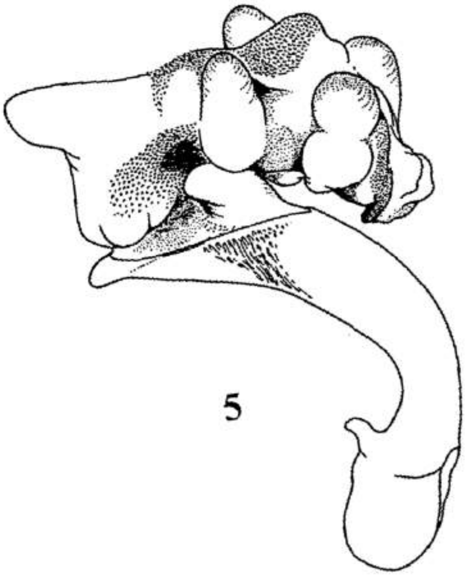
Notes. Our knowledge is still very poor on the molecular phylogeny of the species distributed in the Asia Minor, and the present new genus is monotypical for the time being. However, such species as *rumelicus* CHAUDOIR and *simardianus* DEUVE are considered to be other members of *Rhytidocarabus* nov. The new generic name means a *Carabus* with a rugged- or bark-like epidermis.

12. *Glossocarabus* IMURA, gen. nov.

Type species: *Carabus decolor* FISCHER VON WALDHEIM, 1823.

This genus is erected for a small Caucasian species, *decolor* FISCHER VON WALDHEIM, which should be regarded as belonging to a very unique lineage from both morphological and molecular phylogenetical viewpoints, though nobody has pointed out its taxonomical peculiarity. On the ND5 tree, it constitutes a highly independent cluster (OSAWA *et al.*, 2002, fig. 5-19 d), and should be discriminated at the generic level beyond doubt.

Figs. 5–8. Fully everted endophalli (right lateral view) of the type species of newly proposed genera. —— 5, *Mianningocarabus confucius kangdingensis* (DEUVE) (W. of Kangding, WC. Sichuan); 6, *Sangocarabus maleki* (DEUVE) (Shuajingsi, N. Sichuan); 7, *Rhytidocarabus scabripennis ponticola* (DEUVE et SIMARD) (Giresun, NE. Turkey); 8, *Glossocarabus decolor* (FISCHER VON WALDHEIM) (Semashkho Mt., Krasnodar Prov., W. Caucasus). Scale: 2 mm.



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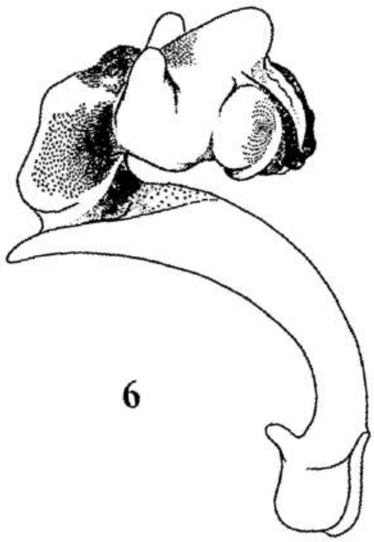

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Morphology. Small-sized carabid beetle with the facies similar to those of *Tomocarabus* REITTER, but the thiridium of the male antennae are conspicuously carved and sculptural pattern of the elytra is triploid. Male genitalia as shown in Fig. 8: OS bilobed, with the right lobe much smaller than the left; BL weakly inflated to form rather sharply ridged carinae on both sides near ligulum, ML completely lost, PRE flat, PAR small, PP sharply and triangularly protruded with marked pigmentation near apical base, AL large and rather strongly inflated, PL faintly recognizable, a finger- or tongue-shaped large sclerite protruded on inflexed side of endophallus a little before the middle, AGG unremarkable.

Range. West-Central Caucasia.

Notes. As described above, *G. decolor* bears very unique genitalic characters, which deviate apparently from the morphological criteria of the *Tomocarabus* series. The most striking is the presence of a tongue-shaped sclerite strongly protruded on the inflexed side of the endophallus, which is regarded as the feature of generic importance. For this characteristic structure, here I propose a new term "glossulus". So far as I have examined, the same sclerite is also observable in all the species belonging to the genus *Nesaeocarabus* BEDEL of the Canary Islands. However, the resemblance seems to have been brought about through parallel evolution, since both the genera have no direct relationship on the genealogical tree (OSAWA *et al.*, 2002, fig. 5-19 a). Besides, there is a very wide geographical gap between Caucasia and the Canaries, and it is highly implausible that *Nesaeocarabus* and *Glossocarabus* were derived from the common ancestral stock. The new generic name means a *Carabus* with the glossulus.

13. ***Coreocarabus*** IMURA, gen. nov.

Type species: *Carabus fraterculus* REITTER, 1895.

This new genus is proposed to accept *fraterculus* REITTER, one of the popular species mainly distributed in the mountainous regions of the Korean Peninsula. Although originally described as a member of *Eurycarabus* GÉHIN, this species has long been regarded as a member of *Tomocarabus* REITTER (cf. BREUNING, 1932–'37; KWON & LEE, 1984; DEUVE, 1991, '94, '97; IMURA & MIZUSAWA, 1996) or *Diocarabus* (cf. KRYZHANOVSKIJ *et al.*, 1995; BŘEZINA, 1999). On the ND5 tree, however, it falls into an isolated clade without any direct relatedness to the other species belonging to either *Tomocarabus* or *Diocarabus* (OSAWA *et al.*, 2002, fig. 5-19 d).

Morphology. Small-sized carabid beetle with the external appearance similar to such Japanese genera as *Asthenocarabus* LAPOUGE or *Pentacarabus* ISHIKAWA, though the dorsal surface is much more roughly sculptured. Endophallus as shown in Fig. 9, showing a close resemblance to that of *Rhytidocarabus*, though a hump-like inflation on the inflexed side of the endophallus is much larger and its lateral sides are not inflated.

Range. Korea, southern Far East Russia and Northeast China.

Notes. It should be emphasized again that on the genealogical tree, the present new genus is connected with none of such Oriental genera as *Tomocarabus*, *Diocarabus*, *Asthenocarabus* and *Pentacarabus*, all having been considered as rather close relatives of the new genus. The close resemblance in the endophallic morphology between *Rhytidocarabus* and *Coreocarabus* can be regarded as the result of parallel evolution. *Coreocarabus* is considered monotypical so far as the analyzed species are concerned. The new generic name means a *Carabus* of Korea, which is the main distributinal area of the type species.

14. ***Watanabeocarabus*** IMURA, gen. nov.

Type species: *Carabus slovtzovi* MANNERHEIM, 1849.

The present new genus is erected for a small Siberian species, *slovtzovi* MANNERHEIM, which has long been considered a member of *Tomocarabus* or *Diocarabus*, and its taxonomical peculiarity has never been indicated. On the molecular genealogical tree, *slovtzovi* constitutes an isolated branch remote from either *convexus* FABRICIUS (type species of *Tomocarabus*) or *loschnikovi* FISCHER VON WALDHEIM (type species of *Diocarabus*).

Morphology. Very small carabid beetle with the external features similar to those of *Diocarabus* than to those of *Tomocarabus*. Male genitalia of the type species (Fig. 10) also as in *Diocarabus*, though different in details as follows: OL conspicuously bilobed, BL inflated bilaterally, ML absent though apparently recognizable in *Diocarabus*, PRE weakly inflated, PAR small, PP symmetrical, AL moderately inflated, PL rather strongly protruded though unremarkable in *Diocarabus*, a hump-like inflation on inflexed side of endophallus large, and AGG not developed, only a pair of pigmented patches recognized on both sides.

Range. South-Central Siberia.

Notes. Since our knowledge is rather poor on the phyloanalytical data of the species presumably belonging to the *Diocarabus* series, it is still premature to decide whether *Watanabeocarabus* nov. is monotypical or involves several more species. Analyses of the allied species to know their true phylogenetical positions remain to be made, above all of such taxa as *massagetus* MOTSCHULSKY, *dorogostaiskii* SHILENKOV, *aurocinctus* MOTSCHULSKY, *caustomarginatus* IMURA et MIZUSAWA, *beybienkoi* KRYZHANOVSKIJ and *chamissonis* FISCHER VON WALDHEIM. The new genus is dedicated to Prof. Yasuaki WATANABE, an eminent specialist of the Staphylinidae, to commemorate his retirement from Tokyo University of Agriculture.

15. ***Durangocarabus*** IMURA, gen. nov.

Type species: *Carabus forreri* BATES, 1882.

The unique North American species, *forreri* BATES, has been placed in *Tanaocarabus* REITTER, but it constitutes a distinct cluster on the molecular genealogical tree without indicating any direct relationship to the branch of *sylvosus* SAY, the type species of *Tanaocarabus* (OSAWA *et al.*, 2002, fig. 5-19 d). A new genus is proposed for BATES' species..

Morphology. Almost agreeing in general appearance with *Tanaocarabus*. Configuration of the male genitalia (Fig. 11) also similar to that of *Tanaocarabus*, though different in details as follows: OL indicated by two separated narrow projections, with the right one a little smaller than the left; BL rather weakly inflated on both sides, ML absent, PRE almost flat, PAR small but prominently protruded, PP symmetrical and strongly pigmented on the dorsal wall, AL moderately inflated, PL faintly so, a hump on the inflexed side of endophallus not so large, short tongue-like in shape, strongly pigmented and densely covered with short hairs, AGG not sclerotized, only a pair of pigmented patches recognized on both sides.

Range. Southwestern North America.

Notes. Although closely similar to each other, *D. forreri* differs from *T. sylvosus* not only at the specific but at the generic level as mentioned above. The close resemblance of external and endophallic features might have been resulted from convergence. The new generic name means a *Carabus* of Durango, the type locality of the type species.

16. *Coccocarabus* IMURA, gen. nov.

Type species: *Carabus minimus* SEMENOV-TIAN-SHANSKIJ et ZNOJKO, 1932.

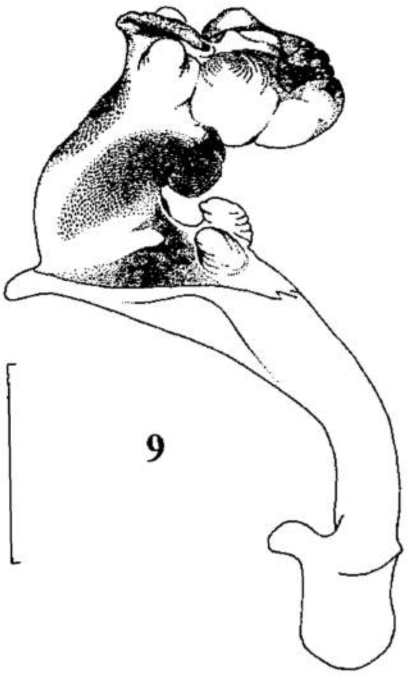
One of the smallest Tianshanese species, *minimus* SEMENOV-TIAN-SHANSKIJ et ZNOJKO, has been considered to belong to *Semnocarabus* REITTER together with several other small and dark colored species occurring on the Tianshan Mountains. Unexpectedly, however, it constitutes a single branch reflecting a striking phylogenetic discrepancy with the cluster of *Semnocarabus* (type species: *regulus* DOHRN) (OSAWA *et al.*, 2002, fig. 5-19 d). The new genus is therefore proposed here.

Morphology. Very small carabid beetle with the facies almost agreeing with those of *Semnocarabus*. Male genitalia with OL large and bilobed, endophallus rather poor in characteristics, BL unclear, ML absent, PRE not strongly inflated, PAR weakly protruded, both AL and PL unremarkable, inflexed side of endophallus moderately inflated and carinate at middle, lateral sides of AGG rather prominently protruded to form a pair of terminal plates.

Range. Eastern Tianshans.

Notes. Athough basically indistinguishable in external and endophallic structures from the other species belonging to *Semnocarabus*, that is, *regulus* DOHRN, *erosus* MOTSCHULSKY, *carbonicolor* MORAWITZ and *transiliensis* SEMENOV, "*Carabus*"

Figs. 9–12. Fully everted endophalli (right lateral view) of the type species of newly proposed genera. —— 9, *Coreocarabus fraterculus jirisanensis* (ISHIKAWA et KIM) (Mt. Paegun-san, Chollanam-do, S. Korea); 10, *Watanabeocarabus slovtzovi* (MANNERHEIM) (Akademika Obrucheva Mts., Tuva, SC. Russia); 11, *Durangocarabus forreri* (BATES) (La Ciudad, Sierra Madre occ., Durango, C. Mexico); 12, *Protomegodontus germarii* (STURM) (Miane, Treviso, Veneto, NE. Italy). Scale: 2 mm.



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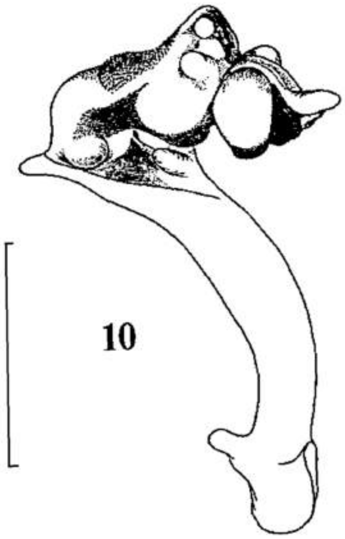

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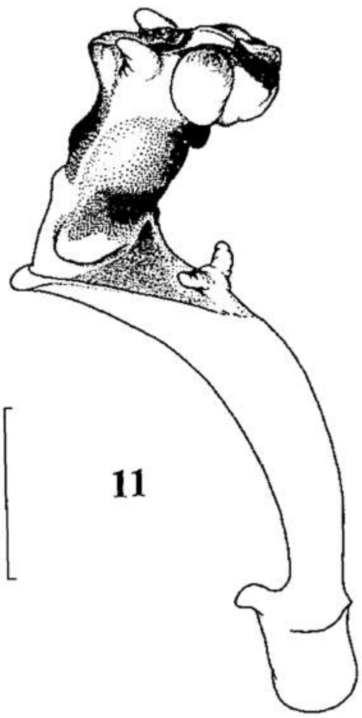

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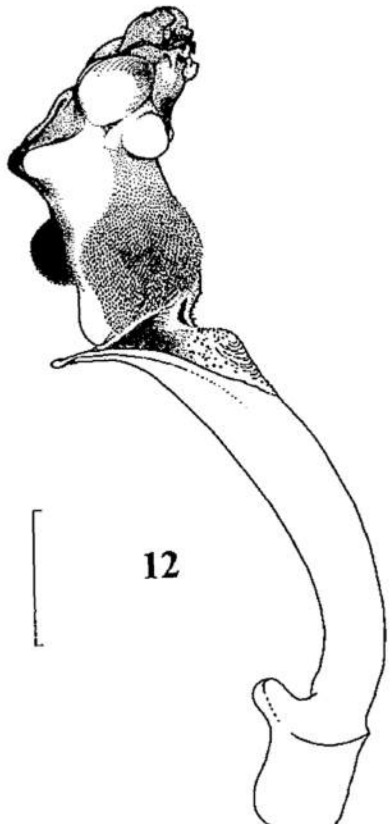

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minimus constitutes a highly independent branch, whose peculiarity of generic importance is almost equivalent to that of *Zoocarabus* REITTER (type species: *bogdanowi* BALLION), *Ulocarabus* REITTER (type species: *stschurovskii* SOLSKY) and *Carpathophilus* REITTER (type species: *linnei* PANZER). So far as the analyzed materials are concerned, *Coccocarabus* nov. is monotypical. The new generic name means grain- or seed-like *Carabus*.

17. ***Protomegodontus*** IMURA, gen. nov.

Type species: *Carabus germarii* STURM, 1815.

Taxonomic arrangement of the South-Central European species *germarii* STURM is different according to the authors. Although this taxon was often regarded as a subspecies of "*Carabus*" *violaceus* LINNÉ (*e.g.*, BREUNING, 1932–'37; MANDLE, 1960; DEUVE, 1991; BŘEZINA, 1999, etc.), it should be considered a good species, since the distributional area of *germarii* partly overlaps that of *violaceus* and the apical part of the aedeagus is utterly different in shape (*e.g.*, CASALE *et al.*, 1982; TURIN *et al.*, 1993; DEUVE, 1994; FOREL & LEPLAT, 1995, IMURA & MIZUSAWA, 1996, etc.). Viewed from the molecular phylogeny, *germarii* never falls into the same cluster as that involving *violaceus* but constitutes a completely isolated branch, at least concerning the analyzed population from Northeast Italy represented by subsp. *savinicus* HAMMER (OSAWA *et al.*, 2002, figs. 5-31, 35). The branch of *germarii* is derived from near the base of a large cluster corresponding to the division Procrustimorphi (sensu IMURA, 1996), suggesting that the two taxa are not conspecific, not even congeneric. A new genus is therefore proposed for *germarii* under the name *Protomegodontus* nov.

Morphology. Medium-sized carabid beetle with the morphological features almost agreeing with those of *Proteocarabus* GÉHIN, except for differently shaped aedeagal apex. Male genitalia as shown in Fig. 12: basal part of aedeagal apex wide, apparently depressed and often weakly concave dorsad, while it is narrow and compressed right laterad in *Proteocarabus*; membraneous preostium weakly inflated showing a tendency to form a low OL; configuration of endophallus almost as in *Proteocarabus*, both BL and ML absent, PRE hemispherically protruded, wider than long and densely covered with long hairs, PAR small, PP symmetrical with pigmented dorsal surface, AL moderately inflated, PL rather prominently so, median portion of endophallus on lateral and inflexed sides strongly inflated and densely covered with short scales, preapical areola protruded to form a small ridge-like projection, AGG not forming terminal plates.

Range. South-Central Europe (Southeast France, South-Central Switzerland, North Italy, South Austria, Southwest Hungary, Slovenia, Croatia and Bosnia-Herzegovina).

Notes. According to the molecular phyloanalyses made by OSAWA *et al.* (2002), the so-called Procrustimorphi was radiated at first to five large phyletic series almost corresponding to the distributional zones, that is, European, Caucasian, Pan-Eurasian, Tianshanese, and Chinese groups. "*Carabus*" *germarii* is a single component of one of four to five main lineages in the third group, and constitutes a highly isolated branch derived from near the root of the cluster. Its status as a full genus is almost equivalent to that of *Pachycranion* SOLIER, *Procerus* DEJEAN+*Megodontus* SOLIER and *Procrustes* BONELLI, all in the present sense. On the other hand, *violaceus* falls at most into one of several sublineages in the cluster corresponding to the genus *Pachycranion*. Systematic position of *violaceus* should thus be lower than that of *germarii*, and *Proteocarabus* GÉHIN is applied as one of the subgenera of the genus *Pachycranion*. Judging from the molecular genealogical tree, the origin of *germarii* is very old, and this species may reflect the most primitive form of all the *Procerus*−*Megodontus* series (this is why I named the new genus "*Protomegodontus*"), though much more comprehensive studies remain to be made to clarify the detailed phylogenetical relationships in and around the new genus. The close resemblance between *violaceus* and *germarii* may be regarded as the result of parallel evolution that occurred in two different phyletic lines.

18. ***Yezacoptolabrus*** IMURA, subgen. nov.

Type species: *Carabus gehinii* FAIRMAIRE, 1886.

Acoptolabrus has been treated as a distinct subgenus of the genus *Carabus* LINNÉ (s. lat.) or of the genus *Damaster* KOLLAR. In my new system now under preparation, I am going to raise *Acoptolabrus* to the generic rank. In either case, this higher taxon is regarded as well-defined monophyletic group. On the molecular genealogical trees shown by OSAWA *et al.* (2002, fig. 8-25), however, it is clearly split into two different lineages; one containing several continental species, namely, *schrencki* MOTSCHULSKY, *constricticollis* KRAATZ, *leechi* BATES, and *mirabilissimus* ISHIKAWA et DEUVE, and the other containing two insular species, *lopatini* MORAWITZ and *gehinii* FAIRMAIRE. A remarkable Korean species, *changeonleei* ISHIKAWA et KIM is surmised to be a member of the former group, though the DNA is not yet analyzed. Since the type species of *Acoptolabrus* is *schrencki*, this category should be restricted to the former series and the latter two could be discriminated at the subgeneric level, named *Yezacoptolabrus* nov., designating *gehinii* as the type species. On the other hand, morphological difference between these two subgenera is rather indistinct. The most useful diagnostic character is found in configuration of the prothorax. In *Acoptolabrus* (s. str.), the pronotum is barrel-shaped, with the front margin more distinctly raised, the lateral sides more or less constricted just behind the front angles and concave or emarginate before the hind angles. In *Yezacoptolabrus* nov., on the other hand, the pronotum is less specialized, without marked constriction on the lateral sides.

Range. South Sakhalin and Hokkaido.

Notes. The new subgeneric name means an *Acoptolabrus* of *Yezo*, which is an ancient name of Hokkaido, northern Japan.

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The *Trechiama* (Coleoptera, Trechinae) of the Maya Mountains in Northeast Japan

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Abstract Four new species of the trechine genus *Trechiama* are described from the Maya Mountains stretching along the coast of the Japan Sea in northeastern Honshu, Northeast Japan. All belong to the *nivalis* subgroup of the group of *T. oreas*, but are rather diverse in chaetotaxial and aedeagal features. The new names given are *Trechiama watanabeorum*, *T. maja*, *T. tripraecipitis* and *T. cantantimaris*.

Dealing with the *Trechiama* species occurring on the Asahi Mountains and the adjacent volcanoes (UÉNO, 2001), I set aside those found on the Maya Mountains, which are geologically similar to the Asahis and could be regarded as a large branch of the latter. The main reason for this exclusion is that I wanted to dedicate the paper dealing with the *Trechiama* species of the Maya Mountains to Yasuaki WATANABE for commemorating his retirement from Tokyo University of Agriculture at the end of March 2002, since his wife Michiko came from a hot spring resort at the western foot of the mountains and therefore they both are familiar with the Mayas. Besides, WATANABE helped me in searching for trechine beetles when I visited the mountains early in the autumn of 1982.

The Maya Mountains stretch from north to south for about 45 km along the coast of the Japan Sea to the northwest of the Asahi Mountains. They are roughly separated from the Asahis by the deep valleys of the Ohtori-gawa and the Miomoté-gawa Rivers, but are connected with the latter by the Masugata Ridge between the sources of the two rivers. Like the Asahis, the Maya Mountains are non-volcanic, mainly formed by a granitic body, mostly of granodiorite, and with mudstone formations of the Miocene origin here and there. The highest point is Jûzô-zan (1,036 m in height) at the southern part, followed by Maya-san (1,020 m in height) at the central part. Other peaks and heads are mostly between 700 m and 1,000 m in height. Because of such elevation, the Mayas are completely devoid of alpine zone, and even subalpine vegetations are found only in limited places at the highest parts. Instead, the upper half of the mountain range is extensively covered with beech forest, in which are found habitats of trechine beetles belonging to the genus *Trechiama*.

Four different species of these trechine beetles have so far been found from four localities on the Maya Mountains, three at the northern and central parts and the remaining one at the southern part. At the two northern localities, they were collected from two neighbouring sites, respectively, while the other two collecting sites at the central and southern parts were much restricted. All the species belong to the *nivalis* subgroup of the group of *Trechiama oreas* and are related to *T. yoshihikoi* S. UÉNO, but they are rather diverse in the elytral chaetotaxy and the configuration of the male genitalia. In the present paper, I am going to describe them under the names *Trechiama watanabeorum* (from Mt. Atsumi-daké), *T. maja* (from Mt. Maya-san), *T. tripraecipitis* (from Mt. Sanbôgura-yama) and *T. cantantimaris* (from Mt. Narumi-yama). The abbreviations used herein are the same as those explained in previous papers of mine.

Before going into further details, I wish to express my heartfelt thanks to Professor Yasuaki WATANABE, Professor Yoshiaki NISHIKAWA and the late Dr. Kintaro BABA for their kind help extended to me in the field works.

***Trechiama* (s. str.) *watanabeorum* S. UÉNO, sp. nov.**

[Japanese name: Atsumi-nagachibi-gomimushi]

(Figs. 1–3)

Length: 5.00–5.55 mm (from apical margin of clypeus to apices of elytra).

Doubtless allied to *T. yoshihikoi* S. UÉNO (2001, p. 380, figs. 8–10) from Mt. Gassan as is clearly indicated by the close similarity in the basic conformation of male genitalia, but distinguished at first sight from the latter species by the reduction of eyes, lighter coloration and narrower fore body, obviously narrower prothorax in particular. Decisively different from *T. yoshihikoi* also in the configuration of aedeagus, which is much higher at middle, with much broader and ventrally curved apical lobe whose tip is narrowly tuberculate in dorsal view, and bears obviously larger copulatory piece and much shorter dorso-apical teeth-patch.

Body depressed on dorsum, concolorously reddish brown and shiny, appendages partially a little lighter.

Head small, subquadrate, a little wider than long, depressed on dorsum though the frons and supraorbital areas are gently convex; frontal furrows deep throughout, not angulate at middle, divergent anteriad and curving round posteriad towards neck constriction, which is distinctly marked at the sides though not deep; microsculpture sharply impressed, mostly consisting of transverse reticulation; eyes variable in size and convexity, though completely flat and probably not functional in most individuals; genae moderately convex, three-fourths to one and one-third as long as eyes (usually a little shorter than eyes); neck wide; labrum deeply emarginate at apex; mandibles stout; antennae fairly stout, usually reaching basal four-ninths of elytra in ♂, slightly shorter than that in ♀; pedicel the shortest, about two-thirds as long as antennomere 3, which is the longest, about as long as terminal segment and a little longer than scape.

Pronotum subcordate, much less transverse than in *T. yoshihikoi*, evidently wider than head, a little wider than long, widest at about two-thirds from base, and a little more gradually contracted towards base than towards apex; PW/HW 1.39–1.50 (M

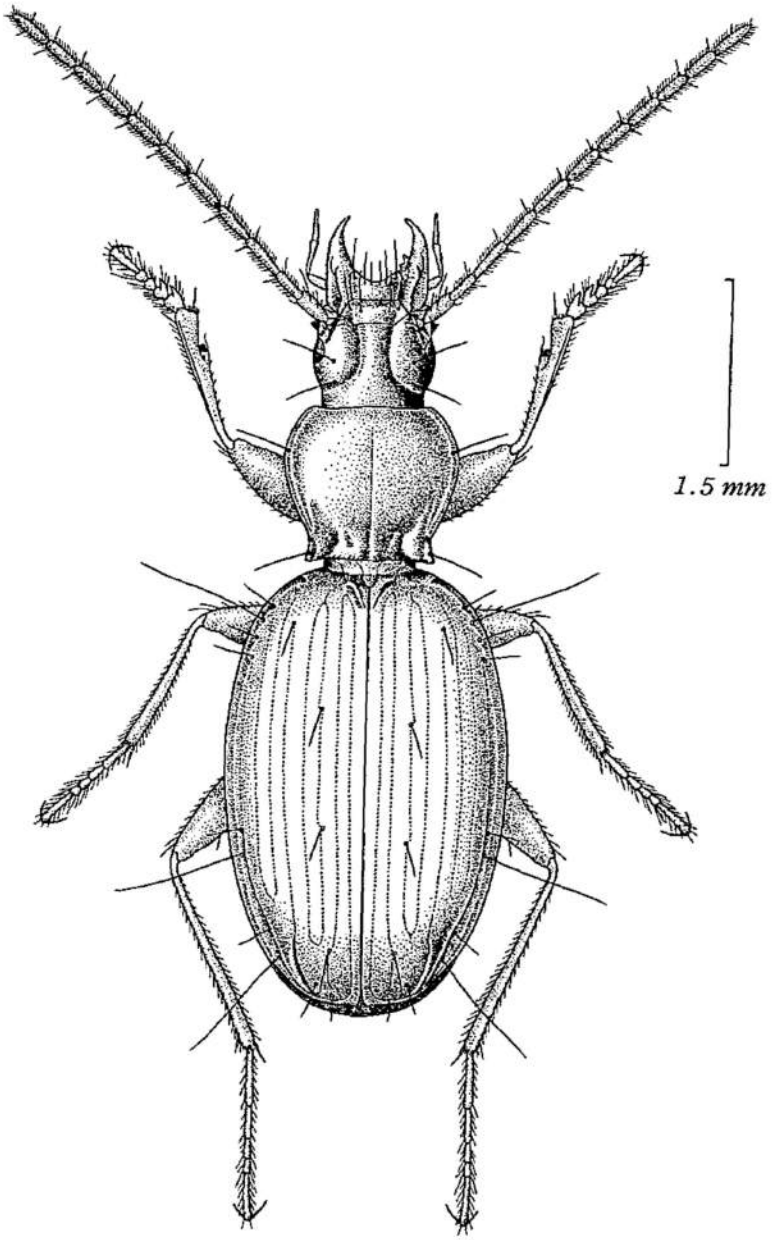


Fig. 1. *Trechiama* (s. str.) *watanabeorum* S. UÉNO, sp. nov., ♂, from Kowa-shimizu on Mt. Atsumi-daké.

1.44), PW/PL 1.15–1.20 (M 1.17), PW/PA 1.52–1.61 (M 1.56), PW/PB 1.36–1.48 (M 1.43); sides moderately bordered throughout, strongly rounded in front, deeply sinuate at a level between basal eighth and sixth, and then more or less widely divergent towards sharp hind angles, which are protrudent postero-laterad; apex more or less narrower than base, PB/PA 1.02–1.14 (M 1.09), with front angles very obtuse though advanced; base nearly straight at middle, somewhat oblique posteriorly on each side; dorsum depressed though steeply declivous at the antero-lateral parts, with a fine median line deepened in basal area; microsculpture mostly consisting of fine transverse lines though partially obliterated; transverse impressions mal-defined, the basal one being provided with a deep oblique foveole on each side of median line; basal foveae small but deep, extending antero-laterally; postangular carinae sharp; basal area smooth though notched along the basal margin.

Elytra oval, much wider than prothorax, moderately longer than wide, usually widest at about four-ninths from bases, and equally narrowed in front and behind; EW/PW 1.52–1.69 (M 1.60), EL/EW 1.42–1.56 (M 1.51); shoulders widely rounded, humeral and prehumeral borders continuously arcuate and only slightly oblique at the innermost point; sides rather widely reflexed, particularly before middle, gently arcuate in proximal two-thirds, less so posteriorly, and rather narrowly and almost conjointly rounded at apices, usually with a very small re-entrant angle at suture; dorsum widely depressed even in ♂, rather steeply declivous in narrow lateral parts and along apices; microsculpture consisting of very fine transverse lines; striae entire, fairly deep and indistinctly crenulate; scutellar striole fairly long; apical striole short and moderately curved, joining stria 5 at the anterior end; intervals slightly convex, particularly near suture, apical carina prominent; setiferous dorsal pores on stria 3 variable in the number and position, usually two or three in number, the first (anterior) pore, if present, located at about 1/9 from base though missing in more than half the specimens examined, the third (posterior) pore usually present at 3/5–5/7 (usually 2/3) from base but missing on the right elytron in two paratypes, the second (middle) pore always present but variable in its position from basal 1/4 to 2/5 (usually 1/3); stria 5 always with a single setiferous dorsal pore at 1/11–1/8 (usually 1/9) from base; preapical pore located at the apical anastomosis of striae 2 and 3 just behind the level of the terminus of apical striole and more widely distant from apex than from suture.

Ventral surface smooth; anal sternite with the apical margin more strongly rounded in ♂ than in ♀, bisetose in the former and quadrisetose in the latter. Legs slenderer than in *T. yoshihikoi*; tarsi thin, tarsomere 1 longer than tarsomeres 2–3 combined but shorter than tarsomeres 2–4 combined in both meso- and metatarsi; in ♂, protarsomeres 1 and 2 widely dilated and stoutly produced inwards at apices.

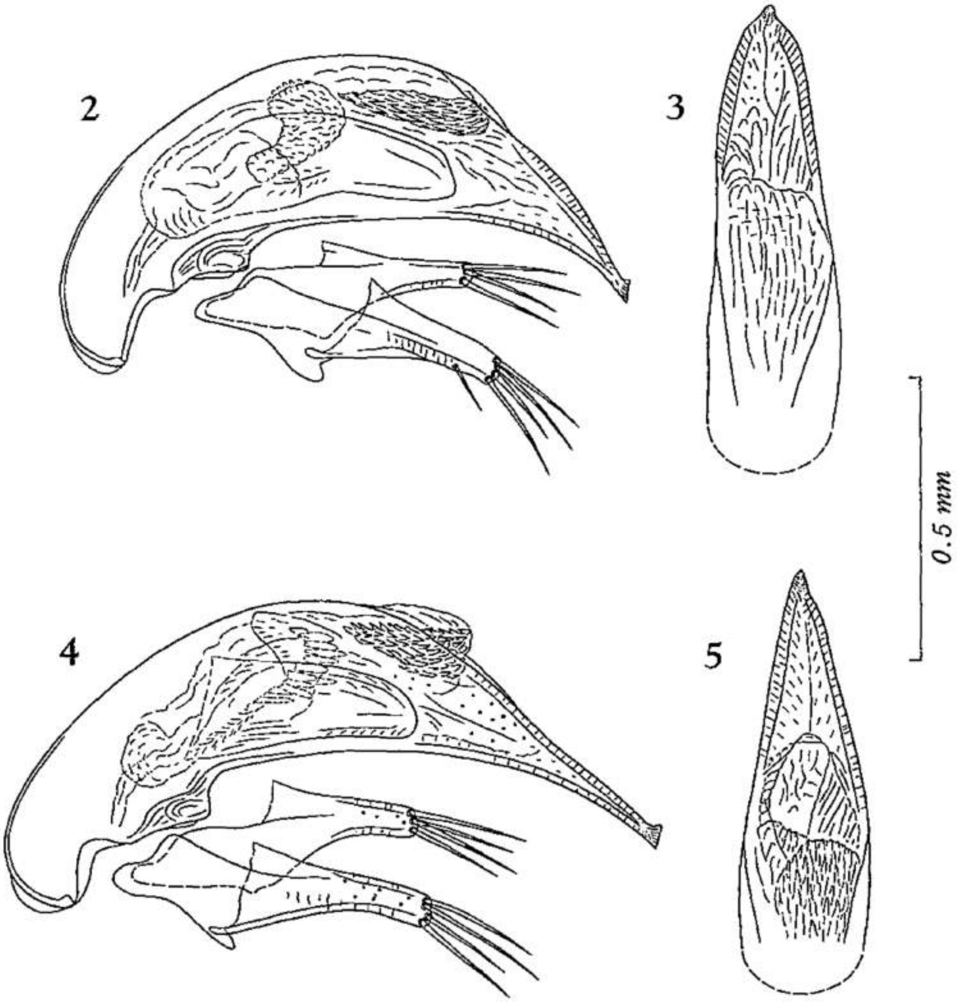
Male genital organ relatively small though moderately sclerotized. Aedeagus only three-tenths as long as elytra, compressed, high at middle, and ventrally curved in both basal and apical parts, with the dorsal margin semicircularly rounded in profile; ventral margin hardly emarginate at middle in profile; basal part small and short, deeply emarginate at the sides of basal orifice, and provided with a very small and narrow sagittal aileron; viewed dorsally, apical lobe fairly wide to near apex, and then abruptly narrowed towards the narrowly tuberculate extremity; viewed laterally, apical lobe fairly wide at base, and rather rapidly attenuate and curved ventrad to pointed tip which is sharply tuberculate on the dorsal side. Inner sac armed with a large copulatory piece in the middle and a patch of heavily sclerotized aciculate teeth just inside apical orifice; copulatory piece asymmetrically spatulate, well sclerotized in apical part but becoming membraneous anteriorly and bearing no clearly defined proximal part; dorso-apical teeth-patch only a little more than one-fourth as long as aedeagus, much shorter as a whole than in *T. yoshihikoi*. Styles fairly narrow, left style obviously longer than the right, each bearing four ordinary apical setae frequently supplemented by a shorter additional seta, which rarely occurs on the ventral margin distant from the apex (cf. Fig. 2).

Variation in elytral chaetotaxy. This species is unusually variable in the chaetotaxy of the elytral dorsum, and the mode of variation seems to suggest that it has been derived from an ancestor that possessed three setiferous dorsal pores of the internal series and two setiferous dorsal pores of the external series, just as is seen at present in *T. yoshikoae* S. UÉNO (1994, p. 24, figs. 1–4) from Mt. Chôkai-zan and *T. cantantimaris* S. UÉNO from Mt. Narumi-yama to be described on later pages, though no specimen bearing the posterior dorsal seta on the 5th stria has so far been found in the Atsumi-daké population of *Trechiama*. This is, however, clearly suggested by its close relative *T. maja* to be described next, in which the posterior pore of the external series exists on both the elytra. The nearest condition to the assumed prototype is exhibited by two female paratypes (22.2% of the total specimens examined), in which the internal series consists of three setiferous dorsal pores and the external series of one dorsal pore, and also by a female bearing three internal dorsal pores on the left elytron.

The holotype and allotype are selected from such individuals as have two internal and one external dorsal pores, since individuals of this type occupy more than a half of the specimens examined, that is, five out of the nine specimens in total, or 55.6% of the type series. In these individuals, both the elytra are lacking in the first (proximal) dorsal pore on the 3rd stria. On the other hand, one male paratype is lacking in the posterior pore of the internal series on the right elytron, and the female that has the proximal pore of the internal series on the left elytron alone possesses only a single dorsal pore on the 3rd stria of the right elytron at a level between the ordinary positions of the two (second and third) dorsal pores.

Thus, 44.4% of the known specimens of *T. watanabeorum* are more or less different in the number and arrangement of the setiferous dorsal pores of the elytra from the remaining ones including the holotype and allotype, a situation that is quite exceptional even in the individually variable members of the *oreas* group of *Trechiama*.

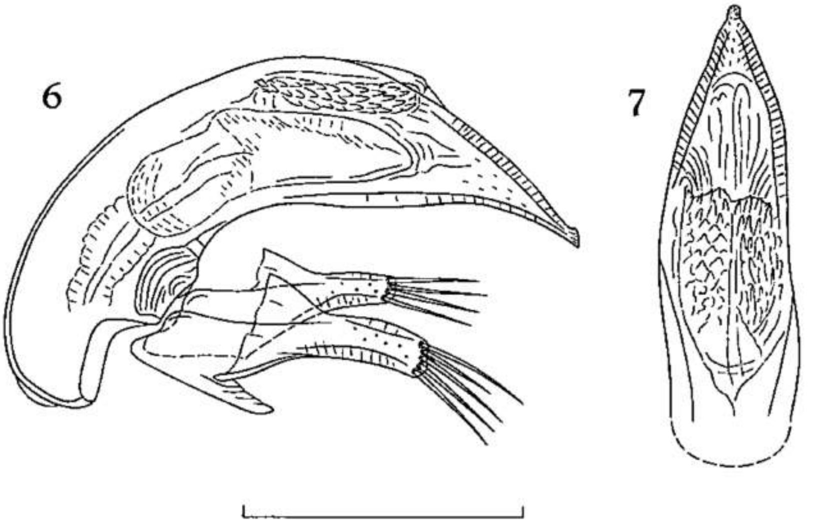
Type series. Holotype: ♂, allotype: ♀, Kowa-shimizu, 2–IX–1982, Y. NISHIKAWA leg. Paratypes: 2♂♂, 3♀♀, Kowa-shimizu, 2–IX–1982, S. UÉNO, Y. NISHIKAWA & Y. WATANABE leg.; 2♂♂, Ni-no-taki, 2–IX–1982, S. UÉNO leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.



Figs. 2–5. Male genitalia of *Trechiama* (s. str.) spp.; left lateral view (2, 4), and apical part of aedeagus, dorso-apical view (3, 5). —— 2–3. *T. watanabeorum* S. UÉNO, sp. nov., from Kowa-shimizu on Mt. Atsumi-daké. —— 4–5. *T. maja* S. UÉNO, sp. nov., from Iriyama-rindô on Mt. Maya-san.

Type locality. Mt. Atsumi-daké, Kowa-shimizu, 240 m in altitude, and Ni-no-taki, 260 m in altitude, both on the western slope, in Atsumi-machi of Yamagata Prefecture, at the western side of northeastern Honshu, Northeast Japan.

Notes. This interesting new species, recognized at first sight on its facies, depigmentation and reduction of the eyes, has been known from two spots in the gully called Yu-no-sawa on the western slope of Mt. Atsumi-daké at the back of the hot spring resort Yuatsumi. The mountain lies on a western branch of the Maya Mountains and is



Figs. 6–7. Male genitalia of *Trechiama* (s. str.) *tripraecipitis* S. UÉNO, sp. nov., from Mt. Sanbôgura-yama of the Maya Mountains; left lateral view (6), and apical part of aedeagus, dorso-apical view (7).

only 4 km removed from the shore of the Japan Sea. The discovery of the endogean trechine beetle near the foot of such a coastal hill is of considerable interest from the zoogeographical viewpoint, since its direct relatives previously known are confined to the high altitude of very recent volcanoes. One of them is *T. yoshikoae* S. UÉNO endemic to Mt. Chôkai-zan about 65 km distant to the north-northeast from Mt. Atsumi-daké, and the other is *T. yoshihikoi* S. UÉNO from Mt. Gassan about 35 km distant to the east by south from the same coastal mountain. We now know of the occurrence of four more species of the same complex on the non-volcanic mountains stretching along the coast of the Japan Sea, that is, *T. watanabeorum*, *T. maja*, *T. tripraecipitis* and *T. cantantimaris*, the latter three of which will be described on later pages of the present paper.

It is possible that this species-complex, to be called the *yoshikoae* complex, originated somewhere on the non-volcanic mountains at the western side of northeastern Honshu and dispersed later onto the nearby volcanoes of the late Pleistocene origin. The Maya Mountains are one of the obvious candidates for the centre of this radiation, since they are the only known mountain range that harbours various forms of the species-complex and since the epigean species to be described later show a lesser modification of the aedeagal apex than the two species occurring on the recent volcanoes.

Most specimens of the type series of *T. watanabeorum* were found near the rheocrene called Kowa-shimizu from beneath stones embedded above the water of the narrow stream in the narrow dim gully. The species is therefore endogean, not upper hypogean, though the compound eyes are reduced and apparently not functional. This is exceptional for a member of the *nivalis* subgroup, though two undescribed cave species belonging to the *oreas* subgroup have been known from the Kitakami Mountains stretching at the eastern side of northeastern Honshu.

Two male specimens of the paratypes were taken near Ni-no-taki about 600 m upstream from Kowa-shimizu. Like the others, they were found from beneath stones embedded in the soil near the water of the narrow stream.

This remarkable new species is dedicated to Yasuaki WATANABE and his wife Michiko in commemoration of Yasuaki's retirement from Tokyo University of Agriculture and in token of deep gratitude for their unfailing friendship.

Trechiama (s. str.) *maja* S. UÉNO, sp. nov.

[Japanese name: Mayasan-nagachibi-gomimushi]

(Figs. 4–5, 8)

Length: 5.35 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *T. watanabeorum* and accordant with it in most details with the exception of the elytral chaetotaxy and the configuration of aedeagal apical lobe. Readily recognized in external morphology on the absence of the third (posterior) setiferous dorsal pore on the 3rd elytral stria and the presence of the second (posterior) dorsal pore on the 5th.

Colour as in *T. watanabeorum*, depigmented and wholly reddish brown. Head as in *T. watanabeorum*, but the eyes are more degenerated, completely flat, about as long as genae, and with imperfect ommatidia; antennae as in *T. watanabeorum*, similarly reaching basal four-ninths of elytra in ♂. Pronotum also similar to that of *T. watanabeorum*, though widest at about three-fifths from base and with the sides a little less strongly arcuate in front; PW/HW 1.48, PW/PL 1.20, PW/PA 1.51, PW/PB 1.38, PB/PA 1.09. Elytra ampler in basal area, with shoulders more distinct and more strongly rounded; sides more feebly arcuate in proximal two-thirds; EW/PW 1.58, EL/EW 1.54; stria 3 with two (anterior and middle) setiferous dorsal pores at about 2/15 and 2/5 from base, respectively, the third (posterior) pore missing; stria 5 also with two setiferous dorsal pores at about 1/9 and 4/7 from base, respectively. Other external features as in *T. watanabeorum*.

Male genital organ similar to that of *T. watanabeorum*, but a little larger, bearing obviously narrower, much more elongate and straightly produced apical lobe which occupies nearly one-third of aedeagus in length. Aedeagus a little more than one-third as long as elytra, generally similar in configuration to that of *T. watanabeorum* with the exception of apical lobe, which is long and straight, gradually attenuate in both dorsal and lateral views, pointed and somewhat tuberculate at the extremity in dorsal view, less acute at the extremity and dorsally tuberculate in lateral view; basal part a little more elongate and less curved ventrad than in *T. watanabeorum*; ventral margin widely and shallowly emarginate in profile. Copulatory piece large but membraneous at the

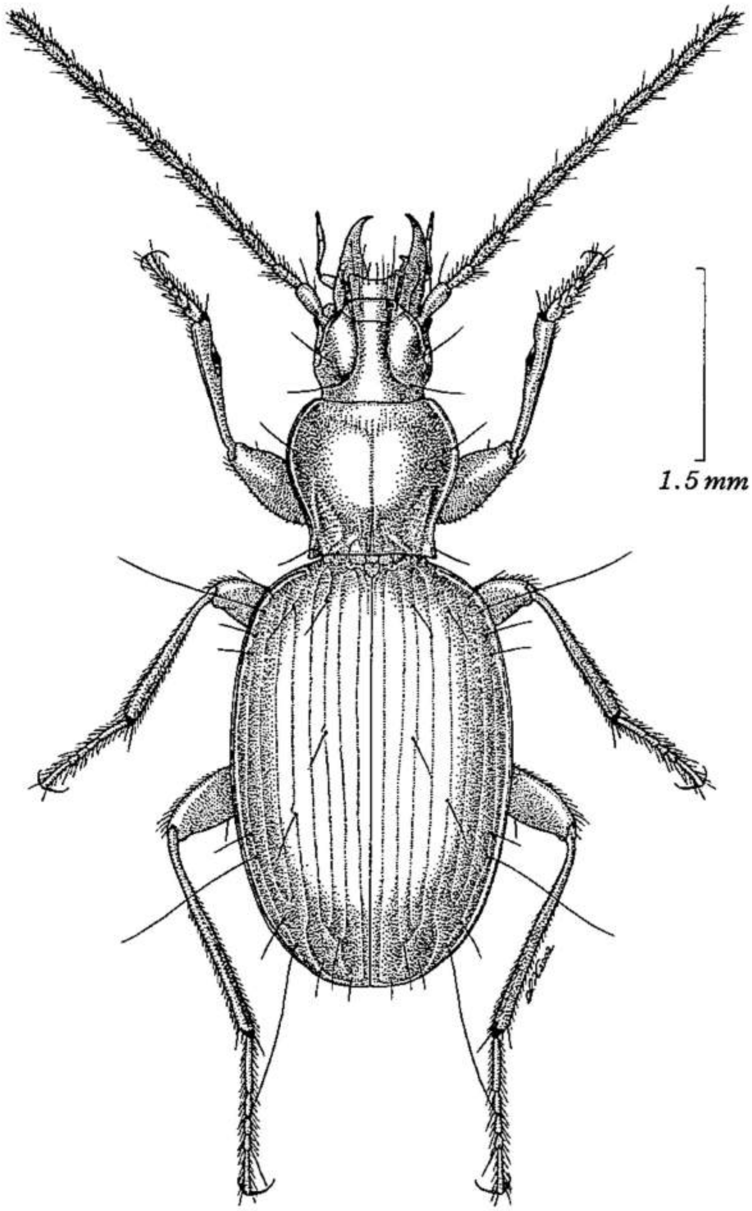


Fig. 8. *Trechiama* (s. str.) *maja* S. UÉNO, sp. nov., ♂, from Iriyama-rindô on Mt. Maya-san.

proximal part, widely rounded at the apex; dorso-apical teeth-patch obviously smaller than in *T. watanabeorum*; an irregular arcuate row of fairly large but very poorly sclerotized teeth present at the left side of copulatory piece and extending to above the sclerite. Styles as in *T. watanabeorum*, each bearing four setae at the apex.

Female unknown.

Type specimen. Holotype: ♂, 1–IX–1982, S. UÉNO leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Mt. Maya-san, Iriyama-rindô, 430 m in altitude at the west-southwestern side, in Atsumi-machi of Yamagata Prefecture, at the western side of northeastern Honshu, Northeast Japan.

Notes. This upper hypogean species is doubtless closely allied to *T. watanabeorum* in view of the similarity in the relatively depressed body, reduction of the eyes and general configuration of the male genitalia, though obviously differing from it in the number and arrangement of setiferous dorsal pores on the elytra. Instead of the first pore of the internal series, the third pore disappears from the 3rd stria in this new species and the posterior pore of the external series exists on the 5th stria.

The single known specimen of *T. maja* was dug out from a colluvium in a small gully shaded by deciduous broadleaved trees in the Minaminezugaseki-gawa Valley at the west-southwestern side of Mt. Maya-san. What seems worth noting is the geographical and topographical relationship between this species and *T. watanabeorum*. The type locality of the former is about 14.4 km distant to the south-southeast in a beeline from that of the latter species beyond the valleys of the Atsumi-gawa and the Oguni-gawa Rivers, and lies on the main ridge of the Maya Mountains, whereas the type locality of *T. watanabeorum* lies near the western end of a western ridge branching off from near Mt. Sanbôgura-yama on the main ridge, on which dwells the epigean congener *T. tripraecipitis*. The type locality of *T. maja* is only 8.3 km distant to the south-southwest along the watershed ridge of the Mayas from that of *T. tripraecipitis*. It is therefore much nearer to the habitats of the epigean species than to those of the endogean one both geographically and topographically. It is possible that the two species with reduced eyes are the older inhabitants of the Maya Mountains, now confined to the endogean or upper hypogean habitats at relatively low places, and that the later immigrants like *T. tripraecipitis* and *T. cantantimaris* occur now at higher parts of the same mountain range.

The new name of this species is formed by a Latinized spelling of Maya [-san], its type locality.

Trechiama (s. str.) ***tripraecipitis*** S. UÉNO, sp. nov.

[Japanese name: Sanbôgura-nagachibi-gomimushi]

(Figs. 6–7, 9)

Length: 4.55–5.55 mm (from apical margin of clypeus to apices of elytra).

Similar in many respects to *T. watanabeorum*, but different from it in the darker

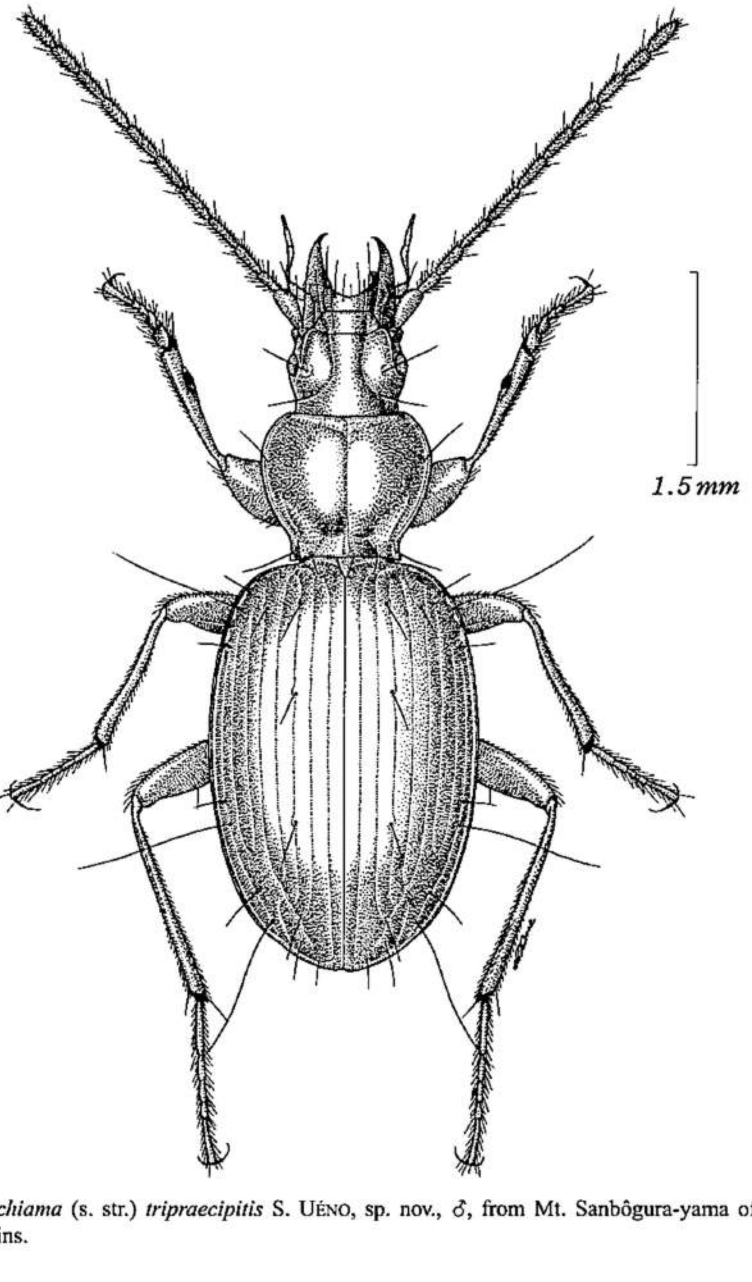


Fig. 9. *Trechiama* (s. str.) *tripraecipitis* S. UÉNO, sp. nov., ♂, from Mt. Sanbôgura-yama of the Maya Mountains.

coloration, less depressed dorsum, particularly the elytra in the male, more clearly marked shoulders of the elytra, which always bear the first (proximal) setiferous dorsal pore of the internal series, a little stouter antennae and particularly legs, less degenerated eyes, and much broader proximal and narrower apical portions of the aedeagal apical lobe in dorsal view.

Colour dark reddish brown to dark brown, shiny; palpi, apical antennomeres, venter of hind body, and legs evidently lighter than dorsum. Head as in *T. watanabeorum*, but the eyes are less degenerated, usually as long as genae and gently convex though sometimes flat; antennae somewhat stouter than in *T. watanabeorum*, though similarly reaching basal four-ninths of elytra in ♂, basal two-fifths of elytra in ♀. Pronotum similar in shape to that of *T. watanabeorum*, but the dorsum is more regularly convex; PW/HW 1.34–1.46 (M 1.41), PW/PL 1.09–1.21 (M 1.17), PW/PA 1.49–1.58 (M 1.55), PW/PB 1.39–1.49 (M 1.43), PB/PA 1.06–1.13 (M 1.08). Elytra somewhat longer on an average than those of *T. watanabeorum*, with more clearly marked shoulders and a little ampler basal parts; EW/PW 1.51–1.61 (M 1.56), EL/EW 1.50–1.60 (M 1.55); humeral and prehumeral borders continuously arcuate in a stronger curvature; sides a little less convergent towards bases; dorsum more regularly convex than in *T. watanabeorum* though more or less depressed in sutural areas before middle, with more deeply impressed striae particularly on the disc; stria 3 with three setiferous dorsal pores at 1/11–1/8, about 1/3 and about 3/5 from base, respectively, the first (anterior) pore always present, the second (middle) pore rather variable in position; stria 5 usually with a single (anterior) setiferous dorsal pore at 1/10–1/7 from base; preapical pore as in *T. watanabeorum*. Legs somewhat stouter than in *T. watanabeorum*.

Male genital organ closely similar to that of *T. watanabeorum*, definitely differing from the latter only in the configuration of aedeagal apical lobe. Aedeagus about one-third as long as elytra, almost identical with that of *T. watanabeorum* in lateral view, though the ventral margin is feebly convex just behind middle and the apical lobe is hardly curved ventrad; viewed dorsally, apical lobe subtriangular in apical half, regularly narrowed towards terminal tubercle which is distinctly recognizable; viewed laterally, apical lobe a little higher at base and almost straightly attenuate to the extremity, which is less acute and obtusely tuberculate dorsad; inner armature as in *T. watanabeorum*; each style usually quadrisetose at the apex but sometimes supplemented with a shorter fifth seta.

Variation in elytral chaetotaxy. In contrast with that of *T. watanabeorum*, the elytral chaetotaxy is relatively stable in *T. tripraecipitis*, only three, or 15%, of the twenty specimens examined being aberrant in this respect. One male paratype lacks in the second (middle) dorsal pore of the internal series on the left elytron, and one female paratype lacks in the third (posterior) dorsal pore on the left elytron. More interesting is a male paratype from the upper collecting site, which has the second (posterior) dorsal pore of the external series at about 2/5 from base on the left elytron. This may be regarded as a reversion just like the exceptional occurrence of the first (anterior) dorsal pore of the internal series on the elytra of *T. watanabeorum*.

Type series. Holotype: ♂, allotype: ♀, 540 m alt., 1–IX–1982, S. UÉNO leg. Paratypes: 8♂♂, 4♀♀, 540 m alt., 1–IX–1982, S. UÉNO & Y. NISHIKAWA leg.; 4♂♂, 2♀♀, 600 m alt., 1–IX–1982, S. UÉNO & Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Mt. Sanbôgura-yama, 540 m and 600 m in altitude at the west-southwestern side, in Atsumi-machi of Yamagata Prefecture, at the western side of northeastern Honshu, Northeast Japan.

Notes. This new species is closely similar to *T. watanabeorum* in both the external and genitalic characteristics, and may represent an ancestral type of the latter. Its body is evidently less depressed and dark coloured, with less degenerated eyes and stouter legs, all indicating that *T. tripraecipitis* is less adapted to subterranean life than *T. watanabeorum*. Besides, lesser modification of the apex of the aedeagal apical lobe is an archaic state, though the difference is not so conspicuous.

Unlike *T. watanabeorum*, this species is epigean, having been found in two short gullies about 1 km apart from each other at the west-southwestern side of Mt. Sanbôgura-yama on the watershed ridge of the Maya Mountains. The lower site (540 m in altitude) is about 11.5 km distant to the east-southeast from the type locality of *T. watanabeorum*, and about 24 km distant to the west by north from that of *T. yoshihikoi*, beyond the valleys of the Bonji-gawa and the Ohtori-gawa, both of which are the main branches of the Aka-gawa River. The upper site (600 m in altitude) is about 1 km distant to the east from the lower. The two collecting sites are similar to each other in environmental condition: both lying in beech forests on the northward slope of a branch ridge, rather gently slanting, moist but devoid of streams at least in dry seasons, and relatively earthy and with many fist-sized stones. All the specimens of the type series were found out from beneath stones lying in shaded places.

The specific name of this new species is derived from its type locality, Mt. Sanbôgura-yama, which means "a mountain with three bluffs" in the local dialect of that part of Northeast Japan.

Trechiama (s. str.) ***cantantimaris*** S. Uéno, sp. nov.

[Japanese name: Narumi-nagachibi-gomimushi]

(Figs. 10–12)

Length: 4.60–5.40 mm (from apical margin of clypeus to apices of elytra).

Similar in many respects to *T. yoshikoae* S. Uéno from Mt. Chôkai-zan, but smaller in size on an average and evidently lighter and more reddish in coloration, with the hind body broader and shorter on an average and with the appendages obviously slenderer. Strikingly different from *T. yoshikoae* in the conformation of aedeagal apical lobe, which is elongated falcate and remarkably compressed, not comparable with that in any other described species of the genus.

Depigmented; colour reddish brown to dark reddish brown, shiny; palpi, apical antennomeres, venter of hind body, and legs more or less lighter than dorsum.

Head wider than long, depressed above, with strongly arcuate frontal furrows not angulate at middle and divergent in front and behind; frons and supraorbital areas rather feebly convex; microsculpture as in *T. yoshikoae*; eyes variable in size but usually flat; genae more or less convex, sometimes tumid, seven-tenths to one and three-tenths as long as eyes; neck fairly wide, with the anterior constriction distinct at the sides; labrum emarginate at the apex; mandibles relatively slender; antennae either reaching basal two-fifths of elytra or a little shorter, antennomeres 7–9 each well more than 2.5 times as long as wide. Pronotum as in *T. yoshikoae*, widest at about two-thirds from base, with the sides more deeply sinuate at a level between one-thirteenth and one-eighth from base and more widely divergent towards sharper hind angles than in *T. yoshikoae*; PW/HW 1.38–1.51 (M 1.44), PW/PL 1.13–1.26 (M 1.17), PW/PA 1.47–1.60 (M 1.53), PW/PB 1.30–1.43 (M 1.37), PB/PA 1.06–1.19 (M 1.12).

Elytra a little broader and shorter on an average than in *T. yoshikoae*, oval to ovate, widest at about or a little before middle, and a little more gradually narrowed towards bases than towards apices; EW/PW 1.43–1.54 (M 1.47), EL/EW 1.50–1.64 (M 1.56); striae somewhat deeper on the disc than in *T. yoshikoae* and more clearly punctate, scutellar striole fairly long; stria 3 with three setiferous dorsal pores at 1/10–1/8, 1/4–3/8 and 3/5–3/4 from base, respectively, the second (middle) pore varying to some extent in its position; stria 5 with two setiferous dorsal pores at 1/11–1/8 and 3/7–1/2 from base, respectively; preapical pore located at the apical anastomosis of striae 2 and 3 behind the level of the terminus of apical striole and a little more distant from apex than from suture.

Legs slenderer than in *T. yoshikoae*; protibiae straight and gently dilated towards apices; tarsi fairly thin, tarsomere 1 longer than tarsomeres 2–3 combined but shorter than tarsomeres 2–4 combined in meso- and metatarsi; in ♂, two proximal protarsomeres widely dilated and stoutly produced inwards at apices.

Male genital organ small though rather heavily sclerotized. Aedeagus nearly one-third as long as elytra, elongate, hardly arcuate at middle, but ventrally curved in both basal and apical parts; basal part elongate, nearly straight, with a small basal orifice whose sides are deeply emarginate; sagittal aileron fairly large; apical lobe unique in conformation, very long, narrow and compressed, occupying about 3/13 of aedeagus in length; viewed dorsally, apical lobe narrow, straight, symmetrical and parallel-sided, with the apical portion lanceolate and acute at the extremity; viewed laterally, apical lobe elongated falcate, ventro-apically produced and gradually attenuate, with the apical portion briefly arcuate ventrad to acute extremity and almost invisibly tuberculate on the dorsal side; ventral margin slightly convex just behind middle in profile. Inner sac armed with a large spatulate copulatory piece at about middle of aedeagus and a dorso-apical patch of heavily sclerotized teeth just inside apical orifice; copulatory piece lightly sclerotized in apical part but becoming membraneous proximally without forming clearly defined base; dorso-apical teeth-patch about two-sevenths as long as aedeagus and forming a compact horizontal apical margin. Styles of moderate size, with narrow apical parts; left style a little longer than the right, each usually bearing four apical setae, which are sometimes supplemented with a shorter fifth seta.

Variation in elytral chaetotaxy. The elytral chaetotaxy is fairly stable in this species, only five, or 10.6%, of the 47 specimens examined being aberrant in the num-

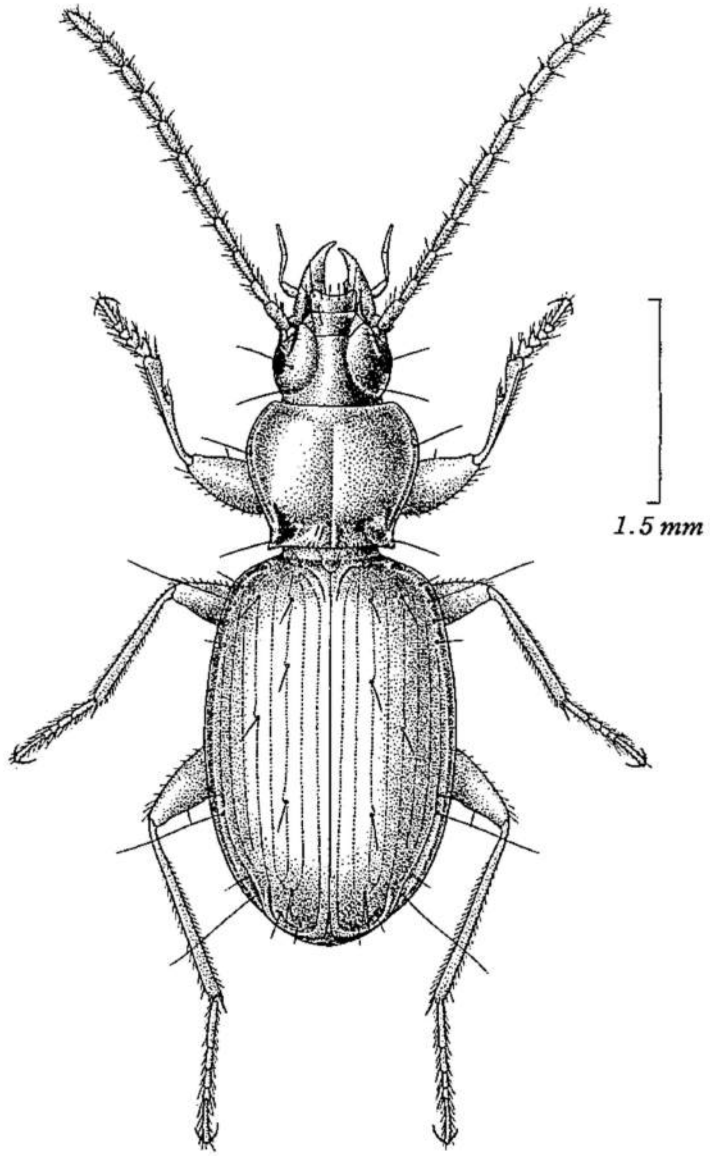
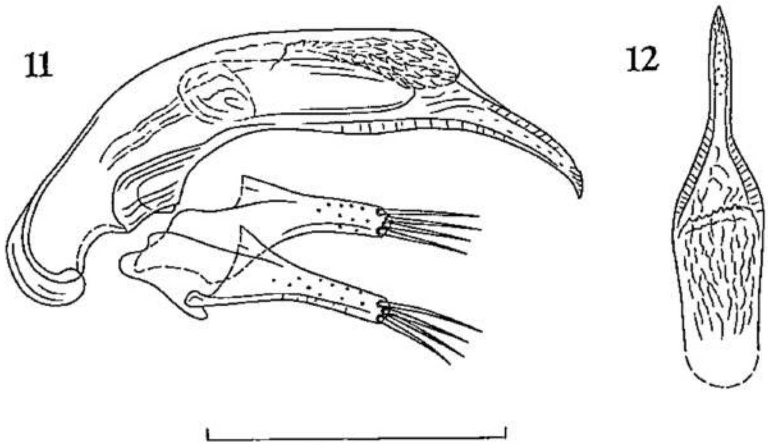


Fig. 10. *Trechiama* (s. str.) *cantantimaris* S. UÉNO, sp. nov., ♂, from Mt. Narumi-yama of the Maya Mountains.

ber of setiferous dorsal pores. One male paratype lacks in the second (middle) dorsal pore of the internal series on the left elytron, and three paratypes (1♂, 2♀♀) are lacking in the third (posterior) dorsal pore on the right elytron. More interesting is a male paratype, in which the second (posterior) dorsal pore of the external series is missing



Figs. 11–12. Male genitalia of *Trechiama* (s. str.) *cantantimaris* S. UÉNO, sp. nov., from Mt. Narumi-yama of the Maya Mountains; left lateral view (11), and apical part of aedeagus, dorso-apical view (12).

on the left elytron, forming a pattern identical with that exhibited by *T. tripraecipitis*.

Type series. Holotype: ♂, allotype: ♀, 3–IX–1982, S. UÉNO leg. Paratypes: 1♂, 18–VI–1968, K. BABA leg.; 3♂♂, 1♀, 19–VI–1968, K. BABA leg.; 24♂♂, 16♀♀ (incl. teneral 2♂♂, 5♀♀), 3–IX–1982, S. UÉNO & Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Mt. Narumi-yama, entrance to Takané-kinzan Mine, 640 m in altitude on the northern slope, in Asahi-mura of Niigata Prefecture, at the western side of northeastern Honshu, Northeast Japan.

Notes. Though unique in the conformation of the aedeagal apical lobe, this new species may have a remote relationship with *T. yoshikoae* S. UÉNO of Mt. Chôkai-zan, which is located at about 85 km north-northeast of Mt. Narumi-yama harbouring *T. cantantimaris*. The two species are similar to each other in external morphology including the elytral chaetotaxy and also in the elongated aedeagus even though the apical lobe is markedly different in conformation between them. They may have been derived from a common ancestor and have become differentiated after the eruption of Mt. Chôkai-zan took place in the northeast of the Maya Mountains sometime in the latest Pleistocene or early in the Postglacial Age.

The type locality of *T. cantantimaris* lies about 14 km south of that of *T. maja*, near the branching point of the Masugata Ridge that connects the Mayas with the Asahis. There is an abandoned gold mine, called Takané-kinzan, on the northern slope of Mt. Narumi-yama (780 m in height), in a beech forest at an elevation of 640 m. The adit is crushed at a point not much removed from the entrance, but a narrow underground stream emerges from the collapse, flows through the remaining adit, debouches onto a platform in front of the entrance, and runs down into a steep forested slope. The trechine beetle was first found in the adit itself, from beneath stones lying at the edges of the stream, but is much more abundant on the outside just in front of the entrance, where it inhabits stone piles bordering the edges of the stream.

The specific name of this new trechine beetle is derived from its type locality, Mt. Narumi-yama, which means "a mountain of the singing sea" in Japanese.

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A New Species of the Subgenus *Amaroschesis* (Carabidae, Harpalini) from Shaanxi in China, with a Redescription of *Trichotichnus* (*Amaroschesis*) *cordaticollis*

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Abstract A new species of the subgenus *Amaroschesis* of the harpaline genus *Trichotichnus* is described from Shaanxi in China under the name *T.* (*A.*) *watanabei*, and its peculiarity in the inner structure of aedeagus is shown. *Trichotichnus* (*A.*) *cordaticollis* SCHAUBERGER is redescribed. Further the validity of the subgenus *Amaroschesis* is discussed.

Many species of the genus *Trichotichnus* MORAWITZ, 1864 have already been described from China. Most of them are known from Sichuan, Yunnan and Gansu. Recently, I obtained many material of carabid beetles collected in Shaanxi lying to the north of Sichuan and found a new species among them. It is similar to *Trichotichnus* (*Amaroschesis*) *cordaticollis* SCHAUBERGER, *T.* (*A.*) *denticollis* SCHAUBERGER and *T.* (*A.*) *jedlickai* SCHAUBERGER, but is distinguished from the three known species by the basal angles of the pronotum and the chaetotaxy of the 6th abodominal sternite as will be pointed out in the description. It is remarkable in that the aedeagus possesses a long peg-shaped sclerite in the inner sac. This character state does not agree with the typical characteristics of the subgenus, but, at the present moment, I do not prefer to change the taxonomic status of the subgenus *Amaroschesis*, in view of the insufficiency of our knowledge about the species with the same peculiarity.

In this paper I am going to describe the new species under the name of *Trichotichnus* (*Amaroschesis*) *watanabei* and to redescribe *Trichotichnus* (*Amaroschesis*) *cordaticollis* SCHAUBERGER. Also I will discuss the taxonomic status of *Amaroschesis*. The new species is named after Dr. Yasuaki WATANABE, who is an excellent staphylinidologist and has made many contributions to the clarification of the fauna of the Asian Staphylinidae. In commemoration of his retirement from Tokyo University of Agriculture, I would like to dedicate this small paper to him. I also hope that he will continue activities in his entomological works in his second life after the retirement.

Before going further, I wish to express my deep gratitude to Dr. Fritz GUSENLEITNER of the Oberösterreichisches Landesmuseum, Linz for his kind loan of SCHAUBERGER's type under his care. Concerning measurement, refer to the previous papers of mine.

Trichotichnus (*Amaroschesis*) *cordaticollis* SCHAUBERGER

(Figs. 1, 3)

Trichotichnus (*Amaroschesis*) *cordaticollis* SCHAUBERGER, 1936, Koleopt. Rdsch., **22**: 14, 19; type loc.: Giufushan [=Mt. Jinfo Shan].

Body oblong, dark reddish brown, shiny, with iridescent lustre on elytra; palpi yellowish brown, antennae and tarsi light brown.

Head large, 0.75 times as wide as the pronotal width, gently elevated on frons, microscopically punctate, with wide interocular space 0.70 times as wide as the width of head including eyes; labrum subtrapezoidal, sides forming sharp angles with slightly emarginate apex; clypeus triangularly protruding at apical corners, transversely depressed behind apex; clypeal suture fine, shallow, and entire; frontal impressions arcuately divergent behind, gradually shallowed towards supraorbital grooves; eyes more or less small, moderate in curvature; temples short, one-fourth the eye length, rather steeply contracted behind; genuine ventral margin widely separated from buccal fissure; antennae slender, short, surpassing pronotal base in apical segments, 3rd segment slightly dilated apicad, 1.13 times as long as the 4th and twice the 2nd; mandibles moderate in shape and robustness; ligula sharply protruding laterad just before truncate apex; labial palpi slender, apical palpal segments missing; paraglossae narrow, parallel-sided, rounded apically, not surpassing ligula; mentum with epilobes narrow and parallel at sides, median tooth regularly triangular, rounded at apex; microsculpture obscure, composed of isodiametric meshes apically on clypeus, partly visible as transverse meshes.

Pronotum cordate, similar in shape to that of *Trichotichnus dainsenicus* HABU, widest just before apical two-fifths, 1.37 times as wide as long, gently declivous apicolaterad; sides rather strongly convergent basad, arcuate in front, obliquely sublinear behind from the widest point, parallel near base; apex fairly emarginate, border broken in middle; base slightly wider than apex, thickly and entirely bordered, hardly emarginate; apical angles moderately produced, narrowly rounded; basal angles acute, slightly smaller than right angle; lateral furrows narrow in apical three-fifths, thence weakly widened basad; basal foveae each large, almost even, with indistinct longitudinal hump in the middle; front transverse impression vague and shallow, hind one obsolete; median line fine, shallow, reaching apex and base; dorsal punctures absent on disc, fine and sparse near apex, dense and coarse in lateral furrows and basal foveae; microsculpture vague, visible as isodiametric meshes near apex, and in the furrows and foveae, partly so as transverse ones.

Elytra oval, one-fourth wider than pronotal width, a half longer than wide, flattened, very sparsely and microscopically punctate; sides gently arcuate, with shallow preapical sinus; apices separately rounded; bases each straight, minutely toothed at outer end, forming a sharp and obtuse angle with lateral border; striae shallow, moderate in width, scutellar striole comparatively long; intervals flat, slightly raised in apico-external portions, without setiferous pore on 3rd interval; marginal series continuous, composed of 26 umbilicate pores; microsculpture observed as vague transverse lines. Hind wings reduced, 0.27 times as long as elytral length.

Ventral surface sparsely and moderately punctate on prepisterna and minutely so on meso- and metepisterna, sparsely with very short pubescence on median part of pro- and metasterna and 2nd and 3rd abdominal segments; metepisternum one-seventh shorter than wide; 6th abdominal segment of ♂ subtruncate at apex and unisetose at each side.

Hind femur trisetose near hind margin; fore tibia weakly dilated distad, trispinous along apico-external margin, and without sulcus, terminal spur long and lanceolate; tarsi quite glabrous, 1st segment of mid tarsus in ♂ bearing adhesive squamae only at apex, hind tarsus as long as the width of head, 1st segment seven-ninths as long as the 2nd and 3rd taken together, two-fifths longer than the 2nd, 3rd 1.63 times as long as the 4th, claw segment quadrisetose along each ventral margin.

Aedeagus (Fig. 3) largely missing; distal margin of apical lobe rounded and thickly bordered.

Female unknown.

Length: 10.9 mm. Width: 4.3 mm.

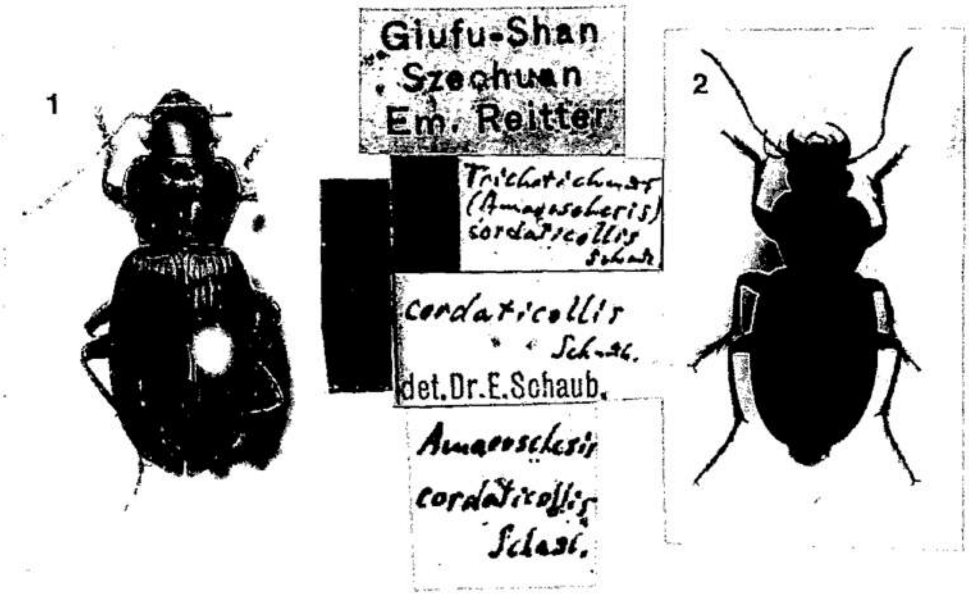
Specimen examined. ♂ (holotype), Giufu-Shan, Szechuan, Em. REITTER. (Preserved in Oberösterreichisches Landesmuseum, Linz).

Trichotichnus (Amaroschesis) watanabei N. ITO, sp. nov.

(Figs. 2, 4, 5)

Body robust, fairly thick, widely oblong, black, shiny, with iridescent lustre on elytra; buccal part yellowish brown, antennae, tibiae and tarsi light to moderate reddish brown, labrum, mandibles and femora dark brown.

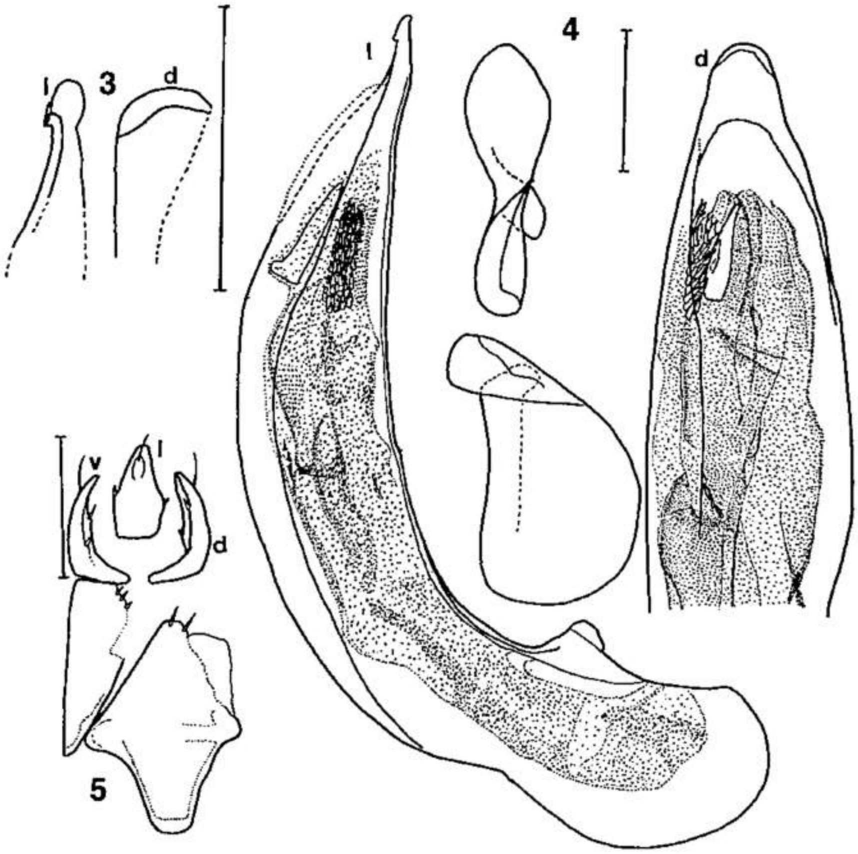
Head fairly convex, moderate in width, about two-thirds as wide as the pronotal width, with very sparse and microscopic punctures; labrum subtrapezoidal, shallowly and triangularly emarginate at apex; clypeus not thick, with or without vague rugosities near sides; clypeal suture fine, shallow, and entire; frontal impressions shallow but clear in apical portions, obliterated near supraorbital grooves; eyes rather small, weakly convex; temples gently oblique, rather elongate, one-third the eye length; genuine ventral margin of eye widely isolated from buccal fissure; antennae slender, apical three segments surpassing the pronotal base, 3rd segment pubescent in apical half, as long as the 4th, and twice the 2nd; mandibles blunt at tips, terebral tooth of left mandible weakly and roundly produced and that of right one slightly swollen, retinacular tooth of left one blunt triangular and that of right one widely triangular; palpi slender, 3rd segment of labial palpus one-tenth shorter than the 2nd; ligula wide, wedge-shaped, acutely protruding laterad at apical corners; paraglossae narrow, prolonged a little beyond ligula; epilobes of mentum weakly widened apicad; microsculpture fine, mostly obscurely visible, consisting of isodiametric meshes on apical portion of clypeus and vertex and of transverse meshes on the remaining portions.



Figs. 1–2. Habitus of *Trichotichnus* spp. —— 1, *T.* (*Amaroschesis*) *cordaticollis* SCHAUBERGER, holotype, and labels; 2, *T.* (*A.*) *watanabei* N. ITO, sp. nov.

Pronotum subcordate, widest at apical two-fifths, medium in convexity, two-fifths wider than long; sides arcuate from apex to middle, thence almost straightly convergent backwards and not or hardly sinuate just before base; apex gently emarginate, with border entire or medially interrupted; base 1.13–1.16 times as wide as apex, hardly bisinuate, and thickly bordered lengthwise; apical angles narrowly rounded; basal angles a little larger than right angle, barely produced laterad; lateral furrows gradually widened from apex to middle, where the furrows each counters to a hump in basal fovea; the fovea large, with long and shallow groove; front transverse impression obscurely to more or less clearly carved, hind one obsolete; median line clear, reduced near apex and base; dorsal punctures widely absent on disc, vague near apex, rather coarse in lateral furrows and basal foveae whose punctures are confluent in part; microsculpture obscure, observed as transverse meshes on disc and as isodiametric ones in lateral furrows and basal foveae.

Elytra oval, 1.37–1.44 times as long as wide, 1.24–1.28 times as wide as the pronotal width, uniformly convex, very sparsely with extremely minute punctures; sides clearly arcuate in humeri, rather deeply sinuate before apices; apices narrowly rounded or subangulate at tips, separated from each other; bases shallowly emarginate, acutely and minutely protrudent at lateral tips; humeral angles very obtuse and not rounded; striae relatively wide, deep, and finely and clearly crenulate, scutellar striole short, sometimes rather long; intervals flat on disc, 3rd interval devoid of setiferous



Figs. 3–5. Genitalia of *Trichotichnus* spp. —— 3, Apical part of male genitalia of *T.* (*Amaroschesis*) *cordaticollis* SCHAUBERGER; 4, male genitalia of *T.* (*A.*) *watanabei* N. ITO, sp. nov.; 5, female genitalia of *Trichotichnus* (*A.*) *watanabei* N. ITO, sp. nov.; l, lateral view; d, dorsal view; v, ventral view. Scale: 0.5 mm.

pore; marginal series continuous, somewhat wide in spaces of middle umbilicate pores, composed of 24–27 pores; microsculpture finely visible as transverse lines. Hind wings fully reduced, one-fifth the elytral length.

Ventral surface densely punctate on pro- and metepisterna and lateral portions of metasternum and of 1st and 2nd abdominal sternites; metepisternum two-sevenths wider than long; 6th abdominal sternite in both sexes bisetose at each side and similarly weakly arcuate to apical margin.

Hind femur trisetose near hind margin; fore tibia bearing vague sulcus, tri- or quadrisetose apico-externally, terminal spur slim and lanceolate; tarsi long, mid tarsus of ♂ with adhesive squamae only at apex of 1st segment, hind tarsus in ♂ one-seventh longer than and in ♀ as long as the width of head, 1st segment three-fourths as long as the 2nd and 3rd taken together, 2nd almost equal in length to the 3rd and twice the 4th, claw segment quadrisetose along each ventral margin.

Aedeagus (Fig. 4) in lateral aspect robust, weakly arcuate, thinned apically, slightly thickened at tip; apical orifice widely opening, inner sac with long peg-shaped sclerite near apex, cluster of small sclerites in obliquely ventral part of the sclerite, and with seriate minute sclerites in the middle; apical lobe weakly narrowed distad, widely rounded and bordered at distal margin; ventral surface narrowly and longitudinally concave before apex to near middle, even near apex. Stylus (Fig. 5) thick, gently curved, with a small spine along each external margin; basal segment bearing three short spines apico-externally; valvifer bisetose at apex.

Length: 11.0–12.6 mm. Width: 4.7–5.1 mm.

Holotype: ♂, Qinling Mts., alt.–1,200 m, Xunyangba env., Shaanxi Prov., China, 20–V~10–VI–2001. (Preserved in the Osaka Museum of Natural History, Osaka). Paratypes: 13♂♂, 7♀♀, same data as the holotype.

This new species is allied to *T.* (*A.*) *cordaticollis* SCHAUBERGER, but the body is larger in size, the pronotum is not parallel-sided near base, the pronotal basal angles are larger than right angle, and the basal foveae each possesses a large hump. It is also allied to *T.* (*A.*) *denticollis* SCHAUBERGER, but is distinguished from the latter by the pronotum not sinuate before the base at sides and not produced at basal angles and the 6th abdominal sternite bisetose at each side instead of being unisetose.

This species is similar to *T.* (*A.*) *jedlickai* SCHAUBERGER, but the pronotum is not sinuate before the base and larger at basal angles than right angle and the 6th abdominal sternite is not unisetose on each side, but bisetose.

This new species is peculiar in possessing a long peg-shaped sclerite in the aedeagal inner sac. *Trichotichnus* (*A.*) *denticollis* SCHAUBERGER also has such a sclerite. The possession of the sclerite may affect the subgeneric validity of *Amaroschesis*.

This subgenus was defined by a combination of such characters as the moderate to shallow frontal impressions, the short metepisterna, and the absence of peg-shaped sclerite in the aedeagal inner sac (KATAEV & ITO, 1999). They mentioned that the subgenus may be closely related to the *leptopus* group of the subgenus *Trichotichnus* and is only discriminated by the shorter metepisterna and the absence of the sclerite. Because of the possession of the sclerite in *T. denticollis* and *T. watanabei*, the difference between *Amaroschesis* and the *leptopus* group is limited to the length of the metepisterna. Shortening of the metepisterna commonly occurs in accordance with reduction of the hind wings. It is therefore doubtful if the short metepisternum has some meaning for subgeneric classification. Since only two species exceptional in this respect are known at the present moment, and since more satisfactory data and detailed researches including phylogenetic analysis are needed for determining their taxonomic status, I prefer to retain the subgenus *Amaroschesis* for the time being.

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A New *Hexagonia* (Coleoptera, Carabidae) from Southwest Japan

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Abstract A new species of the carabid genus *Hexagonia* is described from Southwest Japan, under the name of *H. watanabei*. It is mainly characterized by the colour on the dorsum, elytral spots, shape of the pronotum, and the anal sternite with two pairs of setae in the male, three pairs in the female.

It has been known that an undetermined species of the genus *Hexagonia* was collected from the subtropical islands of Southwest Japan. It was found as a by-product of collecting longicorn beetles, mainly by beating and sweeping methods.

Recently, the second author was able to locate natural habitats of this species, so that our material now at hand is adequate for scrutinizing individual variation, above all its body size, coloration and elytral chaetotaxy. In this paper, we will describe it under the name of *H. watanabei* in commemorating Dr. Yasuaki WATANABE's retirement from Tokyo University of Agriculture.

The abbreviations used herein are as follows: L – body length, measured from apical margin of clypeus to apices of elytra; HW – greatest width of head; PW – greatest width of pronotum; PL – length of pronotum, measured along the median line; PA – width of pronotal apex; PB – width of pronotal base; EL – greatest length of elytra; EB – width of elytral base, measured between lateral ends of basal border; EW – greatest width of elytra; M – arithmetic mean; NSMT – National Science Museum (Nat. Hist.), Tokyo; KPMNH – Kanagawa Prefectural Museum of Natural History. The PA value was taken as the widest part of neck, since the pronotal apical angles are extremely obtuse.

We are deeply indebted to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for reading the manuscript of this paper. Dr. Yasuaki WATANABE has affectionately watched our study of carabid beetles and has given us helpful advice for a long time.

Our special thanks are due to Dr. Svatopluk BILÝ and Dr. Ivo KOVÁŘ of the National Museum, Prague, for loan of the type material of *H. apicalis* SCHMIDT-GÖBEL under their care. We are also indebted to the following entomologists for their kind offer of the materials used in this study: Dr. Yoshiro KUROSA, Dr. Shûhei NOMURA, Miss Shiho ARAI, Messrs. Katsumi AKITA, Masao ITO, Haruki KARUBE, Masaaki KIMURA, Isao MATOBA and Takashi SHIMADA.

Hexagonia watanabei MORITA et TOYODA, sp. nov.

[Japanese name : Watanabe-hiranaga-gomimushi]

(Figs. 1 – 9)

Diagnosis. Head black; pronotum reddish brown; elytral black spot anteriorly with emarginate limit on each side; mentum tooth wide; gula with transverse wrinkles; mentum with irregular wrinkles; sides of pronotum usually moderately arcuate, rarely weakly angulate; elytral sides slightly divergent posteriad; anal sternite with two pairs of setae in ♂, three pairs in ♀.

Description. L: 5.48–7.05 mm. Body small with rather narrow elytra.

Head black; neck blackish brown to dark brown; pronotum reddish brown; elytra reddish brown or lighter than pronotum, and with black spots; ventral side brown; mandibles, labrum, apical part of clypeus, and antennae brown; gula, mouth parts and legs yellowish brown.

Head large; frontal furrows wide, shallow, and a little divergent posteriad and reaching the mid-eye level; PW/HW 0.91–0.98 (M 0.94) in 19♂♂, 0.90–0.97 (M 0.95) in 17♀♀; lateral grooves deep, linear and slightly arcuate inwards at the posterior ends; frons depressed, with several wrinkles and melange of coarse and fine punctures; clypeus convex, with deep posterior suture; anterior supraorbital pore located a little before the mid-eye level; posterior ones apart from the post-eye level; genae strongly and widely tumid and smooth; neck constriction deep; neck narrow and dilated posteriad in dorsal view; gula and ventral sides of genae with deep transverse wrinkles; mentum tooth very wide and obtuse at the tip; apex of labrum moderately emarginate; right mandible with two teeth (see apico-dorsal view); mentum with irregular wrinkles; microsculpture vanished; surface with microscopic punctures; antennae rather short and stout; antennal segments I with a seta on each side, sometimes with an additional seta, rarely with two additional ones; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.34 : 0.63 : 0.78 : 0.72 : 0.66 : 1.06 in 19 ♂♂ and 17 ♀♀.

Pronotum narrow; PW/PL 1.03–1.13 (M 1.09) in 19♂♂, 1.05–1.16 (M 1.11) in 17♀♀; PW/PA 1.95–2.30 (M 2.09) in 19♂♂, 1.97–2.16 (M 2.08) in 17♀♀; PW/PB 1.54–1.80 (M 1.63) in 19♂♂, 1.57–1.73 (M 1.65) in 17♀♀; PA/PB 0.71–0.85 (M 0.78) in 19♂♂, 0.75–0.84 (M 0.80) in 17♀♀; apical margin slightly emarginate; sides widely and strongly arcuate in front due to inclusion of apical angles, moderately arcuate at the widest part, weakly convergent posteriad, and then slightly sinuate before hind angles; apical angles extremely obtuse; hind ones rectangular, though the apices are obtuse; disc flat, and sparsely and weakly punctate; reflexed lateral sides wide at the

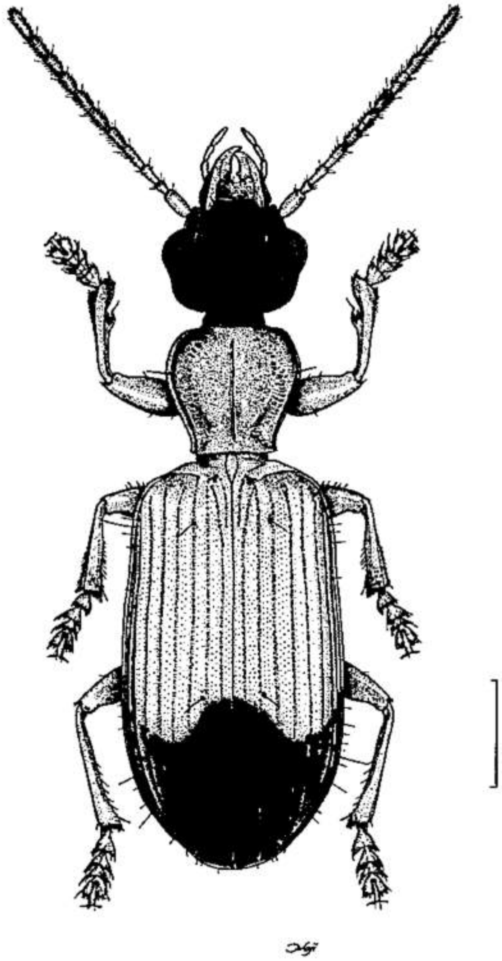
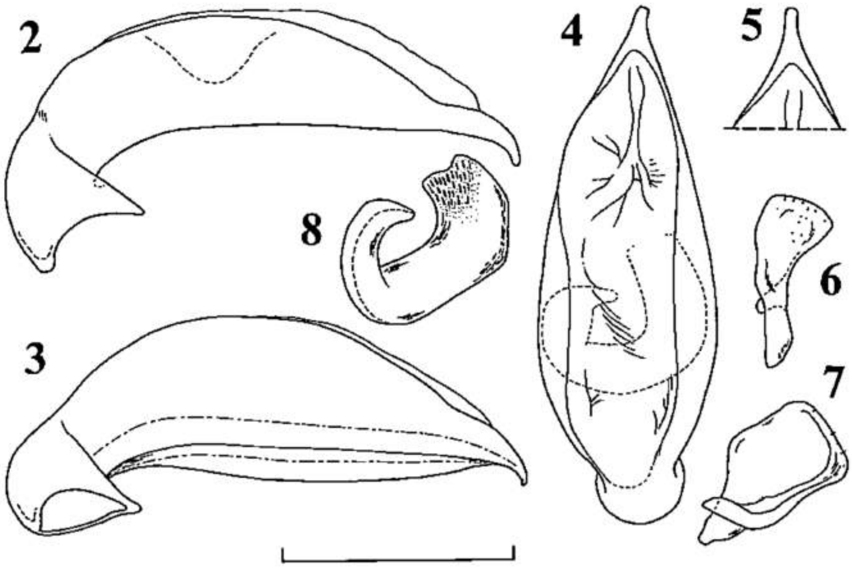


Fig. 1. *Hexagonia watanabei* MORITA et TOYODA, sp. nov., ♂ from Nakano, Iriomote Is., Southwest Japan. Scale: 1.0 mm.

widest part of pronotum, and with anterior marginal seta, becoming narrower towards base and apex on each side; median line deep, rather wide and clearly impressed; microsculpture vanished.

Elytra rather wide; EW/PW 1.54–1.75 (M 1.63) in 19♂♂, 1.56–1.69 (M 1.62) in 17♀♀; EB/EW 0.47–0.53 (M 0.50) in 19♂♂, 0.46–0.51 (M 0.49) in 17♀♀; EL/EW 1.67–1.93 (M 1.79) in 19♂♂, 1.74–1.86 (M 1.80) in 17♀♀; basal border usually joining stria 3 and not bordered at interval III, rarely weakly so at the interval; shoulders widely rounded; sides very weakly arcuate towards the widest part which is at about basal 3/5; intervals moderately convex; striae clearly impressed and rather coarsely



Figs. 2–8. Male genital organ of *Hexagonia watanabei* MORITA et TOYODA, sp. nov., from Iriomote Is. —— 2, Aedeagus, left lateral view; 3, same, oblique left ventro-lateral view; 4, same, dorsal view; 5, apical part of aedeagus, apico-dorsal view; 6, left paramere, left lateral view; 7, right paramere, left lateral view; 8, copulatory piece, dorsal view. Scale: 0.5 mm.

punctate; scutellar striole long and located on interval I; dorsal pores situated on intervals III and V; first pore on interval III and close to stria III, and situated at basal 3/20; second one on interval III, close to stria II, and situated at basal 3/5; third one situated on interval III and at basal 4/5; fourth pore situated on interval V at basal 7/10 and joining stria 5; marginal series usually composed of 5+1+8 pores, rarely 5+1+9 or 10 in number; microsculpture composed of fine and short transverse lines in front, partially of wide or isodiametric meshes, and partially vanished.

Legs short; metatrochanter short, widest at basal part, becoming narrower towards and simply rounded at the apex; metafemur with three setae on each side on ventral side; protarsus wide in ♂ and ♀; in ♀, proximal four protarsomeres furnished beneath with white pubescence; claw segment of metatarsus with some hairs on ventro-lateral sides.

Male genital organ rather small; aedeagus broad and with short apical lobe; basal part strongly contracted; apical lobe curved ventrad and blunt at the extremity; ventral side with a longitudinal carina; right paramere wider than the left one; surface of each paramere with microscopic hairs. Inner sac armed with a copulatory piece at about middle; copulatory piece C-shaped, flat and moderately sclerotized.

Variation of pronotal sides. The pronotal sides are usually moderately arcuate and rarely angulate at the widest parts. Even in the latter case, degree of angulation is

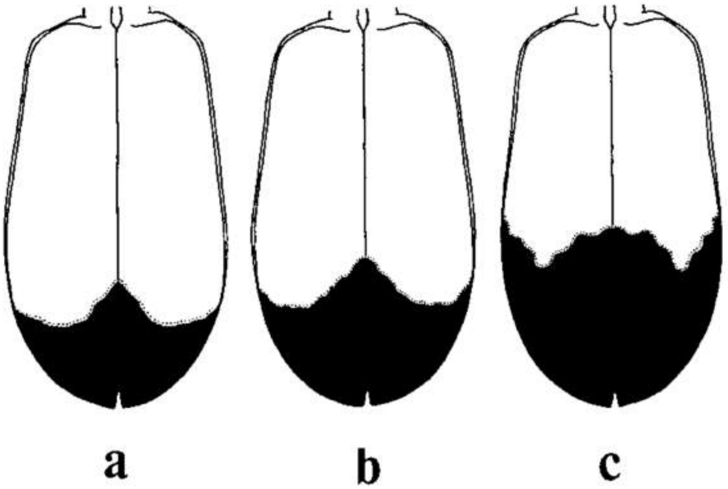


Fig. 9. Variation of elytral spots in *Hexagonia watanabei* MORITA et TOYODA, sp. nov., from Iriomote Is.; a, smallest specimen; b, moderate-sized specimen; c, peculiarly formed specimen.

always weaker than in *H. terminata* KIRBY (1825, p. 564).

Variation of elytral spots. Individual variation is presented in Fig. 9.

Elytral chaetotaxy. In 1♂, the third pore is located near the elytral base. In 1♀, an extra pore is present on the interval IV of the left elytron. In another ♀, the third pore is lacking on the left elytron.

Anal sternite. The following aberrancy occurs in the anal sternite: in ♂, rarely with one or two additional seta(e) on one side; in ♀, with an additional seta on one side. Extremes are as follows: in 2♂♂, with a short additional seta on one side; in 2♂♂ and 1♀, an ordinary seta lacking on one side; in 1♀, with a pair of short additional setae.

Type series. Holotype: ♂, allotype: ♀, Nakano, Iriomote Is., 2–V–1999, S. ARAI & K. TOYODA leg. (NSMT). Paratypes: 41♂♂, 28♀♀, Nakano, 29–IV–1998, K. TOYODA leg.; 13♂♂, 8♀♀, same locality, 2–V–1999, S. ARAI & K. TOYODA leg.; 1♀, Sonai, Iriomote Is., 28–V–1997, J. OKUMA leg.; 1♀, Taishô-ike, Ôtomi-rindô, Iriomote Is., 29–V–1997, H. KARUBE leg. (KPMNH); 1♀, same locality, 26–III–1999, I. MATOBA leg.; 1♂, Ôtomi, Iriomote Is., 15–IV–1998, H. ONODERA leg.; 3♀♀, Nakamagawa-rindô, Iriomote Is., 15–IV–1998, M. ITO leg.; 2♀♀, Hoshidate, Iriomote Is., 18–III–2001, Y. KUROSA leg.; 1♀, Mt. Omoto-dake, Ishigaki Is., 8–V–1974, H. IRIE leg. (NSMT); 1♂, same locality, 9–IV–1975, H. IRIE leg. (NSMT); 3♂♂, 1♀, same locality, 4–IV–1995, K. TOYODA leg.; 10♂♂, 3♀♀, same locality, 3–IV–1995, K. TOYODA leg.; 12♂♂, 12♀♀, same locality, 18–III–1997, K. TOYODA leg.; 2♂♂, 1♀, same locality, 26–V–2001, T. SHIMADA leg.; 1♂, Mt.Yonaha-dake, Okinawa-hontô Is., 29–III–1987, I. MATOBA leg.; 1♂, Yona, Okinawa-hontô Is., 30–III–1987, I. MATOBA leg.; 1♂, Benoki, Okinawa-hontô, 3–V–1989, HIRATATE leg.; 1♀, Hiji, Kunigami-son, Okinawa-hontô Is., 31–V–1995, M. KIMURA leg.; 3♂♂, 2♀♀, Ôkuni-rindô, Kunigami-son, Okinawa-hontô Is., 22–III–2001, K. TAKAHASHI leg.

Localities of the type series. Nakano, Hoshidate, Nakamagawa-rindô, Ôtomi, Sonai and Taishô-ike on Iriomote Is.; Mt. Omoto-dake on Ishigaki Is.; Ôkuni-rindô, Mt. Yonaha-dake, Yona, Benoki and Hiji on Okinawa-hontô Is.

Range. Southwest Japan (Ishigaki Is., Iriomote Is. and Okinawa-hontô Is.).

Notes. The Asian members of the group of *Hexagonia terminata* inclusive of this new species and *H. apicalis* SCHMIDT-GÖBEL (1846, p. 51) are mainly characterized by the coloration on the dorsal side and the presence of elytral spots. Though we were unable to study male genital organ of the latter species, they are closely similar to each other in their male genital organ including the structure of the inner sac.

It is difficult to determine the true affinity of this new species, but it can be determined with confidence by the peculiarities of the following body parts: head black; pronotum reddish brown; elytral black spot anteriorly with emarginate limit on each side; gula with transverse wrinkles; sides of pronotum moderately arcuate; and anal sternite with two pairs of setae in the male, three in the female.

Unfortunately, aberrancy in setal number is sometimes found on the anal sternite of this species, and individual variation is also found in the shape of the pronotum. This makes identification of single specimens difficult.

At the type locality, Nakano, all the specimens were found from the spaces between leaf sheaths and stems of the monocotyledonous plants, *Carex* sp. growing on the moist ground exposed to the sun. Contrary to this, the collecting spots on Mt. Omoto-dake were at the top of the mountain and on dry ground. The majority of the specimens were found from the spaces under leaf sheaths of the so-called screwpine, *Freycinetia formosana*.

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Discovery of a Third Species of the Chlamydopsinae (Coleoptera, Histeridae) in Japan

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Abstract A new species of the histerid genus *Orectoscelis* is described from Yonaguni-jima Island, the Ryukyus, under the name *Orectoscelis shihoae* sp. nov. This new species is a third representative of the subfamily Chlamydopsinae in Japan. As it was extracted from the sifted debris of leaf-litter, its actual host is unknown, but several ant species extracted with the beetle give a clue for further searches. A key to the species is provided for chlamydopsine histerids distributed in Japan and Taiwan.

The amazing discovery of an *Eucurtiopsis*-like histerid species in the Ryukyus was recently informed me from a student of entomology, Ms. Shiho ARAI. She recently visited Yonaguni-jima Island, the southwesternmost island of Japan and the nearest one to Taiwan, and collected litter-dwelling insects together with the pselaphine staphylinids. Sifted residue of leaf-litter was sent to Tokyo University of Agriculture, Atsugi, and was placed in Tullgren funnels for extracting insects. In the sorted materials, she found a strange beetle, which turned out to be a third representative of the Japanese chlamydopsine histerids. Fortunately, several specimens were available for my study. This species will be described in the present paper under the name *Orectoscelis shihoae* sp. nov. The abbreviations used herein are the same as those explained in my previous paper (NISHIKAWA, 1995).

Before going further, I wish to express my deep gratitude to Ms. Shiho ARAI, Tokyo University of Agriculture, Atsugi, for giving me the opportunity to study on the present new species. Special thanks are also due to Drs. Masahiro ÔHARA, Hokkaido University Museum, Sapporo, and Michael S. CATERINO, Santa Barbara Museum of Natural History, CA, U.S.A., for their kindness in critically reading the original manuscript of this paper. Mr. Koji TOYODA of Saitama Prefecture offered me his drawing of the new species. This paper seems suitable for dedication to Dr. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture, since the specimens used were obtained by one of his last students.

Description

Orectoscelis shihoae M. NISHIKAWA, sp. nov.

[Japanese name: Kobunashi-kobu-enmamushi]

(Figs. 1–4)

Male and Female. Length 1.85–2.15 mm in male, 2.2 mm in female (from apical margin of pronotum to apices of elytra); width 1.34–1.35 mm in male, 1.5 mm in female. Body similar in outline to those of the Japanese *Eucurtiopsis* species, but elytral elevations are absent, with the thorax black, the remainings reddish black, except for antennal funicles and clubs yellowish brown, almost clothed with whitish short scale-like setae and slender erect setae, the scale-like ones of the female longer than in the male.

Head foveate, parallel-sided and somewhat carinate in lateral margins, punctate between antennal insertions. Labrum semicircularly elevated, rounded apicad, but the clypeo-labral suture is indistinct. Eyes moderately prominent. Antennae with scape subtriangular, deeply excavated at outer side, foveate on dorsal surface as on head, the foveae bearing scale-like setae, punctate on ventral surface; funicle without setae; club longitudinally elliptical, 2.2–2.8× in male and 2.5× in female as long as wide, with silky hairs.

Pronotum subtrapezoidal, gibbous, widest at base, PW/HW 3.72–3.92 (M 3.82) in male, 4.32 in female, PW/PL 1.27–1.40 (M 1.34) in male, 1.38 in female; sides convergent apicad; cavities of antennae strongly emarginate when seen from above, with inner edges angulate; basal angles angulate; basal margin acuminate at the middle; disc strongly depressed in antero-lateral portions, with a pair of projections in medio-apical portion and a low carina along the mid-line; surface densely foveate, the foveae bearing short whitish scale-like setae, with sparse microsculpture formed by irregular lines. Scutellum invisible from above. Hind wings complete.

Elytra convex, widest at the middle, EW/PW 1.38–1.44 (M 1.41) in male, 1.39 in female, EL/PL 1.71–1.79 (M 1.75) in male, 1.83 in female, EL/EW 0.93 in male, 0.95 in female; sides arcuate in apical 1/3; apices conjointly arcuate; disc slightly depressed elliptically inside of each humerus, swollen before humeral angles, gently convex in the middle portions, with fine marginal striae along sutures and basal margins; trichome fields exhibited in each outer corner of the humeral depressions, small, cleft, transversely semicircular in shape, opening anteriorly, the trichomes golden, short, rounded apically, situated at the edges of the clefts; elytral surface foveate, except glabrous around trichome fields, the foveae slightly smaller and sparser than on pronotum, clothed with scale-like setae as those of pronotum and slender erect setae mainly in lateral portions, with microsculpture as on pronotum. Epipleura flat, glabrous, with marginal stria strongly sinuate at the level of the middle of elytra (Fig. 2).

Propygidium transverse (ca. 1 : 2.3), clothed with setiferous foveae as those on

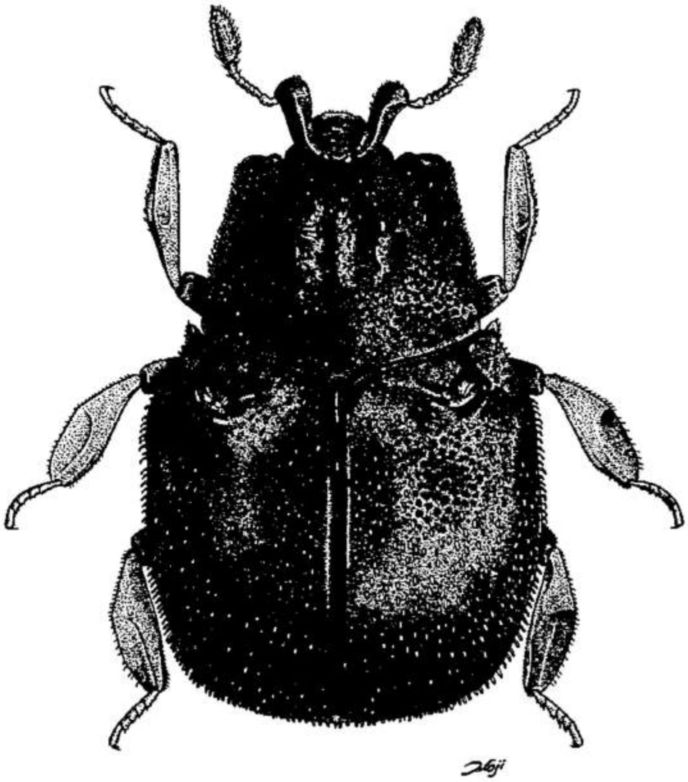
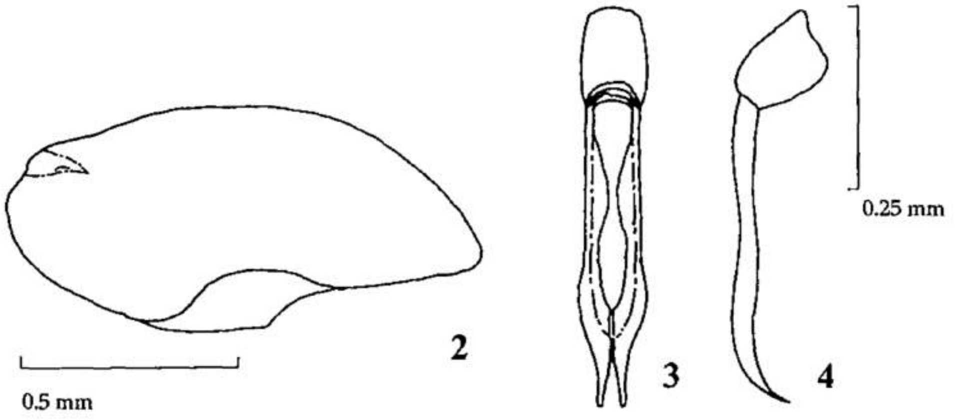


Fig. 1. *Orectoscelis shihoae* M. NISHIKAWA, sp. nov., ♀, from Kubura-dake, Yonaguni-jima Is., Ryukyus, SW Japan.

elytra, though with only scale-like setae. Pygidium about 1.3× as long as wide, with foveae somewhat smaller than those on propygidium. Prosternum convex, slightly depressed, indistinctly carinate longitudinally at the middle, the carina extending to the posterior portion of prosternal process; surface foveate and setiferous as on pronotum. Prosternal process depressed in closely punctate middle portion except for the carina, slightly rounded in posterior margin. Mesosternum short, transverse, emarginate at front margin and straight at posterior one, sparsely foveate and closely punctate among foveae, without setae. Epimera projected outwards at its anterior tips. Metasternum sparsely foveate, setiferous, the setae scale-like but shorter than those on elytra, shiny among foveae, with median longitudinal suture distinct. Abdomen convex, wider than long (AW/AL 3.29 in the holotype), with punctures as those on metasternum. Aedeagus as shown in Figs. 3–4.

Legs with femora elongate, tibiae angulate outwards, widest at basal third, narrowed to the apex; ventral surface clothed with short scale-like setae and slender short hairs on each leg.



Figs. 2–4. *Orectoscelis shihoae* M. NISHIKAWA, sp. nov. —— 2, Left elytron and epipleuron in lateral view, ♂; 3, aedeagus, dorsal view; 4, same, lateral view.

Type series. Holotype: ♂, Kubura-dake, 150 m in alt., Yonaguni-jima Is., Ryukyus, SW Japan, 18–VI–2001, S. ARAI leg. Paratypes: 1♂, 1♀, same locality and collector as for the holotype but 180 m in alt. and 16–VI–2001. The holotype is deposited in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture, Atsugi, and the paratypes will be separately deposited in those of the Hokkaido University Museum, Sapporo, and the National Science Museum (Nat. Hist.), Tokyo.

Other specimen examined. 1♀, same data as for the paratypes. This specimen is almost entirely reddish brown, distinctly smaller (length 1.70 mm, width 1.13 mm), and differs from the type series in the shape of trichome fields. However, the latter is so obscure that further examination is required under high magnification. Proportions of body parts are as follows: PW/HW 3.20, PW/PL 1.27, EW/PW 1.41, EL/PL 1.71 and EL/EW 0.96.

Notes. The present new species is similar in general appearance to *Orectoscelis punctatus* CATERINO and *O. aurolepidus* CATERINO from Sulawesi Utara, Indonesia, and an undescribed species of *Orectoscelis* from Australia (CATERINO, pers. comm.), but can be distinguished from the latter by the following characteristics: pronotum with a pair of projections in medio-apical portion and a low carina along the mid-line; trichome fields on elytra small and simple. This new species is also similar to *Ceratohister phedoliphilus* REICHENSPERGER (1924, pp. 303–304, fig. 1) from India in general appearance except for the presence of trichomes.

The genus *Orectoscelis* was erected by LEWIS (1903, p. 426) based on a single species, *O. humeralis* LEWIS, though he stated that "...it is somewhat difficult to select characters which may ultimately be deemed important, but those given here are wholly different to any in the allied genus *Chlamydopsis*." Classification of the subfamily Chlamydopsinae has not been thoroughly revised since LEWIS' account, so that a generic revision of the subfamily based on a modern viewpoint is needed (and is in progress: CATERINO, pers. comm.).

Kubura-dake (188 m in alt.), the type locality, lies at the eastern part of Yonaguni-jima Island. To obtain litter-dwelling insects, two sites were selected on the hill (ARAI, pers. comm.): one near its summit (180 m in alt.) and the other at an altitude of 150 m, both of which are surrounded by a typical vegetation of Chinese fan palms; the litter was preferentially taken around rotten logs. According to CATERINO (2000), the *Orectoscelis* species have been caught by flight intercept traps during the period of the Project Wallace (HAMMOND, 1990). Such a collecting method seems very useful for researches of the hidden beetle fauna. If the host of a beetle is previously known, it can be extracted from litter around nests of the host by using a Tullgren funnel or by sifting samples taken from such places (SHIMANO, 1996; MIYATANI, 1996). The host of the present new species is unknown, though several ants were extracted together with the beetle from the same samples and a few termites were found near the collecting sites. If the host is an ant species, it may have a large colony and make a nest in a rotten log judging from the collecting condition. Probably, the actual host can be sought from the followings: *Aphaenogaster* sp., *Crematogaster*? sp., *Cryptopone* sp.*, *Monomorium* sp.*, *Paratrechina* sp., *Pheidole* sp., *Proceratium* sp., *Strumigenys* sp.* and *Tetramorium* sp.* (*Commonly extracted from the samples of the two sites in these species; determined by Japanese Ant Database Group (1995).)

On the other hand, a wide gap still exists in the known distributional range of the subfamily Chlamydopsinae as was stated by CATERINO (2000). Its members are now known from Sulawesi Utara, Borneo (DEGALLIER & CATERINO, in prep.), the Australian Continent and Tasmania, New Guinea, Fiji, India, Taiwan and Japan. To make further speculation on their zoogeography, future researches will be needed at least in the Philippines and the coastal areas of the Southeast Asian Continent. The unexpected discovery of the present species is therefore interesting from the zoogeographical viewpoint, since it is congeneric with the Australian and Sulawesian ones. From near the northern periphery of their distribution, i.e. Japan and Taiwan, four chlamydopsine histerids are now known; *Eucurtiopsis ohtanii* (SAWADA), *E. hiranoi* M. NISHIKAWA, *Orectoscelis shihoae* sp. nov. and *E. mirabilis* SILVESTRI, which may be discriminated by using the following key:

Key to the Species of the Chlamydopsinae in Japan and Taiwan

1. Pronotum with a pair of projections in medio-apical portion, longitudinally carinate along the mid-line; elytra without elevations, entirely foveate, clothed with scale-like setae as on pronotum, with simple trichomes inside of humeral portion each, the trichome field semicircular, cleft, opening anteriorly; Ryukyus (Yonaguni-jima Is.) . . . . *Orectoscelis shihoae* sp. nov.

— Pronotum with two parallel ridges longitudinally along mid-line, gradually projected towards their apices; elytra gibbous, glabrous among punctures, partly clothed with bifurcate setae, with trichomes at the apices of humeral and postero-lateral elevations, which are opposed in latero-basal portions of elytra . . . 2.

2. Body more than 2 mm in length (2.8 mm in SILVESTRI (1926)); elytra subcordate, with humeral elevations exhibited entirely in basal portions, gibbous; trichomes simple; Taiwan . . . . *Eucurtiopsis mirabilis* SILVESTRI.

— Body less than 2 mm in length; elytra subquadrate, with humeral elevations exhibited in each lateral 1/2 . . . . 3.

3. Humeral elevations tri-sulcate; postero-lateral elevations robust; trichomes simple; host ant: *Pheidole fervida* Fred. SMITH; Japan (Honshu, Kyushu) . . . . *E. ohtanii* (SAWADA).

— Humeral elevations without sulci; postero-lateral elevations weaker; trichomes with short erect setae; Ryukyus (Okinawa-hontô Is.). . . . . . *E. hiranoi* M. NISHIKAWA.

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A New Species of the Genus *Agathidium* (Coleoptera, Leiodidae) from Kyushu, Japan

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Abstract A new species of leiodid beetle is described from Kyushu, Japan, under the name *Agathidium* (*Neoceble*) *watanabei* sp. nov. The number of *Neoceble* species attains now to 21 in Japan.

The subgenus *Neoceble* Gozis belongs to the genus *Agathidium* Panzer of the family Leiodidae. In Japan, 20 species have hitherto been known to occur (Angelini & De Marzo, 1990; Angelini, 1995; Hoshina, 2000, 2001).

In 1995–1998, I collected some leiodid beetles from blight trees by the beating method on Mt. Tachibana, Fukuoka Prefecture, Kyushu, Japan. My careful examination revealed that these specimens belong to a new Japanese member of *Neoceble*. In order to present the finding for clarifying the Japanese fauna of the subgenus, I will describe the new species under the name, *Agathidium* (*Neoceble*) *watanabei* sp. nov., in the present paper.

The holotype to be designated in the present paper is preserved in the collection of the Museum of the Nature and Human Activities, Hyôgo.

Before going further, I wish to express my sincere gratitude to Dr. Shûhei Nomura (National Science Museum (Nat. Hist.)) for lending me a valuable specimen.

Agathidium (*Neoceble*) *watanabei* sp. nov.

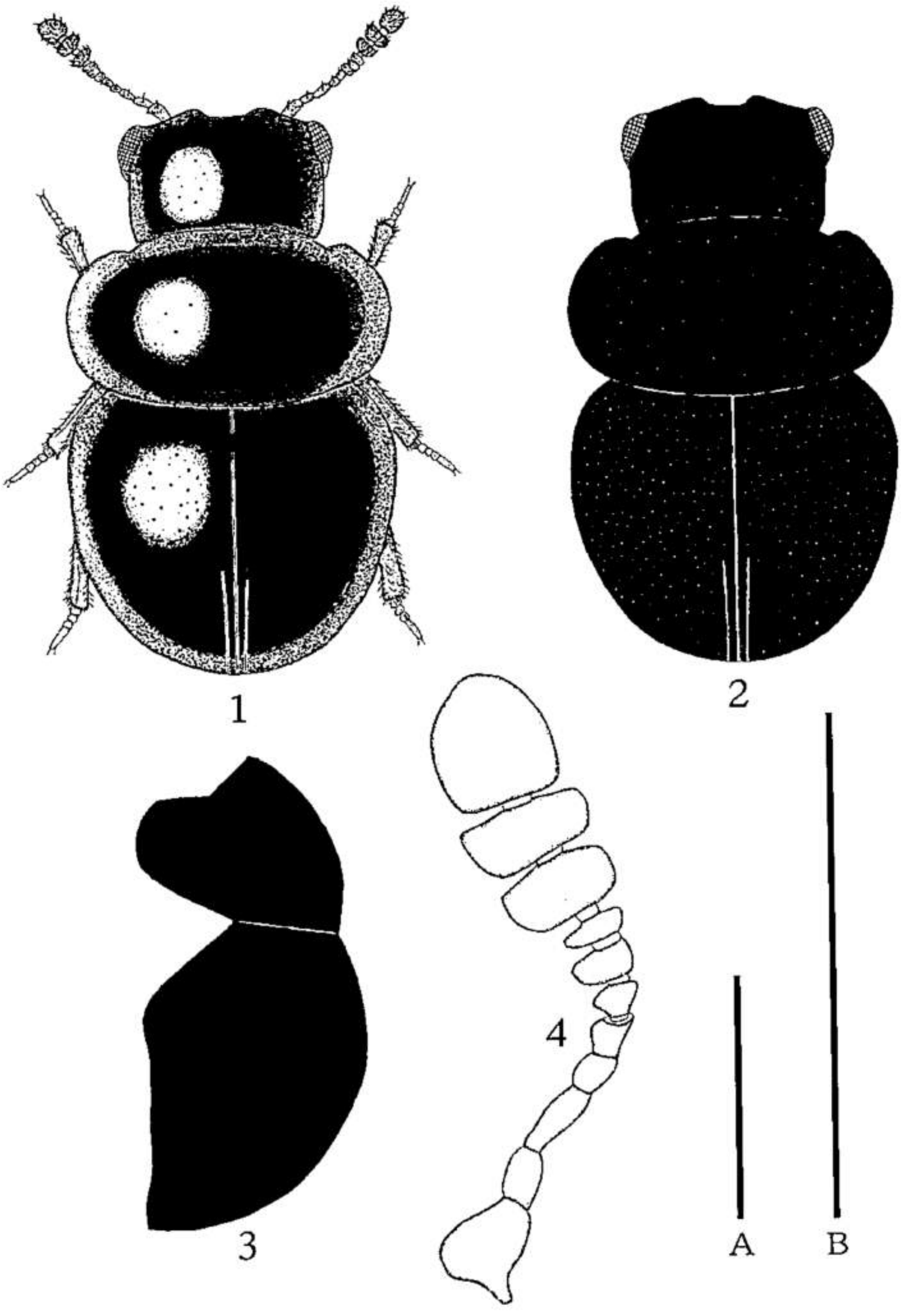
[Japanese name: Watanabe-maru-tamakinokomushi]

(Figs. 1–11)

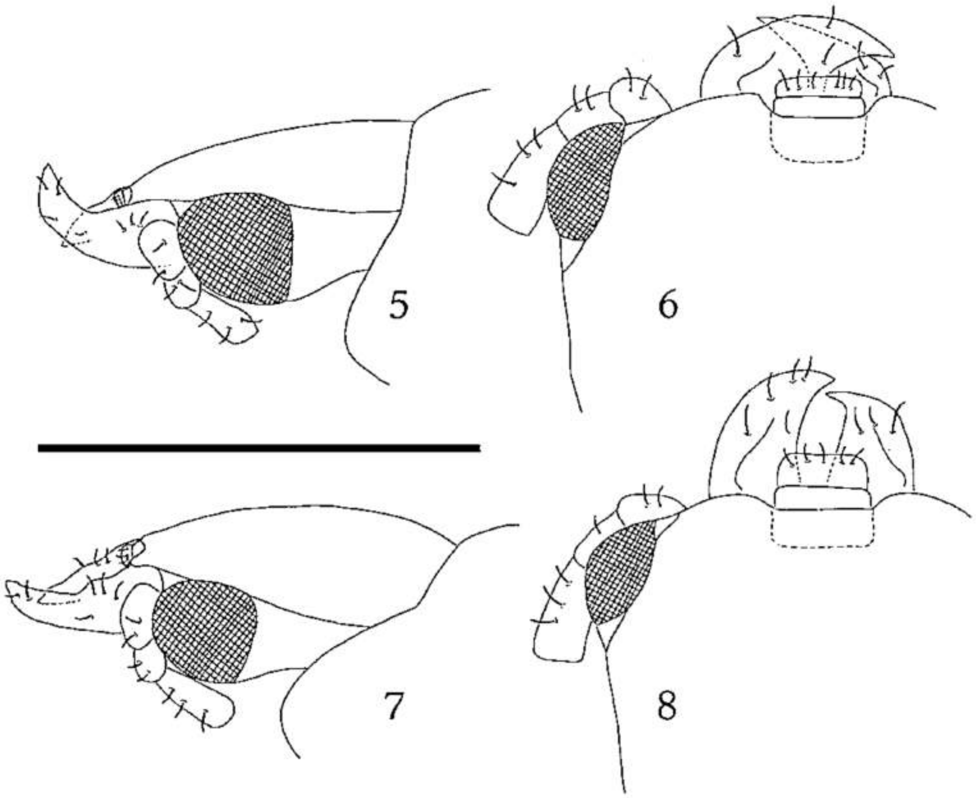
Male and female. Coloration:— Head and pronotum brown; elytra dark brown; mesosternum brown or light brown; metasternum and venter brown; fore and mid coxae brown; fore and mid trochanters brown; fore and mid femora brown; other parts of legs reddish brown; 1st segment of antennae brown, 2nd–8th segments light brown, 9th–11th segments dark brown, sometimes about apical half of 11th segment a little lighter in color than the basal part.

Body about 1.8 times as long as wide (Fig. 1), convex in general (Fig. 3).

Head widest at eyes (Figs. 6, 8), about 1.5 times as wide as long, punctate minutely (Fig. 2), not microreticulate; length and width of head about 0.73 times as



Figs. 1–4. *Agathidium* (*Neoceble*) *watanabei* sp. nov.; 1, body, dorsal view; 2, punctures of dorsum; 3, body, lateral view; 4, antenna. Scale A: 1.0 mm for Figs. 1–3. Scale B: 0.5 mm for Fig. 4.

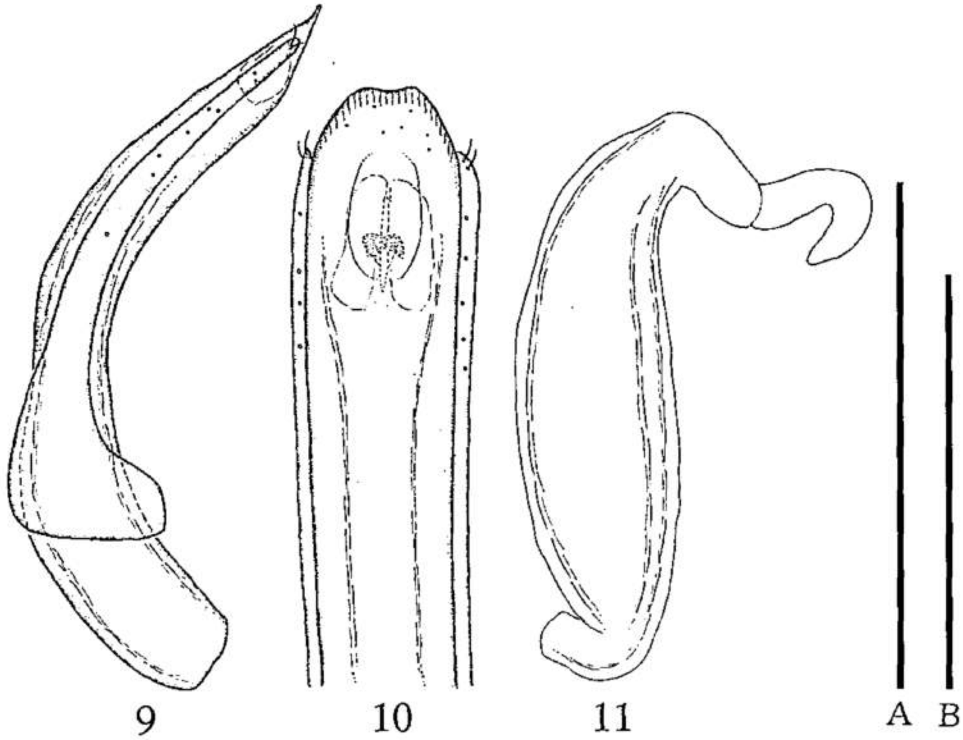


Figs. 5–8. *Agathidium* (*Neoceble*) *watanabei* sp. nov.; 5 & 7, head of male, lateral view; 6 & 8, head of male, dorsal view. Scale : 0.5 mm for Figs. 5–8.

long as and about 0.66 times as wide as those of pronotum, respectively (Fig. 1); eyes oval, located at about apical one-fourth to one-third of lateral margins; clypeal line shallow; male left mandible larger than right one (Figs. 6, 8), and sharply or feebly curved apicad in lateral view (Figs. 5, 7); both mandibles of almost the same size in female; antennae shorter than width of head; 1st–5th and 11th segments each longer than wide; the other segments each wider than long (Fig. 4); 3rd segment about 1.3 times as long as 2nd, and a little shorter than 4th and 5th; length and width of 9th segment about 2.3 times as long as and about 1.8 times as wide as those of 8th, respectively, and almost as large as 10th; 11th segment robust.

Pronotum widest at about apical two-fifths of lateral margins, about 1.7 times as wide as long, punctate minutely (Fig. 2), not microreticulate; length of pronotum about 0.56 times as long as that of elytra; width of pronotum almost as wide as or sometimes a little narrower than that of elytra (Fig. 1).

Elytra widest at about basal one-fourth to one-third of lateral margins, almost as



Figs. 9–11. *Agathidium* (*Neoceble*) *watanabei* sp. nov.; 9, aedeagus, lateral view; 10, aedeagus, ventral view; 9, spermatheca. Scale A: 0.5 mm for Fig. 9 and 0.25 mm for Fig. 10. Scale B: 0.125 mm for Fig. 11.

wide as long (Fig. 1), not microreticulate; punctures clearly denser than those of head and pronotum (Fig. 2); sutural stria shallow, present at about apical third of elytra.

Tarsal formula 5–5–4 in male, 4–4–4 in female.

Hind wings normal.

Mesosternum with a median carina and complete lateral lines; metasternum without femoral lines.

Male. Aedeagus (Figs. 9, 10) slender in general; median lobe curved simply and weakly in lateral view, feebly sinuate at apical margins in ventral view; parameres slender, a little shorter than median lobe, curved in an arc, round apically in lateral view, straight at sides in ventral view.

Female. Spermatheca slender, winding near apex (Fig. 11).

Length. 2.5–2.7 mm (Holotype: 2.5 mm).

Distribution. Japan: Kyushu (Fukuoka Pref. and Ôita Pref.).

Type series. Holotype: ♂, Mt. Tachibana, Fukuoka Pref., 30–IV–1998, H. HOSHINA leg. (preserved in the collection of the Museum of Nature and Human Activities, Hyôgo). Paratypes: 2♂♂, 5♀♀, same data as holotype; 1♂, Mt. Tachibana, Fukuoka Pref., 15–IX–1983, S. NOMURA leg.; 2♀♀, Mt. Tachibana, Fukuoka Pref., 16–V–1995, H. HOSHINA leg.; 1♂, Mt. Kurodake, Ôita Pref., 29–VI–1995, H. HOSHINA leg.

Remarks. *Agathidium* (*Neoceble*) *watanabei* sp. nov. is similar in appearance to *A.* (*N.*) *aeneum* ANGELINI et DE MARZO, 1990, but is distinguished by the pronotum not microreticulate in comparison with that of *A.* (*N.*) *aeneum* which is clearly microreticulate. This new species is also similar to *A.* (*N.*) *multitodum* HOSHINA, 2000, but the 11th segment of antennae is robust (Fig. 4), the aedeagus is generally slender (Fig. 9), and the apical margin of the median lobe of the male genitalia is feebly sinuate in ventral view (Fig. 10). In contrast, *A.* (*N.*) *multitodum* has a slender 11th segment of the antennae, thick aedeagus, and almost straight apical margin of the median lobe.

Etymology. The specific name is given after Dr. Yasuaki WATANABE.

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The Female of *Derops dingshanus* Y. WATANABE, 1999 (Coleoptera, Staphylinidae, Tachyporinae)

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Abstract The female of *Derops dingshanus* Y. WATANABE is described for the first time, with illustration of the last visible abdominal tergite and sternite. It was found on Tianmu Shan in Zhejiang Province, East China.

The original description of *Derops dingshanus* Y. WATANABE, 1999, was based on a single male specimen from Dingshan of Yixing in Jiangsu Province. Recently, through the courtesy of Mr. WU Hong of Zhejiang Forestry College, I was able to examine some specimens (4♂♂, 2♀♀) of *Derops* obtained on Tianmu Shan in Zhejiang Province. It was found that these specimens belong to *D. dingshanus* Y. WATANABE for the reason of having identical aedeagus and secondary sexual character of the abdomen in the male. Therefore, the females will be described and illustrated in the present paper for the first time. All the specimens examined are deposited in the collection of Sichuan Teachers College, Nanchong, Sichuan.

I am deeply thankful to Professor Yasuaki WATANABE, Laboratory of Insect Resources, Tokyo University of Agriculture, Atsugi, Kanagawa, Japan, for his kind help in consulting with literature, and dedicate the present paper to him in commemoration of his retirement from the university. I am deeply indebted to Mr. WU Hong, Zhejiang Forestry College, for his kindness in giving me the opportunity of studying on the specimens.

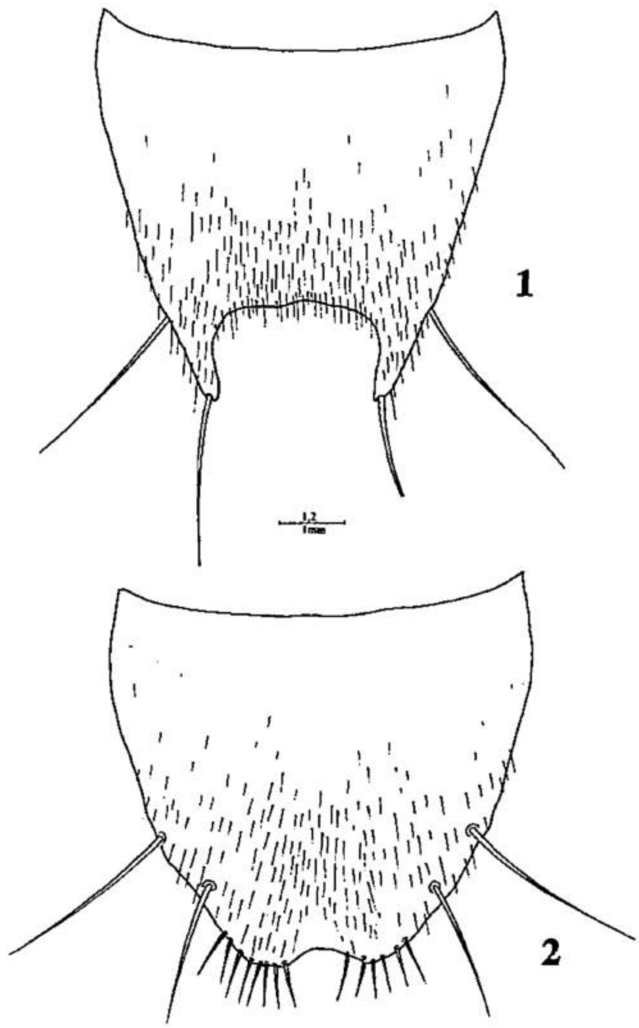
Derops dingshanus Y. WATANABE

(Figs. 1–2)

Derops dingshanus Y. WATANABE, 1999, Elytra, Tokyo, **27**, p. 253, figs. 6–10; type loc.: Linggu Dong Cave at Dingshan.

Female. Body black, somewhat lustrous; both maxillary and labial palpi brunneous; antennae brown with basal two segments brownish yellow; legs piceous with tarsi brunneous. Length 6.0–6.3 mm.

Head subquadrate, markedly wider than long (ratio 1.54), narrowed behind eyes, posterior angle obsolete; eyes rather large and convex, tempora shorter than eyes seen



Figs. 1–2. Last visible segment of abdomen in the female of *Derops dingshanus* Y. WATANABE: 1, tergite; 2, sternite.

from above (ratio 0.65); surface shallowly and obliquely depressed on each side of the middle and finely, densely punctured and shortly pubescent all over. Antennae elongate, almost reaching posterior margin of elytra and rather thickened toward apex, segment 1 robust, segment 2 the shortest, segments 3–6 about as long as wide, segments 7–10 gradually becoming shorter and wider, last segment shorter than the preceding segment.

Pronotum cordate, slightly wider than long (ratio 1.1), distinctly wider than head (ratio 1.24), laterally expanded in anterior half and abruptly narrowed in posterior third; lateral sides arcuate in anterior two-thirds and mostly straight in posterior third; anterior angles bluntly angulate, posterior ones nearly rectangular though blunt at the corners; surface with punctures and pubescence similar to those on head, a vague and shallow depression present at the middle before posterior margin. Scutellum punctate.

Elytra oblong, evidently longer than wide (ratio 1.28), at the basal part clearly wider than pronotum at the widest point (ratio 1.25), at suture obviously longer than pronotum on midline (ratio 1.84); lateral sides nearly straight, posterior angles broadly rounded; surface with punctation and pubescence coarser and sparser than those on pronotum; a shallow and longitudinal depression on each side of suture, other on each lateral side; epipleura each with a fine longitudinal keel, which is abbreviated behind shoulder. Legs slender, basal four segments of front tarsus slightly dilated, basal segment of hind tarsus about equal in length to the following three segments together.

Abdomen subcylindrical, gradually narrowed toward apex of abdomen; tergites 4–7 each transversely depressed along the base, surface of the depression uneven; each tergite finely and superficially punctured and with pubescence similar to that on pronotum; last visible abdominal tergite with wide, trapezoidal, fimbriate emargination at the middle of posterior margin, last visible sternite with a shallow semicircular medio-apical emargination, a small triangular area before the emargination flattened and smooth, fringed with 6–8 cilia on each latero-posterior part.

Specimens examined. 1♂, Jinshanmen, Tianmu Shan, Zhejiang, 7–XI–1998, ZHAO Peng-shui; 1♂, Houshanmen, Tianmu Shan, Zhejiang, 22–VI–1998, ZHAO Peng-shui; 2♂♂, 2♀♀, Sanjieting, Tianmu Shan, Zhejiang, 12–VI–1998, ZHAO Peng-shui.

Reference

WATANABE, Y., 1999. Two new subterranean staphylinids (Coleoptera) from East China. *Elytra, Tokyo*, **27**: 249–257.

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New Species of *Peitawopsis* and a Review of the Genus (Coleoptera, Staphylinidae, Tachyporinae, Megarthropsini)

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Abstract The Taiwanese genus *Peitawopsis*, with three species, is reviewed. *Peitawopsis watanabei* new species, is described and diagnoses are presented for the other two species and for the genus. Illustrations and a key for identification are provided.

Introduction

Peitawopsis with one species was found in 1991 and described by SMETANA (1992). The following year he found a second species and later named it (SMETANA, 1995 a). Both species were found high in the mountains of southern Taiwan, the first in Peitawushan and the other, about 70 kilometers north in Kuanshan. While preparing a review of the genera and species of Megarthropsini, HERMAN discovered that a second species had been collected in Peitawushan. The new species and other newly collected specimens prompted a review of the genus. Since the genus and the two species were recently described and illustrated in detail (SMETANA, 1992, 1995 a), we refer to SMETANA's illustrations for the two species he named. We include herein only illustrations for the new species and for the spermathecae of the other two species.

Peitawopsis is endemic to Taiwan and all the species were found in the Chung-Yang Shan (or Central Range) between 1,500 and 2,900 meters elevation. The discovery of a second species of *Peitawopsis* at a site that had already yielded one species suggests that others may be found. The Central Range is a long string of lofty peaks many of which are 3,000 to as high as 3,900 meters. The three species of *Peitawopsis* were collected near the southern end of the Central Range (see map in SMETANA, 1995 b, 6, sites 10, 18, 48). As all are flightless and restricted to high montane sites, local endemicity in the genus is likely to be high. However, the genus may not occur in the north since no specimens have been found there by SMETANA, who has collected extensively in the mountains of Taiwan.

Abbreviations.

AMNH – American Museum of Natural History, New York, New York, USA.
ASC – A. SMETANA Collection, Ottawa, Ontario, Canada.

Genus ***Peitawopsis*** SMETANA

Peitawopsis SMETANA, 1992, 199. Type species: *Peitawopsis monticola* SMETANA, fixed by original designation and monotypy.

Diagnosis. The broadly rounded posterior pronotal angle will separate *Peitawopsis* (SMETANA, 1992, fig. 15) from *Nepaliodes* and *Megarthropsis* which have strongly angulate posterior angles (SMETANA, 1983, fig. 25 and 1992, fig. 33). The lateral third of the elytra of *Peitawopsis* is concave (SMETANA, 1992, fig. 15), the elytra of *Megarthropsis* are convex to the narrowly reflexed epipleural ridge (SMETANA, 1992, fig. 33), and the elytra of *Nepaliodes* are strongly convex to about the lateral fifth which is concave, explanate, and sparsely punctured. The distinct postocular cephalic carina of *Nepaliodes* (SMETANA, 1983, fig. 27) and *Megarthropsis* (SMETANA, 1992, fig. 31) is modified to a rounded ridge in *Peitawopsis* (SMETANA, 1992, fig. 12). The antennal scape of *Peitawopsis* is nearly parallel-sided from near the base to the apex (SMETANA, 1992, fig. 14), whereas the scape of *Nepaliodes* is tapered apically from the base (SMETANA, 1983, fig. 28). A habitus illustration of the genus was published by SMETANA (1992, fig. 11).

Discussion. *Peitawopsis*, with three species, is known only from the Chung-Yang Shan of Taiwan. The species are flightless and found at elevations of 1,500 to 2,900 meters. Two species, *P. monticola* and *P. watanabei*, live in Peitawushan where both were collected from moist litter on the forest floor. The two species were collected together at one site where *P. watanabei* was found in litter in depressions and gullies of the forest floor and *P. monticola* was found in litter and debris along a trail. Although the two species overlap in their elevational distribution, *P. watanabei* is found at higher elevations to about 2,900 meters. The third species (*P. inexspectata*) is from Kuanshan and Peinantashan where it also was collected from moist, forest floor litter.

Key to Species of *Peitawopsis*

1. Abdominal sternites VII and VIII modified (males) (Figs. 1, 3) . . . . 2.
— Abdominal sternites VII and VIII unmodified (females) . . . . 4.
2(1). Sternite VII with uninterrupted row of peg setae along posterior margin (Figs. 1, 2) . . . . *P. watanabei*.
— Sternite VII with two rows of peg setae separated medially (SMETANA, 1992, fig. 1; 1995 a, fig 1) . . . . 3.
3(2). Sternite VII with two rows of peg setae on posterior margin and with two small

groups of peg setae on disc (SMETANA, 1992, fig. 1) . . . . *P. monticola*.
— Sternite VII with two rows of peg setae beginning at posterior margin and extending onto disc and without separate small group of peg setae on disc (SMETANA, 1995 a, fig. 1) . . . . *P. inexspectata*.
4(1). Spermathecal capsule gradually enlarged at one end; spermathecal duct with multiple loops near capsule (Fig. 7). . . . . *P. monticola*.
— Spermathecal capsule abruptly expanded at one end; spermathecal duct with a few loops near capsule (Figs. 4, 8, 9) . . . . 5.
5(4). Present in Peitawushan and its foothills . . . . *P. watanabei*.
— Present in Kuanshan and Peinantashan . . . . *P. inexspectata*.

Peitawopsis monticola SMETANA

(Fig. 7)

Peitawopsis monticola SMETANA, 1992, 204. Type locality: Taiwan: Pingtung Hsien, Peitawushan Trail at 2000 m. Holotype in the SMETANA Collection (ASC), to be deposited in the Muséum d'Histoire Naturelle, Genève, Switzerland.

Diagnostic features. On sternite VII of the males of *P. monticola* the row of peg setae on the posterior margin is separated medially and the disc has a small cluster of peg setae on each side of the midline of the disc (SMETANA, 1992, fig. 1); this configuration of peg setae will separate the species from the others. The parameres of *P. monticola* are about as long as the median lobe (SMETANA, 1992, fig. 6) in contrast to the longer parameres of *P. inexspectata* (SMETANA, 1995 a, fig. 5).

The spermatheca of the females of *P. monticola* has the basal end gradually enlarged (Fig. 7) in contrast to the abruptly enlarged basal end of the other two species (Figs. 4, 8, 9). The spermathecal duct is densely coiled near the spermathecal capsule in *P. monticola* (Fig. 7), but only slightly coiled in the other two species (Figs. 4, 8, 9).

Distribution and Habitat. This species is known only from Peitawushan (see SMETANA, 1995 b, 6, site 10) in Pingtung Hsien where it was collected at 1,500 to 2,325 meters elevation. Specimens were collected in mature broadleaf forests by sifting leaves, humus, and other debris from the forest floor.

Material examined. 51 specimens: 34 males, 17 females.

[Taiwan]: Pingtung Hsien: Peitawushan trail at 2,000 m, May 23, 1991, A. SMETANA, sifting fallen leaves, various other debris and humus accumulated along large fallen trees [T91] (Holotype male, Allotype, Paratypes: 1 male, 2 females, ASC). Peitawushan, Kuai-Ku Hut, 2,325 m, May 22, 1991, A. SMETANA, sifting fallen leaves and other debris along trail in mature broadleaf evergreen forest [T90] (Paratypes: 11 males, 3 females, ASC); 2,125 m, April 27, 1992, A. SMETANA, sifting fallen leaves, dead vegetation and various other moist debris in mature broadleaf evergreen forest [T102] (6 males, 2 females, ASC); 2,130 m, April 27, 1992, A. SMETANA, sifting fallen leaves, dead vegetation and various other moist debris in mature broadleaf evergreen forest [T101] (4 males, 4 females, ASC; 2 males, 1 female, AMNH); 2,135 m, April

30, 1992, A. SMETANA, sifting fallen leaves, various other debris and humus accumulated along large fallen trees [T108] (5 males, 3 females, ASC). Peitawushan Trail at 1,500 m, May 1, 1992, A. SMETANA, sifting fallen leaves, various other debris and humus accumulated along large fallen trees [T110] (4 males, 1 female, ASC).

Five males and two females were dissected for characters of the genital segments and genitalia and one female was disarticulated.

Peitawopsis inexspectata SMETANA

(Figs. 8, 9)

Peitawopsis inexspectata SMETANA, 1995 a, 131. Type locality: Taiwan: Kaohsiung Hsien, Kuanshan trail above Kuanshanchi River, 2,550 m. Holotype in the SMETANA Collection (ASC), to be deposited in the Muséum d'Histoire Naturelle, Genève, Switzerland.

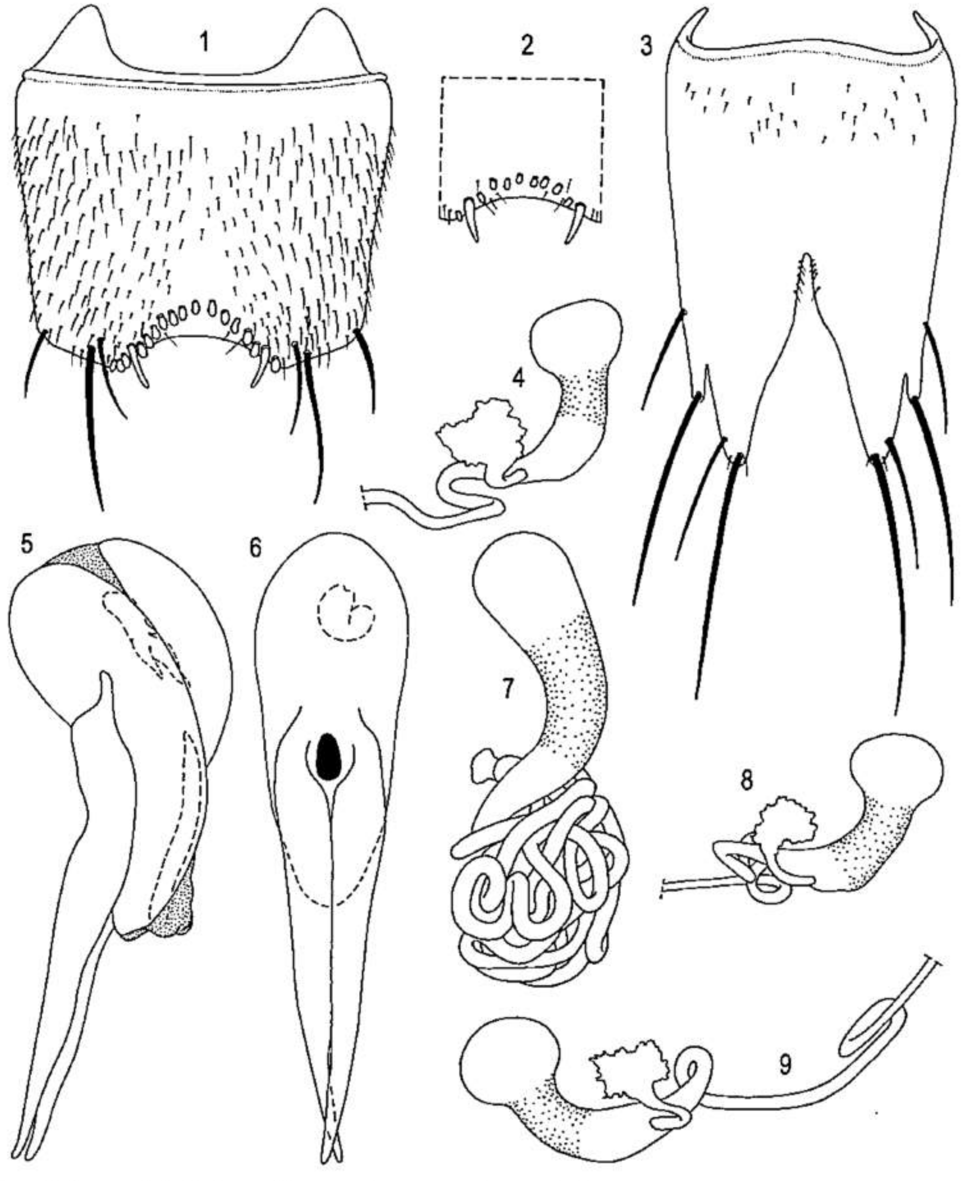
Diagnostic features. Sternite VII of the males of *P. inexspectata* has a row of peg setae on each side of the midline that begins at the posterior margin and curves medioanteriorly onto the disc; the disc lacks separate clusters of peg setae (SMETANA, 1995 a, fig. 1). This arrangement of peg setae is unique among the three species of the genus.

The females of *P. inexspectata* are separated from *P. monticola* by the abruptly expanded basal end of the spermatheca of the former species (Figs. 8, 9) in contrast to the gradually expanded basal end of the latter (Fig. 7). Females of *P. inexspectata* and *P. watanabei* are similar and identified by site of collection.

Distribution and Habitat. This species is known only from Kuanshan and Peinantashan (see SMETANA, 1995 b, 6, sites 18, 48) in Kaohsiung Hsien, Taiwan, where it was collected at 2,080 to 2,550 meters elevation. Specimens were found in litter and debris on the floor of mature broadleaf evergreen, mixed broadleaf evergreen, and coniferous forests.

Material examined. 35 specimens: 19 males, 16 females.

[Taiwan]: Kaohsiung Hsien: Kuanshan trail above Kuanshanchi River, 2,550 m, April 21, 1992, A. SMETANA, sifting fallen leaves, twigs, and humus from floor of mature broadleaf evergreen forest [T96] (Holotype male, Allotype, Paratypes: 3 males, 3 females, ASC; 1 female, AMNH); July 22, 1993, sifting leaves, twigs, and debris from floor of mature mixed broadleaf evergreen and coniferous (*Abies*) forest [T160] (1 male, Paratypes: 2 males, ASC; 1 male, AMNH). Peinantashan trail, 2,500 m, July 4, 1993, A. SMETANA, sifting fallen leaves and other debris from under deciduous bushes along trail [T136] (3 males, 1 female, ASC); 2,390–2,490 m, July 4, 1993, sifting fallen leaves and other debris from under deciduous bushes along trail [T138] (3 males, 4 females, ASC); 2,080 m, July 6, 1993, sifting layers of moist fallen leaves and other debris accumulated along wall of old forest road in mature broadleaf evergreen forest [T141] (4 males, 3 females, ASC); 2,450 m, May 2, 1995, sifting debris from a few moist spots on floor of very dry mature mixed forest (*Quercus, Pinus, Chamaecyparis*) [T170] (1 male, 3 females, ASC).



Figs. 1–9. —— 1–6. *Peitawopsis watanabei* sp. nov.; 1, sternite VII, male; 2, sternite VII, male, midapical region; 3, sternite VIII, male; 4, spermatheca; 5, aedeagus, right lateral view; 6, aedeagus, ventral view. —— 7. *Peitawopsis monticola* SMETANA; spermatheca. —— 8–9. *Peitawopsis inexspectata* SMETANA; spermathecae.

One specimen lacking the abdominal segments VI through X was collected at 2,500 m elevation along the Peinantashan Trail and is almost certainly *P. inexspectata*.

Five males and a female were dissected for features of the genital segments and genitalia and one female was disarticulated.

Peitawopsis watanabei sp. nov.

(Figs. 1–6)

Holotype. Male. [Taiwan]: Pingtung Hsien, Peitawushan, above Kuai-Ku Hut 2,680 m, 29–IV–1992, A. SMETANA [T106]. Holotype in the SMETANA Collection (ASC), to be deposited in the Muséum d'Histoire Naturelle, Genève, Switzerland. Typotypic series collected by sifting moist fallen leaves, moss, and other debris from small seepage in mature *Abies* forest with lush undergrowth.

Paratypes. 17 males, 12 females. [Taiwan]: Pingtung Hsien: Same data as holotype (9 males, 6 females, ASC; 3 males, 2 females, AMNH). Peitawushan, Kuai-Ku Hut, 2,325 m, May 21, 1991, A. SMETANA, sifting litter in forest floor depression and in small gullies in mature broadleaf evergreen forest [T88] (1 male, ASC). Peitawushan, above Kuai-Ku Hut, 2,750 m, April 29, 1992, A. SMETANA, sifting fallen leaves, old vegetation, moss and various other debris in forest floor depressions and small gullies in mature broadleaf forest intermixed with conifers [T107] (1 male, ASC). Peitawushan ridge, 2,800–2,910 m, April 28, 1992, A. SMETANA, sifting of moss, twigs, and various other debris on shaded areas below groups of low *Abies* trees [T105] (2 males, 2 females, ASC). Kaohsiung Hsien: Road above Tona Forest Station, Km 16–17, 1,700–1,800 m, April 28, 1998, A. SMETANA, sifting moist to wet fallen leaves and other debris accumulated along rock wall at edge of forest road in mature broadleaf evergreen forest [190] (1 male, 2 females, ASC).

Diagnostic features. Males of *Peitawopsis watanabei* are separated from those of *P. inexspectata* and *P. monticola* by the uninterrupted row of peg setae near the posterior margin of sternite VII (Fig. 1).

The spermatheca of *P. watanabei* is abruptly enlarged basally and the spermathecal duct is slightly coiled (Fig. 4). The spermatheca of *P. monticola* is gradually expanded basally and the duct is densely coiled near the capsule (Fig. 7). Females of *P. watanabei* and *P. inexspectata* are similar and separated by the site of collection.

Description. Length 3.3 to 3.7 mm; width 1.3 to 1.4 mm.

Color pale to dark reddish brown with dark reddish brown to nearly black head. Pronotum with central region dark reddish brown and lateral, anterior, and posterior margins pale reddish brown to yellowish brown. Elytra with central region dark reddish brown and with lateral and anterior margins pale reddish brown to yellowish brown. Antenna reddish brown to dark reddish brown. Legs pale reddish brown to yellowish brown.

Head with sparse, fine clypeal punctation and with moderately dense, moderately coarse punctation on vertex; punctation coarser and denser near neck. Middorsal groove of vertex moderately deep to shallow to rudimentary.

Elytra reduced, combined width greater than length as measured from scutellar carina to line across lateroapical angles of elytra; surface with dense, setigerous microtuberculation.

Wings reduced to minute pads.

Tergum VII with minute, irregularly interrupted palisade fringe on posterior margin.

Males. Sternite V with slight, elliptical impression on midapical half; impression with microsetae and micropunctures.

Sternite VI with feeble, anteriorly tapering, median depression; depression nearly as long as sternite; depression with microsetae and micropunctures basally and laterally and without punctures or setae midapically.

Sternite VII (Fig. 1) with moderately broad, moderately deep, arcuate median emargination of posterior margin; surface adjacent to emargination with uninterrupted row of peg setae arranged in arc; gap between row of peg setae and posterior margin of sternite variable; number of peg setae varying from 9 to 16 (Figs. 1, 2) in specimens for which setae were counted; row of peg setae with spine-like seta near lateral end; surface of sternite without cluster of peg setae on disc separated from posterior row; surface with shallow, anteriorly tapering, median depression extending anteriorly from posterior margin; depression without setae or punctures on median surface posteriorly, but with micropunctures and microsetae on lateral and basal regions.

Sternite VIII (Fig. 3) with broad, deep, anteriorly tapering emargination; posterior two-thirds of emargination wide and gradually and strongly convergent anteriorly; anterior third of emargination narrow but less strongly convergent; base of emargination rounded; margin of emargination broadly and shallowly sinuous.

Aedeagus with parameres, from apical margin of basal orifice to apex of parameres, about as long as median lobe (Figs. 5, 6).

Females. Spermathecal capusule with one end globular and abruptly enlarged then capsule tapered to spermathecal duct; spermathecal duct with several loops near capsule (Fig. 4).

Etymology. Patronymic, the species was named in honor of Dr. Yasuaki WATANABE of Tokyo, who substantially contributed to the knowledge of the family Staphylinidae of Japan and of the eastern portion of the Palaearctic region.

Distribution and Habitat. This species is known in Pingtung Hsien from Peitawushan (see SMETANA, 1995 b, 6, site 10) and its southern foothills that extend into northern Kaohsiung Hsien (about 25 km south of site 10 in SMETANA, 1995 b, 6), where it was collected at elevations of 1,700 to 2,910 meters. Specimens were found in moist leaflitter and debris and moss on the floor of broadleaf evergreen and *Abies* forests. Unlike *P. monticola*, this species ascends to the main ridge of Peitawushan and occurs there in the *Abies* forest at close to 3,000 meters elevation.

Material examined. 30 specimens: Male holotype and 17 male and 12 female paratypes. Six males and three females were dissected for features of the genital segments and genitalia; an additional male and female were disarticulated.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 205–208, Mar. 31, 2002

A New Species of the Genus *Tachinus* (Coleoptera, Staphylinidae) from Mt. Emei, Southwest China

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Abstract A new species belonging to the genus *Tachinus* Gravenhorst is described under the name of *Tachinus* (*Tachinus*) *yasuakii*. It was collected from Mt. Emei, Sichuan Province, Southwest China. Its diagnostic characters are illustrated.

In the summer of 2001, Li and Zhao had an opportunity to visit Mt. Emei, Sichuan Province, Southwest China and collected some staphylinid beetles. Among them, a *Tachinus* species with beautiful coloration was found. After a careful examination, we have concluded that the species is new to science and will describe it in the following lines.

This paper is dedicated to Prof. Dr. Yasuaki Watanabe, Tokyo University of Agriculture for his great contributions to the knowledge of the Staphylinidae.

Before going into details, we wish to express our hearty thanks to Dr. Masahiro Sakai (Entomological Laboratory, Ehime University) for his useful advice for the manuscript, and to Miss Yan Zhang (Department of Biology, Shanghai Teachers University) for her help in many ways.

Tachinus* (*Tachinus*) *yasuakii sp. nov.

(Figs. 1–7)

Body length: 4.5–6.0 mm (from front margin of head to anal end); 3.1–3.7 mm (from front margin of head to elytral apices).

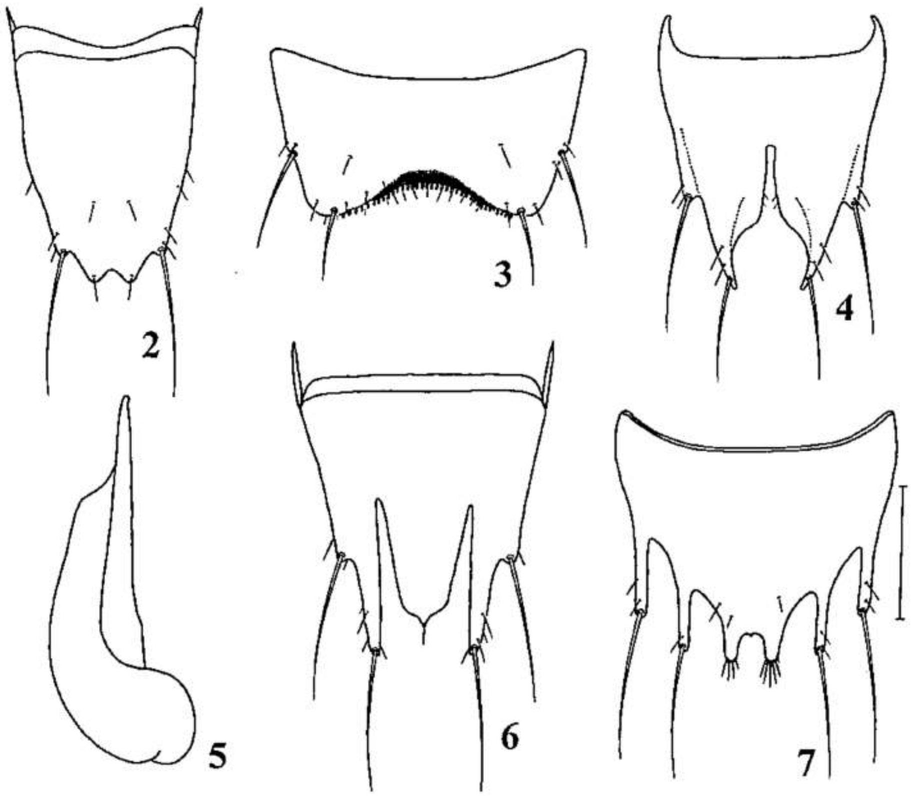
Male. Body (Fig. 1) medium in size, oval. Color black to piceous with shine; basal 4 segments of antennae, mouthparts, posterior margins of abdominal tergites and legs reddish brown, sides of pronotum and basal halves of elytra light reddish yellow.

Fig. 1. *Tachinus yasuakii* sp. nov. (Holotype).

Head small, 0.61 times as wide as pronotum, very finely and sparsely punctate; with dense microsculpture mostly consisting of transverse lines. Eye moderately large and convex; fine ocular setae located near the inner posterior margin of each eye and much shorter than transverse diameter of an eye. Antennae long, exceeding the posterior margin of pronotum; 1st to 4th segments glabrous except for a few long setae, 5th to 11th densely pubescent; 10th segment as long as wide, relative length of each segment from base to apex:— 14 : 8 : 9 : 5 : 9 : 9 : 9 : 9 : 9 : 9 : 14. Maxillary palpus moderately long, relative lengths of 4th and 3rd segments 12 : 5. Labial palpus with last segment about 2.5 times as long as the 2nd.

Pronotum 0.65 times as long as wide; anterior margin bisinuate; lateral margins arcuate, widest near basal third; posterior margin distinctly and roundly produced behind; posterior angles rounded; punctures and microsculpture on the disc similar to those on head. Scutellum broadly parabolic, with similar punctures and microsculpture to those on pronotum.

Elytra in sutural length 1.42 times as long as the median length of pronotum, 0.82



Figs. 2–7. *Tachinus yasuakii* sp. nov.——2, Male 8th tergite; 3, male 7th sternite; 4, male 8th sternite; 5, aedeagus (in lateral view); 6, female 8th tergite; 7, female 8th sternite. (Scale: 0.5 mm).

times as long as wide; sides gradually broadened apicad; posterior conjoint margins distinctly emarginate at the middle; apical angles rounded; punctures similar to, and microsculpture a little denser than those on pronotum, respectively.

Abdomen triangular, strongly narrowed from base to apex; surface sparsely covered with fine pubescence; punctures a little coarser and microsculpture distinctly finer than those on elytra, respectively. Third to 6th tergites each with a pair of pruinose spots near the middle. Eighth tergite (Fig. 2) 4-lobed at apex; inner lobes separated from each other by a subtriangular emargination, much broader and longer than outer lobes; outer lobes small, but definite. Seventh sternite (Fig. 3) broadly and moderately emarginate at apical margin, with sickle-shaped granulate zone in the middle of posterior part. Eighth sternite (Fig. 4) deeply incised between inner lobes, the depth about 0.63 times as long as the median length of sternite; outer lobes small, but definite. Aedeagus (Fig. 5) rather long and robust; lateral lobes long and almost straight, gradually tapering apicad, slightly curved ventrad at apices.

Legs moderately long, with protarsal segments 1–4 dilated.

Female. Eighth tergite (Fig. 6) 5-lobed; middle lobe much broader and rather shorter than intermediate lobes, strongly tapering near apex, distinctly separated from intermediate lobes, which are long and narrow; outer lobes degenerated into small humps. Eighth sternite (Fig. 7) 6-lobed; inner lobes somewhat broader than intermediate lobes, separated from each other by a U-shaped emargination, armed with an indistinct tooth at the bottom of emargination; both intermediate and outer lobes relatively narrow. Legs with protarsal segments 1–4 not dilated.

Type series. Holotype: ♂, Mt. Emei, Sichuan Province, 1–VIII–2001, LI & ZHAO leg. Paratypes: 1♂, 3♀♀, same data as for the holotype.

All the type specimens are deposited in the Department of Biology, Shanghai Teachers University.

Distribution. China (Sichuan Province).

Remarks. The present new species is very similar to *Tachinus proximus* KRAATZ from Europe, but is separable from the latter by the following characters: male 8th tergite with 4 distinct lobes; lateral lobes of aedeagus almost straight; inner lobe of female 8th tergite much shorter than intermediate lobes and outer lobes of this tergite distinctly larger. It seems similar to *Tachinus humeralis* GRAVENHORST also from Europe, but can be distinguished from the latter by the following points: elytra with only basal halves reddish yellow; lateral lobes of aedeagus almost straight; inner lobe of female 8th tergite distinctly separated from intermediate lobes and much shorter than intermediate lobes.

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A New Genus and Species of Intertidal Oxypodini (Coleoptera, Staphylinidae, Aleocharinae) from the Eastern Palearctic Region

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Abstract *Oreuryalea watanabei* gen. et sp. nov., the first intertidal genus and species of the Oxypodini from the Holarctic Region, is described from the Russian Far East and from northern Japan and is distinguished from similar oxypodine genera. Its facies, mouthparts, and sexual characters are illustrated. The distribution of the species is mapped.

Introduction

Among the known species of coastal Coleoptera, the Staphylinidae by far outnumber any other family, with approximately 400 intertidal species worldwide (HAMMOND, 2000; MOORE & LEGNER, 1976). In view of the fact that the majority (35+) of the genera with intertidal species belong to the subfamily Aleocharinae, it seems remarkable that the diverse tribe Oxypodini is represented by only three genera: *Chilodera* from the Falkland Islands, and *Gyronotus* and *Dasydera* from New Zealand (CAMERON, 1944, 1945, 1948).

While the intertidal Aleocharinae of the Western Palearctic Region have been subject to a long taxonomic tradition and can be considered rather well-known (although some genera such as *Halobrecta* THOMSON still require revision), our current knowledge of Eastern Palearctic coastal Aleocharinae may still be somewhat incomplete, as is shown by numerous additions only in the past 50 years (*e.g.*, AHN & MARUYAMA, 2000; ASSING, 1995, 1997; MARUYAMA & AHN, 2000 a, b; SAWADA, 1955, 1971, 1991; ZERCHE, 1998). Nevertheless, the recent discovery of a large and conspicuous intertidal representative of the Oxypodini from the Russian Far East and northern

Japan seems remarkable; it was studied and eventually found to belong to an undescribed genus by both authors independently.

Material and Measurements

Material from the following institutions and private collections was examined:

DEI	Deutsches Entomologisches Institut, Eberswalde (L. ZERCHE)
MNHUB	Museum für Naturkunde der Humboldt-Universität, Berlin (M. UHLIG)
SEHU	Systematic Entomology, Hokkaido University (M. ÔHARA)
cAss	private collection V. ASSING, Hannover
cMar	private collection M. MARUYAMA, Sapporo
cPut	private collection A. PÜTZ, Eisenhüttenstadt
cSch	private collection M. SCHÜLKE, Berlin

The measurements are given in mm and abbreviated as follows:

AL:	length of antenna
HW:	head width across (and including) eyes
PW:	maximal width of pronotum
PL:	length of pronotum along median line
EL:	length of elytra from apex of scutellum to elytral hind margin
HTiL:	length of metatibia (external aspect)
HTaL:	length of metatarsus (claws not included)
HT1L:	length of first metatarsomere (dorsal view)
HT2L:	combined length of second to fourth metatarsomere (dorsal view)
ML:	length of median lobe of aedeagus (from base to apex of ventral process)
TL:	body length from apex of mandibles to hind margin of abdominal segment VIII.

The internal structures of the aedeagus were examined after dissecting the median lobe. After macerating the aedeagus in KOH, the dorsal membrane of the median lobe was removed with fine needles, the internal structures were then separated from the median lobe and mounted for examination under a compound microscope.

Oreuryalea gen. nov.

Type species: *Oreuryalea watanabei* sp. nov.

Description. Species of relatively large size (approx. 4–6 mm) and dark coloration, in general facies somewhat reminding of the genus *Euryalea* MULSANT et REY. Forebody with pronounced microreticulation, integument only with subdued shine or mat. Abdomen with weaker microreticulation and with moderate shine.

Head weakly transverse, widest across eyes, posteriorly distinctly margined, but not constricted; posterior angles completely obsolete, temples in dorsal view converging towards posterior margin in almost straight line; eyes large and prominent, longer than temples; frontal suture present. Puncturation moderately dense and shallow; pu-

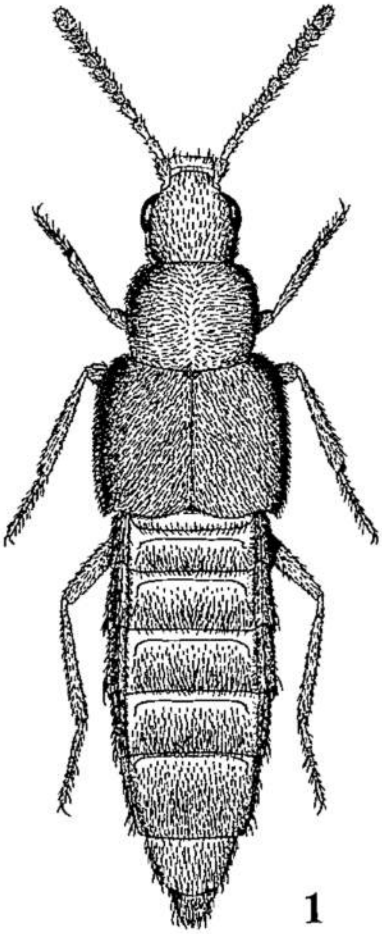

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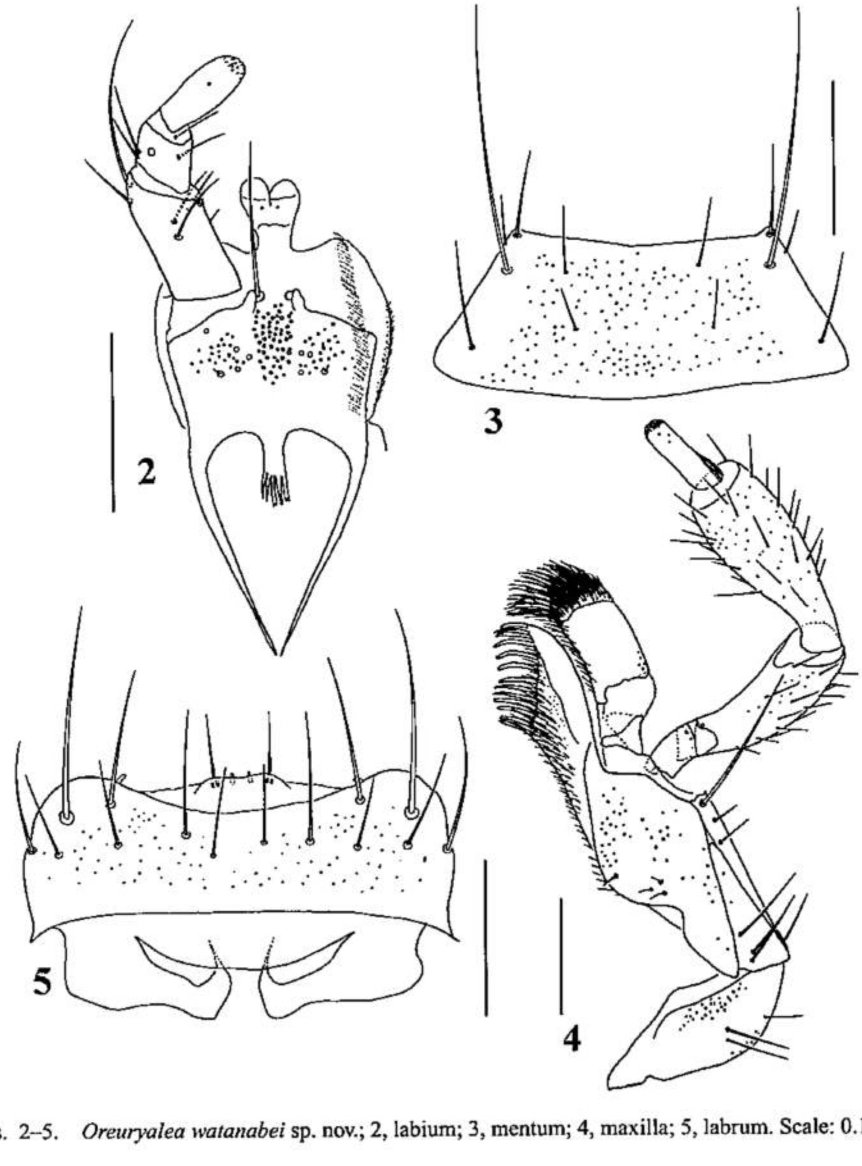
Fig. 1. *Oreuryalea watanabei* sp. nov., facies.

bescence relatively long, erect, in central dorsal area directed predominantly anteriad. Genal carinae pronounced; ventral aspect of head conspicuously flat; gular sutures widely separated; submentum delimited by fine carina, basally with transverse furrow; submentum and mentum (Fig. 3) with numerous pseudopores (as in *Euryalea*). Maxilla similar to that of *Euryalea*, 4-jointed, slender (Fig. 4); labial palpi 3-jointed, stouter than in *Euryalea* (Fig. 2); ligula relatively short and broad, apically moderately sclerotized and with weak median incision (Fig. 2). Labrum (Fig. 5) transverse, anteriorly broadly concave and membranous. Right mandible with distinct tooth.

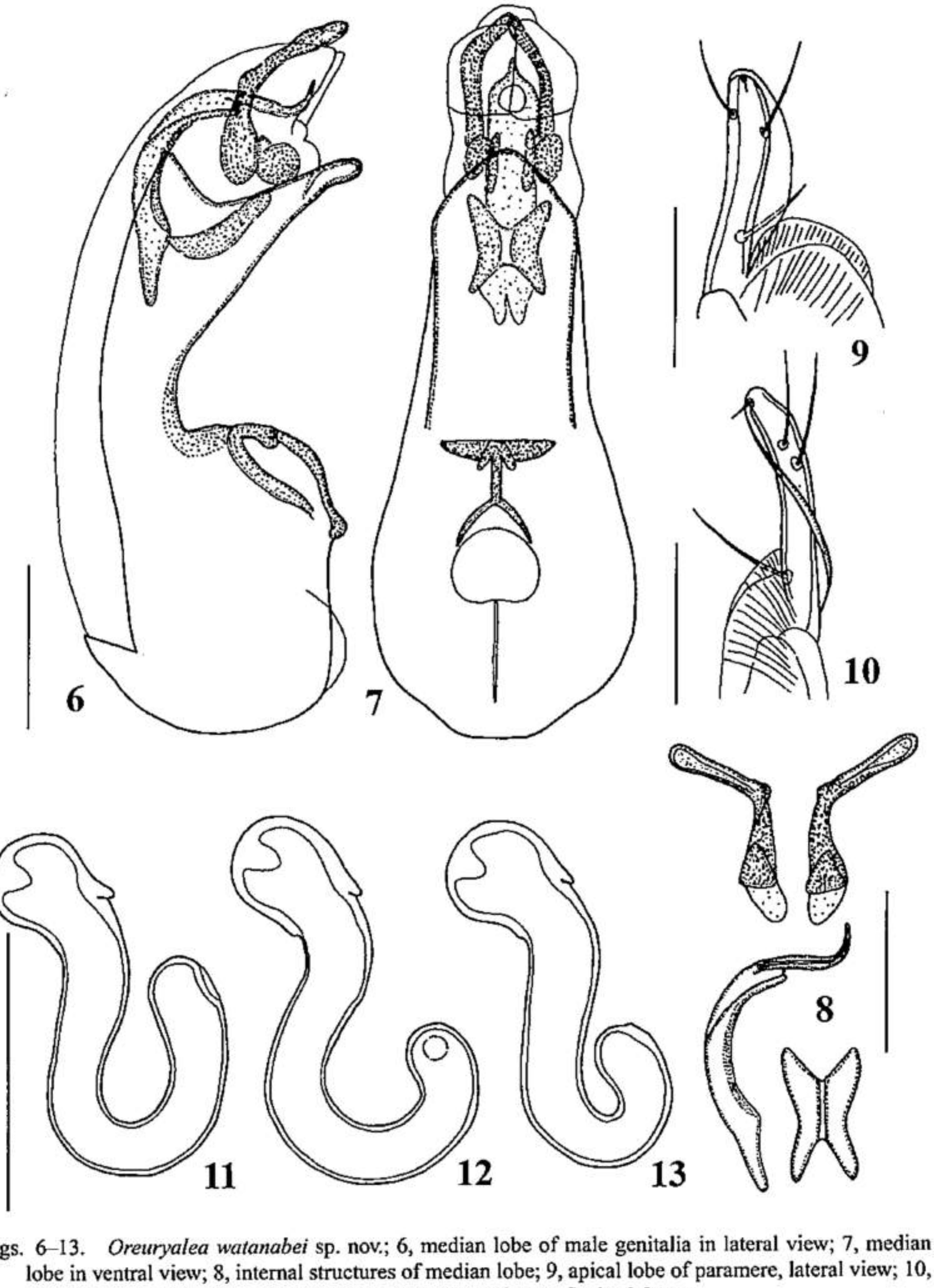
Antennae relatively slender and moderately long; antennomeres I and II distinctly oblong and of equal length; antennomere III slightly shorter than II; IV and V weakly oblong, weakly coniform, and of similar length; VI–X almost wedge-shaped, oval in



Figs. 2–5. *Oreuryalea watanabei* sp. nov.; 2, labium; 3, mentum; 4, maxilla; 5, labrum. Scale: 0.1 mm.

cross-section, apically distinctly widened, gradually increasing in breadth towards apex of antenna; antennomere XI approximately as long as combined length of IX and X, distinctly constricted in anterior half, without sexual dimorphism.

Pronotum moderately transverse, approximately 1.2 times as wide as long and approximately 1.3 times as wide as head, maximal width a short distance anterior to middle; lateral margins weakly concave near posterior angles, the latter obtuse, but well-



Figs. 6–13. *Oreuryalea watanabei* sp. nov.; 6, median lobe of male genitalia in lateral view; 7, median lobe in ventral view; 8, internal structures of median lobe; 9, apical lobe of paramere, lateral view; 10, apical lobe of paramere, ventral view; 11–13, spermathecae. Scale: 0.2 mm.

defined. Pubescence suberect, directed cephalad along most of midline and caudad only for short distance near posterior margin; pubescence of lateral areas predominantly transverse and near lateral margin predominantly caudad. Puncturation denser and less distinct than that of head. Hypomera in lateral view distinctly visible; prosternum similar to that of *Euryalea*, but with acute median process.

Elytra large and long, wider than pronotum, posterior margin near posterior angles weakly sinuate; pubescence suberect, directed predominantly caudad to transversely latero-caudad; puncturation similar to that of pronotum; hind wings fully developed. Mesosternum anteriorly with delimited area of triangular shape (similar in shape and size to scutellum), extending ventrad into a weak median carina, mesosternal process long and acute, reaching more than halfway between mesocoxae; mesocoxal cavities posteriorly and laterally delimited from metasternum by distinct carina; metasternum very long (longer than in *Euryalea*).

Legs long and slender, pro- and mesotibiae with spines on external sides; first metatarsomere long, longer than the combined length of the two following metatarsomeres; claws broad and moderately long. Tarsal formula: 5–5–5.

Abdomen subparallel up to tergum VI; terga III–VI with moderately deep anterior impressions, that of tergum VI only slightly shallower than those of terga III–V. Puncturation relatively dense and distinct, not distinctly sparser on posterior than on anterior terga. Tergum VIII posteriorly convex to pointed, at hind margin with moderately long thin setae (Figs. 14, 15); tergum X with sexual dimorphism, in ♂ anteriorly with narrow (Fig. 18), in ♀ anteriorly with broader base (Fig. 19); pubescence dense, not particularly stout.

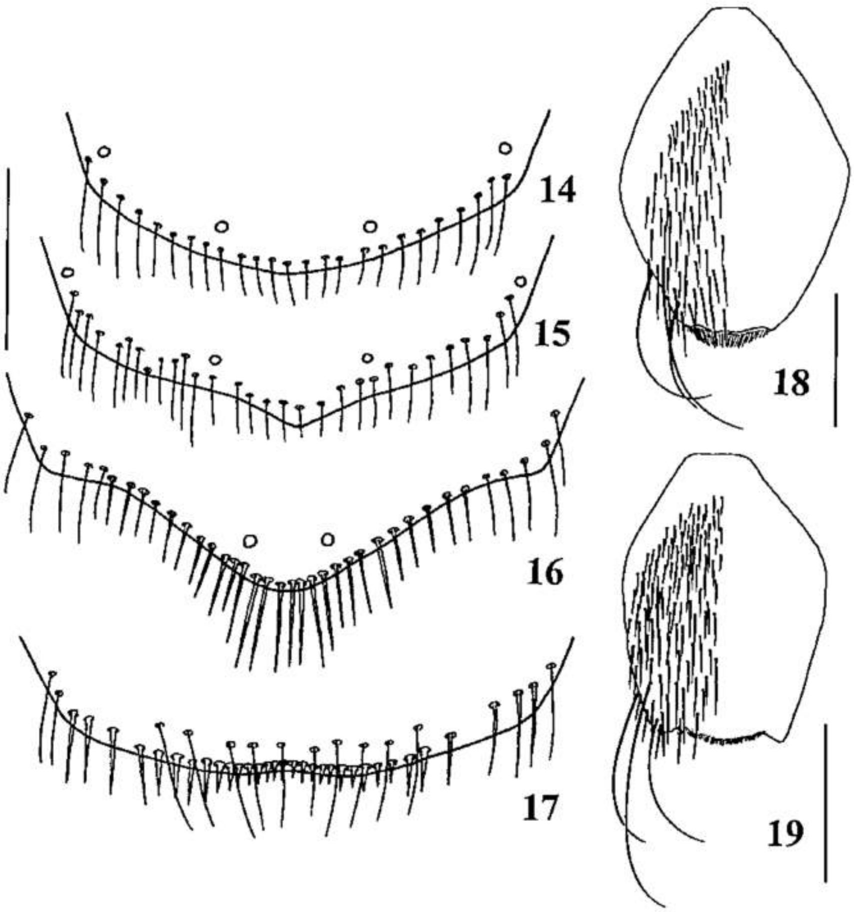
♂: Sternum VIII posteriorly obtusely pointed, marginal setae in the middle of posterior margin distinctly longer than in lateral parts. Aedeagus large, with median lobe distinctly arched in lateral view; internal structures similar to those in *Ilyobates* KRAATZ and *Calodera* MANNERHEIM; apical lobe of paramere moderately long, with one long basal, two long subapical, and one short apical setae (Figs. 9, 10).

♀: Posterior margin of sternum VIII weakly convex, in the middle with shallow concavity; with modified stout marginal setae, which are longer laterally than centrally, and without micro-pubescence. Spermatheca with relatively short, broad, proximally curved duct (Figs. 11–13).

Etymology. The name (gender: feminine) is composed of the Latin noun *ora* (=coast) and the generic name *Euryalea*.

Systematics and comparative notes. Based on morphological characters, the new genus is attributed to the tribe Oxypodini. As a comprehensive phylogenetic study of the Palearctic genera of this tribe has never been attempted, the phylogenetic affiliations of *Oreuryalea* within the Oxypodini are doubtful.

The new genus shares various characters with *Euryalea* MULSANT et REY: the general facies (size, proportions, coloration), the slender antennae, the general morphology of the mouthparts and of the ventral aspect of head and thorax, the presence of an anterior impression on the abdominal tergum VI (variable in *Euryalea*), the sexual



Figs. 14–19. *Oreuryalea watanabei* sp. nov.; 14, posterior margin of ♂ tergum VIII; 15, posterior margin of ♀ tergum VIII; 16, posterior margin of ♂ sternum VIII; 17, posterior margin of ♀ sternum VIII; 18, ♂ tergum X; 19, ♀ tergum X. 14–17: Long setae omitted. Scale: 0.2 mm.

dimorphism of tergum X, the shape and chaetotaxy of sternum VIII, and the lamellate extension of the apical lobe of the paramere. On the other hand, there are numerous characters distinguishing *Oreuryalea* from *Euryalea*: the pronounced microsculpture, as well as the denser and more erect pubescence of the body (morphological adaptations found also in many other intertidal Aleocharinae), the apically constricted antennomere XI, the presence of a frontal suture, the less slender maxillary and labial palpi, the shorter and broader ligula, the pronotal pubescence pattern, the acute process of the prosternum, the large anterior triangular area on the mesosternum, the longer metasternum, the shorter and less slender legs, the spinose pro- and mesotibiae, the shorter and much broader tarsal claws, the different morphology of the median lobe of the male genitalia (including internal structures), and the longer and more slender duct of the spermatheca.

The external morphology of the median lobe and the sclerotized structures in the internal sac are similar to those found in *Ilyobates* KRAATZ and *Calodera* MANNERHEIM, genera with which *Oreuryalea* also shares a similar general morphology of the mouthparts, a flattened ventral aspect of the head (only *Ilyobates*), a weakly transverse pronotum, the presence of a median carina on the mesosternum (only *Ilyobates*), a long and acute mesosternal process, the presence of an anterior impression on the abdominal tergum VI, the absence of micropubescence at the posterior margin of the sternum VIII, the presence of a lamellate extension on the apical lobe of the paramere (much less pronounced in *Calodera* and *Ilyobates*), and a short duct of the spermatheca (only *Ilyobates*). From both genera, however, *Oreuryalea* is distinguished by the pronounced microreticulation and more erect pubescence of the forebody, the completely different morphology of the antennae, the stouter and broader terminal segment of the labial palpi, the shorter ligula, the chaetotaxy of the labrum, the pronotal pubescence pattern, the acute process of the prosternum, the larger triangular area at the anterior margin of the mesosternum, the longer metasternum, the spinose pro- and mesotibiae, the shorter and much broader tarsal claws, the anteriorly only weakly constricted sterna III–VI, the shallower impressions on terga III–VI, the sexual dimorphism of tergum X, and by the more pronounced lamellate extension and the chaetotaxy of the apical lobe of the paramere. For illustrations of the mouthparts, other morphological characters, and of the genitalia of *Euryalea*, *Ilyobates*, and *Calodera*, see ASSING (1996, 1999) and ASSING and WUNDERLE (1997, 1998).

As can be inferred from their respective descriptions (CAMERON, 1944, 1945), the three previously known genera of intertidal Oxypodini are apparently not closely related to *Oreuryalea*, which, in view of their distributions, is not particularly surprising. *Chilodera* from the Falkland Islands differs from *Oreuryalea* in the relatively wider head and narrower pronotum (head as wide as pronotum, pronotum not transverse), the apically dentate mandibles, the much smaller eyes, the distinctly longer mesosternal process, the shorter and much narrower elytra, the shorter legs, tarsi, and first metatarsomere, and the absence of spines on the pro- and mesotibiae. In *Dasydera*, the antennae are massive and distinctly incrassate apically, the mandibles are edentate, the labium is of different morphology, the mesosternal process is longer, and the microsculpture is very weak or absent. In *Gyronotus*, the integument of the whole body lacks microsculpture, the genal carinae are absent, the mandibles are edentate, the third segment of the labial palpi is much longer, the ligula is long, narrow, and apically divided, the elytra are distinctly emarginate postero-externally, the pro- and mesotibiae are not spinose, and the first metatarsomere is shorter.

Distribution and bionomics. The genus is apparently confined to the Eastern Palearctic Region (Russian Far East, Japan), where it was found in coastal habitats, in seaweed and other debris on sandy beaches. *Oreuryalea* is the first example of intertidal Oxypodini occurring in the Holarctic Region.

Fig. 20. Distribution of *Oreuryalea watanabei* sp. nov.

Oreuryalea watanabei sp. nov.

Holotype ♂: "RUSSIA, Sakhalin, Korsakov distr., Ismenshyroye lake, 21./22.VII.1993, Pütz & Wrase (cAss) / Holotypus ♂ *Oreuryalea watanabei* sp. n. Assing & Maruyama 2001" (cAss).

Paratypes: [Russian Federation]: 1♂, 5♀♀ (two ♀♀ each with a mature egg in the ovaries), same data as holotype (cAss, cPüt); 1♂: "UdSSR: RSFSR: Fernost, Bezirk Primorje, Umgeb. Wladiwostok, leg. U. Heinig / Japanisches Meer, Annabucht bei Liwadija, ca. 30 km. nord-westl. Nachodka, 5.–10.VII.1991" (cAss); 1♂: "Rußland, Ussuri-Gebiet, leg. Sundukow / Nat. Reserv. Lazo Kordon Petrow, 12.IV.1993, Sandstrand" (MNHUB); 1♂: "Russia or. Primorie, Lasovsky Nat. Res. Kordon Proselochny, 134°07′43E, 43°00′34N, 4.–6.X.1999, leg. J. Sundukov" (cSch); 1: "RUSSIA: Primorskiy Kray, Ryazanovka, 14 km SW Slavyanka / 42.48 N 131.12 E, 16.VI.1993, Beach, leg. Zerche" (DEI).

[Japan]: 14♂♂, 22♀♀ [two ♀♀ each with a mature egg in the ovaries]: "Hamamatsu, Nemuro-shi, Hokkaido, JAPAN, 11.IX.1999, M. Maruyama leg." (cAss, cMar); 16♂♂, 12♀♀, same locality, "26. IX. 2000, M. Maryuama leg." (cMar, SEHU); 6♂♂, 1♀: "Yoichi, Shakotan-chô, Hokkaido, JAPAN, 21.VIII.1999, M. Maruyama leg./ under decayed seaweed in coarse sandy beach" (cAss, cMar). All paratypes with label: Paratypus *Oreuryalea watanabei* sp. n. Assing & Maruyama 2001.

Description (see also description of genus). Measurements and ratios (range, arithmetic mean; n=17): AL: 1.30–1.63, 1.46; HW: 0.63–0.72, 0.67; PW: 0.83–0.94, 0.88; PL: 0.66–0.79, 0.73; EL: 0.79–0.88, 0.82; HTiL: 0.79–0.88, 0.82; HTaL: 0.79–0.88, 0.83; HT1L: 0.16–0.20, 0.18; HT2L: 0.17–0.23, 0.21; ML: 0.69–0.74, 0.72; TL: 4.6–6.0, 5.2; PW/HW: 1.27–1.39, 1.31; PW/PL: 1.17–1.27, 1.22; EL/PL: 1.08–1.20, 1.13; HTaL/HTiL: 0.69–0.81, 0.73; HT1L/HT2L: 0.73–1.00, 0.85.

Whole body blackish; antennae blackish brown, with the connecting joints between antennomeres III–XI and sometimes also the bases of antennomeres I–III; legs brown to blackish brown, bases of the tibiae and femora usually slightly lighter.

Head with shallow central impression, which is sometimes almost obsolete; punctuation distinct, but not very deep, interstices approximately as wide as diameter of punctures. Pronotum moderately transverse and wider than head (see ratios PW/PL and PW/HW), rather weakly convex in cross-section; midline mostly at least with very shallow impression; puncturation denser, much finer, and less distinct than that of head. Elytra large and long, distinctly (>1.4×) wider and at suture longer than pronotum (see ratio EL/PL); puncturation similar to that of pronotum, or even finer and less distinct. Abdomen with more shiny and weaker microreticulation than forebody, densely and distinctly punctured; posterior margin of tergum VIII in both sexes angulate in the middle or broadly convex (Figs. 14, 15).

♂: Tergum X as in Fig. 18; posterior margin of sternum VIII pointed, marginal pubescence longer in the middle than in lateral areas; median lobe of aedeagus shaped as in Figs. 6, 7; internal sac with distinctly sclerotized structures (Fig. 8); apical lobe of paramere as in Figs. 9, 10.

♀: Posterior margin of sternum VIII weakly convex, in the middle shallowly convex, laterally with longer and sparser, centrally with short and dense modified setae; spermatheca of somewhat variable shape (Figs. 11–13).

Etymology. We dedicate the species to Dr. Yasuaki WATANABE for his invaluable contributions to the Eastern Palearctic and Oriental staphylinid fauna.

Intraspecific variation. Most morphological characters are subject to only modest intraspecific variation. In the material examined from Primorskiy Kray, however, the legs and antennae are mostly of lighter colour and the abdominal tergum VIII is broadly convex, whereas in the material from Japan and Sakhalin it is more or less distinctly angulate.

Distribution and bionomics. *Oreuryalea watanabei* is currently known from the Pacific coasts of Japan (Hokkaido) and of the Russian Far East (Primorskiy Kray, Sakhalin) (Map 1). As far as is known, the species lives in debris and seaweed on sandy shores. In Sakhalin, it was collected on the sandy shore of a salt lake, together with the intertidal *Aleochara (Emplenota) puetzi* (ASSING) and *Aleochara (Triochara) nubis* (ASSING). Four females collected in July and September each had a mature egg in the ovaries.

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A Redescription of *Omoplandria gyrophaenula* (SHARP) (Coleoptera, Staphylinidae, Aleocharinae)

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Abstract The aleocharine staphylinid beetle, *Omoplandria gyrophaenula* (SHARP) is redescribed. Male secondary sexual characters are described and illustrated for the first time. Its habitat is briefly noted.

Homalota gyrophaenula was described by SHARP (1888) on the basis of the specimens collected by George LEWIS in Japan. BERNHAUER (1907) regarded this species as a member of the subgenus *Microdota* in the grand genus *Atheta*. SAWADA (1977) has correctly pointed out that the aleocharine staphylinid does not belong to the genus *Atheta* in view of the five-segmented maxillary palpus though the tarsal formula is 4–5–5. He placed it in the genus *Omoplandria* CAMERON, because of its bisinuate labrum, bidentate right mandible and gloss feature of labium. PACE (1988) agreed with SAWADA's opinion and described its male genitalic character on the type specimens.

It is, however, necessary to obtain fresh material for verifying the accuracy of their opinion. Unfortunately, no Japanese staphylinidologists including myself were able to find out the natural habitats of this problematical staphylinid. We had to wait till the summer of 1997, when Mr. Koji TOYODA, one of the colleagues in the Laboratory of Entomology, came across many individuals of a strange aleocharine beetle gathering on the flowers of hydrangea, *Hydrangea serrata* (THUNBERG), at Chichibu in Central Japan. A careful study of the specimens revealed that the beetle was nothing but the species long waited for.

In this brief report, I am going to redescribe *Omoplandria gyrophaenula* on the basis of the ample material thus secured and to point out some new taxonomic characters.

I am grateful to Professor Yasuaki WATANABE, Laboratory of Insect Resources, Tokyo University of Agriculture, for his continuous guidance of the study on the Staphylinidae. My thanks are also due to Dr. Shun-Ichi UÉNO for kindly reading the manuscript and Mr. Koji TOYODA for his offer of interesting specimens. It is a great pleasure to me to dedicate this paper to Professor WATANABE in commemoration of his retirement from Tokyo University of Agriculture and to his wife Michiko who always helped Professor WATANABE's works and also kindly looked after his students.

Genus *Omoplandria* CAMERON, 1949

Omoplandria CAMERON, 1949, 475 (type species: *Omoplandria fuscipennis* CAMERON, 1949, 475, by monotypy). —— BLACKWELDER, 1952, 274.

Head somewhat broader than long, with distinct complete occipital suture; frontal suture absent. Labrum transverse, sinuate on anterior margin and feebly emarginate at the middle. Mandibles rather robust, slightly curved and pointed; right mandible provided with two small but distinct teeth; left mandible with small emargination. Maxillae moderately elongate; galea with tuft of fine setae at apex; lacinia strongly curved at apex and pointed, with 5 or 6 rather long spines; maxillary palpus 4-segmented, segment 1 small, segment 2 curved and thickened toward apex, segment 3 as long as segment 2 but much thicker than the preceding segment, segment 4 subulate, with a small pseudosegment. Ligula bilobed and elongate. Labial palpus 3-segmented, short and robust, with more or less small pseudosegment. Gula rather wide, genae not expanded. Pronotum a little convex above. Pronotal hypomeron not visible in lateral view. Mesosternum not carinate; metasternal process acute and connected with mesosternal process which is acuter than metasternal process. Mesocoxae narrowly separated. Elytra sinuate at postero-lateral corners. Legs finely ciliate; tarsal formula 4–5–5. Seventh male tergite without carina.

Remarks. The genus *Omoplandria* undoubtedly belongs to the tribe Hoplandrini in having the pseudosegment on the maxillary pulpus, the 4–5–5 tarsal formula and the absence of "athetine bridge" (SEEVERS, 1978) of the median lobe of the male genitalia. It is distinguishable from all the other members of the tribe distributed in Asia or the Holarctic Region by the following combination of characters: tarsal fomula 4–5–5 (5–5–5 in the genus *Hoplandria* FENYES; 4–4–5 in the genus *Brachidamorpha* CAMERON); non-carinate mesonotum (carinate in *Paroplandria* CAMERON, *Alloplandria* PACE and *Pseudoplandria* FENYES); nearly contiguous mesocoxae (widely separated in *Hoplandria* FENYES, *Platandria* CASEY and *Tetrallus* BERNHAUER); right mandible with two small but distinct teeth (both mandibles simple without tooth in *Nosora* CASEY and *Palaleochara* CAMERON).

Omoplandria gyrophaenula (SHARP, 1888)

[Japanese name: Michiko-hime-hana-hanekakushi]

(Figs. 1–6)

Homalota gyrophaenula SHARP, 1888, 294; type locality: Kurigahara (Usui-toge).
Atheta (*Microdota*) *gyrophaenula*: BERNHAUER, 1907, 396. —— BERNHAUER & SCHEERPELTZ, 1926, 632.
Omoplandria gyrophaenula: SAWADA, 1977, 220. —— PACE, 1984, 54.

Body length 2.0–2.5 mm. Body elongate, fusiform in dorsal aspect but short and compact in dried specimens, somewhat convex above. Color brownish red and shining, elytra infuscate, distal 3 or 4 segments of antennae, and apical half of abdomen blackish. Head convex above, transverse (width/length = 1.27); surface sparsely covered with

Fig. 1. *Omoplandria gyrophaenula* (SHARP), male, habitus.

short and glossy pubescence and covered with fine dense punctures. Antennae short and thickened apically; segment 1 stout, segment 2 as long as but slightly narrower than segment 1, segment 3 much shorter than segment 2, segment 4 lightly transverse and smaller than segment 5, segments 7–10 strongly transverse; relative length of each segment from base to apex:— 3.5 : 3.5 : 2.2 : 1.6 : 1.2 : 1.2 : 1.3 : 1.5 : 1.4 : 1.4 : 3.7.

Pronotum convex above, transverse (width/length=1.52), apparently wider than head (pronotum/head=1.45), widest at about basal third; sides uniformly arcuate; surface with sparse pubecence and fine punctures throughout. Elytra relatively flat, wider than long (width/length=1.51), longer than pronotum (elytra/pronotum=1.26), shallowly emarginate behind, weakly sinuate at postero-lateral corners; surface coarsely covered with pubescence. Abdomen fusiform, flattened above, narrowed toward apex.

Male. Abdominal tergite 3 with distinct projection directed posteriad at the middle, but in some individuals, it is represented by only a small knob-like process; tergite 8 emarginate at posterior margin bearing small tooth (Fig. 3). Median lobe of genital organ long with thin and long flagellum. Parameres as shown in Fig. 6.

Female. Abdominal tergite 3 not modified, tergite 8 short and truncate behind. Spermatheca complicated in shape; duct strongly coiled and folded many times

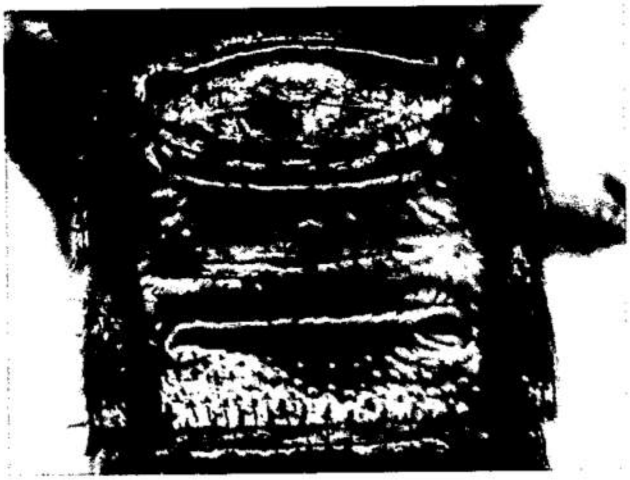
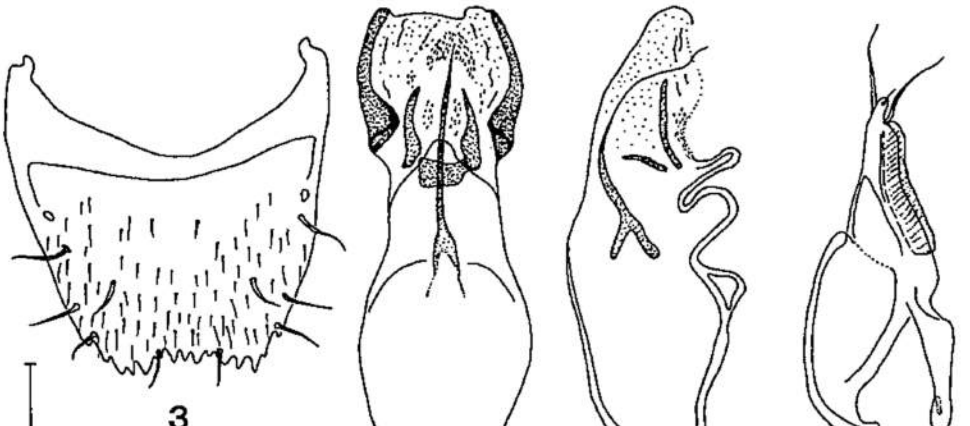


Fig. 2. *Omoplandria gyrophaenula* (SHARP), secondary sexual character of male 3rd tergite.



Figs. 3–6. *Omoplandria gyrophaenula* (SHARP). —— 3, Male 8th tergite; 4, median lobe of male genitalia, ventral view; 5, median lobe of male genitalia, lateral view; 6, paramere of male genitalia. Scale: 0.1 mm.

(SAWADA, 1977, p. 220, fig. 22 K).

Material examined. 30♂♂, 54♀♀, Zaike, Higashi-chichibu, Saitama Pref., 2–VIII–1997, K. TOYODA leg.; 62 exs., same locality and collector as above but 12–VIII–1998.

Notes. The genus *Omoplandria* comprises only two species: one is *O. fuscipen-*

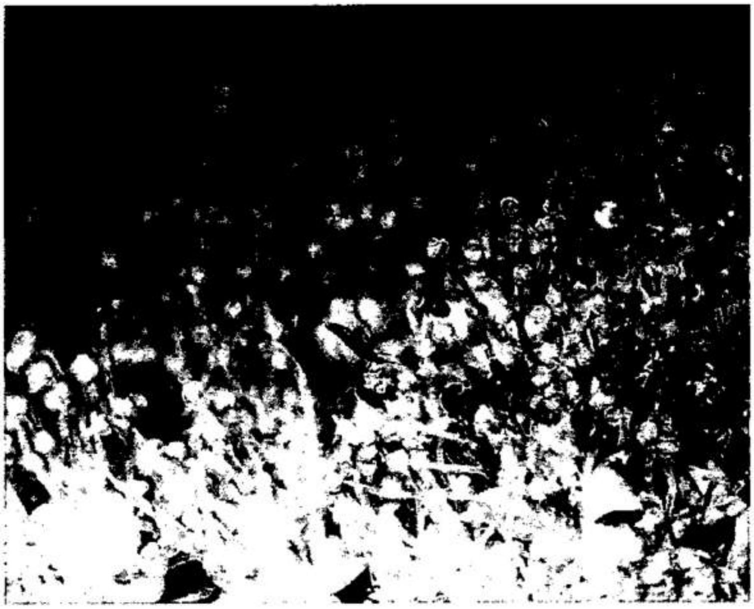


Fig. 7. Natural habitat of *Omoplandria gyrophaenula* (SHARP) gathering on the flowers of *Hydrangea serrata* (THUNBERG) (photo by K. TOYODA).

nis CAMERON described from Mt. Arisan [=Ali-shan], Taiwan, and the other is this species. The latter species is easily distinguished from the formar by the blackish elytra, the male abdominal tergite 3 with a distinct projection, and male abdominal tergite 7 without any keel. The adults of this staphylinid beetle were seen gathering on the flowers of *Hydrangea serrata* (THUNBERG) late in the summer, which usually occurs as undergrowths of rather wet and dim forests and seldom attracts insects particularly beetles. However, *Omoplandria gyrophaenula* may not be a pollen feeder, because I never observed pollen grains in the alimentary canals of dissected beetles.

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Myrmecophilous Species of *Drusilla* (Coleoptera, Staphylinidae, Aleocharinae) Associated with *Lasius* (*Dendrolasius*) spp. (Hymenoptera, Formicidae, Formicinae) from China

Part 1

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Abstract *Drusilla watanabei* sp. nov. of the *canaliculata* group of the staphylinid tribe Lomechusini is described from Hubei and Hunan Provinces, China. *Drusilla yunnanensis* PACE, which was originally described from Yunnan Province, is first recorded from these provinces.

The genus *Drusilla* LEACH, 1819, belonging to the tribe Lomechusini, includes more than 150 species mainly from Europe and Asia (MARUYAMA, 2000), and some species are known as being myrmecophilous or termitophilous (KISTNER, 1993; KISTNER *et al.*, 1997; SEEVERS, 1957).

In June of 2000, the second author collected four species of *Drusilla* from trails of *Lasius* (*Dendrolasius*) spp., in Hunan and Hubei Provinces of Central China. All the species are black and shining, and seem to mimic to such dendrolasiine ants as lomechusine members of *Pella* spp. which are well known myrmecophiles associated with *Dendrolasius* ants in Europe. These characteristics are not common in the other members of the genus and imply closer associations with the ants than merely walking around ant trails. In this paper, therefore, we tentatively regard them as myrmecophiles and record the ant species, from whose trails they were collected. Further observations of their relationships with ants are needed.

The purpose of this paper is to describe and record these four species of *Drusilla* in two parts. In this part, we are going to deal with two of the four species: one new species, and one known species newly recorded from the provinces.

Number of setae and bristles in the descriptions are confined to one side of the body. The following abbreviations are used: NSMT (National Science Museum, Tokyo); CMM (private collection of MM); TUA (Laboratory of Insect Resources, Tokyo University of Agriculture); *LDS* (from trails of *Lasius* (*Dendrolasius*) *spathepus* WHEELER, 1910); *LDC* (from trails of *L.* (*D.*) *capitatus* (KUZNETSOV-UGAMSKY, 1927)).

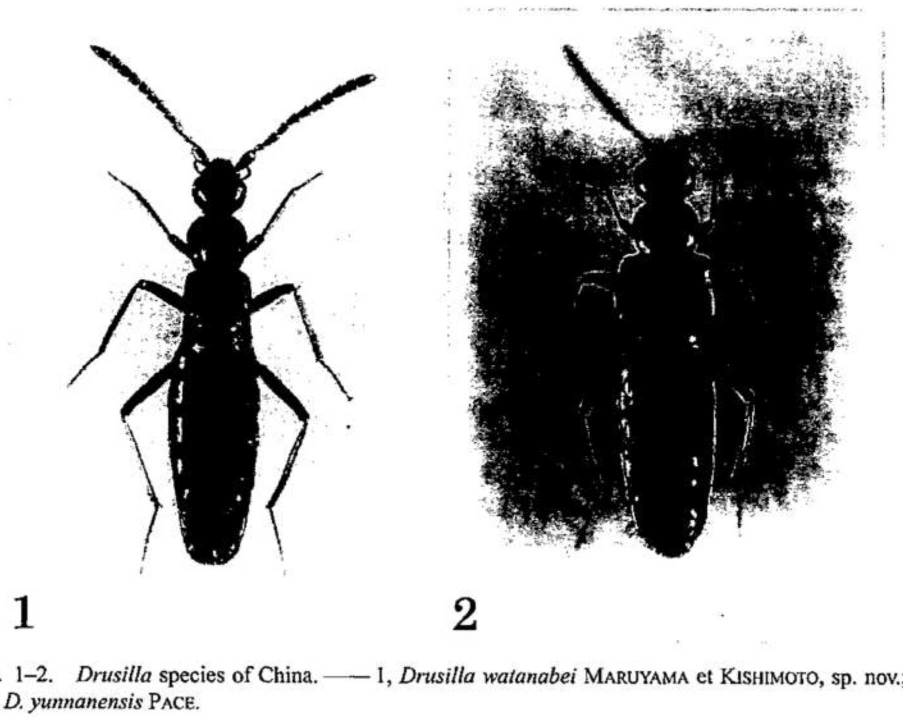
We are grateful to Dr. Shun-Ichi UÉNO (NSMT) for revising the manuscript of this paper. Special thanks are due to Dr. Masaaki SUWA (Systematic Entomology, Hokkaido University) for his continuous guidance to MM, and Dr. Yûki IMURA (Yokohama) for his kind help in the field during TK's collecting trip in China.

Drusilla watanabei MARUYAMA et KISHIMOTO, sp. nov.

(Figs. 1, 3–10)

Type series. Holotype: ♂, Near Xueluozhai (1,250–1,300 m alt.), Sheping Qu, Xuan'en Xian, Hubei Prov., 12–VI–2000, TK leg. (*LDS*), preserved at present in the collection of NSMT. Paratypes: 3♂♂, 4♀♀, same data as holotype (TUA & CMM); 5♂♂, 3♀♀, Dohong Cun (1,030 m alt.), Daan Xiang, Longshan, Hunan Prov., 13–VI–2000, TK leg. (*LDS*) (TUA & CMM).

Etymology. Dedicated to Professor Yasuaki WATANABE for his invaluable contri-



Figs. 1–2. *Drusilla* species of China. —— 1, *Drusilla watanabei* MARUYAMA et KISHIMOTO, sp. nov.; 2, *D. yunnanensis* PACE.

bution to the clarification of the staphylinid fauna of East Asia.

Description. Body length: 6.0–6.5 mm (from front margin of head to apex of 8th abdominal tergite); 2.5–2.8 mm (from front margin of head to apices of elytra).

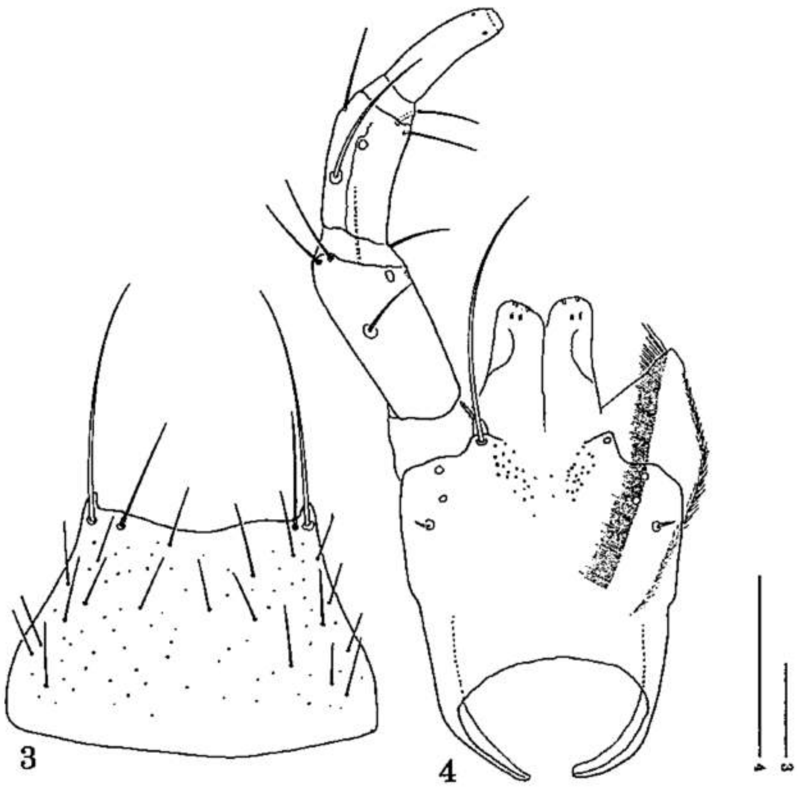
Body (Fig. 1) very elongate and slender. Blackish brown in ground color; antennae reddish brown; apical margins of 3rd to 6th (sometimes 7th) abdominal segments pale brown; mid and hind legs with bases of femora, tibiae and tarsi yellowish brown.

Head circular (width/length=0.96), moderately convex, broadest behind the anterior margin, slightly depressed above; surface very slightly reticulated and sparsely covered with long setae; eye small, with very fine pubescence among facets; longitudinal diameter of eye nearly half the length of postocular part; clypeus depressed laterally. Antenna 11-segmented, 1st segment stout and apically dilated, nearly 2.7 times as long as broad; 2nd shorter than the 1st; 3rd much longer than the 2nd but somewhat shorter than the 1st; 4th to 10th each slightly longer than wide; 11th conical, 1.7 times as long as broad; relative lengths of segments from basal to apical:— 35: 16.5: 25: 15: 15: 14: 15: 15: 15: 14: 29. Labrum transverse, truncate anteriorly but slightly emarginate anteromedially. Mandible slightly curved, pointed apically, and edentate. Maxilla moderately elongate; galea nearly parallel-sided, slightly curved near apex, with fine apical pubescence; lacinia much broader than galea, with fine pubescence on inner margin; maxillary palpus with 1st segment very short, 2nd slightly curved, thickened toward apex, 3rd slightly longer than the 2nd, and 4th subulate, 1/3 as long as the 2nd. Mentum (Fig. 3) trapezoidal; anterior margin slightly emarginate, with its lateral corners prominent; surface almost uniformly covered with pseudopores. Prementum (Fig. 4) with 50–60 medial pseudopores, 2 real pores and 1 setal pore. Ligula (Fig. 4) bilobed and slender. Labial palpus (Fig. 4) with 1st segment long; 2nd shorter and narrower than the 1st; 3rd as long as the 2nd but much narrower.

Pronotum moderately convex with rounded anterior and posterior margins, as long as broad (width/length=1.0), a little broader than head, widest behind anterior margin; side margin weakly sinuate; disc with median sulcus, and with a deep, large, and round depression (male) or a shallow depression (female) before median posterior margin; surface moderately granulate-punctured, covered with short and rather stiff setae, and with four or five suberect bristles along lateral margins. Scutellum triangular; surface densely punctured and sparsely covered with minute setae. Metasternal process apically rounded. Elytra slightly widened posteriad, broader than long (width/length=1.37) and broader than pronotum; posterior margin of each elytron nearly truncate but slightly convex, thus forming a small recess at adjoining point of elytra, posterior corner rounded; dorsal surface slightly convex, moderately and rugosely punctured, and covered with long setae; puncturation sparser posteriad; lateral margin with three short blackish bristles. Hind wing very small, as long as elytron.

Legs moderately long; relative lengths of tarsomeres from basal to apical:— foretarsus — 9 : 10 : 10 : 21; midtarsus — 21 : 11 : 10 : 9 : 18; hindtarsus — 37 : 16 : 12 : 9 : 13.

Abdomen elongate; 3rd to 5th segments moderately expanded and 6th to 8th nar-

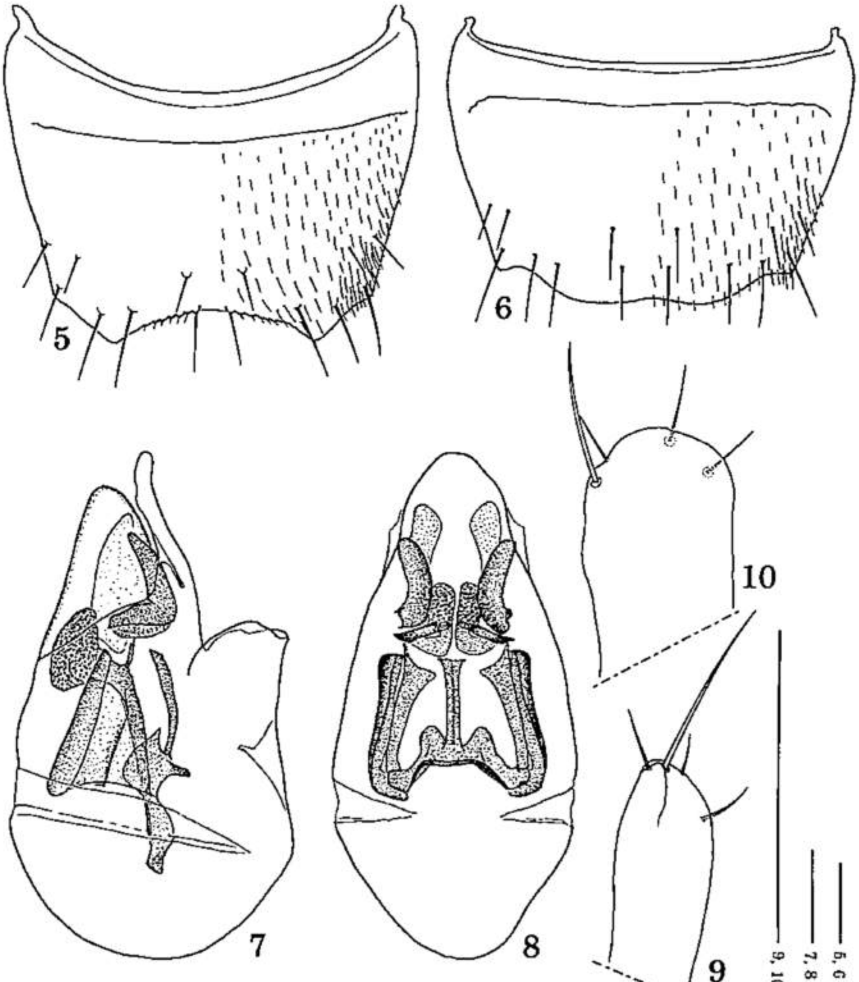


Figs. 3–4. *Drusilla watanabei* MARUYAMA et KISHIMOTO, sp. nov. —— 3, Mentum, ventral view; 4, labium, ventral view (labial palpus is omitted and hypopharynx is indicated at right side). Scale: 0.1 mm.

rowed posteriad; surfaces of 3rd to 8th tergites shining, sparsely pubescent; number of black bristles on 3rd to 7th tergites:— 2–4–4–5–2 (sometimes variable).

Male. Third tergite with a small setiferous granula posteromedially; 4th to 6th tergites with a pair of small setiferous granulae posteromedially; 7th tergite with two pairs of small setiferous granulae posteromedially; 8th tergite (Fig. 5) broadly emarginate posteriorly, with 7 black bristles; 8th sternite entire, with 25–27 black bristles, without short sensory setae apically; 9th and 10th tergites with four short bristles, respectively; 9th sternite with one small bristle. Median lobe of male genitalia (Figs. 7, 8) broad, oval and large. Paramere shorter than median lobe; apical lobe of paramerite as shown in Figs. 9, 10.

Female. Third to 7th tergites simplified; 8th tergite (Fig. 6) slightly emarginate posteromedially, and with seven black bristles; 8th sternite shaped as in male; 9th and 10th tergites with three and four short bristles, respectively. Spermatheca missing in the type series.



Figs. 5–10. *Drusilla watanabei* MARUYAMA et KISHIMOTO, sp. nov. —— 5, Male 8th tergite, dorsal view; 6, female 8th tergite, dorsal view; 7, median lobe of male genitalia, lateral view; 8, ditto, ventral view; 9, apical lobe of paramerite, lateral view; 10, ditto, ventral view. Scale: 0.2 mm.

Diagnosis. Drusilla watanabei apparently belongs to the *canaliculata* group, which consists of *D. canaliculata* (FABRICIUS, 1787), *D. italica* (BERNHAUER, 1903), *D. cavicollis* CASEY, 1906, *D. aino* NAKANE, 1963, etc. and is widely distributed in northern Palearctic Region and Alaska (MARUYAMA, 2000), in having very small and functionless hind wings, and the complicated structure of the inner sac of aedeagus. The present species can be distinguished from all the other members of this species-group by having parallel-sided elytra, very small but generalized hind wings, and structure of the aedeagus and paramere.

Notes. The type series including the holotype were collected in a secondary deciduous forest near the pass (alt. about 1,350 m) between Xuan'en Xian and Hefeng Xian at the southwestern part of Hubei Province. The second author observed that the forest floor was covered with trails of numerous individuals of *Dendrolasius* and was able to collect the new species along with *Pella* spp. and *Homoeusa* spp. Another locality, Dohong Cun, is also a secondary deciduous forest situated at the backyard of a small village in Longsan Xian, Northwest Hunan (alt. 1,030 m), where the specimens were collected from the trail of *L.* (*D.*) *spathepus*, together with other staphylinids, histerids, scydmaenids and myrmecophilous cricket.

Host ant. *Lasius* (*Dendrolasius*) *spathepus*. (Determined by MM.)

Distribution. China (Provinces: Hubei, Hunan).

Drusilla yunnanensis PACE

(Fig. 2)

Drusilla yunnanensis PACE, 1993, 112.

New records. 1♂, Gaodongzi (700 m alt.), Dashaba, Huangjindong, Xianfeng, Hubei Prov., 9~14–VI–2000, TK leg. (*LDC*) (TUA); 1♂, Dohong Cun (1,030 m alt.), Daan Xiang, Longshan, Hunan Prov., 13–VI–2000, TK leg. (*LDS*) (CMM).

Notes. This species was originally described from Dali and Kunming, Yunnan Province (PACE, 1993). In this study, we were able to examine the specimens of the species taken from trails of *Dendrolasius* species. One locality, in Longshan, Hunan Province, is the same as that of the preceding new species; the other locality is a small secondary forest mixed with evergreen and deciduous trees. Both the localities recorded herewith are the first record of the staphylinid from Hubei and Hunan.

Host ant. *Lasius* (*Dendrolasius*) *spathepus*, and *L.* (*D.*) *capitatus*. (Determined by MM.)

Distribution. China (Provinces: Yunnan, Hubei, Hunan).

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A New *Aploderus* (Coleoptera, Staphylinidae, Oxytelinae) Discovered in Central Japan

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Abstract A new species of the oxyteline staphylinid beetle is described from Central Japan, under the name of *Aploderus watanabei*. It is found by sifting dead leaves under the dung of the Japanese serow at the western part of Kwanto district, Central Japan. This is a thirteenth species of the genus in the world, and is the first record of the peculiar *Aploderus* species from Japan.

Introduction

The genus *Aploderus* belongs to the tribe Thinobiini of the subfamily Oxytelinae in the Staphylinidae (NEWTON *et al.*, 2000). After HERMAN (2001), only twenty species of *Aploderus* have been described from the world. Seven of them were recorded from the Pacific side of North America and five from the Palearctic. The Palearctic members are *A. caelatus* GRAVENHORST from Algeria, Tunisia and Europe, *A. caesus* ERICHSON from Europe and Caucasus, *A. szechuanensis* BERNHAUER from Sichuan, China, *A. indicus* CAMERON from Darjeeling, India, *A. tauchylicus* KASTCHEEV from the Altai Mts., Kazakhstan.

I collected some specimens of this oxyteline staphylinid by sifting dead leaves under the dung of the Japanese serow, *Capricornis crispus* (TEMMINCK), on Mt. Ryôgami-san, Saitama Prefecture, Central Japan on the 1999 excursion of the Staphylinidological Society of Japan. After a careful examination, it becomes clear that the species can be included in the genus *Aploderus* and is new to science. It will be described and illustrated in the present paper. This is the first record of the peculiar *Aploderus* species from Japan and a thirteenth species of the genus in the world.

Aploderus watanabei SHIMADA, sp. nov.

[Japanese name: Watanabe-munemizo-hanekakushi]

(Figs. 1–9)

Male. Body length: 3.9–4.4 mm (from front margin of head to anal end); 2.1–2.4 mm (from front margin of head to elytral apices).

Body elongate, parallel-sided and moderately depressed above; ratio of the maximum breadths of head: pronotum: elytra=1 : 1.07 : 1.25 (mean value of the three specimens measured).

Coloration:— Body shining. Head, pronotum and abdomen black except for reddish brown on the anterior margin of each antennal tubercle; elytra reddish brown, basal triangular area around scutellum black; mouth parts yellow to reddish brown; legs yellowish brown.

Head subquadrate, depressed above and transverse (width/length=1.40–1.45), widest at about posterior third and more strongly narrowed anteriad than posteriad; lateral sides feebly rounded posteriad; fronto-clypeal area subquadrate, moderately depressed, prominent over antero-internal areas of antennal tubercles and truncate at the anterior margin; surface coarsely, moderately and setiferously punctured, the punctures becoming smaller on the latero-basal parts, covered with microscopic alutaceous ground sculpture, and provided with three long suberect yellowish bristles, frontal one between antennal tubercle and clypeo-frontal area, post-antennal one at postero-external corner of antennal tubercle, and posterior one inside of lateral margin at posterior

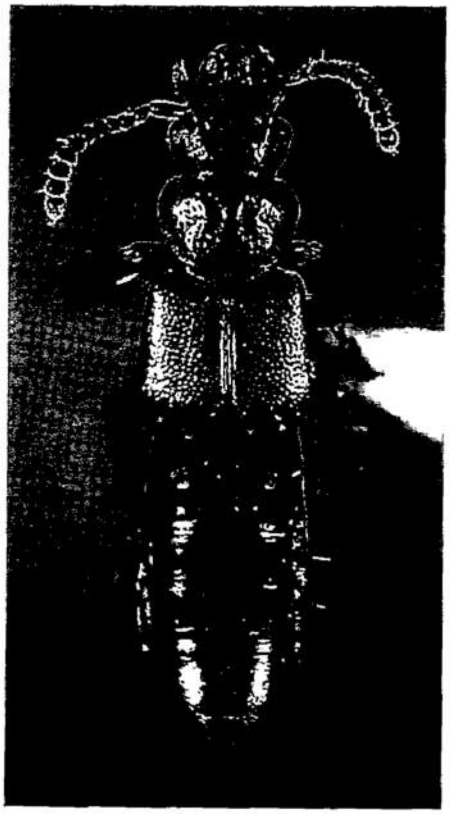
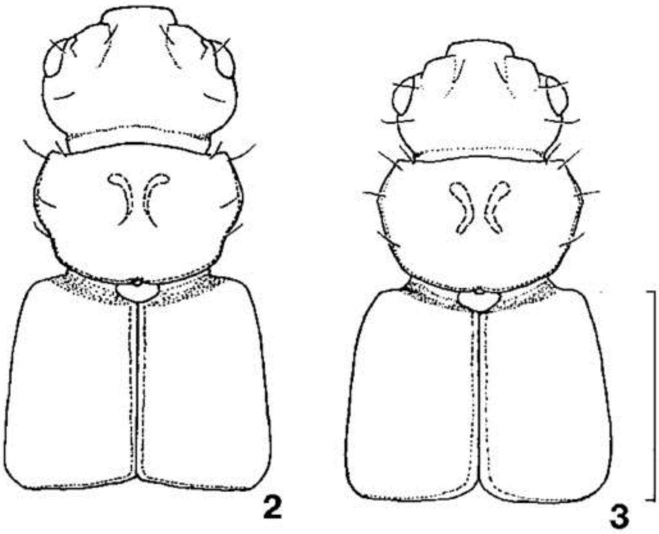


Fig. 1. *Aploderus watanabei* sp. nov.; habitus in female.



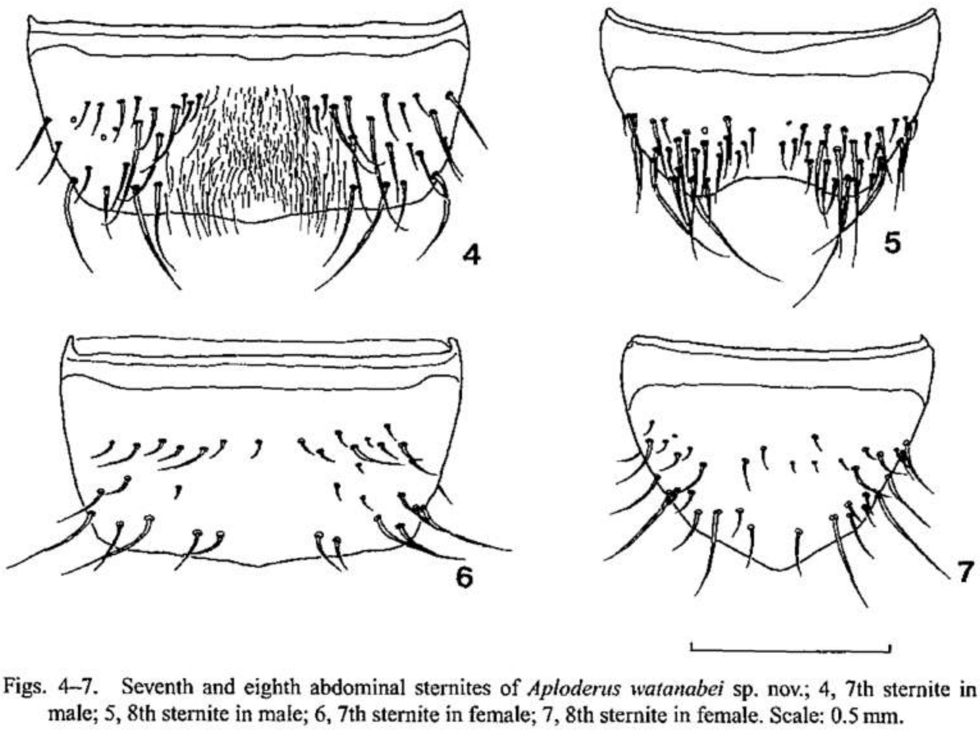
Figs. 2–3. Head, pronotum and elytra of *Aploderus watanabei* sp. nov.; 2, male; 3, female. Scale: 1.0 mm.

third; eyes orbiculate as a whole, moderately convex, the longitudinal diameter of each eye apparently smaller than that of temple (eye/temple=0.51–0.77). Antennae moderately long, extending to the humeral parts of elytra; 1st segment robust, gently dilated apicad and the longest, 2.64 times as long as broad, 2nd constricted at the base, distinctly longer than broad (length/width=1.5) but remarkably narrower (2nd/1st=0.4) and evidently shorter than 1st (2nd/1st=0.71), 3rd as long as and slightly broader than 2nd (3rd/2nd=1.1), 4th almost subconical, shorter (4th/3rd=0.66) and as broad as 3rd, 5th as long as and slightly broader (5th/4th=1.09) than 4th, 6th to 10th clavate and transverse, 11th subconical and 1.43 times as long as broad. Third segment of maxillary palpus long and nearly parallel-sided, longer than broad (length/width=2.5) and broader than 4th (3rd/4th=4), the latter subulate and slightly curved at the middle.

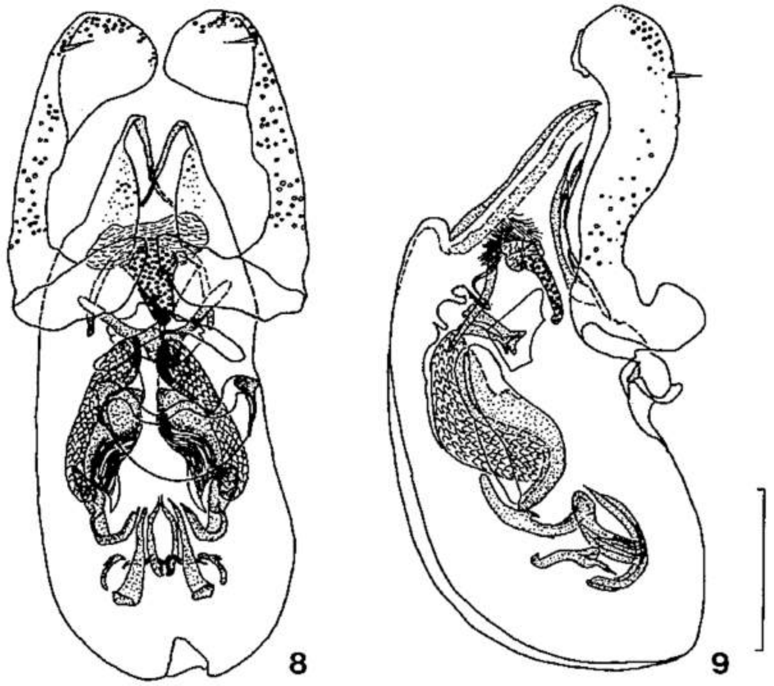
Pronotum subcordate, moderately depressed above and clearly transverse (width/length=1.48–1.60), as broad as or slightly broader (pronotum/head=1.11) than head, widest at about anterior third, and much more strongly narrowed posteriad than anteriad; lateral margins bordered, the border continuing to posterior margin, which is feebly arcuate and slightly emarginate at the middle, anterior margin approximately truncate, anterior angles narrowly and slightly produced anteriad and blunt, posterior ones rounded; disc with a pair of small arcuate sulci, which are feebly curved in middle and abbreviated in posterior third; surface provided more coarsely with setiferous punctures than on head, covered with microscopic alutaceous ground sculpture, provided with four long suberect brownish bristles, anterior one inside of anterior angle near anterior margin, latero-anterior one inside of anterior angle near lateral margin, latero-median one inside of anterior third of lateral margin, and posterior one inside of posterior third of lateral margin. Scutellum subpentagonal, rounded posteriad, median depression longitudinal subrhombic, closely with fine punctures on median line, which is abbreviated in posterior half; posterior depression semicircular, closely with fine punctures, not bordered on posterior margin.

Elytra subtrapezoidal and convex medially, slightly dilated posteriad, slightly transverse (width/length=1.08–1.21), evidently longer (elytra/pronotum=1.48–1.60) and slightly broader (elytra/pronotum=1.08–1.22) than pronotum, widest near posterior sixth, more strongly narrowed anteriad than posteriad; lateral sides provided with one long and four short brownish bristles though a part of them is sometimes missing; posterior margin slightly emarginate at the middle, posterior angles narrowly rounded; surface provided more closely and coarsely with setiferous punctures than on the disc of pronotum.

Legs moderately long; protibiae constricted on preapical portion, each provided with a row of stout spines on anterior half, mesotibiae each with a row of spines on anterior two-thirds, metatibiae with a row of comb-like yellowish setae; first tarsomere of each leg approximately as long as 2nd, the latter provided with long yellowish membranous lobe apicad, 3rd tarsomere evidently longer than the two preceding ones combined.



Figs. 4–7. Seventh and eighth abdominal sternites of *Aploderus watanabei* sp. nov.; 4, 7th sternite in male; 5, 8th sternite in male; 6, 7th sternite in female; 7, 8th sternite in female. Scale: 0.5 mm.



Figs. 8–9. Male genitalia of *Aploderus watanabei* sp. nov.; 8, male genitalia in ventral view; 9, same in lateral view. Scale: 0.1 mm.

Abdomen nearly parallel-sided with the exception of three apical segments, which are abruptly narrowed towards the apical end; surface of each tergite closely covered with microscopic coriaceous ground sculpture, provided moderately and more sparsely with setiferous punctures than on elytra; 7th sternite slightly produced at the middle of posterior margin, densely covered with yellowish pubescence in the middle; 8th sternite apparently emarginate at the middle of posterior margin.

Genitalia elliptical, trilobed and almost symmetrical, moderately sclerotized except for membraneous ventral side of median lobe. Median lobe nearly parallel-sided, though the apical third is abruptly narrowed towards the blunt apex, which is curved dorsad in lateral view. Parameres relatively stout, apparently shorter than median lobe, each abruptly dilated and curved inside in apical third.

Female. Body length: 3.8–4.2 mm (from front margin of head to anal end); 1.8–2.1 mm (from front margin of head to elytral apices).

Ratio of maximum breadths of head: pronotum: elytra = 1 : 1.16 : 1.47 (mean value of four specimens measured).

Head smaller, temple weakly divergent, eyes conspicuously convex, the longitudinal diameter of each eye slightly longer than (eye/temple = 1.1–1.15) that of temple. Antennae slightly shorter.

Pronotum transverse (width/length=1.39−1.49), slightly broader than head (pronotum/head=1.14−1.18); anterior angles less produced anteriad; discal sulci somewhat deeper and slightly broader than in male. Elytra broader than pronotum (elytra/pronotum=1.27−1.29).

Seventh sternite slightly produced at the middle of posterior margin; 8th entire.

Type series. Holotype: 1♂, Mt. Ryôgami-san (Kôbô-ido, 1,300 m alt.), Ryôgami-mura, Saitama Pref., Honshu, Japan, 31–X–1999, T. KISHIMOTO & T. SHIMADA leg. Paratypes: 2♂♂, same data as for the holotype, 4♀♀, same locality as for the holotype, 30–X–1999, T. SHIMADA leg. The type specimens are deposited in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture.

Distribution. Japan (central Honshu).

Remarks. The present new species is closely similar in general appearance to *Aploderus caelatus* (GRAVENHORST, 1802), but can be distinguished from it by the following points: subquadrate head; absence of vertexal longitudinal furrow; weakly convex temples; simple emargination of 8th abdominal sternite; different configuration of male genital organ.

Bionomics. The type specimens were obtained by sifting dead leaves or litter under a dung of the Japanese serow, *Capricornis crispus* (TEMMINCK), in a deciduous broadleaved forest on Mt. Ryôgami-san at an altitude of 1,300 m.

Etymology. The present new species is dedicated to my supervisor, Professor Yasuaki WATANABE, who has made many important contributions to the taxonomy of the Japanese Coleoptera, in particular of the Staphylinidae.

Acknowledgement

I wish to express my cordial thanks to Professor Yasuaki WATANABE, Laboratory of Insect Resources, Tokyo University of Agriculture, for his continuous guidance in the course of my study, to Dr. Shun-Ichi UÉNO and Dr. Toshio KISHIMOTO, Laboratory of Insect Resources, Tokyo University of Agriculture, for their critically reading the original manuscript and helpful advice, to Mr. Koji TOYODA for his support in the field.

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Two New *Stenus* Species (Coleoptera, Staphylinidae) from Yunnan

(271st Contribution to the Knowledge of Steninae)

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Abstract Two new species of the genus *Stenus* are described from Yunnan and named in honour of Prof. Yasuaki Watanabe: *Stenus* (*Hemistenus*) *watanabeianus* sp. nov. and *S.* (*H.*) *yasuakii* sp. nov.

China is an Eldorado concerning its richness of Steninae. The number of new species collected in the last years is amazing. Amongst the material which has been kindly sent for study by Prof. Yasuaki Watanabe, were found two new species of the subgenus *Hemistenus* Motschulsky. They are described here in honour of its famous collector and with thanks for more than 30 year cooperation.

Abbreviations: aE=average distance between eyes; HT=Holotypus; lEl=greatest length of elytra; lP=length of pronotum; lS=length of suture; PM=proportional measurements (1 unit=0.0085 mm); wEl=greatest width of elytra; wH=width of head; wP=width of pronotum.

Stenus (*Hemistenus*) *watanabeianus* sp. nov.

(Fig. 1)

This new species resembles *S. evexifrons* Puthz, *S. wanglangus* Zheng and several species near *S. luteolunatus* Puthz, but it belongs to a different species-group because of its coniform paraglossae (Puthz, 1998). Though this species-group has not been defined up to now, it comprises numerous undescribed species either with margined or with immargined abdomen, most of them being smaller than the new species described here. Superficially it resembles species of the Japanese *indubius* complex.

Brachypterous, slightly shining with an aeneous tint, head blackish, pronotum brown, elytra reddish brown with a long, oval, indistinctly delimited, lateral orange spot, abdomen dark brown. Punctation very coarse and dense, confluent on pronotum and elytra; pubescence distinct, recumbent. Antennae yellowish, club infuscate. Maxillary palpi yellowish. Legs reddish yellow, apical portion of femora slightly infuscate. Clypeus blackish, labrum brown, yellowish pubescence dense.

Length: 4.0–4.8 mm (fore parts: 2.3–2.4 mm).

PM of the HT: wH: 39.5; aE: 23; wP: 33; lP: 37; wEl: 41; lEl: 38; lS: 28.

Male. Legs simple. Metasternum shallowly impressed, coarsely and densely punctate, interstices smaller than half diameter of punctures, shining; punctation of sternites coarse and dense, less coarse posteriorly, no special sexual characters. Sternite 8 with an extremely shallow emargination apically. Sternite 9 with strong apicolateral teeth. Tergite 10 triangularly rounded. Aedeagus (Fig. 1): median lobe long and narrow, apical portion triangularly narrowed; internal strunctures simple: no distinctly sclerotized hooks or clasp; parameres distinctly longer than median lobe, apically broadened with many, very long setae.

Female. Unknown.

Head slightly narrower than elytra, frons very broad with deep longitudinal furrows, median portion slightly broader than each of the side portions, very strongly, convexly elevated, distinctly extending beyond the lever of inner eye margins. Punctation very coarse and dense but mostly simple, not confluent, diameter of punctures about as large as apical cross section of antennal segment 2, interstices extremely small and sharp, only on the top of the middle portion slightly larger, without forming a distinct shining area.

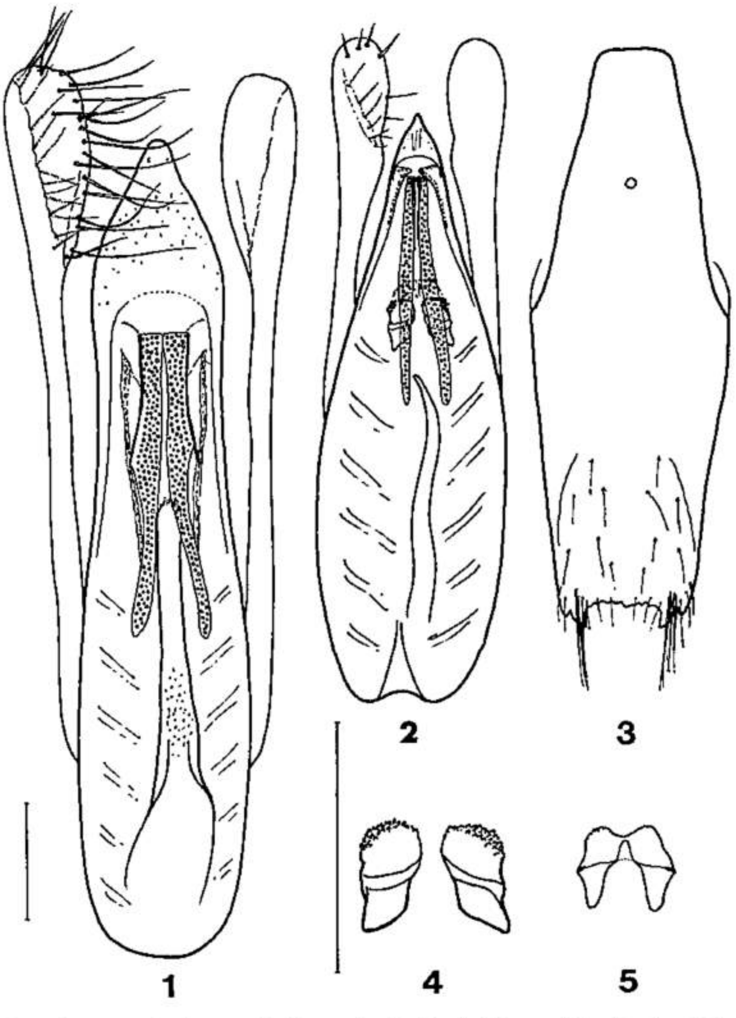
Antennae short, extending towards posterior third of pronotum when reflexed, penultimate segments nearly 1.5× as long as broad.

Pronotum distinctly longer than broad, broadest in anterior half, sides strongly convex anteriorly, distinctly concave in posterior half; surface very uneven, with 5 deep longitudinal impressions from the left to the right. Sculpture irregular, punctation strongly confluent, very dense, delimitation of single punctures nearly impossible.

Elytra trapezoidal, somewhat broader than head, distinctly broader than long, shoulders rectangular, sides strongly (and straightly) divergent, restricted in posterior sixth, posterior margin deeply emarginate. One long impression near suture, other distinct impressions near shoulders and on postero-lateral quarter. Orange spot oval, nearly as long as and as broad as half one elytron, indistinctly delimited. Sculpture very coarse and dense, confluent longitudinally, but not as irregular as on pronotum, single punctures can mostly be more or less delimited.

Abdomen subcylindrical, paratergites narrow, distinctly directed downwards, paratergites of segment 4 as broad as segment 1 of posterior tarsi, punctation of paratergites moderately coarse and moderately dense. Basal impressions of first tergites shallow, tergite 7 with a narrow membranous fringe apically. Punctation throughout very coarse and very dense, regular, punctures on tergite 3 as large as apical cross section of antennal segment 3, punctures on tergite 7 about as large as basal cross section of tergite 3, interstices smaller everywhere than half diameter of punctures. Punctation of tergite 8 at least as coarse as that on tergite 7, yet denser; tergite 10 moderately coarsely and moderately densely punctate.

Legs slender, posterior tarsi nearly two-thirds the length of posterior tibiae, segment 1 slightly longer than the two following segments combined, much longer than the last segment; segment 4 narrowly and deeply bilobed.



Figs. 1–5. Ventral aspect of aedeagus (1, 2), sternite 9 of male (3), expulsion hooks of the aedeagus (4, 5) of *Stenus (Hemistenus) watanabeianus* sp. nov. (1), *S.* (*H.*) *yasuakii* sp. nov. (2–4), *S.* (*H.*) *inconspicuus* CAMERON (Kumaon: Rangarh) (5). Scale=0.1 mm (1=2, 3; 4=5).

Most of the insect lacks microsculpture, only tergite 8 has shallow, tergite 10 distinct microsculpture.

Holotype: ♂, "China: Yunnan: Diancang Shan Mountains, Dali Shi, Yazhu Feng, 3600 m, 5.IX.1993, Y. WATANABE leg." (coll. Shanghai Institute of Entomology, Academia Sinica).

Stenus watanabeianus sp. nov. is distinguished from both *S. evexifrons* PUTHZ and *S. montosus* PUTHZ by its conform paraglossae. From *S. wanglangus* ZHENG which I only know from the description, it is distinguished by much denser punctation of the frons, coarser pronotal punctation, presence of a medial impression on the pronotum and longer elytra.

Stenus (*Hemistenus*) *yasuakii* sp. nov.

(Figs. 2–4)

This new species is the sister species of *S. inconspicuus* CAMERON and looks the same. Because of different internal characters of the aedeagus it has to be regarded as *species propria*.

Black with some brownish tint, slightly shining with some metallic tint, coarsely and very densely punctate; pubescence short, recumbent. Antennae brown, club dark brown. Maxillary palpi with the first segments yellowish, segment 3 infuscate. Paraglossae coniform. Legs light brown, apical portion of femora slightly infuscate. Clypeus black, labrum blackish brown, densely pubescent.

Length: 2.2–2.7 mm (fore parts: 1.2–1.3 mm).

PM of the HT: wH: 25.2; aE: 13; wP: 19; lP: 20; wEl: 24; lEl: 22; lS: 18.

Male. Sternite 8 with a moderately narrow, round notch in about posterior fourteenth (3.5:49). Sternite 9 (Fig. 3). Tergite 10 rounded. Aedeagus (Fig. 2) close to that of *S. inconspicuus* (see fig. 51 in PUTHZ, 1968), internal structures different: two separate expulsion hooks, which are tuberculate distally (Fig. 4), internal tube simple, not enveloped in a rough membranous sac. In *S. inconspicuus*, the expulsion hooks are smaller and coalescent apicomedially (Fig. 5), and the internal tube is enveloped in a finely structured, rough membranous sac.

Female. See below.

Holotype: ♂, "China: Yunnan: Lijian Xian, Saitou, 1830 m, 22.X.1995, Y. WATANABE leg." (coll. Shanghai Institute of Entomology, Academia Sinica).

Since both species are extremely close, *S. yasuakii* sp. nov. has to be identified by dissecting males.

Note. In the Vienna museum there is 1♀ from "Yunnan: 100 km W Kunming, Diaolin Nat. Reserve, 22.V.–2.VI.1993, JENDEK & SOUSA", which might belong to the new species. The spermatheca very closely resembles that of *S. inconspicuus* (a broad, narrowly twice-curved tube with a strongly sclerotized, long distal piece), the proximate portion of the tube is distinctly longer than both other portions (not so in *S. inconspicuus*) — whether this is a specific character or not remains open until more material will be collected.

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Notes on the Species of *Nazeris* from Japan, X

A New Species Allied to *Nazeris validus* (Coleoptera, Staphylinidae) from the Kii Peninsula, Central Honshu, Japan

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Abstract A new staphylinid species of the genus *Nazeris* is described from Japan, under the name *Nazeris yasuakii* Ito, sp. nov. It is related to *N. validus*, but has differently shaped male genitalia.

The Japanese species of the staphylinid genus *Nazeris* have been extensively studied in recent years, but there still remain other species that are unknown to science. In the present paper, I am going to describe an interesting member of the genus found in the mountainous area of the Kii Peninsula on the Pacific side of Central Japan, under the name of *Nazeris yasuakii*.

Before going into further details, I would like to express my cordial thanks to Professor Dr. Yasuaki Watanabe, who has made many important contributions to the taxonomy of the Staphylinidae, for useful suggestions and many other help on my study. The present paper is dedicated to him in commemoration of his retirement from Tokyo University of Agriculture.

Nazeris yasuakii sp. nov.

(Figs. 1–3)

Body large, robust, rather shiny, brownish black to black, mandibles, labrum, basal segments of antennae and coxae reddish brown, maxillary and labial palpi, apical segments of antennae and legs brownish yellow (femora somewhat darker), pubescence on body surface blackish brown but those of mouth parts, antennae and legs are yellowish brown. Length: 6.2–6.8 mm.

Head large, suborbiculate and barely longer than wide (1.02 : 1), coarsely closely punctate, but on frons less coarsely in size and rather irregularly in arrangement; labrum with all teeth nearly pointed and the inner ones more prominent in height than the outer ones; frons slightly unevenly depressed, vertex evenly convex and without distinct V-shaped impression; postgenae more than twice as long as longitudinal diameter of an eye (2.35 : 1), subparallel at sides and constricted toward neck; antennae long, extending fully beyond the middle of pronotum, 1st segment long and robust,

Fig. 1. Habitus of *Nazeris yasuakii* sp. nov. (holotype).

clearly longer than the following two segments together, 2nd shorter than half the 3rd, and 4th to 10th gradually decreasing in length distally, 11th wider and longer than 10th. Underside of head less regularly punctate than on the upper side, interspaces of the punctures similarly devoid of distinct microsculpture to the dorsum; mentum smooth, submentum coarsely scabrous.

Pronotum suboval, longer than wide (1.15 : 1), slightly shorter (1 : 1.04) and narrower (1 : 1.16) than head, without long erect setae near the widest point at apical third, more coarsely but less closely punctate than on head; median line short and rather wide, only visible at basal third, distinctly depressed on each side. Scutellum coarsely and deeply punctate.

Elytra subtriangular, as wide as pronotum, widest near apex and twice as wide as base at that part; sides gradually convergent in apical two-thirds and thence rapidly so basad; surface subdepressed on both sides of scutellum, more or less coarsely undulate, coarsely and closely punctate. Prosternum clearly carinate along the middle, the

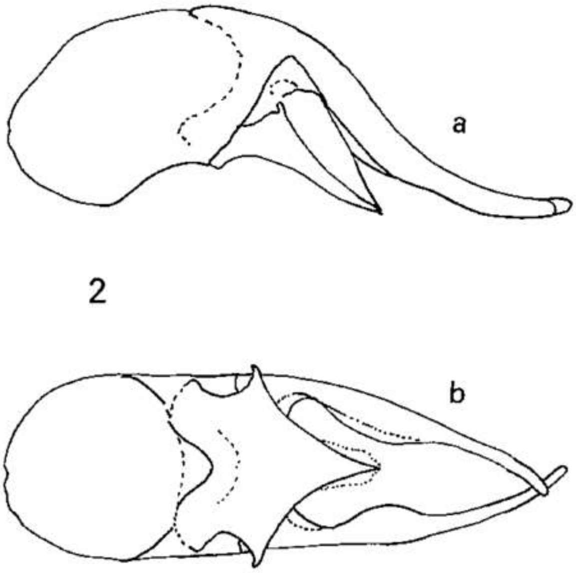

Fig. 2. Male genitalia of *Nazeris yasuakii* sp. nov.; a, aedeagus in lateral view; b, same in ventral view (paratype).

Fig. 3. Map showing the locality of *Nazeris yasuakii* sp. nov. (●).

carina slightly weakened anteriad and invisible near anterior margin.

Abdomen expanded laterally, third to sixth tergites slightly and transversely depressed along base, coarsely and closely but rather irregularly punctate, the punctures gradually becoming finer in size and sparser in density toward apical segments, sternites more regularly and more coarsely punctate than on corresponding tergites; in male 7th sternite slightly and very widely emarginate in middle of apical margin, 8th triangularly but not deeply excised apically, depth of the excision less than two-thirds the subdistal width.

Legs of moderate length, hind femora and their trochanters without any specific characters.

Aedeagus (Fig. 2) robust and symmetrical, strongly sclerotized except for membranous dorsal side of median lobe, consisting of three parts, median lobe and a pair of long processes (as apophyses), ventral plate of median lobe rather short and pointed at apex, bicuspidate laterad in middle, each cusp being hooked latero- or baso-dorsally and less sclerotized at tips; paired processes very long, forcipiform, produced fully beyond the apex of median lobe, slightly sinuate in middle, attenuate toward nearly pointed apex and medianly swollen inwards, the swellings flat, thin and attached on the ventral side of the long processes.

Female unknown.

Holotype: ♂, Mt. Inamura, Nara Pref., 23–VII–1994, T. ITO leg. (to be eventually deposited in the Osaka Natural History Museum). Paratypes: 7♂♂, the same locality and collector as for holotype, 1–VI–1985, 24–VIII–1991, 5~6–V & 22–VII–1994 and 16–V–1995.

The present species is similar to *N. validus* T. ITO in general appearance, but can be distinguished from the latter as follows: the aedeagus differently shaped, the long processes more strongly sclerotized, with an evident thin sclerite on each inner side, sinuous in middle, the median lobe with distinct lateral cusps instead of rudimentary aural lobes, the head wider, and the body larger and robuster.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 251–254, Mar. 31, 2002

A New Microphthalmous *Lathrobium* (Coleoptera, Staphylinidae, Paederinae) from Sichuan

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Abstract *Lathrobium* (s. str.) *watanabei* sp. nov. from Mu Ge Cuo Lake northwest of Kangding, Sichuan, PR China, is described, illustrated, and distinguished from other species of the genus.

The fauna of *Lathrobium* Gravenhorst of the Chinese mainland is far from well known. Up to today, 24 species of the genus have been described or recorded from this region, mostly from Yunnan and Zhejiang provinces (Bernhauer, 1939; Koch, 1939; Li & Chen, 1990; Watanabe, 1999; Watanabe & Luo, 1992; Watanabe & Xiao, 1994, 1996, 1997, 2000). Some additional species originally described in *Lathrobium* have been transferred to the genera *Lobrathium* Mulsant et Rey and *Tetartopeus* Czwalina. There is no doubt that the actual number of species occurring in China is considerably higher, above all in the vast mountain regions of western and central China. This is true of almost all Chinese staphylinids (Smetana, 2001).

Most of the described Chinese species of *Lathrobium* are apterous with presumably restricted areas of distribution in the mountains of Yunnan and Zhejiang Provinces. Up to the present, no species of *Lathrobium* have been recorded or described from Sichuan Province. Below, a new apterous and microphthalmous species of *Lathrobium* is described from the Daxue Shan Mountains in western Sichuan.

Lathrobium (s. str.) *watanabei* sp. nov.

(Figs. 1–4)

Body length: 7.1 mm (from front margin of head to hind margin of segment VII); 3.9 mm (from front margin of head to posterior margin of elytra).

Body (Fig. 1 A, B) elongate and slender, parallel-sided and subdepressed above. Whole body, antennae, and legs uniformly reddish brown.

Head shining, suborbicular (Fig. 1 C), only slightly longer than broad (length/width=1.03), eyes small and not prominent (Fig. 1 G), their longitudinal diameter only one-sixth of the length of temples. Temples broadly rounded. Surface in lateral and posterior areas with moderately coarse and dense puncturation, with interstices as wide as or a little wider than diameter of punctures, puncturation sparser near anterior mar-

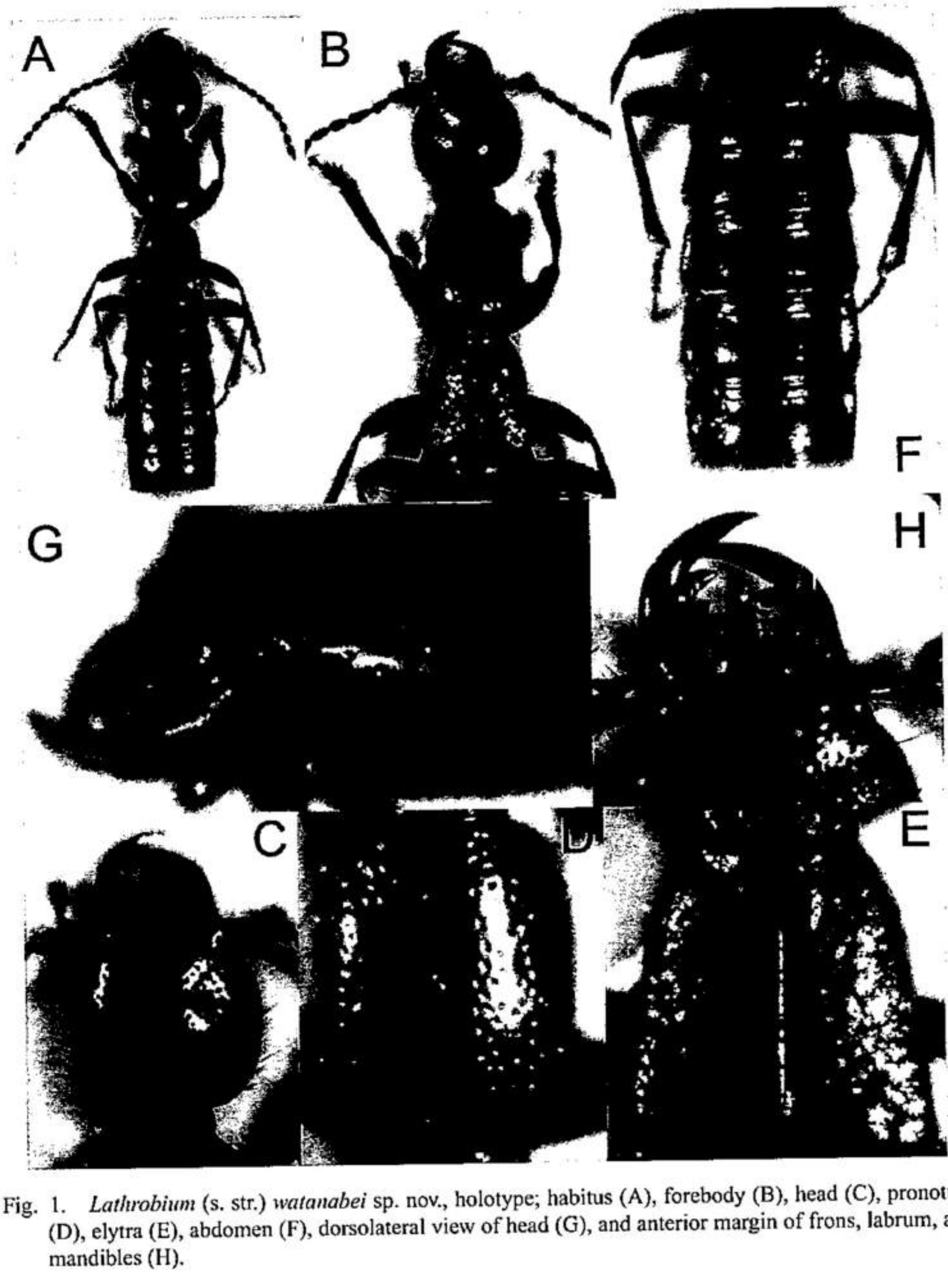
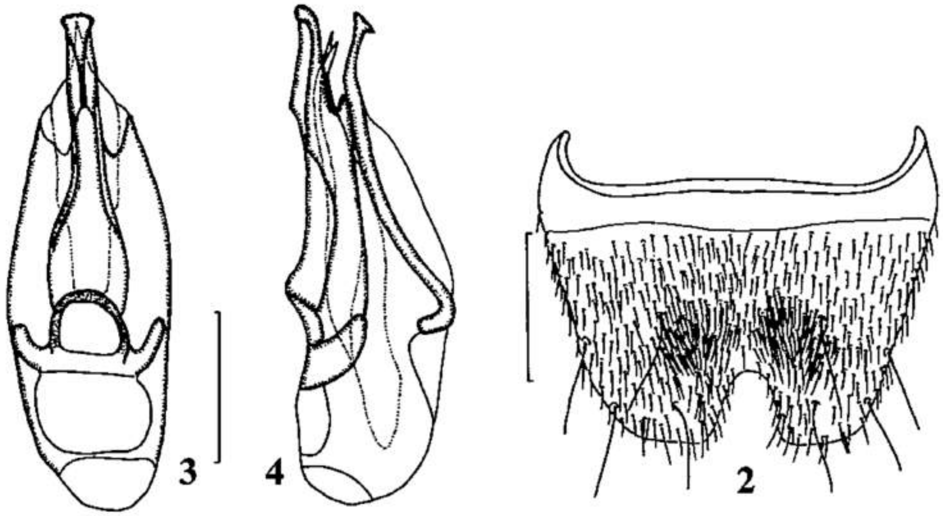


Fig. 1. *Lathrobium* (s. str.) *watanabei* sp. nov., holotype; habitus (A), forebody (B), head (C), pronotum (D), elytra (E), abdomen (F), dorsolateral view of head (G), and anterior margin of frons, labrum, and mandibles (H).

gin of frons, microsculpture absent in median area of clypeus, transverse in lateral and posterior areas. Antennae elongate, almost reaching the end of pronotum when turned backwards, antennomeres IV–X of subequal width, about 1.5–1.6 times as long as



Figs. 2–4. *Lathrobium* (s. str.) *watanabei* sp. nov., holotype; sternite VII (2), aedeagus in ventral (3) and in lateral view (4). Scales: 0.5 mm.

wide.

Pronotum (Fig. 1 D) shining, much (1.8×) longer than wide and distinctly narrower than head (head width / pronotum width = 1.15), puncturation moderately coarse and as dense as that of head, median line impunctate, microsculpture absent.

Scutellum large, triangular and shining with transverse microsculpture.

Elytra (Fig. 1 E) moderately shining, with weakly pronounced shoulders, slightly extended at apex, as wide as head and at suture 0.62 times as long as pronotum, puncturation moderately coarse and ill-defined on uneven surface, microsculpture absent. Hind wings reduced.

Abdomen (Fig. 1 F) moderately shining; puncturation distinct, but much finer and denser than that of fore body, interstices distinctly larger than diameter of punctures, microsculpture transverse; posterior margin of tergite VII without palisade fringe.

Male. Sternite VII with shallow median incision in the middle of posterior margin, sternite VIII (Fig. 2) with deep and almost U-shaped incision, on either side of the apex of the incision with two areas of denser and longer unmodified setae. Aedeagus (Figs. 3–4) with short and inconspicuous ventral process, hook-like apex of dorsal plate in lateral view, and two large sclerites in internal sac.

Female. Unknown.

Type specimen. Holotype: China: W. Sichuan (Ganzi Tibet. Aut. Pref., Kangding Co.), "Daxue Shan, Mu Ge Cuo, upp. lake, 15 km NW Kangding, 3700 m, 30°09N/101°52E, 27.VI.–5.VII.1999 D. W. Wrase / Sammlung M. Schülke Berlin / HOLOTYPUS *Lathrobium* (s. str.) *watanabei* spec. nov. det. M. Schülke 2001" [red]. The holotype is deposited at present in collection M. SCHÜLKE, Berlin (Germany).

Distribution. Western Sichuan (China).

Remarks. *Lathrobium watanabei* sp. nov. is distinguished from all Chinese congeners by the slender and elongate shape of the body with short but not transverse elytra, the different characters of the male abdominal segments VII and VIII, and the shape of the genitalia, from all species except *L. naxii* also by the small eyes. According to the descriptions of the species from mainland China, *L. watanabei* belongs to the *pollens* group of species, which does not represent a monophyletic species-group. It seems certain that the species is not closely related to the microphthalmous species *L. naxii*, which was described from Yunnan; the reduction of eye size has evolved independently in both species.

Bionomics. The type specimen was dug out from deep layers of litter and moss in a montane forest (*Rhododendron*, *Juniperus*, *Alnus*) near the bank of upper Mu Ge Cuo Lake.

Etymology. The new species is named in honour of Dr. Y. WATANABE (Tokyo), especially in appreciation of his work on East Palearctic Lathrobii.

Acknowledgements

My thanks are due to David WRASE, Berlin, for the gift of the holotype, as well as to Volker ASSING, Hannover, for some stylistic improvements of the English manuscript.

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A New Species of the Genus *Hesperus* (Coleoptera, Staphylinidae) from Yunnan Province, Southwest China

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Abstract A new staphylinid beetle of the genus *Hesperus* is described and illustrated from Yunnan, China, under the name of *Hesperus watanabei*. The present new species may be easily recognized from the congeners on its distinctive coloration of the body and the elytra bearing an elevated ridge in the male.

Up to the present, 201 species of the genus *Hesperus* have been reported from the Neotropical, Nearctic, Palearctic, Ethiopian, Oriental, Australian and Oceanic Regions (HERMAN, 2001). However, only one species, *H. chinensis*, was described by CAMERON (1940) from China. Recently, the author had an opportunity to examine an interesting species of this genus obtained in Yunnan Province, Southwest China. After a careful examination, it has become clear that the species is new to science. It will be described in the present paper under the name *H. watanabei*.

Before going further, I wish to express my cordial thanks to Professor Yasuaki WATANABE of Tokyo University of Agriculture for his continuous guidance and encouragement, and to Dr. Shun-Ichi UÉNO for his kindness extended to me in various ways. Hearty thanks are also due to Mr. Itsuro KAWASHIMA for his assistance in preparing the illustration of whole insect inserted in the present paper.

Hesperus watanabei sp. nov.

(Figs. 1–8)

Body broadly elongate, subparallel-sided, somewhat depressed above with the surface strongly shining. Head including mandibles, pronotum, four visible segments of abdomen and three basal segments of antennae clear orange-red, elytra sordid reddish yellow though posterior and postero-lateral parts slightly infuscate, 4th to 8th segments of antennae and 5th to basal part of 6th visible abdominal segments black, palpi and legs yellow, posterior part of 6th to 8th visible abdominal segments pale yellow, three outer segments of antennae creamy white.

Body length: 12.5–15.5 mm.

Male. Head comparatively large, transverse (greatest width of head / greatest length of head=1.65 (large ♂♂), 1.57 (small ♂♂), subrectangular to trapezoidal in

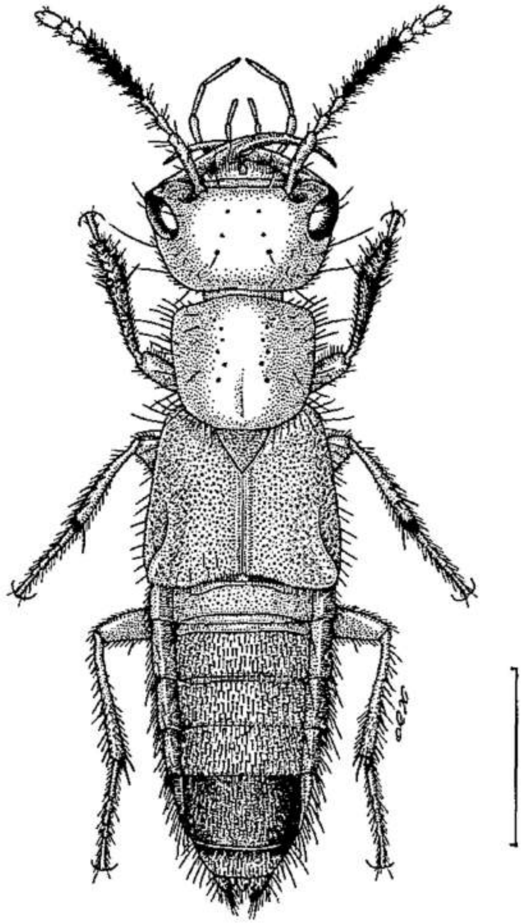


Fig. 1. *Hesperus watanabei* sp. nov., ♂, from Baoshan in western Yunnan, China. Scale: 3.0 mm.

shape and moderately wider than pronotum (greatest width of head / greatest width of pronotum=1.31); eyes large but not so protruding from lateral outlines of head, their longitudinal diameter slightly shorter than postocular areas (longitudinal diameter of eye / length of postocular area=0.94), the latter angularly contracted at neck; frons slightly impressed in the middle, almost impunctate; a small anterior frontal puncture situated at the posterior margin of each antennal tubercle, and two large additional setiferous punctures between anterior frontal punctures, forming a nearly transverse row of four punctures as a whole; disc impunctate, provided with several setiferous punctures on posterior half of each side; latero-posterior parts and the area before base sparsely covered with larger and smaller punctures; surface covered with very fine microsculpture formed by transverse lines and wavy striae.

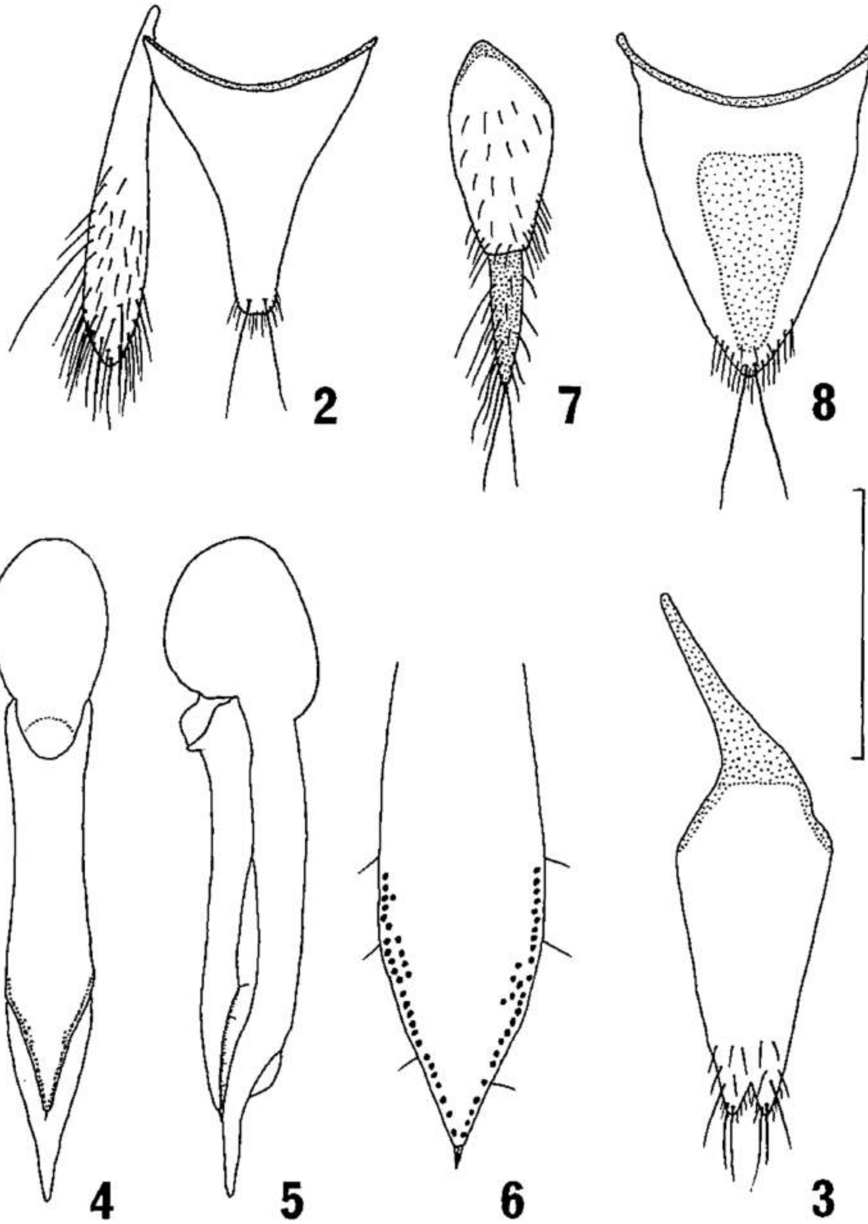
Antennae relatively long, hardly reaching the posterior margin of pronotum, and moderately thickened apicad; three proximal segments polished, the remainings opaque; 1st segment long, thickened towards apex and 2.7 times as long as 2nd, 3rd elongate, distinctly longer than broad (length/width=2.87) and as long as 2nd, 4th to 10th increasing in width towards the preceding segments, 4th distinctly longer than broad (length/width=1.45), 5th and 6th almost as long as wide, 7th to 10th transverse (wide/length=1.27) and each segment dilated apically, apicalmost longer than broad (length/wide=1.69), obviously longer than 10th (11th/10th=1.83), subacuminate towards the tip.

Pronotum convex above, slightly wider than long (greatest width of pronotum / length of pronotum, measured along the midline=1.07), and much narrower than elytra (greatest width of pronotum / greatest width of elytra=0.79), widest just behind the humeral angles, and slightly narrowed posteriad, with lateral sides almost straight; anterior margin broadly and gently rounded though subtruncated at middle; anterior angles obtuse and not visible from above, posterior angles broadly rounded; dorsal rows each with four to six, more or less irregularly located punctures, lateral portions each of six to ten punctures; surface with microsculpture similar to that on head. Scutellum large, triangular, densely and coarsely punctured and pubescent, surface covered with microsculpture as on pronotum.

Elytra subquadrate and flat above, about as broad as long (greatest width of elytra / greatest length of elytra=1.06), though strongly wider than long when measured along the suture (greatest width of elytra / length of elytra from the apex of scutellum to the posterior margin=1.62); lateral sides gently arcuate; postero-lateral parts each provided with an elevated ridge, which extends diagonally towards the middle of basal margin of scutellum, and reaching about a half of the elytra (somewhat variable depending on size of specimens); surface covered with evenly spaced, coarse punctation; without microsculpture.

Abdomen elongate and gradually narrowed towards the anal end, first three visible tergites each shallowly and transversely depressed along the basal part; surface of each tergite moderately coarsely punctured and rather closely pubescent, though the punctures on the last three tergites become smaller and denser than on the basal three; no microsculpture; 6th visible sternite rather deeply and subtriangularly excised at the middle of posterior margin. Genital segment with styli of 9th tergite (Fig. 2) stout, broadly rounded and copiously setose apically; 10th tergite (Fig. 2) rather elongate, distinctly narrowed apicad, with two long, strong subapical setae and with several short apical setae; 9th sternite (Fig. 3) with proximal portion narrow and elongate, asymmetrical; distal portion narrowly emarginate apically, with two apical setae at each side of the emargination and with one subapical seta on each side in front of it. Legs relatively long; protarsi distinctly dilated and bilobed, each with numerous pale modified setae ventrally.

Male genitalia (Figs. 4–6) moderately sclerotized and very elongate, with basal part relatively small and somewhat globular. Viewed ventrally, median lobe gently con-



Figs. 2–8. *Hesperus watanabei* sp. nov. —— 2, Tenth abdominal tergite, with stylus of 9th tergite in male; 3, 9th abdominal sternite in male; 4, male genitalia in ventral view; 5, male genitalia in lateral view; 6, apical portion of underside of paramere; 7, gonocoxite of female genital segment; 8, 10th abdominal tergite in female. Scale: 1.0 mm for 2–5 and 7–8; 0.5 mm for 6.

stricted at basal two-fifths, slightly dilated and then narrowed towards subulate apex (Fig. 4); in lateral view, weakly bent dorsad (Fig. 5); paramere elongate, a little shorter than median lobe, constricted at basal two-fifths, then gently expanded laterad, and then abruptly narrowed towards apex in apical fourth; black peg setae on underside of paramere numerous, fine, densely fringing margins of apical portion; tip of each apical margin provided with a pair of setae which are close together, so that they look like one seta, and one minute seta just below apex on each lateral margin and two additional setae on each margin well before the tip (Fig. 6)

Female. Similar in facies and coloration to male, though the head is smaller, less transverse (greatest width of head / greatest length of head=1.47), and about as wide as pronotum (greatest width of head / greatest width of pronotum=1.04), posterolateral part of elytra without elevated ridge; last abdominal sternite simple; protarsi slightly dilated. Genital segment (Fig. 7) with second gonocoxite narrow and elogate, with minute stylus bearing two long setae; tenth tergite (Fig. 8) subarcuate apically, with a pair of long and strong setae at and near apex, in addition to numerous fine setae.

Type series. Holotype: ♂, allotype: ♀, Baoshan City, env., 2,000 m alt., western Yunnan, SW. China, 15–VII–2000, A. GORODINSKY leg. Paratypes: 5 ♂♂, same locality and data as the holotype.

The holo- and allotypes are deposited in the collection of the Laboratory of Insect Resources, Tokyo University of Agriculture, and the paratypes are preserved in the author's private collection.

Distribution. This species is at present known only from the type locality in western Yunnan, Southwest China.

Notes. The present new species may be easily recognized from the congeners by its distinctive coloration of the body and each elytron bearing an elevated ridge in the male. Similar to *H. inaequalis* FAUVEL from Burma (Myanmar) in general appearance, but can be distinguished from it in the following points: body larger and robuster, elytra sordid reddish yellow, basal three segments of antennae orange-red, three outer creamy white and intermediate black. Furthermore, *H. watanabei* possesses rather peculiar characters such as the pronotum with differentiated dorsal rows of punctures and the paramere of the male genitalia with black peg setae. These character states are usually found in the allied genus *Philonthus* and not found in the species of *Hesperus* distributed in the temperate zone, though I feel certain that *H. watanabei* belongs to the genus *Hesperus*.

Etymology. This interesting species is dedicated to Professor Yasuaki WATANABE, one of the leading coleopterologists in Japan, in commemoration of his retirement from Tokyo University of Agriculture in March 2002.

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Revisional Notes on the Genus *Amichrotus*, with Description of a New Species

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Abstract The staphylinid genus *Amichrotus* is reviewed, with some notes on the type species, *Amichrotus apicipennis* SHARP. A new species, *A. watanabei* sp. nov. is described from China.

The genus *Amichrotus* SHARP is a small genus in the Anisolinina, and was still curtailed in recent years by exclusion of some known species. Although the genus *Amichrotus* SHARP and its type species, *A. apicipennis* SHARP, were reviewed by NAOMI (1983) for the first time after SHARP's original description. Since his redescription is rather brief, I am going to give some supplementary account of them in the present paper. Besides, I will describe a new species of *Amichrotus* from China under the name *A. watanabei*.

It is a great pleasure for me to contribute this paper for commemoration of the retirement of Dr. Yasuaki WATANABE, Professor of Tokyo University of Agriculture. I hope that he will continue his studies for developing the Staphylinidology.

I wish to express my hearty thanks to Dr. Shun-Ichi UÉNO, Emeritus Curator of the National Science Museum (Nat. Hist.), Tokyo, for his kindness in critically reading the manuscript of this paper. I am also much indebted to Mr. M. SCHÜLKE for his kind help in borrowing interesting materials.

Genus ***Amichrotus*** SHARP

Amichrotus SHARP, 1889, Ann. Mag. nat. Hist., (VI), **3**: 114. —— NAOMI, 1983, Kontyû, Tokyo, **51**: 49–51. —— HAYASHI, 1993, Elytra, Tokyo, **21**: 289.
Other literatures are omitted.

Type species: *Amichrotus apicipennis* SHARP.

Body medium in size, elongate, subparallel-sided, rather flattened above, weakly shiny in fore body but strongly so in hind body; punctures on fore body rather coarse, dense and umbilicate, those on elytra less coarse, less dense, and rough on the surface; punctures on abdomen minute and sparse except for base of each segment, those on the base rather coarse and sparse.

Head suborbicular, gently convex above, a little wider than long, sulcate just be-

Fig. 1. *Amichrotus apicipennis* SHARP, habitus.

hind front margin between anntennal insertions; neck rather thick, about a half as wide as head; chaetotaxy consisting of well developed seven macrosetae. Antennae filiform, moderately long, with basal three segments polished. Eyes relatively small, a little shorter than postgenae and weakly convex laterad. Mandibles slender, long, subacute at the tip, nearly straight in basal halves, thence strongly curved apicad, a little longer than head, each with a wide triangular tooth at about middle, and the tooth with a short and slender denticle at the tip; prostheca slender, unilobed, elongate, rather sparsely combed with elongate teeth, each of which is sparingly pubescent.

Labrum short, wide, widely and deeply emarginate at the middle, with several long setae of various length behind reflexed marginal area and sparsely pubescent at the inner half of front margin.

Galea thickened apicad; distal lobe densely pubescent; proximal sclerite elongate, thickened apicad, with two stout terminal setae. Lacinia long, wide and densely pubescent. Maxillary palpi very long and slender; 1st segment very short, weakly curved, with a fine short seta at about middle; 2nd very long, a little longer than 3rd, strongly thickened in apical half, gently curved, with several fine setae of various length on inner side and a few similar ones at apex; 3rd straight, strongly clavate, almost as long as 4th, with sparse fine setae of various length; 4th straight, elongate-subfusiform, glabrous, subacute at the tip, finely, sparsely and indefinitely sulcate, with minute and sparse punctures.

Labial palpi elongate; 1st segment rather long, a little more than twice as long as wide, with a fine erect seta near base; 2nd slender, nearly straight, long, much longer than 1st, weakly clavate, with several setae of various length; 3rd elongate-subfusiform, glabrous, finely and sparsely sulcate, minutely and very sparsely punctate. Ligula short, minutely and weakly emarginate at the tip, with a distinct median line. Paraglossae well developed, rather long, rounded at apex, with dense long pubescence at inner margin and extending beyond the middle of 1st segment of labial palpus. Prementum subpentagonal, strongly transverse and finely lined medially.

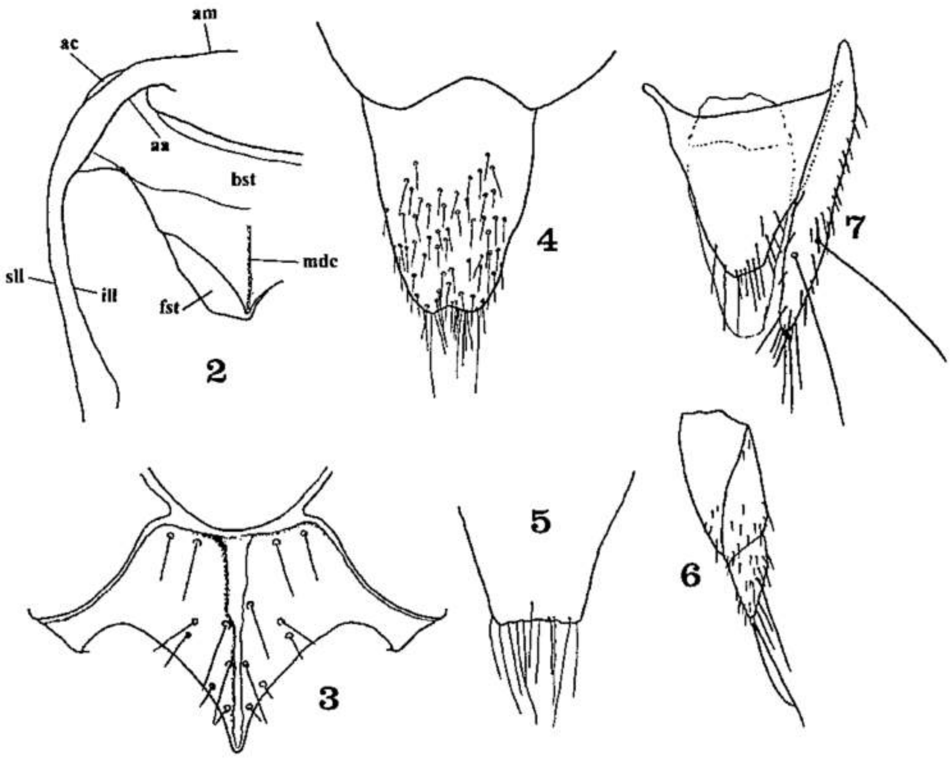
Mentum short, very transverse, feebly emarginate at front margin, bearing 2 setae at each lateral corner, the outer one of them being short and fine, and the inner one long and thick. Submentum bearing only one pair of very long and stout setae, conspicuously reticulo-striate in hind portion. Gular suture deepened anteriorly; gular plate straightly narrowed posteriad and narrowly parallel to each other in posterior fifth.

Subgenae very sparsely, coarsely and shallowly punctured, with a well developed subgenal macroseta on each side; infragenal line distinctly impressed.

Pronotum subcordate, distinctly narrowed posteriad, more or less emarginate at sides, a little longer than wide, strongly convex and widely rounded in all angles; anterior margin feebly arcuate, and posterior one gently rounded; superior lateral line (Fig. 2) widely separated from inferior lateral line throughout, not united with it, hidden by anterior corner in anterior fifth; inferior lateral line ending at the middle of lateral margin of prosternum; chaetotaxy consisting of two pairs of well developed macrosetae, *viz.*, anterolateral macroseta and laterobasal one; apical corner very narrow in ventral view. Pronotal epimera (hypomeral projection) absent.

Scutellum subtriangular, narrowly rounded at the tip, sparsely and shallowly punctured, with microsculpture.

Elytra subquadrate, slightly widened behind, gently arcuate at sides, more or less emarginate behind tips of shoulders, feebly emarginate at posterior margin and narrowly rounded at posterolateral angles; surface weakly convex, roundly declivous to epipleuron, not ridged or carinate at upper border of epipleuron; chaetotaxy on elytron consisting of 4 well developed macrosetae, *viz.*, humeral, post-lateral, antero-median and post-median macrosetae; parascutellar seta vestigial, hardly discernible, very thin and short.



Figs. 2–7. *Amichrotus apicipennis* SHARP; 2, pronotum, ventral view of right anterior part (aa=anterior angle; ac=anterior corner; am=apical margin; bst=basisternum; fst=furcasternum; ill=inferior lateral line; mdc=median carina; sll=superior lateral line); 3, mesosternum; 4, 8th & 9th abdominal sternite of male; 5, 10th abdominal tergite of male; 6, genital segment of female; 7, 9th & 10th abdominal tergite of female with accesory sclerite (?).

Prosternum weakly convex medially, without paired long setae; prosternal fossae (=intercoxal depression, sensu SMETANA, 2000) shallow, flat but clearly bordered anteriorly; median ridge (=carina, sensu SMETANA, 2000) sharp, well marked between prosternal fossae; prosternal process sharply protuberant; lateral borders rather long, widely distant from discal margin of pronotum. Furcasternum short, sharply ridged medially.

Mesosternum (Fig. 3) rather large, nearly twice as wide as long, markedly and sharply carinate medially in full length, declivous anteriad and rather deeply depressed anteriorly; mesosternal process moderately wide at base, subacute at the tip, rather roughened and not reaching the middle of mesocoxae; intercoxal piece (coxal acetablum, sensu SMETANA, 2000) narrow and deeply sunken. Mesocoxae contiguous to each other. Metasternum very finely carinate medially in full length.

Abdomen nearly parallel-sided; basal four visible tergites distinctly depressed at each base and angulately protuberant at each lateral fourth of basal line, the depression becoming shallower in hind tergites; male 7th sternite with a large, wide and shallow fovea, which bears dense long and rather dark pubescence; male 8th sternite feebly emarginate at apex; male 9th sternite (Fig. 4) a little asymmmetrical, elongatedly barrel-shaped, very feebly emarginate at apex and sparsely pubescent in apical third; 10th tergite of male (Fig. 5) symmetrical, truncate at apex. In female, 8th sternite feebly arcuate at apex; genital segment (Fig. 6) rather wide and short, 2nd gonocoxite with a long thick seta near the middle, and minute stylus very short, with two long setae at the tip; 10th tergite (Fig. 7) a little asymmmetrical, obliquely trucate at apex, with membranous plate beneath, the plate extending a little beyond the tergite.

Male genitalia asymmetrical, nearly straight in ventral view and moderate in size; penis subcylindrical, obliquely truncate at apex; parameres unilobed, reaching apex of penis, more or less carinate medially in basal 2/5 of outer side (ventral side) with peg-setae on apical portion of inner (=dorsal) face.

Legs long and slender; protibiae with some spinous setae beneath; male protarsi strongly dilated in basal four segments with modified hairs on planta but weakly dilated in female; meso- and metatibiae with a few fine and short spines; male metatarsi with 1st segment slightly longer than the following two segments combined together and 5th segment, while in female the 1st segment of metatarsi much longer than the following two segments combined together and 5th segment. Empodial setae paired, short and fine.

Distribution. Japan; Taiwan; China; Oriental Region (I was unable to examine the species distributed in this region).

Remarks. *Amichrotus* is closely allied to *Anisolinus* in having similar structure of the mouth organs, above all in the palpi, and male secondary sexual features, but easily distinguished from the latter by the subcordate prothorax and median carina of the mesosternum, which is very similar to that of *Ontholestes* (Staphylinina). This genus is also similar to the genus *Philomyceta* CAMERON in having a depression at each base of the 3rd to 6th abdominal tergites but in the latter genus the 2nd segment of the maxillary palpi is very elongate, not so thickened as in the former and the mesosternum is carinate medially only in the mesosternal process.

This genus may be a little more advanced than *Anisolinus* because of modified terminal segments of the palpi and the mesosternum.

Amichrotus apicipennis SHARP

(Figs. 1–7)

Amichrotus apicipennis SHARP, 1889, Ann. Mag. nat. Hist., (VI), **3**: 115.——NAOMI, 1983, Kontyû, Tokyo, **51**: 51–52.
Other literatures are omitted.

NAOMI (1983) redescribed and illustrated several important parts of the body of this species, but there is some conflicts in his description to the actual state in the species. Therefore, I would like to give some supplementary descriptions of this species.

Colour deep black and weakly shiny; terminal two to four segments of antennae whitish; elytra narrowly yellowish white at apical margin and with whitish yellow recumbent pubescence in sutural area and apex; apex of 6th segment of abdomen narrowly, 7th and 8th wholly reddish brown; tarsi dark reddish brown.

Head transverse, about four-fifths as long as wide; eyes relatively small, a little less than three-fourths of postgenal length; antennae with 10th segment as long as wide, the rest more or less longer than wide, and each segment with the following relative length: 17.0 : 8.0 : 13.0 : 7.5 : 7.0 : 7.0 : 7.0 : 7.0 : 6.5 : 6.0 : 11.0. Pronotum nearly two-thirds as wide as long, weakly emarginate at sides in posterior two-thirds. Elytra faintly emarginate behind shoulders. In male, 7th abdominal sternite with a wide, transverse and shallow fovea in middle, which is provided with long, dense yellowish brown pubescence.

Amichrotus watanabei sp. nov.

(Figs. 8–11)

Body stout, subparallel-sided, feebly convex above, weakly shiny and mostly covered with dark and short pubescence. Colour black; mouth organs reddish pitchy; apical four segments of antennae dark brown with terminal one pale; elytra narrowly yellowish at apical margin, being maculate with whitish yellow long pubescence at humeri (*c*-shaped in right shoulder), on sutural space and on apical margin; abdomen strongly iridescent dorsally and with long golden pubescence except for each base and median area of tergites; 5th abdominal segment narrowly and 6th widely indefinitely reddish brown, 7th and 8th wholly so; tarsi reddish brown with each basal segment darker. Length: 11.2–13.5 mm.

Head transversely semicircular, nearly 1.2 times as wide as long, a little wider and shorter than pronotum (37.0 : 32.0 & 30.0 : 37.0), gently roundly narrowed posteriad and nearly straight at hind margin; upper surface gently convex, somewhat flattened in frons, without microsculpture, very densely and rather coarsely punctured except for clypeal region, the punctures umbilicate and a little irregular in size, and median line traceable as very narrow impunctate space; clypeal region narrowly impunctate, rather widely sulcate along front margin. Mandibles slightly longer than head (33.0 : 30.0). Eyes moderate in size, well convex, the longitudinal diameter much shorter than postgena (11.0 : 16.0). Antennae slender, long, extending beyond the middle of pronotum; 1st to 6th segments each more or less longer than wide, 7th to 9th each nearly as long as wide, 10th slightly wider than long, 11th a little longer than wide, and each segment with the following relative length: 18.0 : 10.0 : 13.0 : 8.0 : 7.5 : 7.0 : 7.0 : 7.0 : 7.0 : 7.0 : 10.5.

Pronotum subcordate, strongly convex, widest at anterior third, a little longer than wide (37.0 : 32.0), much narrower and shorter than elytra (32.0 : 47.0 & 37.0 : 47.0),

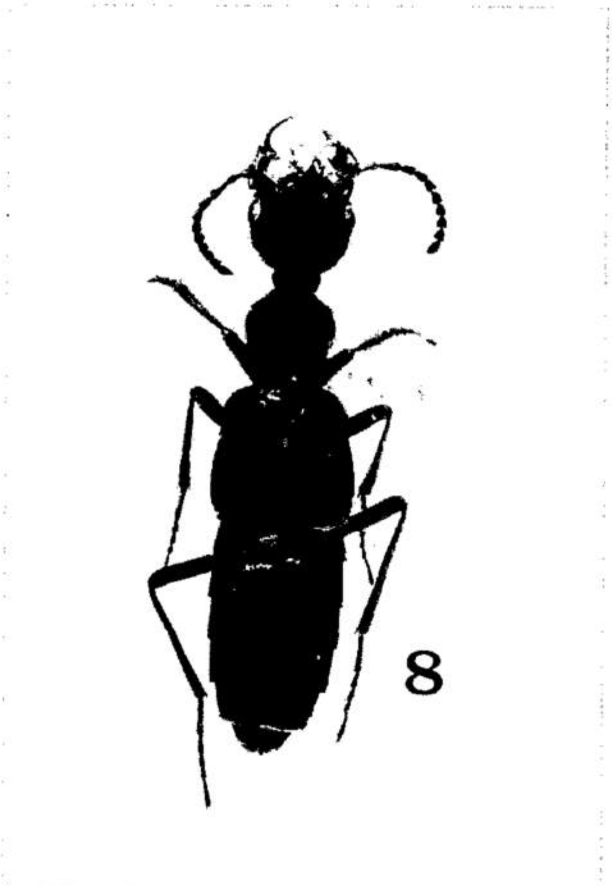
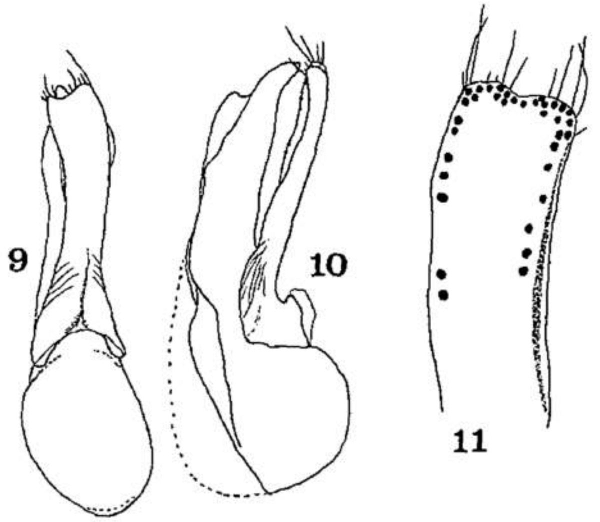


Fig. 8. *Amichrotus watanabei* sp. nov., habitus.

rather strongly narrowed posteriad, markedly emarginate in posterior two-thirds of sides, widely rounded at each angle, nearly straight at anterior margin and feebly arcuate at basal margin; disc densely and coarsely punctured as on head, but the punctures are a little larger and more irregular than on head, without microsculpture; median line barely discernible as very fine and impunctate line in basal half.

Scutellum very shallowly depressed, with reticulo-striate microsculpture; punctures coarse, rather dense, transversely suboval and becoming smaller and denser posteriorly.

Elytra subtrapezoidal, nearly as long as wide, gently widened posteriad, markedly emarginate behind shoulders, slightly arcuate at hind margin; surface weakly convex, finely and rather densely asperate-punctate, the punctures much smaller than those on head; apical yellowish fascia bent ventrad, and shallowly depressed.



Figs. 9–11. *Amichrotus watanabei* sp. nov., male genitalia; 9, ventral view; 10, left lateral view; inner face of parameres, with arrangement of peg-setae.

Abdomen parallel-sided, base of each segment coarsely and sparsely punctured, and the rest finely and rather closely punctured except for 8th segment, the punctures becoming much finer and closer posteriorly in each tergite but much larger and sparser on sternites; the punctures on 8th tergite very sparse and a little larger than on other tergites. In male, 6th sternite with hind margin weakly emarginate; 7th sternite bearing a large, transverse subelliptical shallow depression, which is covered with dense long pubescence; 8th sternite weakly emarginate at apical margin. In female, 8th sternite uniformly rounded at apical margin.

Male genitalia (Figs. 9–11) elongate, subcylindrical, asymmetrical and weakly twisted to the left, with basal ampulla moderate in size and shape; penis nearly straight, membranous throughout along median line of dorsum, weakly emarginate at sides in ventral view, apex triangularly protuberant to the left, and the tip weakly hooked ventrad and not extending beyond tips of parameres; parameres rather slender, slightly narrower than penis, gently curved to the left, gradually widened apicad, subtruncate and weakly emarginate at apex, with about eight fine setae of various length at the apex, and inner (dorsal) face bearing about 35 peg-setae along margin of apical fourth.

Holotype: ♂, Xunyangba env., Qinling Mts., Shaangxi Prov., China, 20–V~10–VI–2000 (in coll. Osaka Museum of Natural History, Osaka). Paratypes: 3♂♂, 1♀, same data as the holotype. 1♂, 1♀, "Foping Nat. Res., Panda area (1600 m; 33°45′N 107°48′E), Shaanxi Prov., China, 6–11. IV. 1999, SINAIEV & PLUTENKO leg."; 1♀, "River bank above Houzhenzi, 15 km WSW Xi'an (1450 m; 33°50′N 107°47′E), Shaanxi Prov., China, 5. VII. 2001, M. SCHÜLKE leg." [gravel bank (floating), mixed deciduous forest, moss, mushrooms].

In the male from Foping Nat. Res. the mandibles are markedly abnormal, namely, they are deeply emarginate at their inner margins, becoming slender and subcylindrical in the basal third.

Notes. The present new species is similar in general appearance to *A. apicipennis* SHARP from Japan, but easily distinguishable from the latter by the following points: in the present species the last three segments of antenna are dark reddish brown, while in the latter they are white; the punctures on head, pronotum and elytra in the latter species are much coarser and a little sparser than those of *A. watanabei* sp. nov.; in *A. apicipennis* the clypeal region is narrowly sulcate along the front margin, the penis extends a little beyond the parameres, which are a little narrower. The present species is also similar in general appearance to *A. formosensis* SHIBATA from Taiwan, but in the latter species the elytra are entirely black, not yellow at the apices.

Etymology. The specific name is given after Dr. Yasuaki WATANABE of Tokyo University of Agriculture, who is one of the most excellent staphylinidologist of Japan.

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Quwatanabius, a New Genus of East Palaearctic Quediina (Coleoptera, Staphylinidae, Staphylinini)

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Abstract A new genus *Quwatanabius* is established to include two east Palaearctic species formerly assigned to the genus *Quedius*: *Q. flavicornis* SHARP, 1889 (Japan and Taiwan) and *Q. chiaw* SMETANA, 1995 (Taiwan). *Quedius flavicornis* is designated as the type species of *Quwatanabius*.

Introduction

SHARP (1889, 30) described *Quedius flavicornis* from seven specimens taken at "Ichiuchi" and "Hytoyoshi," Japan. Following the description, he made the following observation about the species: "This very peculiar species has somewhat the aspect of a *Bolitobius*; it lives under bark of beech trees". Very little was subsequently published on this species. NAKANE (1963, 94) assigned it to the subgenus *Quedionuchus* SHARP, 1884 and provided a small color habitus illustration of the species (pl. 47, fig. 21). SHIBATA (1985, 309) briefly described the species, without assigning it to any subgenus, and presented another, better color habitus illustration of it. SMETANA (1995, 55) included the species, and an additional species *Q. chiaw* from Taiwan, in the subgenus *Microsaurus* DEJEAN, 1833. He pointed out at the same time that these two species differ significantly from all other species of the subgenus by several derived character states and established for them a separate species-group within *Microsaurus*. After recent reevaluation of the synapomorphies shared by the two species, it became obvious that a separate genus should be established for them. In addition to the morphological characters, the two species also share distinct preference of habitats associated with rotting wood, and particularly of those under loose bark of dead trees. The peculiar, characteristic general habitus of both species, resembling some members of some osoriine genera (*e.g.*, *Mimogonus* FAUVEL, 1903), or tachyporine genera (*e.g.*, *Mycetoporus* MANNERHEIM, 1830) is apparently an adaptation to the above habitats.

In the following, the new genus *Quwatanabius* is established to include *Quedius flavicornis* SHARP, 1889 (Japan and Taiwan) and *Quedius chiaw* SMETANA, 1995 (Taiwan). It is likely that either, or both, of the above species, or possibly another additional species of the genus will be discovered in mainland China.

Quwatanabius gen. nov.

(Figs. 1–6)

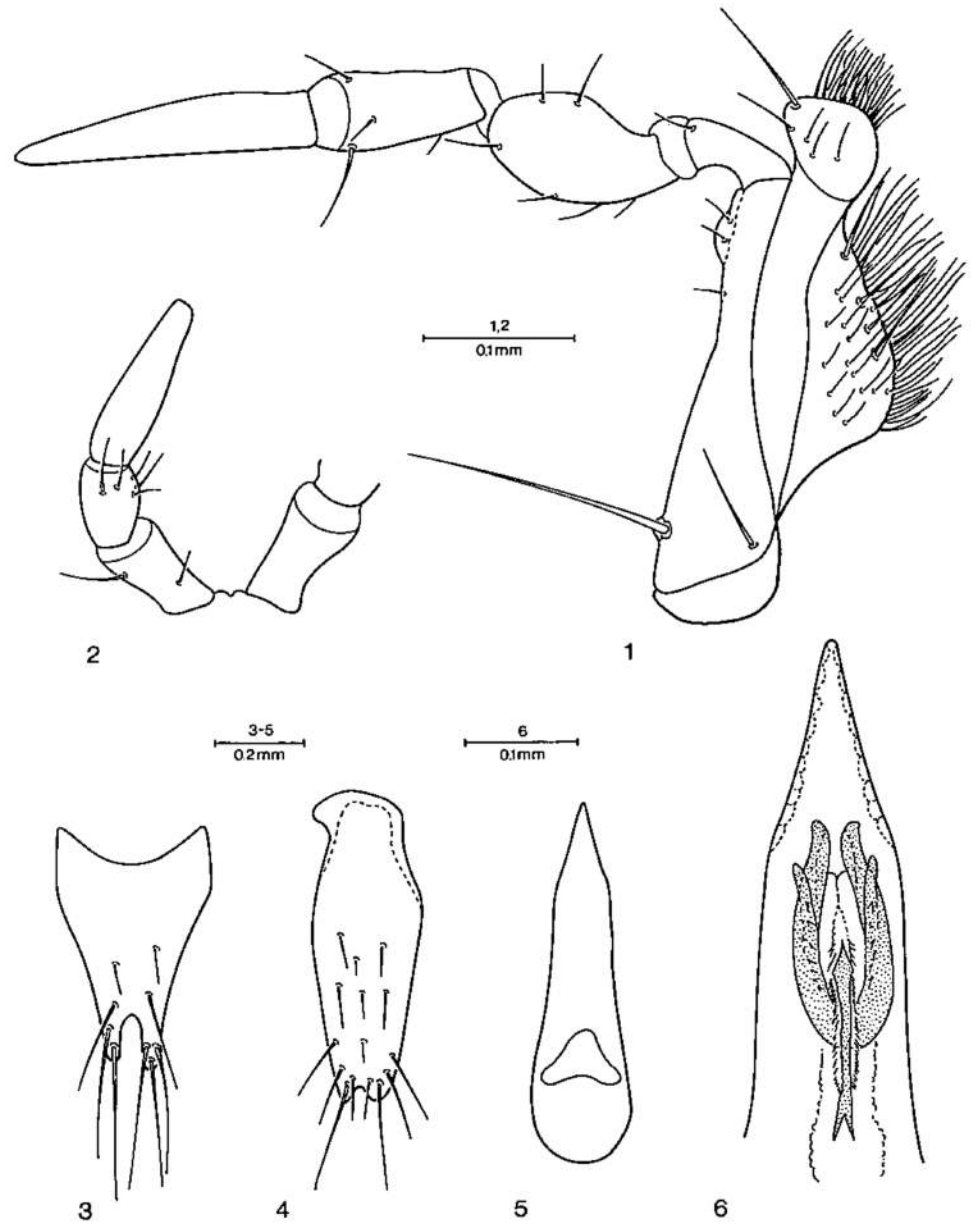
Type species: *Quedius flavicornis* SHARP, 1889.

Gender: masculine.

Description. With the characters of the genus *Quedius*, subgenus *Microsaurus*, but different as follows: dorsal surface of head and pronotum without microsculpture, therefore highly polished; one additional setiferous puncture on head between anterior and posterior frontal punctures near medial margin of eye; maxilla (Fig. 1) with palpus long, with last segment elongate, subacute, about as long as two preceding segments combined, second segment club-like enlarged; labial palpus (Fig. 2) with last segment narrow, elongate, about as long as both preceding segments combined; dorsal rows on pronotum each reduced to only one puncture; scutellum without microsculpture, except at base, impunctate, without transverse rugae at base; elytra each lacking microsculpture, each with two irregular longitudinal rows of three to six punctures bearing longer setae, entirely lacking evenly dispersed punctures; tergite 10 and sternite 9 of male genital segment both emarginate apically (Figs. 3, 4); aedoeagus with paramere markedly reduced to short triangular plate lacking both regular and sensory peg setae (Fig. 5); internal sac of aedoeagus bearing large sclerites (Fig. 6); tergite 10 of female genital segment not modified.

Comments. The genus *Quwatanabius* is well characterized by the above character states that, except perhaps for those on the sclerites of both the male and female genital segments, represent distinct synapomorphies within Quediina. The character state of the lack of microsculpture on front parts of the body is shared with members of the genus *Indoquedius* BLACKWELDER, 1952; that of the presence of an additional setiferous puncture on the head between the anterior and posterior punctures with the species of the genera *Indoquedius* and *Heterothops* STEPHENS, 1829; the absence of the dorsal rows of punctures on the pronotum is shared with the sole member of the genus *Quelaestrygon* SMETANA, 1999; the character state of the presence of irregular longitudinal rows of larger setiferous punctures on the elytra is shared with several species of the subgenera *Microsaurus* and those of the subgenus *Distichalius* CASEY, 1915; the absence of evenly dispersed punctures is shared with the genus *Quelaestrygon* and the members of the subgenus *Quedionuchus*; the reduction of the paramere into more or less triangular plate is shared with the members of the genus *Anchocerus* FAUVEL, 1905, with most species of the latter genus also lacking the sensory peg setae on it.

Etymology. The generic name is a combination of a part of the existing name *Quedius* and the family name Watanabe. The new genus is dedicated to Dr. Yasuaki WATANABE of Tokyo, in recognition of his substantial contribution to the knowledge of the Staphylinidae of the eastern Palaearctic region, and particularly to that of Japan.



Figs. 1–6. *Quwatanabius flavicornis*: 1, maxilla with maxillary palpus; 2, labial palpus; 3, tergite 10 of male genital segment; 4, sternite 9 of male genital segment; 5, aedoeagus with paramere, ventral view; 6, apical portion of median lobe of aedoeagus with internal sac.

Acknowledgment

My colleague D. E. BRIGHT, Agriculture and Agri-Food Canada, Ottawa, provided comments on the original draft of this manuscript and Mr. Go SATO from the same establishment carefully finished the line drawings.

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A New Species of the Genus *Arthromelodes* (Coleoptera, Staphylinidae, Pselaphinae) from Kanto District, Central Japan

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Abstract A new species of the pselaphine genus *Arthromelodes* belonging to the tribe Batrisini is described from Kanto district, Central Japan. It is closely allied to *A. dilatatus daibosatsuanus* Nomura.

The genus *Arthromelodes* belongs to the tribe Batrisini of the supertribe Batrisitae. According to Newton and Chandler (1989), this genus is recorded from Vietnam and Japan. Up to the present, 16 species and 3 subspecies of the genus have been known from Japan after Nomura (1991). He described three subspecies of *A. dilatatus*, namely, *A. d. daibosatsuanus* from the Daibosatsu Mts., *A. d. shiranemontanus* from the Akaishi Mts., and *A. d. fujimontanus* from Mt. Fuji. In the present paper, a new species closely related to *A. dilatatus* will be described.

Arthromelodes watanabei sp. nov.

[Watanabe-hisago-arizukamushi]

(Figs. 1–8)

Male. Length 1.93–2.34 mm. Width 0.81–0.96 mm.

Body reddish brown, maxillary palpi and tarsi light brown, shiny. Head and pronotum narrow, elytra and abdomen thick and broad.

Head about as long as wide, covered with weak and sparse punctures on dorsal surface; clypeus short, arcuate on anterior margin; frons broad, concave in median part, with a Y-shaped transverse sulcus, vertex broad, weakly convex, with a longitudinal carina running from the middle of frontal sulcus to occipital constriction, and a pair of dorsal tentorial pits, just posterior to eyes; postgenae short, gently rounded, densely covered with long erect hairs behind eyes. Eyes convex and semiglobular, each composed of about 18 facets. Maxillary palpi large, geniculate and densely covered with minute hairs, 1st segment very small, 2nd elongate, strongly swollen in apical 1/3, 3rd short, triangular, 4th the largest, fusiform. Antennae long and slender, reaching humeri of elytra, 1st segment about as long as wide, large and thick, subcylindrical, 2nd to 8th

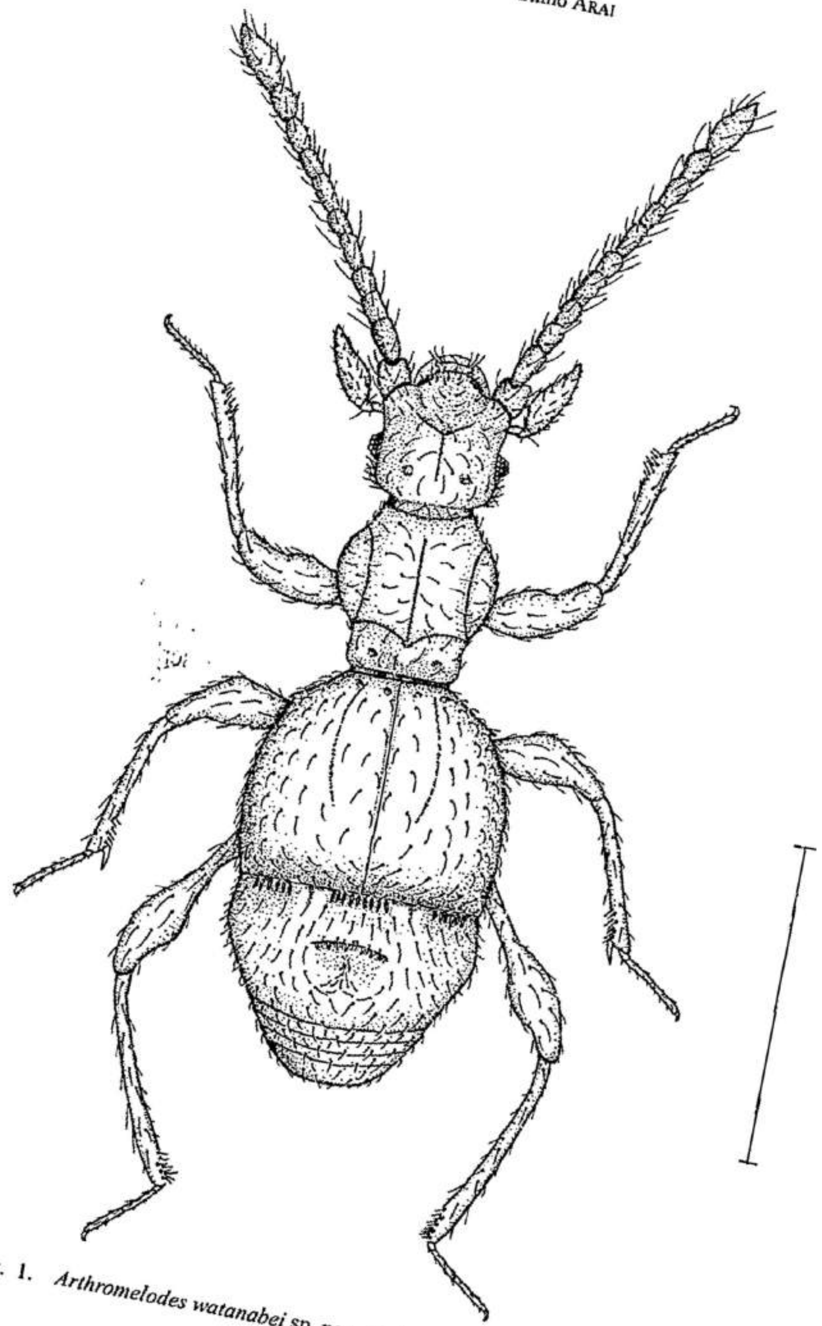
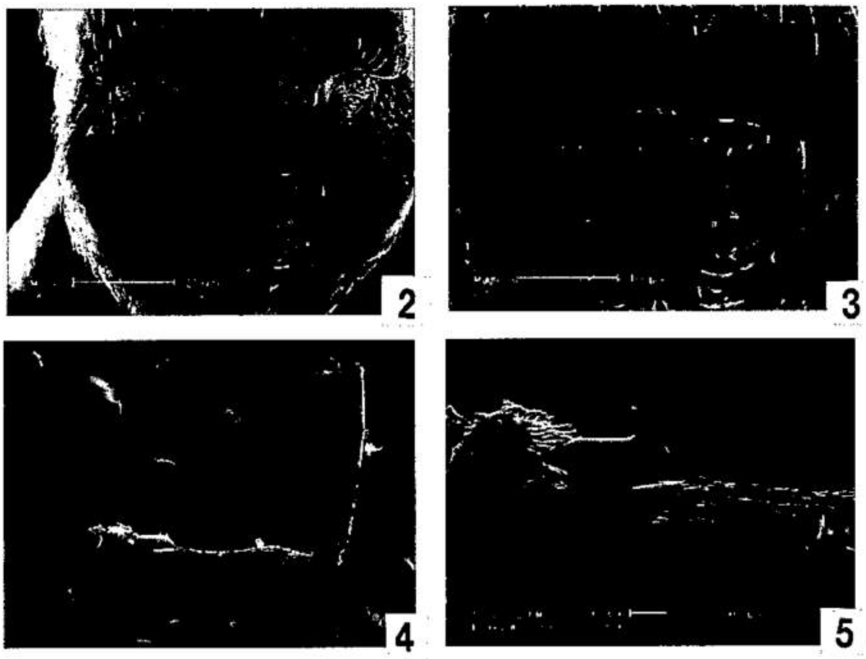
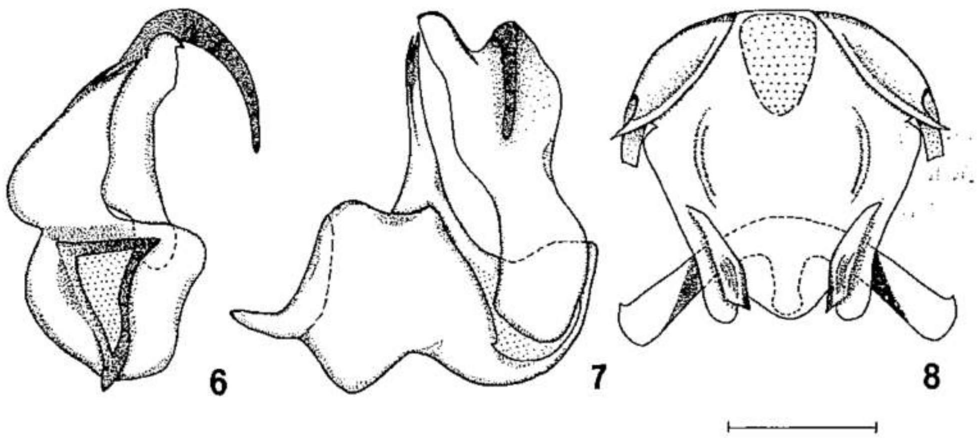


Fig. 1. *Arthromelodes watanabei* sp. nov., male, dorsal view. Scale: 1.0 mm.



Figs. 2–5. *Arthromelodes watanabei* sp. nov.; 2, male 4th abdominal tergite; 3, ditto, enlarged.; 4, hind trochanter; 5, ditto, enlarged.



Figs. 6–8. *Arthromelodes watanabei* sp. nov.; 6, male genitalia, ventral view; 7, ditto, lateral view; 8, female genitalia, ventral view, Scale: 0.1 mm.

a little narrower than 1st, with long hairs, each subcylindrical; 2nd twice as long as wide, 3rd about as long as wide, 4th to 5th each slightly broadened anteriad, 4th 1.1 times as long as wide, 5th 1.4 times as long as wide, 6th as long as wide, 7th 1.3 times as long as wide and the narrowest, 8th about as long as wide, wider than 3rd or 6th, 9th to 10th each ovoid, 9th 1.2 times as long as 10th, 11th the largest, much longer than wide, fusiform.

Pronotum slightly wider than head, about as long as wide, convex, rounded on both sides, sparsely covered with long hairs on dorsal surface, with three longitudinal sulci and a transverse sulcus, median sulcus from anterior 1/9 to transverse sulcus, lateral sulci each from anterior to transverse sulcus. Elytra wider than long, roundly expanded antero-laterad, convex, densely with long hairs; each elytron with two basal foveae, a small humeral denticle, an adsutural sulcus running very close to suture and a lateral longitudinal sulcus running from just inside outer basal foveae to posterior 1/3; hind wings reduced, each shorter than elytron. Legs long and slender, each femur swollen medially, fore tibiae each slender, mid tibiae each weakly thickened apicad, with a large mucro at the apex, hind trochanters each with a short and gently curved spine at apical part of posterior side.

Abdomen slightly shorter than elytra, rounded posteriorly in dorsal view, 4th segment the largest, weakly expanded laterad, flattened on dorsal surface of lateral expansion, with a shallow transverse concavity, small and densely setose nodule on posterior part of concavity and a pair of large setae on both sides of nodule, 5th to 8th tergites successively narrowed posteriad, each short, 5th the shortest, 6th longer than 5th, 7th longer than 6th, 8th as long as 7th, 9th very small and semicirculer.

Male genitalia heavily sclerotized; median lobe consisting of basal capsule, ventral stalk and dorsal apophysis, basal capsule with large and triangular basal foramen, and large ventral process posterior to basal foramen, ventral stalk strongly broadened near base, narrowed distally, and acute at the apex, dorsal apophysis bifurcate in apical part, right apex spinulate, ventral apex broadly projected.

Female. Length 1.88–2.24 mm. Width 0.80–0.90 mm. Similar to male, but different in the following character states: mid tibiae each without mucro at apex, hind trochanters each slender, without spine; fourth abdominal segment normally convex on dorsal side without concavity.

Female genitalia strongly sclerotized, 9th sternite subtriangular, weakly narrowed anteriad, with a subtriangular membranous part at posterior part; genital plate about as wide as 9th sternite, transverse, extending anteriorly, with a pair of long lateral arms, each of which weakly broadens distad.

Type series. Holotype male (preserved in Tokyo University of Agriculture), Kumotori-rindô, 800 m alt., Ohtaki-mura, Saitama Pref., 22–X–2000, K. TOYODA leg. Paratypes: 6 males, 5 females, same data as holotype, but S. NOMURA, K. TOYODA & S. ARAI leg.; 1 male, same locality as holotype, 29–VI–2001, K. TOYODA leg.; 6 males, 1 female, same locality as holotype, 1–VII–2001, S. ARAI leg.; 3 males, Wasabi-sawa, 1,000 m alt., Ohtaki-mura, Saitama Pref., 23–XI–1999, S. ARAI leg.

Distribution. Japan (Honshu: Kanto district).

Remarks. *Arthromelodes watanabei* sp. nov. is similar to *A. dilatatus daibosatsuanus* NOMURA, but differs in the following points: the fourth abdominal segment is less expanded laterally and normally pubescent on the posterolateral sides, bearing a shallower concavity than in *A. d. daibosatsuanus*; the hind trochanter bears a gently curved spine (strongly curved spine in *A. d. daibosatsuanus*).

Biological note. All specimens are collected from sandy litter accumulated on the rocky floor of a broad-leaved forest.

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I wish to express my sincere thanks to Prof. Y. WATANABE for his constant guidance and encouragement. I am also deeply indebted to Dr. Shun-Ichi UÉNO and Dr. Shûhei NOMURA of the National Science Museum, Tokyo, for their kind advice and reading the manuscript. Deep appreciation is also due to Mr. Koji TOYODA of Saitama Prefecture for his kind offer of invaluable specimens and advice in various ways.

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Description of a New Pselaphine Genus *Nabepselaphus* (Coleoptera, Staphylinidae, Pselaphinae) from Yunnan, Southwest China

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Abstract A new pselaphine genus *Nabepselaphus* is defined on the basis of a new species, *N. yasuakii* described in this paper from Yunnan, Southwest China. The systematic position of this genus is noted.

Key words: Taxonomy, Staphylinidae, Pselaphinae, *Nabepselaphus*, Yunnan, China.

Introduction

NOMURA (2000) recorded twelve species of the tribe Pselaphini from Yunnan, Southwest China, classifying them into three known genera and an undescribed genus.

After further examination of these species, I concluded that a species recorded under the generic name *Pselaphogenius* should be classified into a new genus.

Materials and Methods

Body length shown in the present study is a total of the cephalic, pronotal, elytral and abdominal lengths as in the case of *Pselaphogenius* (*Dicentrius* in the literature) by NOMURA (1998). However, the abdominal length includes length of the fifth to eighth abdominal segments, because they are very short and not so variable in length within the type series of the new species.

The terminology of the elytral structure and chaetotaxy defined by NOMURA (2002) is adopted to the description of the elytra. The chaetotaxial formula of the elytra is given by numbers of lines of hairs in each longitudinal rows from mesal to external part, namely, adsutural row – interval I – median row – interval II – lateral row – interval III – lateral area, respectively.

Nabepselaphus gen. nov.

Type species: *Nabepselaphus yasuakii* sp. nov.

Body strongly narrowed in head and pronotum, broadened in elytra and abdomen.

Head longer than wide, clypeus short, invisible in dorsal view, frons broadened and projected anteriorly, with a densely setose apical notch and a broad and shallow median longitudinal gloove, vertex shallowly concave between eyes, with a pair of dorsal tentorial pits, postgenae broad, sparsely covered with pubescence, gular area densely covered with whitish scales in ventro-median part. Antennae long and slender, 1st antennal segment large, elongate and tubular. Maxillary palpi very long, slender and geniculate, 1st segment short, elongate and tubular, 2nd slender, weakly thickened distad, 3rd short, about as long as wide, 4th the largest, very slender in basal part, strongly swollen in apical part, with a short longitudinal sulcus on external side of the apex, a short palpal spine and a few setae at apex.

Pronotum about as long as wide, widest before the middle, with a shallow median depression, a pair of lateral longitudinal grooves and a transverse sulcus connecting a pair of lateral foveae, glabrous in the depression, grooves and sulcus, sparsely covered with pubescence in the remaining parts. Elytra wider than long, strongly narrowed anteriad, nearly trapezoidal, gently convex, sparsely with pubescence in basal and middle part, densely covered with whitish scales along posterior margin, each elytron with a large basimedian and a small basilateral foveae, and an adsutural and a median longitudinal carinae. Legs short, thick in fomora, slender in tibiae and tarsi.

Abdomen wider than long, 4th abdominal segment predominantly large, 4th tergite broadened posteriorly, with a shallow transverse basal concavity and a pair of well demarcated and broad paratergites, 5th to 8th each short and transverse. Male genitalia well sclerotized; parameres paired and symmetrical, each elongate; median lobe reniform in lateral view, basal capsule bulbous, with an elliptical membranous part, apical part asymmetrical, with a short ventral process on ventro-apical side; endophallus composed of a few elongate sclerites. Female genitalia weakly sclerotized, symmetrical, composed of 9th sternite and genital plate; 9th sternite consisting of a pair of sclerites; genital plate more heavily sclerotized than 9th sternite, complicated in shape.

Remarks. This genus is distinctly characterized by the unique shape of the pronotum with glabrous median depression, a pair of lateral grooves and a deep transverse sulcus. It is similar to *Pselaphaulax* (Fig. 2 C) in having a transverse sulcus on the pronotum, though, this new genus is not a sister group of *Pselaphaulax*. The transverse sulcus in the pronotum must not be an apomorphic character, but a plesiomorphic one. In the tribe Pselaphini, this structure is more or less reduced except in *Pselaphaulax* and this new genus, only the lateral foveae remain as its vestige in some genera.

This genus is probably closely allied to the genus *Pselaphogenius* in having each elytron with two or three basal foveae and a median carina located between basimedian and basilateral foveae. It is easily separated from *Pselaphogenius* by the peculiar form of the pronotum as shown above. For example, the pronotum is simply convex and uniformly covered with sparse pubescence on the dorsal surface in *P. lanceolatus* K. SAWADA as shown in Fig. 2 B.

Etymology. The new generic name is formed from a Japanese prefix "*Nabe-*" and a related genus name, "*Pselaphus*". The prefix "*Nabe-*" is derived from the nick-

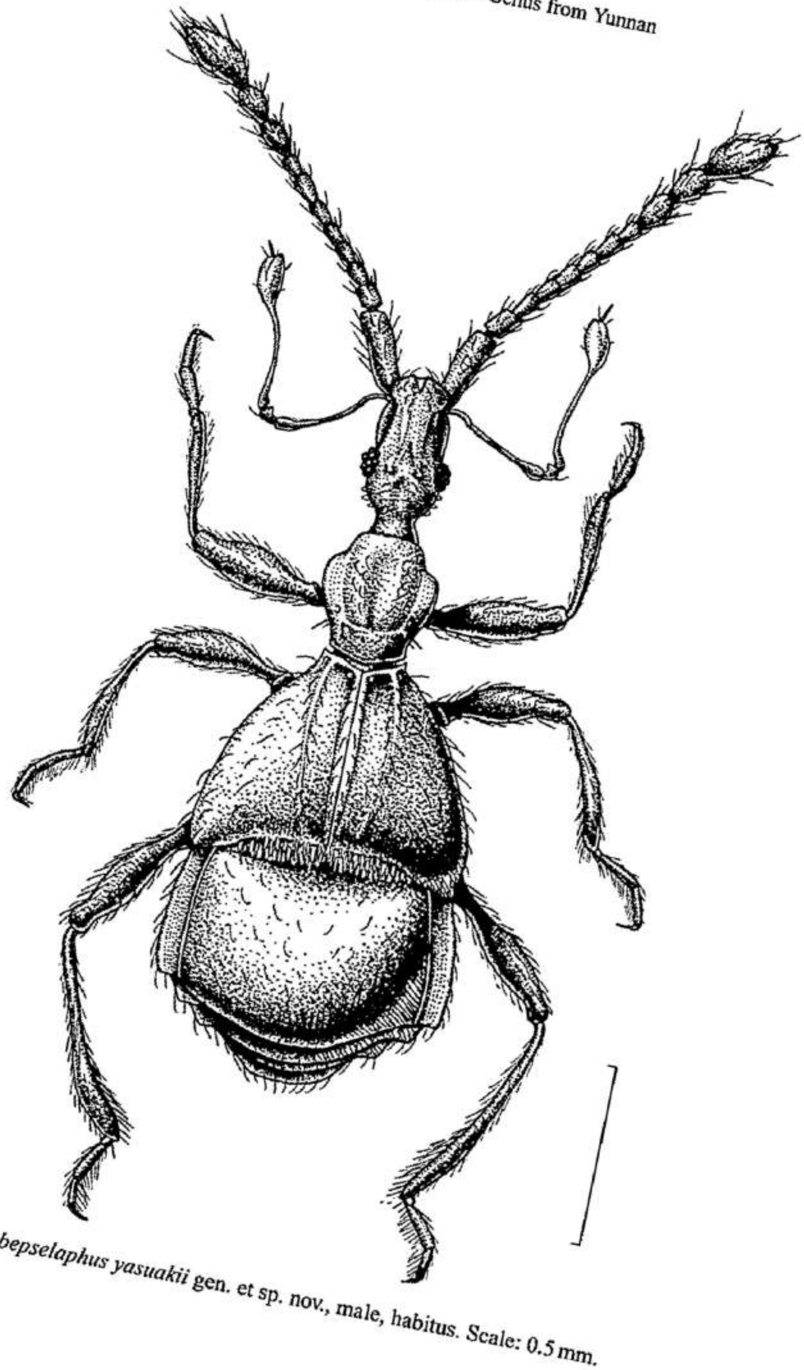

Fig. 1. *Nabepselaphus yasuakii* gen. et sp. nov., male, habitus. Scale: 0.5 mm.

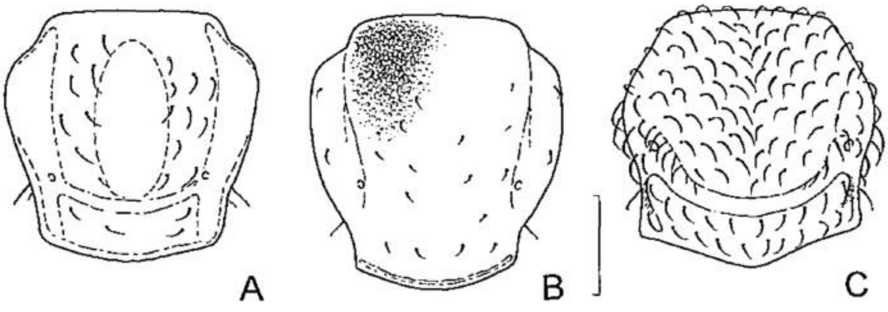

Fig. 2. Pronotal structure of three genera of the tribe Pselaphini; A, *Nabepselaphus yasuakii* sp. nov.; B, *Pselaphogenius lanceolatus* K. SAWADA; C, *Pselaphaulax japonicus* (RAFFRAY). Scale: 0.2 mm.

name of Professor Yasuaki WATANABE, "*Nabe-san*".

Nabepselaphus yasuakii sp. nov.

Male. Length 1.79–1.93 mm. Width 0.68–0.85 mm.

Body reddish brown to light brown, maxillary palpi and tarsi yellowish.

Head elongate, ovoid in dorsal view, frons constricted behind antennal base, with a short, narrow and V-shaped apical notch, an indistinct median and a pair of lateral longitudinal grooves before dorsal tentorial pits, vertex gently convex, with a shallow median concavity, postgenae broad, each with a short and oblique carina behind eye, gular area densely with scales at ventromedian part. Eyes small and ovoid, each composed of 7–8 facets. Antennae long and slender, 1st segment large and thick, subcylindrical in apical part, slightly thickened distad, 2nd obliquely subcylindrical, 3rd to 8th subequal in width, each small and ovoid, 9th to 10th subequal, each large and ovoid, 11th the largest and ovoid, 1.8 times as long as wide; relative length (width) of each segment from base to apex:— 2.5 (1.0): 1.0 (0.7): 0.8 (0.6): 0.8 (0.6): 0.7 (0.6): 0.7 (0.6): 0.8 (0.6): 0.7 (0.6): 1.2 (0.8): 1.2 (0.8): 2.3 (1.3). Maxillary palpi long and slender, 1st segment short and slender, weakly curved near base, 2nd elongate, very slender in basal 2/3, then thickened distally, 3rd short and nearly triangular, broadened distally, 4th the largest, longer than 1st+2nd+3rd, very slender in basal 5/7, swollen and nearly ovoid in apical 2/7.

Pronotum slightly longer than wide, widest at apical 1/4. Elytra nearly trapezoidal, gently convex, but weakly concave near base, median longitudinal carina broad at base, narrowed and gently incurved posteriorly, reaching near posterior margin of elytra; chaetotaxial formula of elytra: 1–0–2–0–1–0–2/3.

Abdomen large and the widest, 4th tergite rectangular, gently convex, sparsely pubescent, with a pair of narrow, arcuate and parallel-sided paratergites, 4th sternite broad and transverse, slightly convex, with a pair of short and longitudinal fringes at the middle. Male genitalia well sclerotized; parameres almost symmetrical, slender and

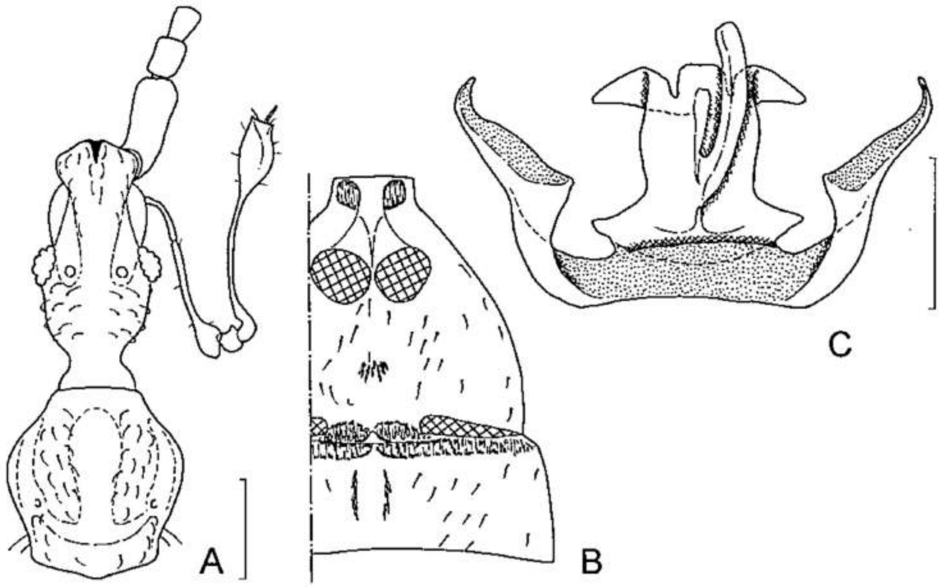

Fig. 3. *Nabepselaphus yasuakii* sp. nov.; A, head and pronotum; B, meso-metasterna and 3rd to 4th abdominal sternites; C, 9th sternite and genital plate in the female. Scale for A and B: 0.2 mm; scale for C: 0.1 mm.

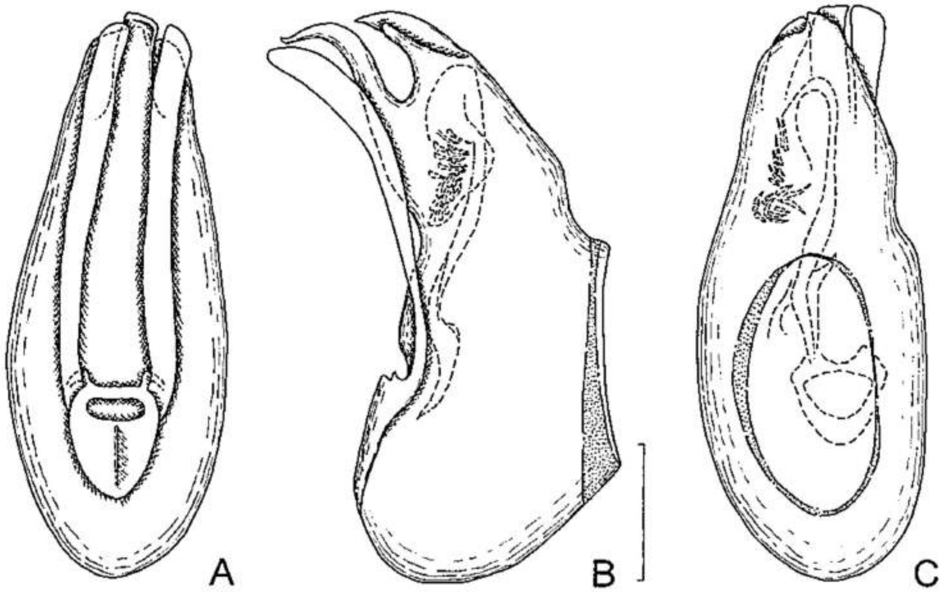

Fig. 4. Male genitalia of *Nabepselaphus yasuakii* sp. nov.; A, ventral view; B, lateral view; C, dorsal view. Scale: 0.1 mm.

rounded at apices; median lobe nearly reniform, with a short projection on the left side of apex and a short and narrow ventral process at apical 1/4 on ventral side; endophallus very weakly sclerotized, consisting of slender and apically curved sclerite and a group of small spines attatched to the end of the sclerite.

Female. Length 1.85–1.88 mm. Width 0.73–0.74 mm. Very similar to male, but metasternum less convex than in male, sparsely covered with pubescence in median area; 4th abdominal sternite uniformly with sparse pubescence. Ninth abdominal sternite containing a pair of narrow and weakly sclerotized plates; genital plate well sclerotized, strongly constricted at the middle, with a ventral process at median part.

Holotype ♂ (preserved in National Science Museum, Tokyo), Xuerenfeng, 3,120 m alt., Diancangshan Mts., Dali-shi, Yunnan, China, 27–X–1995, S. UÉNO leg. Paratypes: 1♂, same data as the holotype; 2♂, same data as above, but Y. WATANABE & N. XIAO leg.; 2♂, Yuzhufeng, 3,250 m alt., Diancangshan Mts., Dali-shi, Yunnan, 6–IX–1993, Y. WATANABE & S. UÉNO leg.; 1♂, Zhonghefeng, 2,540 m alt., Diancangshan Mts., Dali-shi, Yunnan, 28–X–1995, S. UÉNO leg.; 4♂, 1♀, above Dali, 2,500–2,700 m alt., Yunnan, 8~18–IV–1999, W. SCHAWALLER leg.; 5♂, 1♀, same locality as above, but 2,700–2,900 m alt., 14–IV–1999, W. SCHAWALLER leg.

Distribution. Yunnan, Southwest China (Diancangshan Mts.).

Remarks. This new species was already reported as *Pselaphogenius* sp. 4 in NOMURA (2000). It is characterized by the frons with a short, narrow and V-shaped apical notch in both the sexes, the metasternum with a small fringe at the middle in the male and the median lobe of male genitalia with a small and narrow ventral process and short projection at the left apex.

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Two New Species of *Episcaphium* ACHARD (Coleoptera, Staphylinidae, Scaphidiinae)

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Abstract *Episcaphium watanabei* sp. nov. is described from China and Taiwan, and *E. grande* sp. nov. is described from Vietnam. Two species-groups are recognised within the genus and a key to species is provided.

Introduction

Episcaphium LEWIS, 1893 is one of the three constituent genera of the tribe Scaphiini that appears to be a sister group of the species rich tribes Scaphidiini plus Scaphisomatini (LESCHEN & LÖBL, 1995). The genus *Episcaphium* was based on a single Japanese species, *E. semirufum* LEWIS, 1893 and considered monospecific until 1992 when I have transferred to *Episcaphium* the Sri Lankan *Scaphidium saucineum* MOTSCHULSKY, 1859 and described a new species, *E. unicolor* (LÖBL, 1992) from Nepal. LESCHEN and LÖBL (1995) have synonymized *Phenoscaphium* ACHARD, 1922 with *Episcaphium* and transferred its unique member, *P. callosipenne* ACHARD, 1922 to the latter genus. Additional three species were recognized in new collections coming from Yunnan and Sichuan and subsequently described (LÖBL, 1999). *Episcaphium* includes presently seven described species. Two additional species are described below, *E. watanabei* from Taiwan and continental China, and *E. grande* from Vietnam.

Two of the *Episcaphium* species, *E. callosipenne* (ACHARD) and *E. grande* sp. nov., share a deeply notched hypopharynx, strongly widened, subtriangular antennal segments 7 to 10, elongate and wrinkled labium, and have uneven elytral disc. They form a distinct, likely monophyletic group. The remaining species of *Episcaphium* are not linked by any obvious synapomorphy.

Episcaphium watanabei sp. nov.

(Figs. 1–3)

Holotype ♂: "China, W-Sichuan, Ya'an Pref., Shimian Co., Xiaoxiang Ling, side valley above Nanya Cun nr. Caluo, 11 km S Shimian,1250 m, 7.VII.1999, leg. D. W. Wraze" (coll. Mus. Zool. Berlin).

Paratypes: 2♂, "China, W-Sichuan, Ya'an Pref., Shimian Co., Xiaoxiang Ling, side valley above Nanya Cun nr. Caluo, 11km S Shimian,1250m, 7.VII.1999, leg A. Pütz" (coll. A. PÜTZ and Mus. Geneva); 1♀ labelled "Formosa Taihorin, V.10 H. Sauter S. G." (coll. Mus. Geneva); 1♀, "Taiwan, Nanshanchi, 800m, Nantou Hsien, 30.VI.1965, leg. Y. Kurosawa" (coll. Mus. Tokyo).

Description. Length (total) 4.2–4.6 mm, length from anterior margin of pronotum to apical margin of elytra 3.2–3.4 mm. Head ochreous anteriorly, with vertex darkened or black. Pronotum ochreous, with black or at least darkened base and two black or dark admesal fasciae. Dark or black basal area extended from basal margin to antebasal puncture row, interrupted at middle and not extended up to lateral margin. Upper part of prohypomera ochreous, lower part of prohypomera darkened to black. Elytra each with two dark to black transverse fasciae, and darkened to black at basal, sutural and apical margins, and with dark epipleura and supra-epipleura. Prosternum ochreous, remainder of ventral side and exposed abdominal segments very dark to black in specimens from continental China, rufous in specimens from Taiwan. Appendages ochreous, black antennal club excepted.

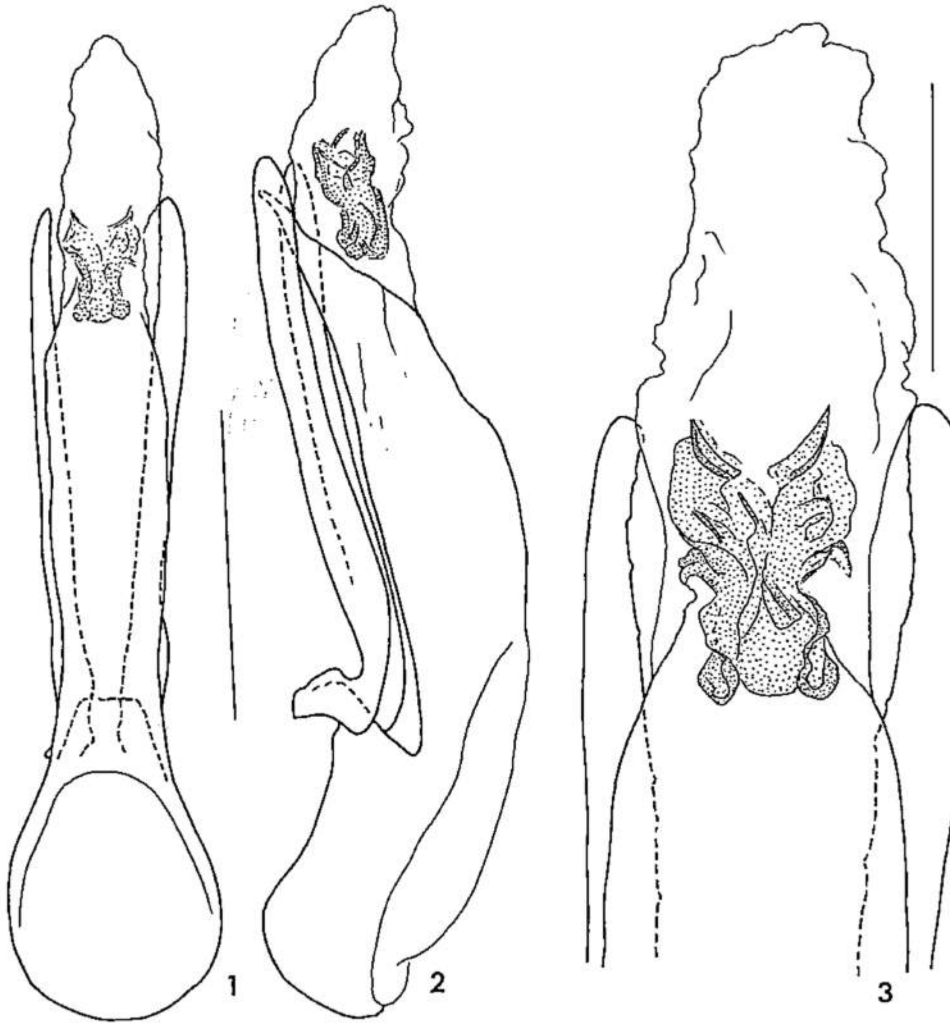
Head with very large eyes, eye width at dorsal view superior to smallest width of frons. Vertexal punctation irregular, fairly coarse, consisting partly of elongate punctures, becoming finer anteriorly. Antennae short. Antennal segment 3 longer than segments 2 and 4, segments 4 to 6 gradually shorter, segment 5 slightly longer than 6, about 3 times as long as wide. Club segment 7 longer than wide, moderately widened apically, segments 8 to 10 with lateral margins subparallel, each about as long as wide. Labium smooth, slightly impressed, with a pair of mediolateral, long, erect setae. Segments 1 and 2 of labial palpi short, wider than long, 1 larger than 2. Gular striae impressed, groove-like basally. Hypopharynx with slightly emarginate anterior margin.

Pronotum 1.05–1.20 mm long at mid-line, 1.50–1.60 mm wide at base. Disc strongly convex, lateral margins oblique in basal half, slightly rounded in anterior half. Basal margin emarginate at each side of basal lobe. Anterior margin with 4 long, erect setae. Antebasal puncture row dense and coarse, hardly interrupted at middle, impressed laterally. Discal punctation sparse and very fine.

Elytral maximum length 2.05–2.15 mm, combined width 1.85–1.95 mm. Disc lacking impressions, humps, and longitudinal puncture rows. Humeral protuberance absent. Basal margin raised, basal puncture row coarse and dense. Discal punctation fine and sparse anteriorly, becoming denser and more coarse near apices. Long, erect setae situated along lateral, sutural and apical margins and two such setae situated on apicomedian part of disc.

Mesosternal process grooved. Margins of mesosternal process extending apicolaterally to form two short, curved ridges. Transverse mesosternal ridge absent.

Metasternum lacking microsculpture, extremely finely punctate, one pair of larger, medio-anterior, setiferous punctures excepted, with large medio-apical impression and extremely shallow, median impression narrowed anteriorly. Submesocoxal lines continuous.



Figs. 1–3. *Episcaphium watanabei* sp. nov., aedeagus at dorsal and lateral views (1, 2), with apical portion of median lobe, parameres and internal sac at higher magnification (3). Scale lines=0.5 mm (Figs. 1 and 2), 0.2 mm (Fig. 3).

Abdomen with punctation extremely fine, pairs of larger, setiferous punctures on exposed sternites 1 to 4 excepted. Exposed sternite 1 impressed apicolaterally; microsculpture absent from most surface, with punctulate microsculpture hardly visible on apical portion, striolate microsculpture on apicolateral areas. Following sternites with distinct microsculpture consisting of meshes and striae.

Male sexual characters:— Legs longer. Profemora with short ridge at about middle of anterior side. Protibiae almost straight. Protarsi with segments 1 to 3 distinctly widened, bearing tenant setae. Mesofemora with subapical tubercle at posterior side. Mesotibiae slightly curved in apical half. Metatibiae slightly curved in apical third. Aedeagus (Figs. 1 to 3) 1.33–1.43 mm long. Median lobe with apical process long, slightly widened toward apical third, inclined ventrally. Lateral margins of apical process somewhat sinuate. Ventral process robust, curved ventrally. Ventral side of apical process sinuate, tip slightly curved. Basal bulb and compression plate small. Parameres fairly wide, slightly extended beyond posterior tip of median lobe, slightly divergent and almost straight at dorsal view, slightly arcuate at lateral view, with inner margin denticulate. Internal sac with complex sclerotized structure.

Comments. This species resembles *E. saucinum* (MOTSCHULSKY) by its colour pattern and the body size. It may be readily distinguished from the latter by the mesosternal ridge that does not reach the basal edge of the mesosternal shield, and the submesocoxal lines that are continuous, while they are widely separated in *E. saucineum*.

Etymology. This species is named in honour of Prof. Y. WATANABE who significantly contributed to a better knowledge of the Asian Staphylinidae.

Episcaphium grande sp. nov.

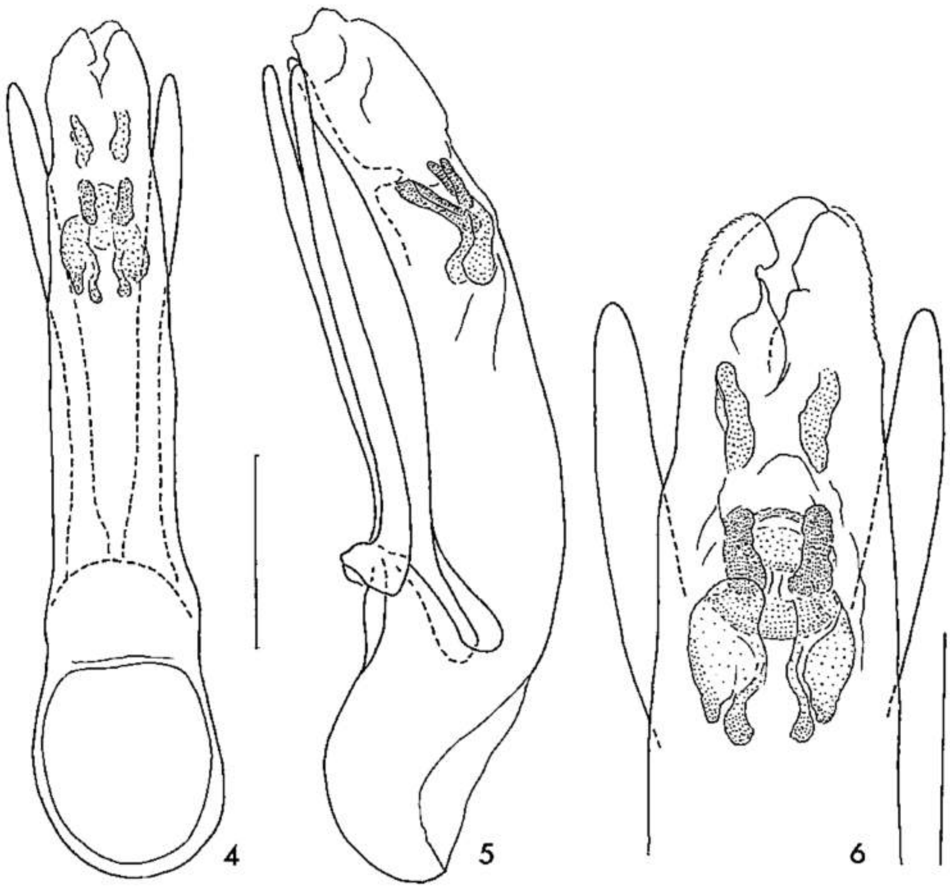
(Figs. 4–6)

Holotype ♂: from Vietnam, labelled "Hoa Binh Tonkin deCooman" (coll. Mus. Geneva).

Description. Length (total) 6.5 mm, length from anterior margin of pronotum to apical margin of elytra 5 mm. Head and pronotum black, elytra rufous. Ventral side of body uniformly black, rufous apical abdominal segments excepted. Antennal segments 1 to 6 rufous, antennal club dark brown. Femora and tibiae almost as dark as ventral side of body and pronotum, tarsi rufous.

Head with large eyes, eye width at dorsal view inferior to smallest width of frons. Vertexal punctation irregular, fairly coarse, becoming finer anteriorly, punctures not elongate. Antennae fairly long. Antennal segments 3 to 5 subequal in length, segment 5 about twice as long as wide; segment 6 distinctly shorter and thicker than segment 5. Club segments 7 to 10 strongly widened apically, subtriangular, similar in size and shape, each longer than wide. Labium wrinkled, impressed anteriorly, with numerous long, erect setae at lateral margin and one pair of long erect setae inserted at anterior angles. Labial palpi with segment 1 large, wider than long, segment 2 distinctly smaller than segment 1, about as wide as long. Gular striae very shallow. Hypopharynx with deep mesal incision.

Pronotum 1.8 mm long at mid-line, 2.6 mm wide at base. Disc strongly convex, lateral margins weakly arcuate. Basal margin slightly impressed at each side of basal lobe. Anterior margin with 6 long, erect setae, a pair of long, erect setae at basal lobe. Antebasal puncture row sparse and comparatively fine, interrupted at middle, shallowly impressed laterally. Discal punctation sparse and very fine.



Figs. 4–6. *Episcaphium grande* sp. nov., aedeagus at dorsal and lateral views (4 and 5), with apical portion of median lobe, parameres and internal sac at higher magnification (6). Scale lines = 0.5 mm (Figs. 4 and 5), 0.3 mm (Fig. 6).

Elytral maximum length 3.3 mm, combined width 3.0 mm. Disc uneven, with large, low, humeral protuberance, wide apical impression. Longitudinal puncture rows absent. Basal margin not raised, basal puncture row moderately coarse and dense. Discal punctation very fine and sparse anteriorly, dense and fairly coarse on most of surface. Long, erect setae situated along lateral and apical margins and on disc.

Mesosternal process hardly grooved, parallel-sided, joined at base to transverse mesosternal ridge. Metasternum lacking microsculpture, with punctation as that in *E. watanabei*; mesal impression very shallow and narrow, narrowed anteriorly. Submesocoxal lines continuous.

Abdomen with punctation as that in *E. watanabei*. Exposed sternite 1 lacking apicolateral impression, most of its surface with punctulate and striolate microsculpture.

Following sternites with microsculpture consisting of striae and meshes.

Male sexual characters:— Femora lacking obvious sexual characters. All tibiae arcuate. Segments 1 to 3 of protarsi widened and bearing tenant setae. Aedeagus (Figs. 4–6) 2.4 mm long. Median lobe subcylindrical, slightly widened posterior basal bulb, moderately curved (lateral view), with ventral side of apical process arcuate. Basal bulb and compression plate small. Ventral process robust, narrowly separated from apical process. Parameres comparatively narrow, hardly reaching tip of apical process, divergent and almost straight at dorsal view, slightly arcuate at lateral view. Internal sac with complex sclerotized structure.

Comments. This species may be easily distinguished from its congeners by its large body size and colour pattern. The wrinkled, elongate labium, the shape of the segments of the antennal club and the uneven elytra indicate close relationship to *E. callosipenne* (ACHARD) from which it may be easily distinguished by the rufous elytra and the lack of metasternal microsculpture.

Key to the Species of *Episcaphium*

1. Elytral disc uneven, lacking puncture rows. Antennal segments 7 to 10 conspicuously widened apically. Labium wrinkled. 2
— Elytral disc even, with or without puncture rows. Antennal segments 7 to 10 moderately widened apically. Labium smooth. 3
2. Body uniformly black. Metasternum with distinct microsculpture consisting of transverse striae. ....*E. callosipenne* (ACHARD)
— Head, thorax and abdomen black, elytra rufous. Metasternum not microsculptured. ....*E. grande* sp. nov.
3. Elytra bicolored. 4
— Elytra uniformly rufous to black. 6
4. Elytra each with a single dark, apical spot, and with discal puncture rows. Pronotum often with dark basal spots. Submesocoxal lines widely separated. Mesosternal shield with transverse ridge. ....*E. haematoides* LÖBL
— Elytra each with two spots or fasciae, lacking discal puncture rows. Pronotum lacking spots or with dark admesal bands. Mesosternal shield without transverse ridge. 5
5. Pronotum uniformly reddish to black. Mesocoxal process not grooved. Submesocoxal lines widely separated. ....*E. saucineum* (MOTSCHULSKY)
— Pronotum with dark admesal fasciae. Mesocoxal process grooved. Submesocoxal lines continuous. ....*E. watanabei* sp. nov.
6. Head, pronotum and elytra uniformly black. 7
— Colour pattern different. 8
7. Elytra lacking discal puncture rows. Abdomen ochreous. ....*E. strenuum* LÖBL
— Elytra with fine discal puncture rows. Abdomen black. ....*E. catenatum* LÖBL
8. Head and ventral side of thorax, or head and entire thorax, much darker than elytra

and abdomen. Submesocoxal lines continuous. ....*E. semirufum* LEWIS
— Head and body uniformly reddish. Submesocoxal lines widely separated. ....
....*E. unicolor* LÖBL

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Relationship between Microhabitat and Relative Body Thickness in Adult Beetles of the Oriental Passalid Genera *Aceraius*, *Macrolinus* and *Ophrygonius* (Coleoptera, Passalidae)

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Abstract Relationship between microhabitat and relative body thickness in adult beetles is studied for the three Oriental passalid genera, *Aceraius*, *Macrolinus* and *Ophrygonius*. As a result, it is revealed that sapwood/heartwood inhabitants are more convex in body shape than underbark inhabitants in each examined genus. It is deduced from the present results that evolutionary change of body thickness occurred at least once associated with that of microhabitat within each genus.

Passalid beetles live in family groups in rotting wood (REYES-CASTILLO & HALFFTER, 1984; SCHUSTER & SCHUSTER, 1997), although a few species are known to live in the other types of microhabitats: *e.g.*, in the detritus chambers of leaf-cutter ants, in the detritus among the rhizomes of epiphytic ferns, and in the log-soil interface (SCHUSTER, 1984; JOHKI & KON, 1987; KON & JOHKI, 1987). Microhabitats utilized by the passalid beetles living in rotting wood are further classified into two types: 1) just under the bark and 2) in either the sapwood and/or heartwood. It has been known that the relative body thickness of adult passalid beetles is related to their microhabitats; i.e., flatter species tend to be found living under the bark, whereas more convex ones either in the sapwood/heartwood or in the detritus-like microhabitats (SCHUSTER, 1978; REYES-CASTILLO & HALFFTER, 1984; JOHKI & KON, 1987; LOBO & CASTILLO, 1997). This association between microhabitat and body shape is considered as a result of morphological adaptation to particular microhabitats (LOBO & CASTILLO, 1997). However, it has also been known that relative body thickness is related to higher phyletic groups in the Passalidae. According to REYES-CASTILLO's (1970) revision, the family Passalidae are classified into the two subfamilies, Passalinae and Aulacocyclinae, the latter of which are more convex in body shape than the former (REYES-CASTILLO, 1970; JOHKI & KON, 1987). Further, the subfamily Passalinae are classified into the two tribes, Passalini and Proculini, the former of which is pan-tropical and the latter solely from the New World (REYES-CASTILLO, 1970). LOBO and CASTILLO (1997) showed for the New World Passalinae that the Proculini is more convex than the Passalini and JOHKI and KON (1987) showed for the Oriental Passalini that the genus *Leptaulax* is flatter than the genus *Aceraius*.

It has been pointed out that it is necessary to take account of the influences of phylogeny or shared ancestry when comparative methods are utilized for evolutionary studies on adaptation (HARVEY & PAGEL, 1991). If some interspecific variation of a character is observed within one monophyletic group (the common ancestor of which

Table 1. Microhabitat and relative body thickness (PT/PW) of 24 passalid beetles belonging to the three genera, *Aceraius*, *Macrolinus* and *Ophrygonius*.

Species	Microhabitat	Body thickness (mean±SD; n=10)
Aceraius alpinus KON, UEDA et JOHKI	sapwood/heartwood	0.68±0.013
Aceraius ashidai KON, ARAYA et JOHKI	sapwood/heartwood	0.68±0.008
Aceraius boucheri KON, ARAYA et JOHKI	sapwood/heartwood	0.66±0.013
Aceraius borneanus KAUP	sapwood/heartwood	0.64±0.013
Aceraius helferi KUWERT	sapwood/heartwood	0.64±0.007
Aceraius hidakai KON, ARAYA et JOHKI	sapwood/heartwood	0.67±0.011
Aceraius hikidai KON, UEDA et JOHKI	sapwood/heartwood	0.68±0.009
Aceraius illegalis KUWERT	sapwood/heartwood	0.67±0.011
Aceraius kinabalensis KON et JOHKI	sapwood/heartwood	0.67±0.011
Aceraius kuwerti ZANG	sapwood/heartwood	0.68±0.011
Aceraius laevicollis (ILLIGER)	sapwood/heartwood	0.66±0.013
Aceraius laniger ZANG	sapwood/heartwood	0.68±0.012
Aceraius oculidens ZANG	sapwood/heartwood	0.68±0.014
Aceraius sabanus KON, UEDA et JOHKI	sapwood/heartwood	0.66±0.010
Aceraius tricornis ZANG	sapwood/heartwood	0.68±0.012
Aceraius wallacei (KUWERT)	underbark	0.57±0.011
Macrolinus cartereti BOUCHER	underbark	0.56±0.014
Macrolinus latipennis (PERCHERON)	sapwood/heartwood	0.64±0.010
Ophrygonius aequidens GRAVELY	underbark	0.61±0.009
Ophrygonius inaequalis (BURMEISTER)	underbark	0.56±0.015
Ophrygonius minor (GRAVELY)	sapwood/heartwood	0.66±0.015
Ophrygonius tuberculosus BOUCHER et KON	sapwood/heartwood	0.65±0.008
Ophrygonius tuberculus BOUCHER	sapwood/heartwood	0.64±0.014
Ophrygonius uedai KON et JOHKI	log–soil interface	0.64±0.011

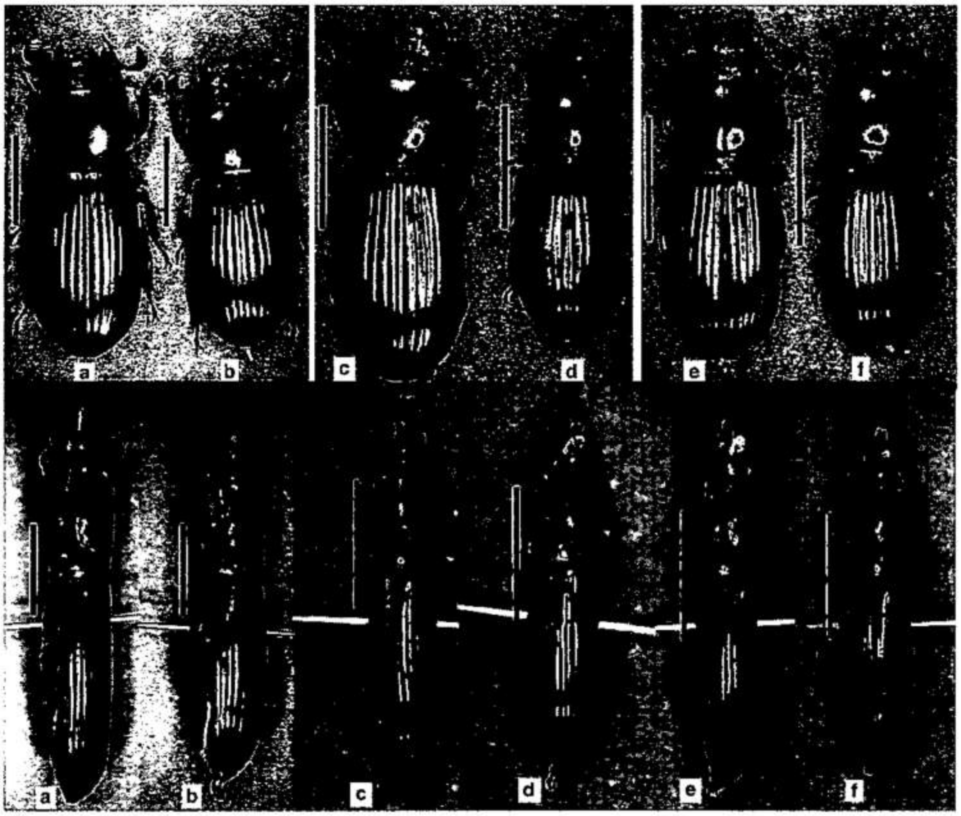

Fig. 1. Six species belonging to the genera *Aceraius*, *Macrolinus* and *Ophrygonius*. Top, dorsal view (scale, 10 mm); bottom, left lateral view (scale 10 mm). a, *A. wallacei*; b, *A. laevicollis*; c, *M. cartereti*; d, *M. latipennis*; e, *O. inaequalis*; f, *O. minor*.

was not polymorphic), it is deduced that evolutionary change of the character has occurred at least once within the clade. In the present study, intrageneric comparisons of relative body thickness are made for the three Oriental passalid genera, *Aceraius*, *Macrolinus* and *Ophrygonius*, each of which includes both types of species inhabiting under the bark and in the sapwood/heartwood. These genera had previously been assigned to the same subfamily Macrolininae due to morphological similarity (GRAVELY, 1918).

Materials and Methods

We restricted the species for analysis to those whose microhabitats had been observed by us in the wild. The microhabitats of the examined species are summarized in Table 1. Photographs of some of examined species appear in Fig. 1.

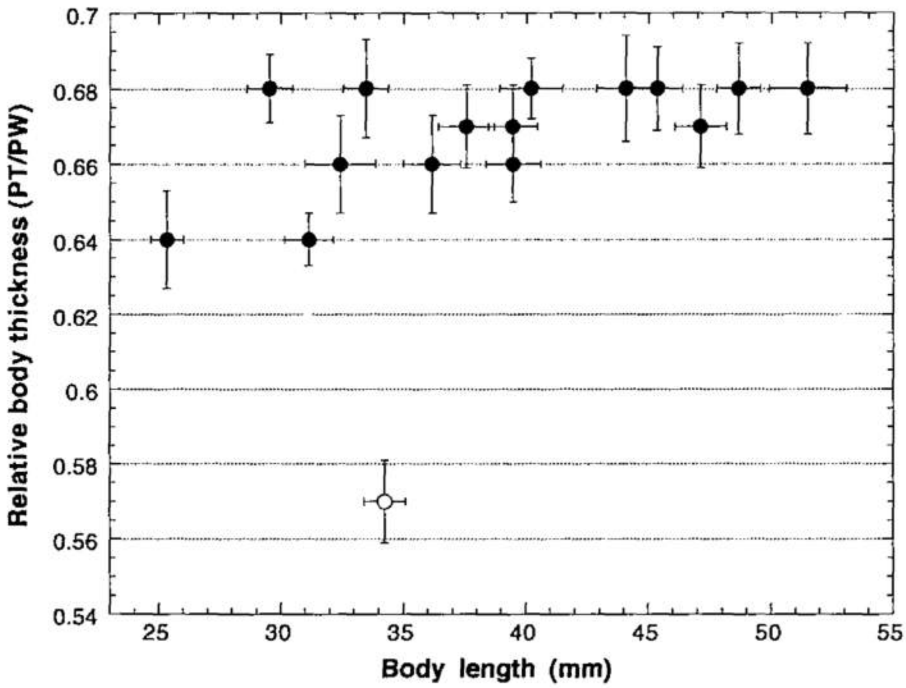

Fig. 2. Mean body length and PT/PW for 16 *Aceraius* species. Closed circle, sapwood/heartwood inhabitant; open circle, underbark inhabitant; error bar, SD.

Ten specimens were measured for each species. In measurements, males and females were combined together because no sexual dimorphism is evident in the Passalidae (ARROW, 1950). For all the specimens, the following three measurements were taken: 1) body length from the anterior margin of head to the tip of elytron, 2) pronotum width (PW), and 3) prothorax thickness at the center (PT). The ratio of PT/PW was calculated and used as an index of relative body thickness.

Results and Discussion

In the present study, it is revealed that relative body thickness is not related to body length but to microhabitat; i.e., sapwood/heartwood inhabitants tend to have a more convex body than underbark inhabitants (Figs. 2, 3; Table 1). This tendency is also observed for each genus. For *Aceraius*, the PT/PW ranges between 0.64 and 0.68 in the 15 species inhabiting in the sapwood/heartwood, whereas 0.57 in *A. wallacei* inhabiting under the bark is distinctly out of this range (Fig. 2). For *Macrolinus*, the PT/PW is 0.64 in the sapwood/heartwood inhabitant, *M. latipennis*, whereas 0.56 in the underbark inhabitant, *M. cartereti* (Fig. 3). For *Ophrygonius*, the smallest and the second smallest values of PT/PW, 0.56 and 0.61, are marked for the two underbark in-

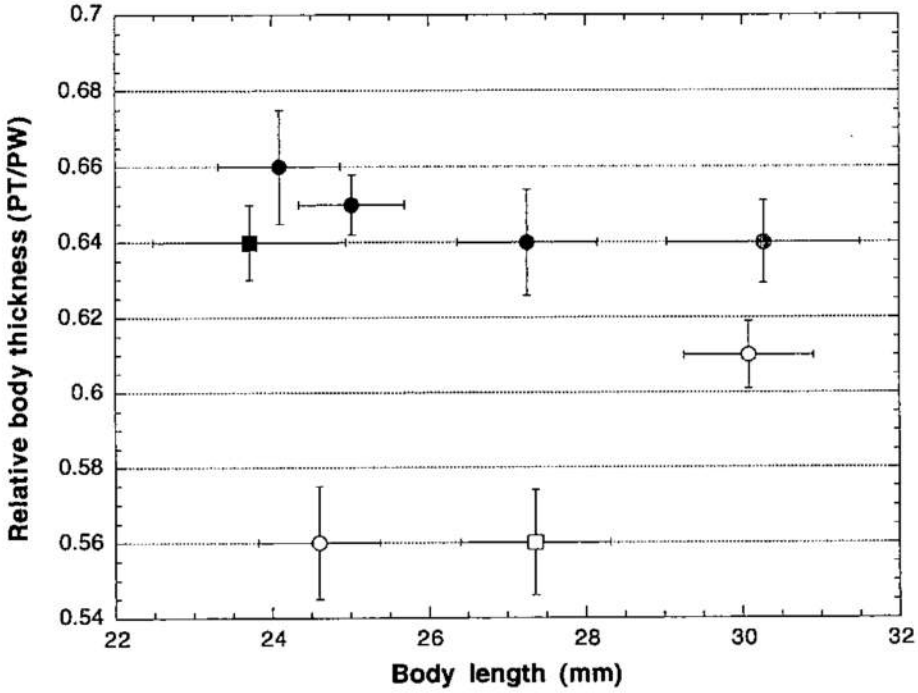

Fig. 3. Mean body length and PT/PW for 6 *Ophrygonius* and 2 *Macrolinus* species. Closed symbol, sapwood/heartwood inhabitant; open symbol, underbark inhabitant; hatched symbol, log–soil interface inhabitant; error bar, SD. Circle, *Ophrygonius* species; rectangle, *Macrolinus* species.

habitants, *O. inaequalis* and *O. aequidens*. On the other hand, the PT/PW of *O. uedai* inhabiting the log–soil interface takes its place within the range of the sapwood/heartwood inhabitants, 0.64–0.66 (Fig. 3).

The present results suggest that evolutionary change of relative body thickness may have occurred at least once associated with that of microhabitat within each genus. However, it remains to be unclear which of a flatter underbark inhabitant or a more convex sapwood/heartwood inhabitant was ancestral for each genus. In addition, the implicitly assumed monophyly of *Ophrygonius* may not be so reliable, because *O. inaequalis* appears to be quite different from the other congeneric members in the external morphology and male genitalia. In order to solve these problems, it is inevitable to make a phylogenetic analysis for the three genera and their relatives.

Acknowledgments

We wish to dedicate this study to Prof. Y. Watanabe, one of the dominant figures in the coleopterology in Japan. This study was supported in part by Grants-in-Aid from the Japan Society for the Promotion of Science (Nos. 11833007, 11833014).

Appendix (Specimens examined)

Aceraius alpinus KON, UEDA et JOHKI: 3♂♂, 1♀, Mt. Kinabalu, 1,900 m, Sabah, Borneo, 25–XI–1987, A. UEDA & G. GUNSALAM leg.; 1♂, 1♀, ditto, 2,100 m, Sabah, Borneo, 25–XI–1987, A. UEDA & G. GUNSALAM leg.; 1♂, 3♀♀, ditto, 2,300 m, Sabah, Borneo, 26–XI–1987, A. UEDA & G. GUNSALAM leg.

Aceraius ashidai KON, ARAYA et JOHKI: 2♂♂, 4♀♀, Bukit Larut, Malay Peninsula, 2–I–1993, K. ARAYA leg.; 2♀♀, Genting Highlands, Malay Peninsula, 14–I–1993, K. ARAYA leg.; 2♀♀, ditto, 9–IV–1994.

Aceraius boucheri KON, ARAYA et JOHKI: 1♂, 1♀, Gunung Emas, Sabah, Borneo, 21–VIII–1987, M. KON leg.; 1♀, Kundasang, Sabah, Borneo, 2–IX–1987; 1♂, ditto, 2–IX–1987; 1♀, Crocker Range, 1,400 m, Sabah, Borneo, 9–III–1989; 2♂♂, ditto, 1,400 m, 25–III–1998; 1♂, Mt. Kinabalu, Sabah, Borneo, 16–IX–1993, Y. JOHKI leg.; 1♀, Mt. Trus Madi, Sabah, Borneo, 16–IX–1997, K. MAEKAWA leg.; 1♀, Mt. Kinabalu, 1,500 m, Sabah, Borneo, 16–XII–1997.

Aceraius borneanus KAUP: 1♂, Beaufort, Sabah, Borneo, 22–VII–1986; 2♂♂, 7♀♀, Sepilok, Sabah, Borneo, 21–VII–1987, M. KON leg.

Aceraius helferi KUWERT: 1♀, Suratthani, Thailand, 18–VIII–1997, M. KON leg.; 2♂♂, 3♀♀, ditto, 18–VIII–1997, M. KON leg.; 1♂, 3♀♀, Ranong, Thailand, 23–VIII–1997, M. KON leg.

Aceraius hidakai KON, ARAYA et JOHKI: 2♂♂, 3♀♀, Poring, 900 m, Sabah, Borneo, 16–XI–1987, A. UEDA & G. GUNSALAM leg.; 3♂♂, Poring, 1,000 m, Sabah, Borneo, 18–XI–1987, A. UEDA & G. GUNSALAM leg.; 2♀♀, Mt. Mulu, 500 m, Sarawak, Borneo, 17–XII–1989, K. ARAYA leg.

Aceraius hikidai KON, UEDA et JOHKI: 1♂, Gunung Emas, 1,600 m, Sabah, Borneo, 19–IX–1997, M. KON leg.; 3♂♂, 4♀♀, ditto, 25–IX–1997, M. KON leg.; 2♂♂, ditto, 29–IX–1997, M. KON leg.

Aceraius illegalis KUWERT: 3♂♂, 7♀♀, Mt. Serapi, Sarawak, Borneo, XII–1989.

Aceraius kinabalensis KON et JOHKI: 1♀, Mt. Kinabalu, Sabah, Borneo, 21–I–1995; 1♀, ditto, 11–IX–1997, M. KON leg.; 5♂♂, 3♀♀, Gunung Emas, 1,600 m, Sabah, Borneo, 25–IX–1997, M. KON leg.

Aceraius kuwerti ZANG: 1♂, Mt. Trusmadi, Sabah, Borneo, 18–IX–1997, M. KON leg.; 1♂, 3♀♀, Poring, Sabah, Borneo, 23–IX–1997, M. KON leg.; 5♂♂, Gunung Emas, 1,600 m, Sabah, Borneo, 29–IX–1997, M. KON leg.

Aceraius laevicollis (ILLIGER): 1♂, Tapah, Malay Peninsula, 19–IV–1976; 1♂, Keningau, Sabah, Borneo, 12–VIII–1977; 1♂, Luasong, Sabah, Borneo, 20–VII–1980; 1♀, Poring, Sabah, Borneo, 18–II–1980; 1♀, Sepilok, Sabah, Borneo, 5–VIII–1985, M. KON leg.; 1♀, ditto, 27–IX–1997, M. KON leg.; 1♀, Brumas, Sabah, Borneo, 24–VIII–1985, M. KON leg.; 1♀, Gunung Emas, 1,600 m, Sabah, Borneo, 29–IX–1997, M. KON leg.; 1♂, 1♀, Suratthani, Thailand, 18–VIII–1997, M. KON leg.

Aceraius laniger ZANG: 1♂, Mt. Trus Madi, Sabah, Borneo, 17–IX–1997, M. KON leg.; 1♂, 2♀♀, Gunung Emas, 1,600 m, Sabah, Borneo, 20–IX–1997, M. KON leg.; 2♂♂, 4♀♀, ditto, 25–IX–1997, M. KON leg.

Aceraius oculidens ZANG: 3♀♀, Tanah Rata, Malay Peninsula, 6–VIII–1990; 1♂, 1♀, Fraser's Hill, Malay Peninsula, 11–XII–1992, K. ARAYA leg.; 4♂♂, 1♀, Bukit Larut, Malay Peninsula, XII–1992.

Aceraius sabanus KON, UEDA et JOHKI: 1♂, Mt. Kinabalu, Sabah, Borneo, 17–VIII–1977; 5♂♂, 4♀♀, Gunung Emas, Sabah, Borneo, 19–IX–1997, M. KON leg.

Aceraius tricornis ZANG: 1♂, 1♀, Kundasang, Sabah, Borneo, 11–II–1974; 1♀, ditto, 18–VII–1985, M. KON leg.; 1♀, ditto, 7–VI–1987; 1♀, ditto, 18–VII–1987, M. KON leg.; 2♂♂, 3♀♀, Crocker Range, Sabah, Borneo, 20–VIII–1987, M. KON leg.

Aceraius wallacei (KUWERT): 1♀, Seplut, Sabah, Borneo, 31–VIII–1987; 1♀, Bung R., Sarawak, 11–VII–1988; 1♀, Sepilok, Sabah, Borneo, 2–VIII–1987, K. OTSUKA leg.; 6♂♂, 1♀, ditto, 27–IX–1997, M. KON leg.

Macrolinus cartereti BOUCHER: 1♂, 1♀, Tanah Rata, Malay Peninsula, 15–I–1992, K. ARAYA leg.; 1♀, ditto, 24–III–1997; 2♀♀, Genting Highlands, Malay Peninsula, 4–VIII–1997; 2♂♂, 3♀♀, Bukit Larut, Malay Peninsula, 27–III–1998.

Macrolinus latipennis (PERCHERON): 1♂, Kundasang, Sabah, Borneo, 12–VIII–1987, M. KON leg.; 1♀, Sepilok, Sabah, Borneo, 19–VIII–1987, M. KON leg.; 2♀♀, Tapah, Malay Peninsula, 24–III–1997; 1♀, Gunug Jerai, Malay Peninsula, 19–III–2000; 2♂♂, 3♀♀, Gurun, Malay Peninsula, 21–III–2000.

Ophrygonius aequidens (GRAVELY): 1♀, Tambunan, Sabah, Borneo; 1♀, Mt. Kinabalu, Sabah, Borneo, 30–V–1976; 1♂, ditto, 21–XI–1980; 1♂, Keningau, Sabah, Borneo, 3–IX–1989; 1♀, KOTA Kinabalu, Sabah, Borneo, IX–1989; 2♂♂, 3♀♀, Gunung Emas, Sabah, Borneo, 14–IX–1997, M. KON leg.

Ophrygonius inaequalis (BURMEISTER): 1♂, Sepilok, Sabah, Borneo, 3–II–1980; 5♀♀, Penang, Malay Peninsula, 24–XII–1992, K. ARAYA leg.; 1♂, Genting Highlands, 760 m, Malay Peninsula, 20–VIII; 1♂, Pagai Is., I–1993; 2♀♀, Aceh, Sumatra.

Ophrygonius minor (GRAVELY): 1♂, Bukit Larut, Malay Peninsula, 2–I–1993, K. ARAYA leg.; 3♂♂, 6♀♀, ditto, 28–III–1998.

Ophrygonius tuberculosus BOUCHER et KON: 4♂♂, 6♀♀, Mt. Bringchan, 2,000 m, Malay Peninsula, 7–I–1993, K. ARAYA leg.

Ophrygonius tuberculus BOUCHER: 1♂, Tanah Rata, Malay Peninsula, 6–I–1993, K. ARAYA leg.; 2♂♂, 2♀♀, ditto, 9–VIII–1997; 1♂, 1♀, Bukit Fraser, Malay Peninsula, 12–XII–1992, K. ARAYA leg.; 3♀♀, Genting Highlands, Malay Peninsula, 14–I–1993, K. ARAYA leg.

Ophrygonius uedai KON et JOHKI: 1♀, Mt. Kinabalu, Sabah, Borneo, 30–V–1976; 1♀, ditto, 20–VIII–1979, Y. JOHKI leg.; 1♂, ditto, 26–VIII–1987, M. KON leg.; 1♂, ditto, 3–X–1987, A. UEDA & G. GUNSALAM leg.; 1♂, ditto, 26–XI–1987, A. UEDA & G. GUNSALAM leg.; 3♂♂, ditto, 18–IX–1993, M. Kon leg.; 1♂, 1♀, ditto, 15–XII–1997.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 305–312, Mar. 31, 2002

A New Horned Species of the Genus *Onthophagus* (Coleoptera, Scarabaeidae) from Sabah, Borneo

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Abstract A new species of *Onthophagus* is described from Sabah, Borneo under the name of *O.* (*Proagoderus*) *watanabei* sp. nov. This new species is closely related to *O.* (*P.*) *schwaneri* VOLLENHOVEN, but can readily be distinguished from the latter by the following character states: body tinged with dark purplish to dark cupreous luster; elytral interstriae mat, without distinct longitudinal wrinkles. In addition, *O.* (*P.*) *schwaneri* is recorded from Sulawesi for the first time.

Onthophagus schwaneri was described from Borneo by VOLLENHOVEN (1864). Later, MARCUS (1920) assigned it to the genus *Proagoderus*. In his monograph, BALTHASAR (1963) regarded *Proagoderus* as a subgenus of *Onthophagus* and noted that *O.* (*P.*) *schwaneri* includes two color forms, i.e. greenish and cupreous.

When we made researches on dung beetles in Sabah, Borneo, we collected many specimens of cupreous form of *Onthophagus* (*Proagoderus*) *schwaneri* (OCHI & KON, 1994; KIKUTA *et al.*, 1997). Later we compared the specimens of cupreous form from Sabah with several specimens of greenish one from East Kalimantan, Borneo, and we found them distinct from each other in several morphological characters as well as body color. Further, based on VOLLENHOVEN's (1864) original description, we have concluded that the greenish form corresponds to true *O.* (*P.*) *schwaneri* and the cupreous form is new to science. We herewith describe the new species of *Onthophagus* based on the specimens from Sabah, Borneo. We adopt the terminology of ZUNINO (1972) for describing the male genitalia. The reflection rates of elytral surface are analyzed by using the Shimadzu Spectrophotometer, UV–240.

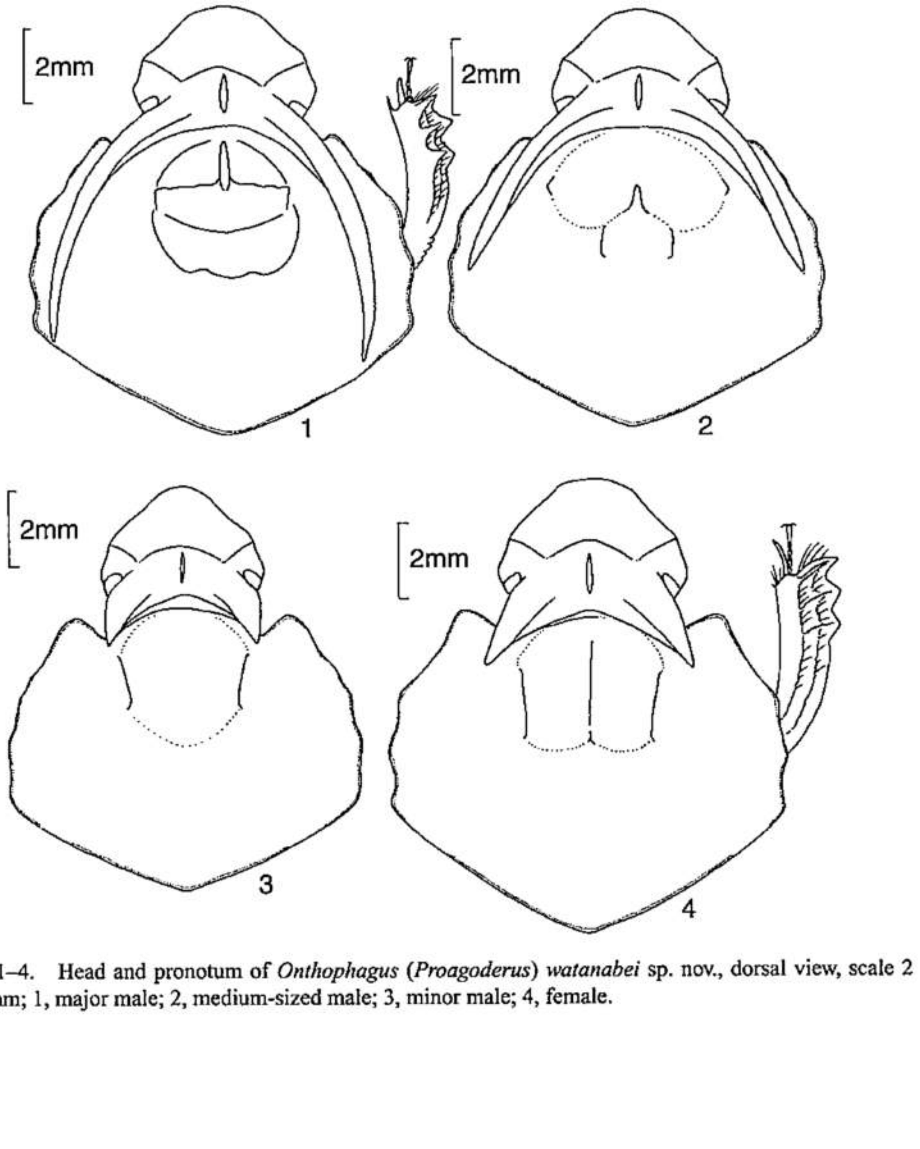
In addtion, *Onthophagus* (*Proagoderus*) *schwaneri* is recorded from Sulawesi for the first time.

Onthophagus (*Proagoderus*) *watanabei* sp. nov.

(Figs. 1–7, 8 b, 9 b, 10 b, 11 b)

Onthophagus (*Proagoderus*) *schwaneri*: OCHI & KON, 1994, Elytra, Tokyo, **22**, p. 293.——KIKUTA, GUNSALAM, KON & OCHI, 1997, Tropics, **7**, p. 127. [Nec VOLLENHOVEN, 1864.]

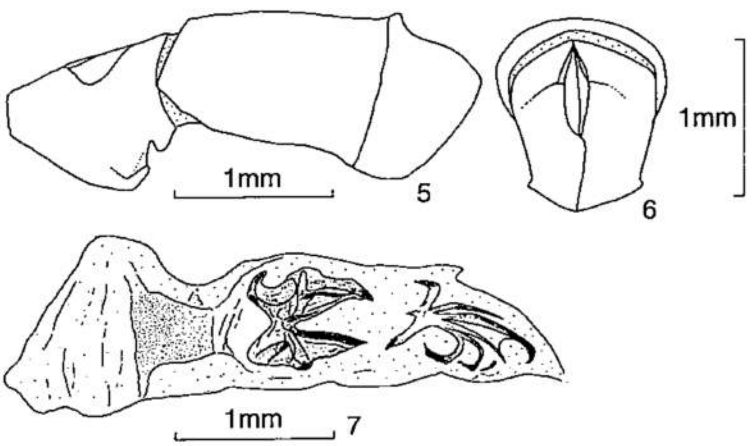
Description of holotype. Major male. Body length, 18.7 mm. Body oblong-oval, strongly convex above; dorsal side black, tinged with dark purplish to dark cupreous luster, almost glabrous except for anterior portion of head with long yellowish-white semi-recumbent hairs; ventral side somewhat shining, partly clothed with blackish brown hairs.



Figs. 1–4. Head and pronotum of *Onthophagus* (*Proagoderus*) *watanabei* sp. nov., dorsal view, scale 2 mm; 1, major male; 2, medium-sized male; 3, minor male; 4, female.

Head subpentagonal, slightly wider than long; clypeus well protrudent forwards, with apex rounded, lateral margin weakly sinuate except for a little expanded portion near the thinly carinate clypeo-genal suture; clypeo-frontal suture finely but clearly carinate, the carina well arched; gena a little protrudent laterad, with genal angle rounded; posterior portion of head produced as a pair of slender horns from just behind the clypeo-frontal suture, the horn gently curved, inclined backwards, extended to base of elytron and sharply pointed at apex, finely serrate on inner-ventral side, clearly carinate from base to near middle on both external and internal margins; basal portions of both horns connected with each other and forming a broad lamina with an obtuse longitudinal elevation along median line; upper surface of head micro-granulose, somewhat more roughly granulate on clypeus and gena, more sparsely and finely on horn. Antennae with anterior portion of scape clearly serrate, foot-stalks reddish brown, club segments blackish brown basad, yellowish brown apicad.

Pronotum strongly convex, with an obtuse longitudinal impression along midline in posterior half; anterior margin bisinuate and bordered, with marginal border a little widened in the middle; lateral margin trisinuate in anterior portion, broadly sinuate in posterior portion, with marginal border very fine; basal margin strongly angulate and a little raised at the middle, with marginal border distinct and sharply edged in the middle, indistinct near posterior angle; anterior angle protrudent forwards, with apex rounded; posterior angle distinct though obtuse and a little reflexed; disc circularly and deeply excavated just behind anterior margin, the excavation divided into anterior and posterior parts by strongly elevated transverse subquadrate lamina, the anterior excavation rather shallow, the posterior one very deep; the upper margin of lamina almost straight with a compressed slender horn abruptly and strongly produced upwards at the middle; surface of pronotum a little densely and unevenly covered with oval to elon-



Figs. 5–7. Male genitalia of *Onthophagus* (*Proagoderus*) *watanabei* sp. nov., scale 1 mm; 5, aedeagus, lateral view; 6, aedeagus, dorsal view; 7, internal sac.

gate-oval granules, the granules changing into punctures near anterior angle and in posterior middle portion.

Elytron with striae very shallowly and finely impressed, the striae sparsely and finely punctate; 7th stria clearly curved near base; interstriae almost flat, strongly micro-granulose, sparsely and very finely punctate, mat in dorsal portion, half-shining and densely punctate in humeral callus and near apical angle; elytral suture very strongly costate along whole length; reflection rates of elytral surface without peak around 500 nm of wave length. Hind wing light brown.

Pygidium slightly convex, carinate at base, micro-granulose, rather sparsely and irregularly covered with setiferous, coarse, and asperate punctures, a little raised along median line. Metasternum declivous in anterior portion, with an obtuse median longitudinal elevation in the middle of declivity. Protibia stout and a little broad, weakly incurved, with three strong lateral teeth; the 1st tooth a little slender than the others, the 2nd largest, the 3rd slightly shorter than the 2nd; the remaining outer margin almost smooth except for posterior portion serrate; apical inner end of protibia slightly produced as a sharp spinule. Meso- and metatibiae short and stout, clearly digitate at outer distal end. Basal segment of metatarsus slender, about three times as long as wide.

Aedeagus relatively robust with phallobase about 2 mm in length. Paramere broad, with a ventral tooth in lateral aspect. Lamella copulatrice of internal sac with a deep median incision located near the middle; lamella accessorie small.

Variation of males. Body length, 12.0–18.7 mm (n=26).

Medium-sized males (Fig. 2). Cephalic horn a little shorter and broader than that of major male; pronotal excavation changing into rather shallow hollow with two distinct longitudinal parallel carinae on posterior portion; upper lateral edge of the hollow slightly tuberculate; transverse lamina of pronotum entirely effaced; pronotal horn directly produced upwards from upper surface.

Minor males (Fig. 3). Cephalic horn reduced to a short subtriangular process with basal portion forming a broad flattened lamina; pronotal excavation changing into a shallow hollow with two distinct longitudinal parallel carinae on lateral margins; surface more densely granulate and sculptured; both pronotal lamina and horn entirely effaced.

Females (Fig. 4). Body length, 15.4–18.2 mm (n=25). Cephalic horn a little more developed than that of minor male; cephalic lamina more strongly granulate, sculptured, more distinctly and densely hairy. Pronotum with a shallow hollow and three longitudinal parallel carinae in antero-central portion. Metatarsus a little broader than that of male.

Type series. Holotype: male, Sepilok, Sabah, Malaysia, 16–VIII–1985, M. KON leg. Paratypes: 12 exs., same data as for the holotype; 2 exs., ditto, 5–VIII–1985, M. KON leg.; 6 exs., ditto, 7–VIII–1985, M. KON leg.; 1 ex., ditto, 15–VIII–1985, M. KON leg.; 7 exs., ditto, 16–VIII–1985, M. KON leg.; 1 ex., ditto, 18–VIII–1985, M. KON leg.; 5 exs., ditto, 30–VII–1987, M. KON leg.; 1 ex., ditto, 1–VIII–1987, M. KON leg.; 2 exs., ditto, 4–VIII–1987, M. KON leg.; 1 ex., ditto, 8–VIII–1987, M. KON leg.; 1 ex., Bru-

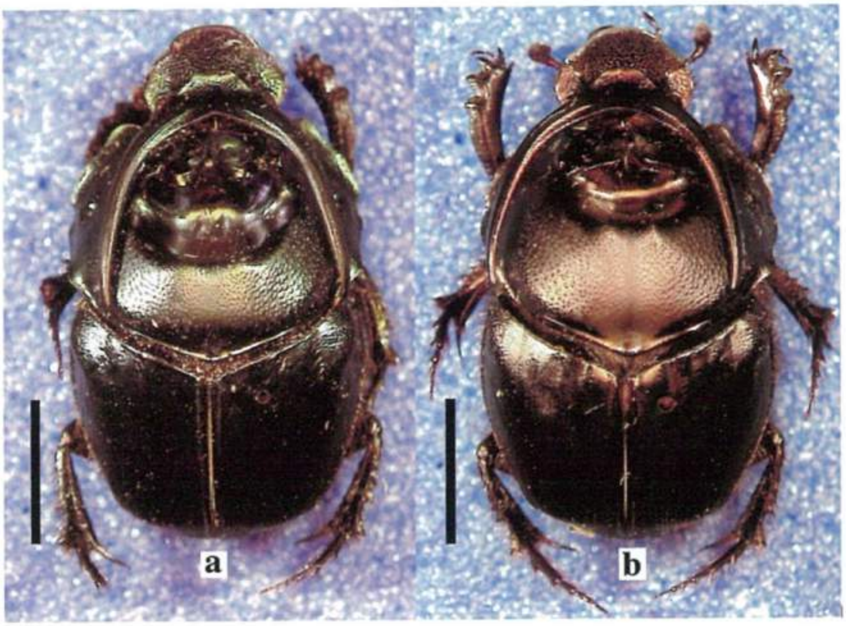


Fig. 8. Habitus of male, dorsal view, scale 5 mm; a, *Onthophagus* (*Proagoderus*) *schwaneri*; b, *O.* (*P.*) *watanabei* sp. nov.

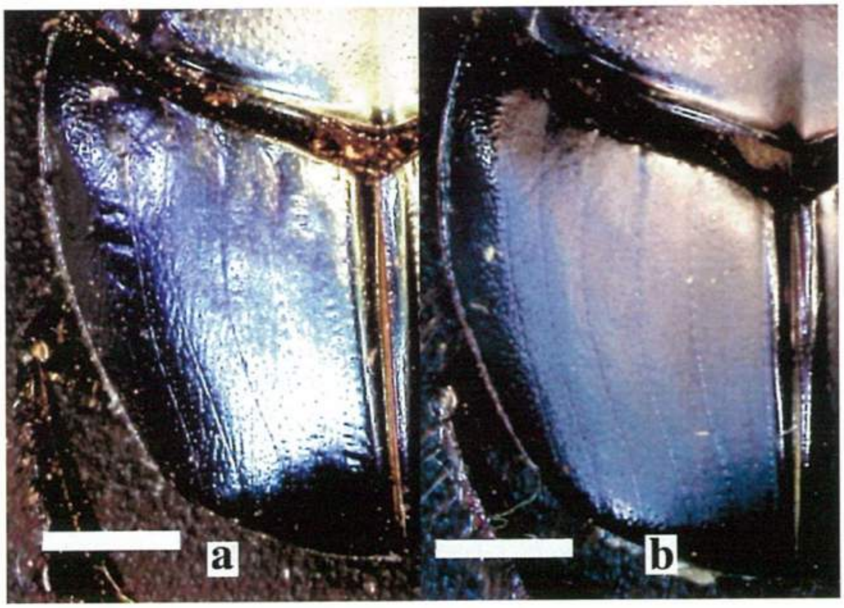


Fig. 9. Left elytron of male, dorsal view, scale 2 mm; a, *Onthophagus* (*Proagoderus*) *schwaneri*; b, *O.* (*P.*) *watanabei* sp. nov.

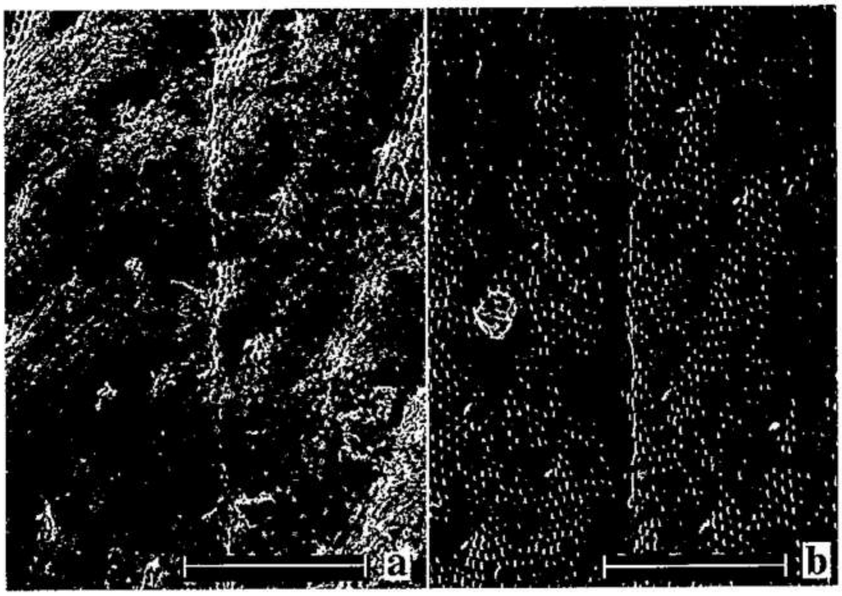


Fig. 10. SEM photograph of fifth stria of male left elytron, scale 200 μm; a, *Onthophagus* (*Proagoderus*) *schwaneri*; b, *O.* (*P.*) *watanabei* sp. nov.

mas, Sabah, 24–VII–1987, M. KON leg.; 4 exs., ditto, 26–VII–1987, M. KON leg.; 7 exs., ditto, 27–VII–1987, M. KON leg.; 1 ex., Poring, 17–III–1995, T. KIKUTA leg. The holotype is deposited in the collection of the University of Sabah, Malaysia.

Distribution. Borneo (Sabah).

Etymology. The present new species is named in honor of Prof. Y. WATANABE, one of the dominant figures in the coleopterology in Japan.

Notes. The present new species is closely related to *Onthophagus* (*Proagoderus*) *schwaneri* VOLLENHOVEN, but can be distinguished from the latter by the following characters: 1) body tinged with dark purplish to dark cupreous luster, whereas with dark blue to dark greenish luster in *O.* (*P.*) *schwaneri* (Fig. 8); 2) reflection rates of elytral surface without peak around 500 nm of wave length, whereas with distinct peak around 500 nm of wave length in *O.* (*P.*) *schwaneri* (Fig. 11); 3) hind wing light brown, whereas blackish brown in *O.* (*P.*) *schwaneri*; 4) elytral interstriae very strongly micro-granulose, mat, without distinct longitudinal wrinkles, whereas weakly micro-granulose, half-shining, with distinct longitudinal wrinkles in *O.* (*P.*) *schwaneri* (Figs. 9, 10); 5) in female, granules on pronotum more crowded; 6) in major male, pronotal excavation smaller; outer angle of pronotal lamina not produced upwards, whereas pronotal excavation larger; outer angle of pronotal lamina distinctly produced upwards in *O.* (*P.*) *schwaneri* (Fig. 8); 7) in male genitalia, paramere a little smaller, internal sac with lamellae copulatrice and accessorie remarkably different in shape

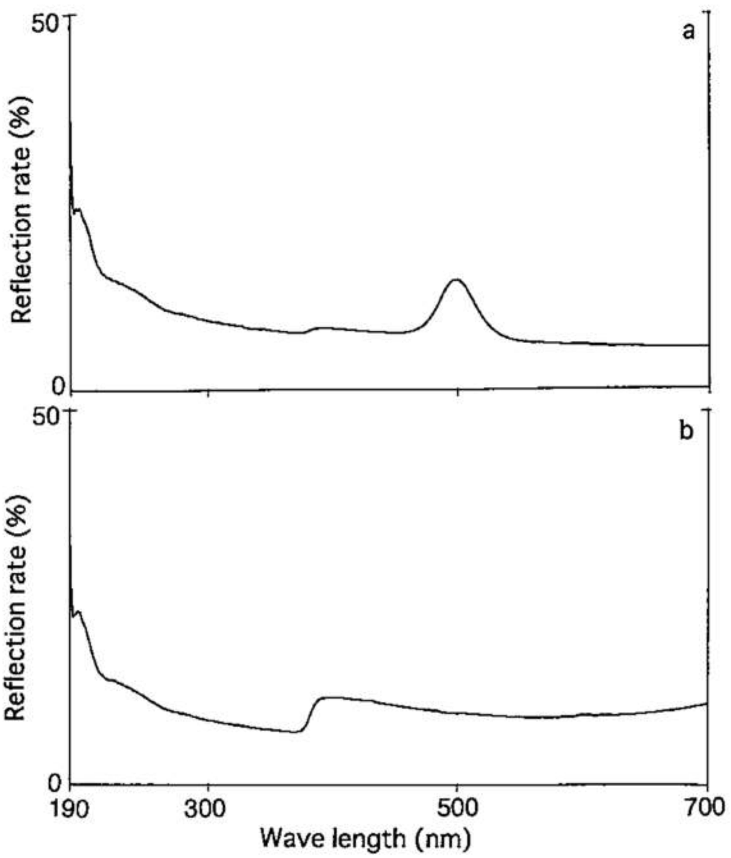


Fig. 11. Reflection rates of male right elytron; a, *Onthophagus* (*Proagoderus*) *schwaneri*; b, *O.* (*P.*) *watanabei* sp. nov.

from those of *O.* (*P.*) *schwaneri* (see PALESTRINI, 1982).

Onthophagus* (*Proagoderus*) *schwaneri VOLLENHOVEN

(Figs. 8 a, 9 a, 10 a, 11 a)

Onthophagus schwaneri VOLLENHOVEN, 1864, Tijdschr. ent., **7**, p. 146.——LANSBERGE, 1883, Not. Leyden Mus., **5**, p. 41.——BOUCOMONT, 1914, Annls. Soc. ent. Fr., **83**, p. 262.——MARCUS, 1917, Arch. Naturg., (A), **83** (10), p. 62.

Proagoderus schwaneri: MARCUS, 1920, Dt. ent. Z., **1920**, p. 181.

Onthophagus (*Proagoderus*) *schwaneri*: BALTHASAR, 1963, Monogr. Scarab., **2**, p. 515 (in part).——PALESTRINI, 1982, Boll. Mus. zool. Univ. Torino, **1982**, p. 33.

Specimens examined. 2♂♂, 1♀, E. Kalimantan, 1994, M. KASAGI leg.; 1♂, Muarawahau, E. Kalimantan, V–1996; 2♂♂, Balikpapan, E. Kalimantan, V–2000; 1♀, Puncak, Palolo, Sulawesi, VIII–1990.

Distribution. Borneo, Sumatra, Sulawesi (new record).

Acknowledgments

We express our hearty thanks to M. KASAGI and M. FUJIOKA for providing specimens of *Onthophagus* (*Proagoderus*) *schwaneri* and to S. YABUTA for analyzing the reflection rates of elytron. This study is supported in part by a Grant-in-Aid from the Japan Society for the Promotion of Science (No. 11833014).

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Descriptions of Three New Sericid Beetles (Coleoptera, Scarabaeidae) from Taiwan

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Abstract Three new species of the scarabaeid genus *Maladera* MULSANT, 1871, are described from northern and central Taiwan. The new species names given are: *M. watanabei*, *M. taiyal* and *M. shihzitouensis*.

Key words: Coleoptera, Scarabaeidae, *Maladera*, Taiwan, new species.

In this paper, the author will describe three new sericid beetles from Taiwan. They belong to the genus *Maladera* MULSANT, 1871.

The holotypes to be designated in this study will be deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo (NSMT). Other specimens are preserved in the author's collection.

Before going further, the author wishes to express his sincere gratitude to Messrs. Ching-Kin YU and Jiin-Chi LO for their kind offer of materials for this study.

Maladera watanabei H. KOBAYASHI, sp. nov.

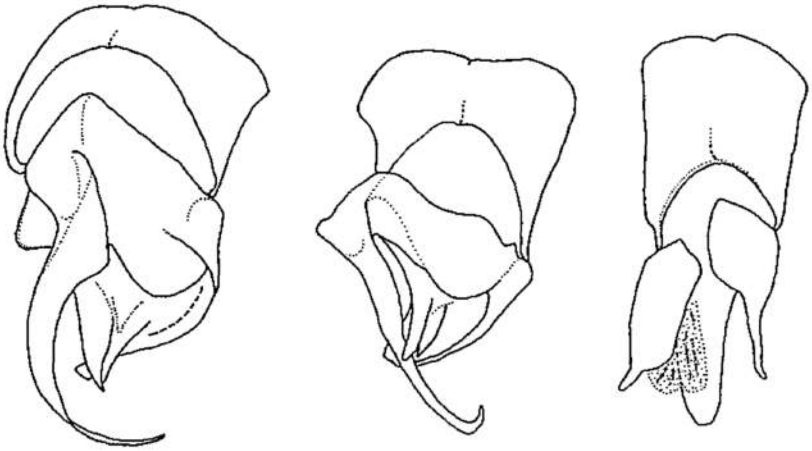
[Japanese name: Watanabe-biroudo-kogane]

(Figs. 1, 4)

Elongated oval, dark reddish brown, legs and antennae reddish brown, dorsal surface blackish brown. Surface of body opaque, with clypeus, antennae, tibiae, tarsi, anterior femora and anterior two-thirds of posterior femora shining.

Clypeus subtrapezoidal, coarsely, densely punctate, surface almost flattened, with anterior margin reflexed and feebly emarginate; fronto-clypeal suture angulate at the middle. Head sparsely, finely punctate, with a few long erect hairs near eye. Antennae 10-segmented, with club evidently longer than footstalk in male, a little shorter than that in female.

Pronotum 1.6 times as broad as its length, somewhat densely, finely punctate, lateral margins fringed with long hairs, weakly arcuate, gradually convergent in front and behind; anterior angles dully protoruded, posterior ones subrectangular. Scutellum flattened and almost impunctate. Elytra very scatteringly with suberect hairs on the disc, with intervals weakly convex, rather sparsely and finely punctate, epipleura bearing rather long scattered hairs. Pygidium feebly convex, rather densely punctate, bearing



Figs. 1–3. Male genitalia of *Maladera* spp.; 1, *M. watanabei* sp. nov.; 2, *M. taiyal* sp. nov.; 3. *M. shihzitouensis* sp. nov.

erect scattered hairs in apical half.

Abdominal sternites sparsely punctate, each with a transverse row of setae. Anterior tibia bidentate, somewhat dilated behind the second tooth, apical spur a little shorter than basal tarsal segment. Posterior femur almost impunctate, except for two transverse rows of setigerous punctures, 2.5 times as long as its breadth, posterior margin sinuate near postero-lateral angle, which is subrectangular. Posterior tibia very sparsely, inconspicuously punctate, longest outer terminal spur a little shorter than basal tarsal segment. Posterior tarsus impunctate, fifth tarsal segment with short setae on ventral side.

Length: 10.5 mm; breadth: 5.0 mm.

Type series. Holotype: ♂, Suchih, Ilan Hsien, 19–VI–1994, J. LO leg. Paratype: 1 ♀, Bihluh-Shenmu, Hualien Hsien, 26–VIII–1992, C. YU leg.

Distribution. Taiwan (northern and central mountain ranges).

Diagnosis. This species is somewhat allied to *M. tienchiana* H. KOBAYASHI, 1988, but may be separated from the latter by the following points: longer antennal club; puncturation of posterior tibia; posterior tarsus with short setae only on the fifth segment.

Etymology. This new species is dedicated to Dr. Yasuaki WATANABE in commemorating his retirement from Tokyo University of Agriculture, who was not only my supervisor in Entomology but also has given me helpful advice for a long time.

Maladera taiyal H. KOBAYASHI, sp. nov.

[Japanese name: Taiwan-kuro-biroudo-kogane]

(Figs. 2, 5)

Oval, dorsal and ventral surface entirely black, sometimes antennal footstalk dark blackish brown. Ventral surface of body opaque, dorsal surface slightly shining, antennae, tibiae, tarsi and major part of posterior femora shining.

Clypeus trapezoidal, densely, rugosely punctate, antero-lateral angles dully angulate, anterior margin feebly emarginate, bearing a few erect hairs near anterior margin. Fronto-clypeal suture roundly arched, not angulate at the middle. Frons coarsely and somewhat rugosely punctate at the sides, rather densely punctate at the middle, bearing a few long erect hairs near eyes. Antennae 10-segmented, with club of the same length as footstalk in male, a little shorter than that in female.

Pronotum rather convex, about twice as broad as its length, broadest at base and gently narrowed anteriad, coarsely and rather densely punctate, some of the punctures with a microscopic hair, anterior angles somewhat protruded, posterior ones dull angulate; lateral margins bearing very sparse hairs. Scutellum broader than its length, rather densely punctate. Elytra with intervals feebly convex, rather coarsely and sparsely punctate, most punctures bearing microscopic hairs; lateral margins fringed with hairs except near apex. Pygidium weakly convex, sparsely and shallowly punctate, bearing rather long sparse hairs along the sides.

Each abdominal sternite with a transverse row of hairs on apical third or the middle, very sparsely, finely punctate, each puncture with a microscopic hair. Anterior tibia bidentate, apical tooth moderate, 2nd one blunt. Posterior femur scantily punctate, 2.5 times as long as its breadth, with an opaque posterior band at apical two-thirds; posterior margin weakly sinuate near apex, without fine serration, antero-lateral angles rounded. Posterior tibia feebly dilated, about three times as long as its breadth, coarsely punctate on basal third, almost impunctate on apical two-thirds; outer longest terminal spur of the same length as basal tarsal segment. Posterior tarsus impunctate, without setae beneath.

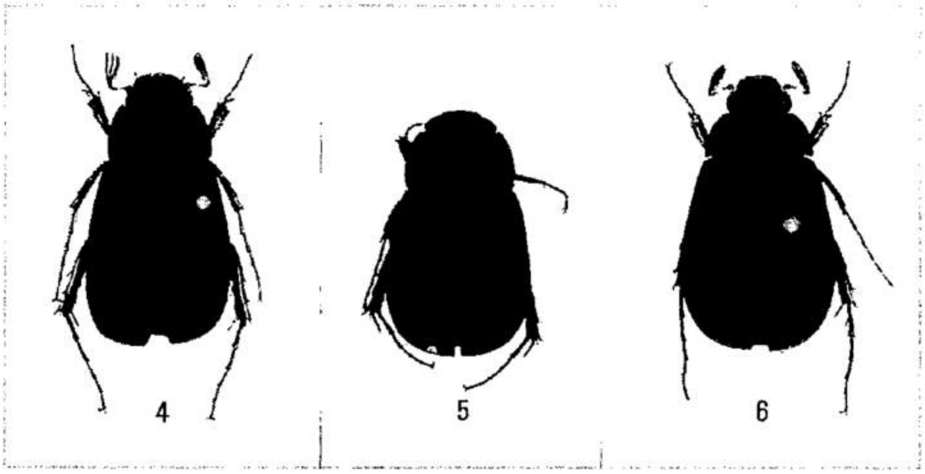
Length: 8.5–9.0 mm; breadth: 5.0 mm.

Type series. Holotype: ♂, Lishan, Taichung Hsien, 16–VI–1993, J. Lo leg.; paratypes: 2♀♀, same data as for the holotype.; 1♂, Shihzitou, Nantou Hsien, 28–V–1995, J. Lo leg.

Distribution. Taiwan (central mountain range).

Diagnosis. This species is somewhat allied to *M. kreyenbergi* (MOSER, 1918), but may be separated from it by the following points: dorsal surface slightly shining; posterior margin of posterior femur shining at basal third.

Etymology. The new name *taiyal* is derived from the name of an indigenous tribe, whose people live in the high mountains of Taiwan.



Figs. 4–6. —— 4, *Maladera watanabei* sp. nov.; 5, *M. taiyal* sp. nov.; 6. *M. shihzitouensis* sp. nov.

Maladera shihzitouensis H. KOBAYASHI, sp. nov.

[Japanese name: Shihzitou-biroudo-kogane]

(Figs. 3, 6)

Oval, reddish brown to light reddish brown, head and pronotum much darker in general, antennae yellowish brown; ventral surface opaque, dorsal surface with a slight opalescence under certain light, with clypeus, tibiae, tarsi and posterior femora shining.

Clypeus trapezoidal, coarsely and rugosely punctate, antero-lateral angles rounded, anterior margin feebly sinuate, with a longitudinal or a boss-like elevation at the middle and with a transverse sulcus behind anterior margin, bearing a few erect hairs in apical half; fronto-clypeal suture somewhat angulate at the middle. Frons finely, rather densely punctate, bearing several long erect hairs near eyes, dressed with a few recumbent hairs in posterior half. Antennae 10-segmented, with club longer than footstalk in male.

Pronotum sparsely, finely punctate, fringed with sparse hairs on each side of anterior margin and along lateral margins, broadest at base, and roundly narrowed in front; anterior angles protruded but not acute, posterior ones subrectangular. Scutellum sparsely punctate. Elytral intervals weakly convex, finely, sparsely punctate, lateral side of each puncture with a microscopic hair; with some short hairs in basal fifth of epipleura. Pygidium weakly convex, finely and rather densely punctate, with a faint longitudinal line at the middle, bearing scattered erect hairs near apical margin.

Abdominal sternites sparsely punctate, each with a transverse row of short setae. Anterior tibia bidentate, second tooth small but evident. Posterior femur vaguely punctate, about three times as long as its breadth, with a transverse row of hairs on apical third. Posterior tibia narrow and flattened above, four times as long as its breadth, finely, sparsely punctate, outer longest terminal spur slender, three-fifths as long as basal tarsal segment. Posterior tarsus impunctate, with one or two short setae on ventral side.

Length: 9.0 mm, breadth: 6.0 mm.

Type specimen. Holotype: ♂, Shihzitou, Nantou Hsien, 15–III–1995, J. Lo leg.

Distribution. Taiwan (central mountain range).

Diagnosis. This species is closely allied to *M. laboriosa* (BRENSKE, 1897), but may be separated from the latter by the following points: longer antennal club, each abdominal sternite with a transverse row of short setae, and posterior tarsus with one or two short setae on ventral side.

Etymology. This new species is named after the name of its type locality.

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Further Evidence of Male Trimorphism in the Horned Beetle *Trypoxylus dichotomus septentrionalis* (Coleoptera, Scarabaeidae)

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Abstract Larvae of the horned beetle *Trypoxylus dichotomus septentrionalis* are reared under an experimental condition, and the horn length and body length of male adults obtained from those larvae are measured. Analysis by a moving-average method indicates trimodal horn-size distribution, where medium-sized males are the most abundant. Body–horn allometry also exhibits three discontinuous regression lines corresponding to three male morphs, namely, small, medium and large males. The present and previous studies strongly suggest existence of male horn trimorphism in this beetle.

Introduction

Males of *Trypoxylus dichotomus septentrionalis* (KÔNO) show morphological dimorphism and are divided into two morphs with respect to horn size, minors and majors (SIVA-JOTHY, 1987; IGUCHI, 1998). Therefore, frequency distribution of male horn sizes in this beetle is usually bimodal. However, SIVA-JOTHY (1987) pointed out the possibility of trimodality of male horn sizes in this beetle. Later, my study (IGUCHI, 2000) also showed this possibility on the basis of body–horn allometry, but the sample size (n=30) was small. Therefore, it is still unclear whether males of this beetle show morphological trimorphism or not. In the present study, I used more males to examine horn-size distribution and body–horn allometry. Here I discuss male trimorphism in this beetle in detail. This paper is dedicated to Professor Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

Materials and Methods

For this study, 200 last instar larvae of *Trypoxylus dichotomus* were collected from the soil (10 m×10 m×0.5 m deep) near a forest of assorted trees in the western part of Tatsuno-machi, Kamiina-gun, Nagano Prefecture on 5 May 2001. The soil was dark, soft, moist humus that contained many chips of decayed wood. The larvae were put in 5 plastic boxes (40 larvae in each box) of the same size (37 cm×70 cm×30 cm high) with the soil (28 cm deep) in which they had lived. Each box was covered with a plastic board and placed 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, 77 males and 84 females emerged in July and August 2001. For the present study, however, only the males were used. For each male, the length of the head horn and the length of the body excluding the horns were measured to 0.1 mm with a slide caliper.

To analyze the polymodal frequency distribution of horn sizes, a moving-average method was used. This method was proposed by TAYLOR (1965) and used by SIVA-JOTHY (1987) to examine the shape of horn-size distribution in this beetle. In the present study, each moving average of horn-size frequencies was calculated over three successive classes of horn sizes. For example, the original frequencies of the three horn-size classes, 4.0–4.5 mm, 4.5–5.0 mm and 5.0–5.5 mm, were 1, 1 and 6, respectively. Then, the moving average of the middle class (4.5–5.0 mm) was calculated as $(1+1+6)/3=2.7$. In this way, the moving average of every class was calculated. If analysis by the moving-average method suggested the existence of a trimodal distribution in horn size, three regression lines were fit to the three separate male groups, that is, small, medium and large males.

Results and Discussion

The moving-average distribution of horn sizes was clearly trimodal (Fig. 1), as suggested by SIVA-JOTHY (1987). In my previous study (IGUCHI, 2000), trimodality of horn sizes was not clear probably because of the small sample size. SIVA-JOTHY (1987) also threw doubt on the existence of horn trimorphism. However, the present study showed trimodality of horn sizes more clearly than both my previous study (IGUCHI, 2000) and SIVA-JOTHY (1987). This may be due to the fact that the present sample size ($n=77$) was larger than my previous sample size ($n=30$) and SIVA-JOTHY's sample size ($n=67$).

SIVA-JOTHY (1987) did not show the mean horn size. Estimated from figure 3 in his paper, however, it was approximately 23.51 mm. On the other hand, it was 8.12 mm in the present study. The mean horn size was significantly smaller in the present study than in SIVA-JOTHY (1987) (Mann–Whitney U-test, $U=4995.5$, $P<0.00001$). As shown in Table 1, this is due to the fact that relative frequencies of small and medium males were higher in the present study than in SIVA-JOTHY (1987). It was also noted in Table 1 that medium males were the most abundant in the present study. If males showed horn dimorphism, relative frequency of medium males would have remained low. However, the relative frequency of medium males was the highest in the present study. This suggests the trimodality of horn sizes.

On the basis of body–horn allometry (Fig. 2), the males were divided into three groups, that is, small males (body length<33.5 mm, $n=34$), medium males (33.5

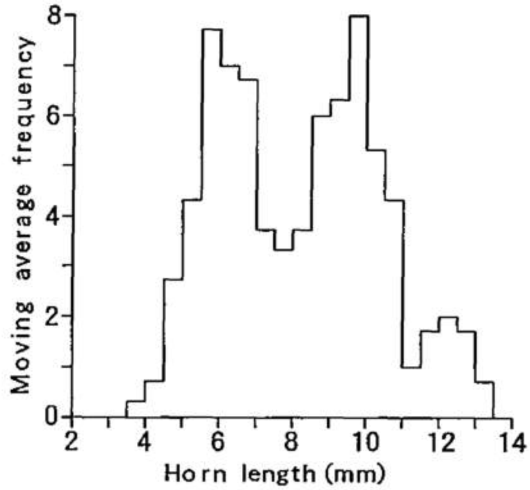

Fig. 1. Moving-average distribution of horn sizes for 77 males. Each moving-average frequency was calculated over three successive classes of horn sizes.

Table 1. Relative frequency (%) of three male morphs, namely, small, medium and large males in this study and SIVA-JOTHY (1987). The sample size indicates the number of males dealt with in each study.

	Small	Medium	Large	Sample size
This study	45	47	8	77
SIVA-JOTHY (1987)	18	10	72	67

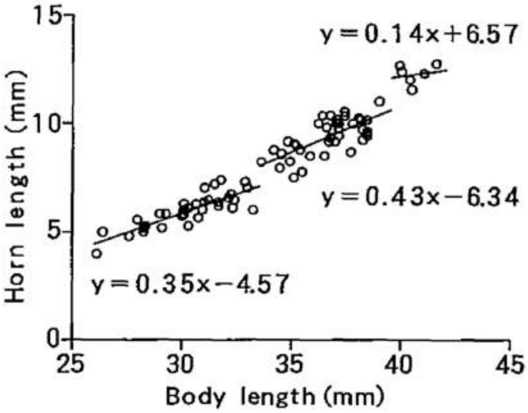

Fig. 2. Body–horn allometry for 77 males. The males were divided into three groups, namely, small males (body length<33.5 mm, n=34), medium males (33.5 mm≦body length<39.5 mm, n=37), and large males (39.5 mm≦body length, n=6).

mm≦body length<39.5 mm, n=37), and large males (39.5 mm≦body length, n=6). The regression lines for small and medium males did not differ significantly in slope (t=1.010, df=67, P>0.3), but they were almost parallel (t=3.891, df=68, P<0.001). Similarly, the regression lines for medium and large males did not differ significantly in slope (t=0.6710, df=39, P>0.5), but they were almost parallel (t=3.172, df=40, P<0.005). This result means that these three regression lines are discontinuous. In some dimorphic beetles, body–horn allometry is expressed as a sigmoidal curve (*e.g.*, EBERHARD, 1987; RASMUSSEN, 1994; EMLEN, 1996). In the present study, however, body–horn allometry was expressed as three discontinuous lines rather than a sigmoidal curve. Therefore, the body–horn allometry also strongly suggests the existence of male trimorphism in this beetle.

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A Revisional Study of the Genus *Campsosternus* (Coleoptera, Elateridae) from Taiwan, with Description of a New Species

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Abstract The Taiwanese species of the oxynopterine genus *Campsosternus* are dealt with. A new species, which has hitherto been regarded as *Campsosternus gemma* CANDÈZE from Taiwan, is described under the name of *C. yasuakii* W. SUZUKI. It is related to *C. watanabei* MIWA, but differs from it in the coloration and pattern of pronotal maculations and the structure of the male genitalia. A key to the Taiwanese species of the genus is provided.

The genus *Campsosternus* LATREILLE, 1834 was established on the basis of *Elater auratus* DRURY, 1773. It contains about 80 species primarily from the Oriental Region, though an exceptional species occurs in the Australian Region (New Guinea).

In Taiwan, four species and an unidentified species have been known up to the present. The unidentified species was considered for a long time to be conspecific with *C. gemma* CANDÈZE from the mainland of China. As the result of my recent re-investigations, however, it has become clear that the species does not agree in the morphological characters with the true *C. gemma*. It seems to be new to science, and will be described under the name of *C. yasuakii*. The other Taiwanese species are briefly described and illustrated for their antennae and male genitalia.

This paper is dedicated to Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

The abbreviations used herein are as follows: NSMT – National Science Museum (Nat. Hist.), Tokyo; MNHN – Muséum National d'Histoire Naturelle, Paris; TMB – Természettudományi Muzeum, Budapest; TARI – Taiwan Agricultural Research Institute, Taichung; HU – Hokkaido University, Sapporo; HOC – Hitoo ÔHIRA's collection, Okazaki; HAC – Hisayuki ARIMOTO's collection, Hyôgo; WSC – Wataru SUZUKI's collection, Kawasaki.

Before going further, I wish to express my hearty thanks to Prof. Y. WATANABE of Tokyo University of Agriculture for his continuous guidance on my taxonomic studies, and to Dr. S.-I. UÉNO of the National Science Museum (Nat. Hist.), Tokyo and Dr. M. TAKAKUWA of the Kanagawa Prefectural Museum of Natural History, Odawara, for their critical reading the original manuscript and in giving me invaluable advice.

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Key to the Taiwanese Species of *Campsosternus*

1. Pronotum with a pair of longitudinal dark red or yellowish orange maculations along lateral margins .... 2.

— Pronotum without any reddish maculations .... 3.

2. Antennae barely extending beyond each apex of posterior angles of pronotum by apical segment in male, and barely reaching there in female; pronotal maculations yellowish orange, parallel-sided though gradually divergent posteriad; reddish maculation on each side of abdominal sternites narrow .... *C. watanabei* MIWA.

— Antennae long, extending beyond each apex of posterior angles of pronotum by apical two segments in male and by apical segment in female; pronotal maculations dark red, subparallel-sided though gradually convergent posteriad and abruptly incurvate at basal sixth; reddish maculation on each side of abdominal sternites broad .... *C. yasuakii* W. SUZUKI, sp. nov.

3. Third antennal segment remarkably longer than wide, 2.5–2.8 times as long as wide; pronotum with lateral portions deeply and somewhat coarsely punctured, interspaces finely reticulate and never granulate .... *C. auratus* (DRURY).

— Third antennal segment shorter, 1.68–1.82 times as long as wide; pronotum with lateral portions sparsely and finely punctured, interspaces finely granulate and opaque .... 4.

4. Body larger (34.7–44.1 mm); female antennae extending a little beyond each apex of posterior angles of pronotum, 3rd segment 1.82 times as long as wide, 4th elongate-triangular, remarkably longer than 3rd (1.8:1.0); elytra deep green .... *C. mirabilis* FLEUTIAUX.

— Body smaller (31.9 mm); female antennae barely reaching each apex of posterior angles of pronotum, 3rd segment 1.68 times as long as wide, 4th subtriangular, somewhat longer than 3rd (1.34 : 1.00); elytra bright green with reddish tint .... *C. guishuni* ÔHIRA.

Campsosternus watanabei MIWA, 1927

(Figs. 1–2, 10–11 & 14–15)

Campsosternus gemma ab. *watanabei* MIWA, 1927, 15 (Hoppo).——SAKAGUTI, 1981, 74–75, fig. 11 (Taiwan).
Campsosternus gemma var. *watanabei*: MIWA, 1929, 240 (in key), 241 (Hoppo, Kayahara); 1931 a, 87; 1931 b, 131 (Hoppo, Kayahara); 1934, 191 (Hoppo, Kayahara).——JIANG, 1993, 137 (Taiwan).
Campsosternus gemma: KATÔ, 1933, pl. 30, fig. 10 (Taiwan). [Nec CANDÈZE, 1857.]
Campsosternus gemma watanabei: HIRAYAMA, 1940, 73, pl. 27, fig. 25 (Musha).——ÔHIRA, 1990, 35–36, pl. 7.——JIANG, 1991, 276 (in key).——KISHII, 1995, 2, figs. 1 b & 6 (Funchifu, Liukuei).
Campsosternus watanabei: W. SUZUKI, 1999, 89.

Male. Length: 34.7–39.3 mm; width: 10.4–12.4 mm.

Antennae (Fig. 10) somewhat long, each barely extending beyond the apex of posterior angle of pronotum by apical segment; 3rd to 10th segments moderately serrate; 3rd about 1.7 times as long as wide; 4th elongate-triangular, nearly as long as the two preceding segments together, 1.43 times as long as 3rd; 5th equal to 4th in length; 10th 1.77 times as long as wide, slightly longer than 3rd; 11th slender, about 3.5 times as long as wide.

Genitalia (Figs. 14–15) somewhat robust and well sclerotized, about 2.9 times as long as basal piece. Median lobe evidently wider at apical fourth than the neck of each paramere. Parameres elongate, subparallel-sided though gradually narrowed apicad, and each enlarged into a triangular portion, which is about 1.5 times as long as its width, and whose outer angle is projected outwards and pointed at the apex.

Female. Length: 36.7–44.1 mm; width: 11.2–14.2 mm.

Antennae (Fig.11) barely reaching each apex of posterior angles of pronotum; 3rd to 10th segments weakly serrate; 4th a little shorter than the two preceding segments together; 10th equal to 3rd in length; 11th subovate, about 2.3 times as long as wide.

Type material examined. Lectotype, sex undetermined, "*Campsosternus gemma*, Cand. ab. *watanabei*. det. Y. Miwa."; "Formosa Matsumura"/"北埔...[=Hoppo...] 8/V [underside]"; "Examined W. Suzuki, 1987" (HU, Sapporo).

Other materials examined. 1♀, Fenchihu, Chiayi Pref., 8–VII–1961, S. UÉNO leg. (NSMT); 1♀ (abdomen missing), ditto, 18–V–1968, T. KIKUCHI leg. (WSC); 1♂, 3♀♀, near Mt. Lalashan, Taoyuan Pref., VI–1976 (NSMT); 1♀, ditto, 1,500–1,700 m in alt., 20–VI–1982, T. SHIMOMURA leg. (WSC); 1♀, Palin, Taoyuan Pref., local collector (WSC); 3♂♂, 4♀♀, Jian Shi [尖石], Xin Zhu Pref., local collector (WSC); 1♂, Mt. Li Dong Shan [李棟山], Xin Zhu Pref., local collector (WSC); 1♀, Mt. Kuantoshan, Nantou Pref., 7–VII–1985, C. C. Lo leg. (WSC); 1♀, ditto, 2–VI–1995, S. TSUYUKI leg. (WSC); 1 ex., Nanshanchi, Nantou Pref., 20–VIII–1972, Q. L. Du leg. (WSC); 1♀, C. Taiwan, 1979 (WSC); 1♂, Shi Nan Shan, 2,000 m in alt., S. Taiwan, 29–IV–1986, K. BABA leg. (WSC); 1♀, Shyk Shan, near Liu Kuei, Kaohsiung Pref., 28–VI–1986, K. BABA leg. (WSC); 8♂♂, 6♀♀, Taiwan, local collector (WSC).

Distribution. Taiwan.

Notes. *Campsosternus watanabei* was originally described by MIWA, as an aberrant form of *C. gemma*, from Hoppo in Taiwan. After that, this species had been considered to be a variety or a subspecies of *C. gemma*, until SUZUKI (1999) recognized it as a good species.

According to the collecting data of the materials, this species seems normally to inhabit mountainous areas at an altitude around 1,400 m to 2,300 m and not to occur in lowland areas.

It is similar to *C. gemma* CANDÈZE from China, but can be distinguished from the latter by the larger body, the longer antennae, and the different features of the male genitalia.

Campsosternus yasuakii W. SUZUKI, sp. nov.

(Figs. 3–4, 12–13 & 16–17)

Campsosternus gemma: MIWA, 1929, 241 (Urai, Musha, Horisha, Baibara); 1930, 97 (Kosempo, Sokutsu); 1931 a, 87; 1931 b, 130 (Urai, Musha, Horisha, Baibara); 1934, 191 (Urai, Musha, Horisha, Baibara, Kosempo, Sokutsu).——MATSUMURA, 1931, 182, fig. 399 (Taiwan, China, India).——KATÔ, 1933, pl. 30, fig. 9 (Taiwan).——HIRAYAMA, 1935, pl. 66, fig. 10 (Koshun); 1940, 12, pl. 6, fig. 10 (Koshun).——ÔHIRA, 1970, 212, pl. 1, fig. H (Fuhosho, Kosempo, Hualien).——ÔHIRA & MAKIHARA, 1975, 59 (Chihpen).——TAKEDA *et al.*, 1976, ii, fig. 9, 6 (Nanshanchi).——SAKAGUTI, 1981, 74–75, fig. 10 (Taiwan).——KISHII, 1989, 20 (Liu-kuei); 1990 a, 11 (Nantou Pref.: Mt. Kuangtou-shan); 1990 b, 9, figs. 31 (Kaohsiung Pref.: Shyk-shan near Liu-kuei, Nan-fon-shan near Liu-kuei, Mt. Sen-pei near Liu-kuei; Nantou Pref.: Mt. Kuantou-shan, Sun-kang).——WANG, 1993, 90–91, fig. [Nec CANDÈZE, 1857.]

Campsosternus sp.: W. SUZUKI, 1999, 88.

Male. Length: 28.7–35.3 mm; width: 9.4–11.8 mm.

Body elliptical, somewhat robust, glabrous and strongly shining. Head and legs black, somewhat tinged with bluish green; antennae black and mat, though basal two segments are shining; pronotum metallic blue, with a pair of longitudinal dark red maculations along lateral margins; scutellum and elytra metallic blue or green; prosternum deep blue, tinged with purple; epipleura dark red, with black circumference; meso- and metasterna bluish indigo; abdominal sternites bluish indigo, with a pair of longitudinal dark red maculations along lateral margins.

Head concave, sparsely covered with small but distinct punctures; interspaces covered with microsculptures. Antennae (Fig. 12) long, each extending beyond the apex of posterior angle of pronotum by apical two segments; 2nd small and subglobose; 3rd triangular, 1.5 times as long as wide; 4th elongate-triangular, apparently longer than 3rd (1.4 : 1.0) and almost equal to 5th in length; 4th to 10th segments ser-

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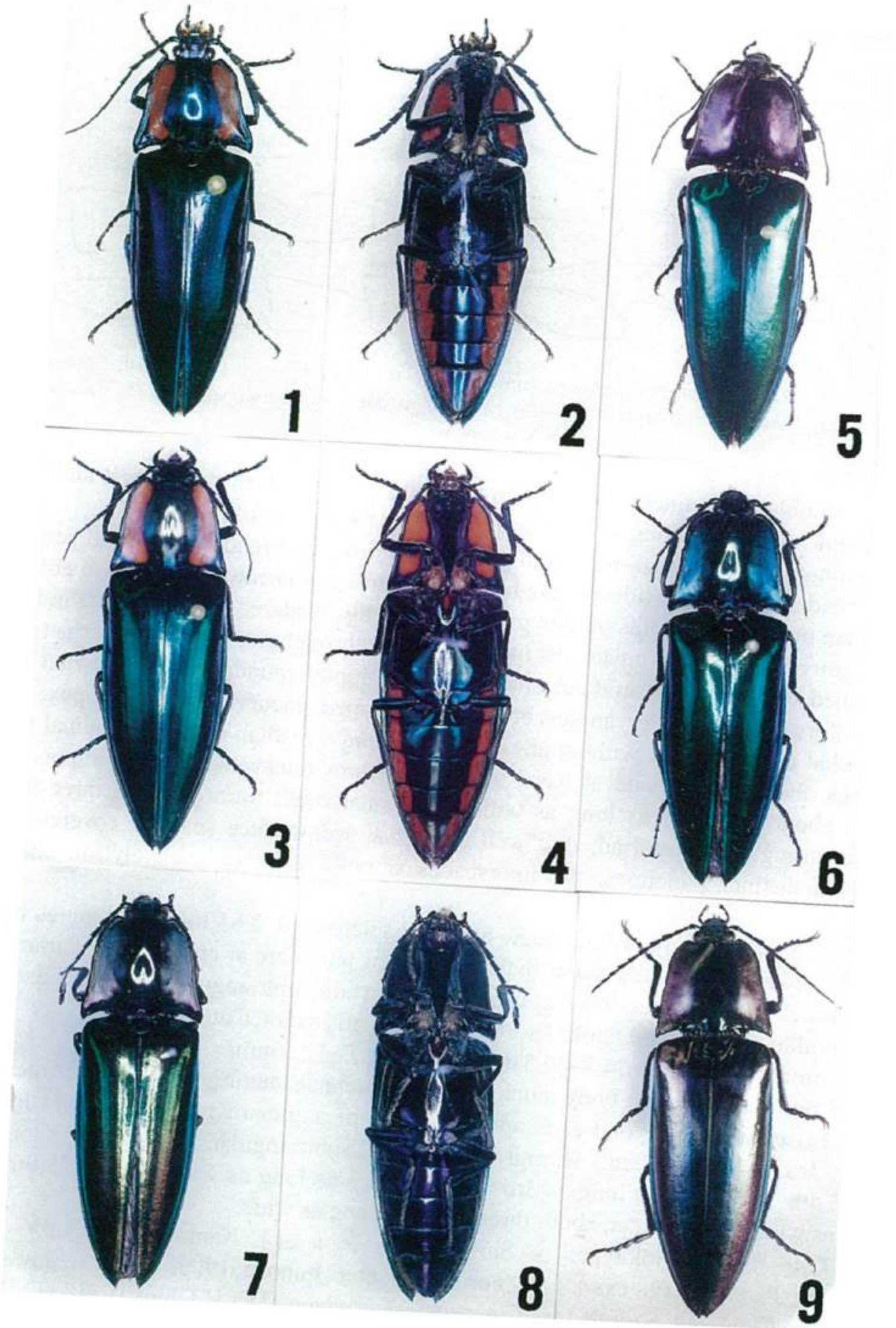
Figs. 1–9. Habitus of *Campsosternus* spp.——1–2, *C. watanabei* MIWA; 1, ♂, from Mt. Li Dong Shan, dorsal view; 2, ♂, ditto, ventral view.——3–4, *C. yasuakii* W. SUZUKI, sp. nov.; 3, ♂, holotype, from Shi Zi Tou, dorsal view; 4, ♂, ditto, ventral view.——5–6, *C. mirabilis* FLEUTIAUX; 5, ♂, from Nanshanchi, dorsal view; 6, ♀, from Mt. Kannonzan, dorsal view.——7–8, *C. guishuni* ÔHIRA, ♀, holotype, from Tian Long Zhuang; 7, dorsal view; 8, ventral view.——9, *C. auratus* (DRURY); ♂, from Kenting Park, dorsal view.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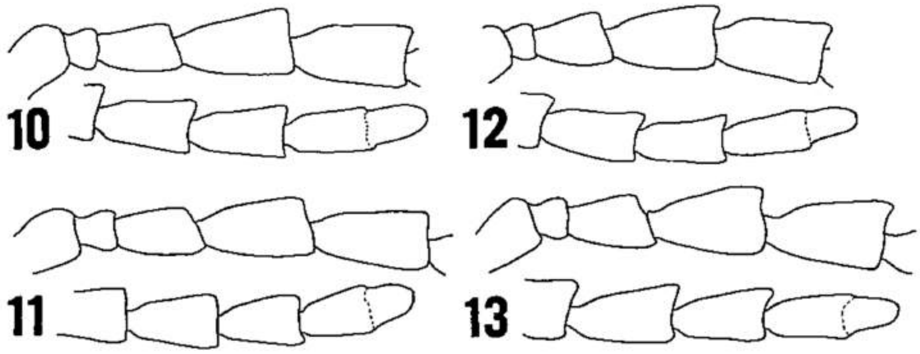


Figs. 10–13. Right antennae of *Campsosternus* spp.—— 10–11, *C. watanabei* MIWA ; 10, ♂, from Mt. Li Dong Shan; 11, ♀, from Jian Shi.—— 12–13, *C. yasuakii* W. SUZUKI, sp. nov.; 12, ♂, holotype, from Shi Zi Tou; 13, ♀, paratype, from Nanshanchi.

rate; 10th oblong, distinctly longer than wide (1.86 : 1.00); 11th the longest and slender, about 3.4 times as long as wide and 1.55 times as long as 10th.

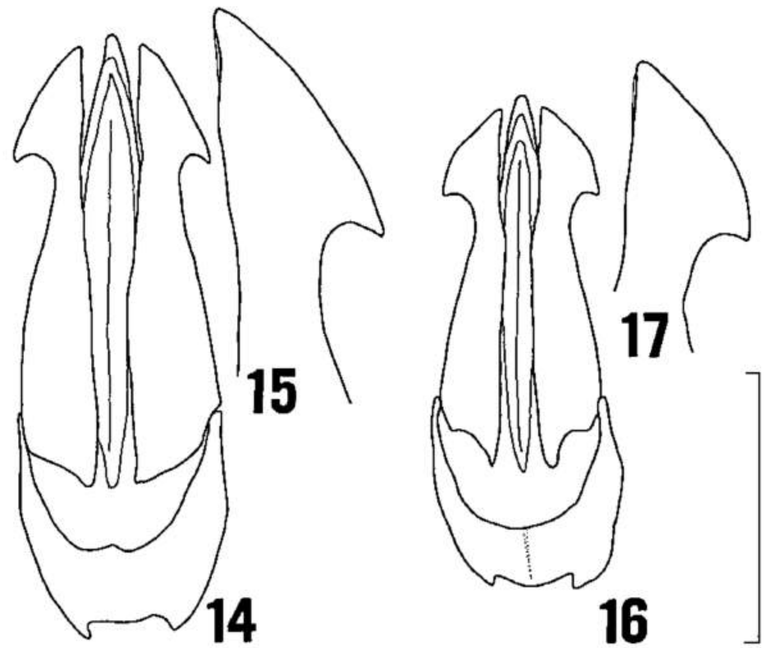
Pronotum trapezoidal, narrowed apicad, 1.3 times as broad as long and remarkably broader than head, widest at the base, more strongly narrowed anteriad in anterior fifth than in basal four-fifths; lateral margins markedly bordered, feebly sinuate in basal third; anterior margin bisinuate, distinctly bordered throughout, but the border is rarely weakened or obsolete at middle; anterior angle bluntly rounded and somewhat produced forwards; posterior angles broadly bill-shaped, incurvate at each apex; disc somewhat convex above, without any canaliculation on median line; longitudinal maculations abruptly incurvate at basal sixth. Scutellum transverse, almost impunctate. Elytra about 2.3 times as long as wide, hardly narrowed towards basal three-fifths, thence strongly so posteriad; disc well convex above; surface sparsely covered with fine and distinct punctures, the interspaces smooth; apex of each elytron sharply spinate.

Genitalia (Figs. 16–17) elongate and well sclerotized, 2.65 times as long as basal piece. Median lobe a little wider than the neck of paramere at apical third. Parameres subparallel in basal three-fourths; each apical portion subtriangular, 1.3 times as long as its width; apico-lateral hooks short, subtriangularly pointed at each apex.

Female. Length: 34.1–40.5 mm; width: 10.7–12.5 mm.

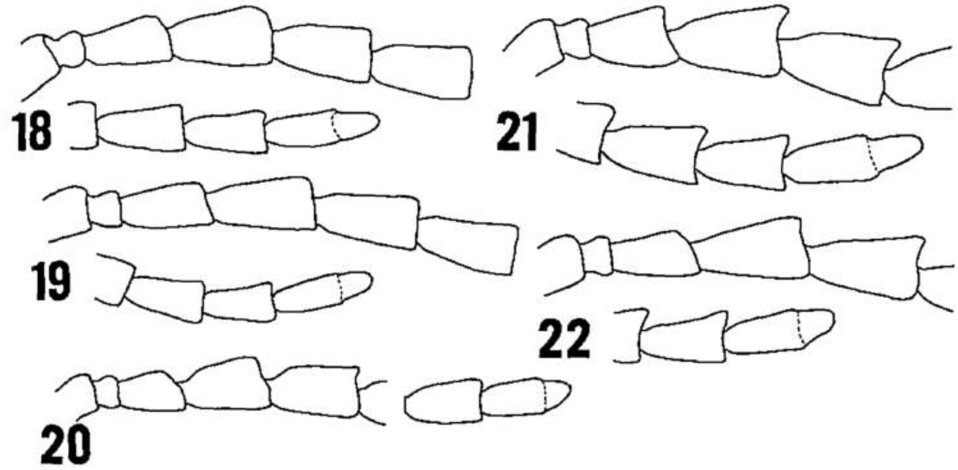
Similar to male, but body much robuster, antennae shining and shorter. Antennae (Fig. 13) extending beyond each apex of posterior angles of pronotum by 11th segment; 3rd to 10th segments strongly serrate; 3rd subtriangular, 1.57 times as long as wide; 4th 1.45 times as long as 3rd and 1.7 times as long as wide; 10th 1.75 time as long as wide; 11th slender, about three times as long as wide.

Type series. Holotype: ♂, Shi Zi Tou [獅子頭], Nantou Pref., 4–IV–1979 (NSMT). Paratypes (78 exs.): 1♂, "Formosa Sauter / Fuhosho1909. IV. / *Campsosternus Stephensi* Cand. det. Szombathy / *Campsosternus gemma* Det H Ohira 1971" (TMB); 2



Figs. 14–17. Male genitalia of *Campsosternus* spp., ventral view. —— 14–15, *C. watanabei* MIWA from Mt. Li Dong Shan. —— 16–17, *C. yasuakii* W. SUZUKI, sp. nov., paratype from Shi Zi Tou. Scale: 2.0 mm for 14 and 16; 1.0 mm for 15 and 17.

exs., "Baibara, Formosa. 4–7. VII. 1939 Y. Miwa." (TARI); 4 exs., "Formosa Musha, 1919 V 18–VI 15 T. Okuni, J. Sonan, K. Miy., Y. Yosh." (TARI); 1 ex., "Hori, FORMOSA vii. 1940. Col. M. CHUJO" (TARI); 1 ex., "Horisha Col. T. Shiraki" (TARI); 1 ex., "Horisha Aug 15, 1919" (TARI); 1 ex., "Horisha Aug. 7. 1919" (TARI); 1 ex., "Formosa Horisha, –18. V.–VIII. H. Kawamura." (TARI); 1 ex., "Formosa Y. Miwa" (TARI); 1♂, 2♀♀, Hori [=Puli], Nantou Pref., Taiwan, VI–1956 (NSMT); 1♀, ditto, VI–1957 (NSMT); 1♀, ditto, VI–1965 (NSMT); 2♀♀, Wulai, Taipei Pref., 2–IX–1968, M. NISHIKAWA leg. (WSC); 2♀♀, ditto, 1–VIII–1968, K. MIZUSAWA leg. (WSC); 1♀, ditto, 1970, S. KAOH leg. (WSC); 1♂, 1♀, Sulo, Taoyuan Pref., 16–VII–1978, T. SHIMOMURA leg. (WSC); 2♀♀, ditto, 17–VII–1978, T. SHIMOMURA leg. (WSC); 1♀, Paling, Taoyuan Pref., 18–VII–1978, T. SHIMOMURA leg. (WSC); 1♂, ditto, 25–VII–1978, W. SUZUKI leg. (WSC); 2 exs., ditto, local collector (WSC); 1♀, ditto, 17~19–VIII–1984, Y. KISHIDA leg. (WSC); 1♀, Hong Shui Keng [紅水坑], 13–VI–1970, N. YASHIRO leg. (WSC); 1♂, Kanshirei, 28–VI–1972, M. S. LAI leg. (WSC); 1♂, Nanshanchi, Nantou Pref., 10–VI–1972, Q. L. DU leg. (WSC); 1♀, 1–VIII–1972, Q. L. DU leg. (WSC); 1♂, ditto, 1–IX–1972, Q. L. DU leg. (WSC); 1♂, 1♀, ditto, 27–VII–1975, S. OKAJIMA leg. (WSC); 1♂, 3♀♀, ditto, at light, 27–VI–1978, K. AKIYAMA leg. (WSC); 1♂, same data as holotype (WSC); 1♂, Jiuyuehtan, Nantou Pref., 1~2–VI–1976, T. SHIMOMURA



Figs. 18–22. Right antennae of *Campsosternus* spp. —— 18–19, *C. auratus* (DRURY); 18, ♂, from Kenting Park; 19, ♀, from Kenting Park. —— 20, *C. guishuni* ÔHIRA, ♀, holotype, from Tian Long Zhuang. —— 21–22, *C. mirabilis* FLEUTIAUX; 21, ♂, from Nanshanchi; 22, ♀, from Suifui.

leg. (WSC); 1♂, ditto, 30–V–1978, Ki. SASAKI leg. (WSC); 1♂, ditto, 10–VI–1978, Ki. SASAKI leg. (WSC); 1♀, ditto, 27–VI–1978, K. AKIYAMA leg. (NSMT); 1♂, ditto, at light, 5–VII–1978, H. AKIYAMA leg. (WSC); 1♂, Near Chihtuan, Ilan Pref., 24–VII–1979, Y. SHIBATA leg. (WSC); 3♂♂, 9♀♀, C. Taiwan, 1979. (WSC); 1♀, C. Taiwan. (WSC); 1♀, Mt. Nan Feng Shan [南峰山], near Liukuei, Kaohsiung Pref., 15–V–1980, A. SEKI leg. (WSC); 2♀♀, ditto, 25–V–1981, K. KAWADA leg. (WSC); 2♂♂, 1♀, ditto, W. L. CHEN leg. (WSC); 2♂♂, 1♀, ditto, local collector (WSC); 1♂, Kukuang, C. Taiwan, 29–VII–1981, T. HATTORI leg. (NSMT); 1♂, Taiwan, VI–1956 (NSMT); 3♂♂, Taiwan, local collector (WSC); 1♀, Chihpen Hot Springs, 400 m, 6–VII–1997, B. HERCZIG & S. T. KOVACS leg. (TMB).

Distribution. Taiwan.

Campsosternus auratus (DRURY, 1773)

(Figs. 9, 18–19 & 23–24)

Elater auratus DRURY, 1773, 65, pl. 55, fig. 3 (China).
Campsosternus auratus: WESTWOOD, 1837, pl. 35, fig. 3.
Elater fulgens OLIVIER, 1790, 12, pl. 4, fig. 43. (Synonymized with *Campsosternus auratus* (DRURY, 1773), by GEMMINGER & HAROLD, 1869, 1506.)
Campsosternus fulgens: HOPE, 1842, 453 (China).
Camptosternus [sic] *fulgens*: BATES, 1866, 350 (Formosa).
Campsosternus auratus var. *fulgens*: FLEUTIAUX, 1947, 315 (in key), 319.
Campsosternus auratus fulgens: JIANG, 1991, 276 (in key).
Campsosternus auratus var. *niger* FLEUTIAUX, 1918, 200 (Tonkin: Bao-Lac; Chine?).

Campsosternus auratus ab. *niger*: SCHENKLING, 1925, 64 (Tonkin).
Campsosternus auratus niger: JIANG, 1991, 276 (in key).
Campsosternus mirabilis: WANG, 1993, 92–93, figs. (Pinglin).——KISHII, 1995, 2, fig. 7 (Formosa) [nec FLEUTIAUX, 1930].
Other references are omitted. See SUZUKI (1999, 84–87).

Male. Length: 32.0–40.7 mm; width: 10.0–12.6 mm.

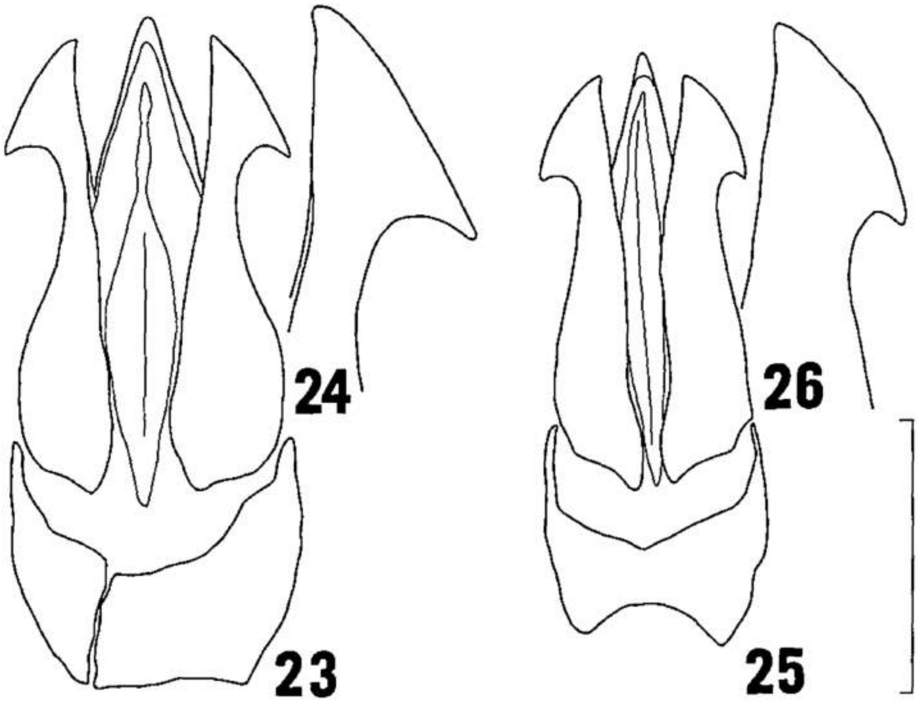
Antennae (Fig. 18) short, hardly reaching apices of posterior angles of pronotum; 3rd to 10th segments weakly serrate; 3rd subcylindrical though somewhat dilated apicad, remarkably longer than wide (2.8 : 1.0); 4th a little longer than 3rd (1.17 : 1.00) and a little shorter than the two preceding segments together (1.0 : 1.2); 10th nearly as long as 3rd (1.0 : 1.1); 11th the longest, a little longer than 4th, 1.42 times as long as 10th.

Genitalia (Figs. 23–24) robust and strongly sclerotized, about 2.9 times as long as basal piece. Median lobe stout, strongly tapered to apex, evidently wider than the neck of paremeres at apical third. Parameres robust, distinctly widened in basal third, each abruptly constricted before apical enlarged portion which is triangular, 1.26 times as long as its width; apico-lateral angles strongly projected outwards.

Female. Length: 40.6–46.6 mm; width: 12.4–13.9 mm.

Antennae (Fig. 19) with 3rd segments 2.5 times as long as wide; 10th slightly shorter than 3rd (1.0 : 1.2); 11th nearly as long as 4th.

Materials examined. 3 exs., near Kenting Park, Pingtung Pref., 23–V–1968, T. KIKUCHI leg. (WSC); 1♂, ditto, 26–VI–1968, K. MIZUSAWA leg. (WSC); 2 exs., ditto, 19~20–VII–1968, K. MIZUSAWA leg. (WSC); 1 ex., ditto, 21–VI–1972, X. X. ZHANG leg. (WSC); 1 ex., ditto, VI–1972, X. X. ZHANG leg. (WSC); 1 ex., ditto, 9–VIII–1972, K. MATSUKI leg. (WSC); 1 ex., ditto, 21–V–1972, S. OKAJIMA leg. (WSC); 3 exs., ditto, 21–V–1973, K. MASUMOTO leg. (WSC); 3 exs., ditto, 25–V–1973, S. OKAJIMA leg. (WSC); 2 exs., ditto, 16–V–1975, M. KUBOTA leg. (WSC); 1♂, 1♀, ditto, 17–V–1975, M. KUBOTA leg. (WSC); 1 ex., ditto, 3–VI–1977, N. YASHIRO leg. (WSC); 1 ex., ditto, 14–VI–1977, N. YASHIRO leg. (WSC); 3 exs., ditto, 14~18–V–1979, Y. KUSUNOKI leg. (WSC); 9 exs., Szechungchi, Pingtung Pref., 25~26–VII–1984, A. SASAI & T. ABE leg. (WSC); 3 exs., Nanshanchi, Nantou Pref., 1–VIII–1972, Q. L. DU leg. (WSC); 2 exs., ditto, 24–V–1973, Q. L. DU leg. (WSC); 2 exs., ditto, 10–VI–1973, Q. L. DU leg. (WSC); 1 ex., ditto, 31–V–1973, Q. L. DU leg. (WSC); 2 exs., ditto, 18–VI–1973, Q. L. DU leg. (WSC); 2 exs., ditto, 15–VI–1974, Q. L. DU leg. (WSC); 1 ex., ditto, 15–VI–1975, Q. L. DU leg. (WSC); 1 ex., ditto, VII–1974, Q. L. DU leg. (WSC); 3 exs., ditto, 27–VII–1975, S. OKAJIMA leg. (WSC); 1 ex., ditto, 20–V–1977, H. SAKAINO leg. (WSC); 1 ex., ditto, Nantou Pref., 11–VII–1977, Ki. SASAKI leg. (WSC); 2 exs., ditto, 27–VI–1978, K. AKIYAMA leg. (WSC); 1 ex., ditto, 13–VII–1984, Ki. SASAKI leg. (WSC); Puli, Nantou Pref., 29–V–1975, K. AKIYAMA leg. (WSC); 1 ex., Mt. Kuantoshan, Nantou Pref., 6–VI–1995, S. TSUYUKI leg. (WSC); 3 exs., Kanshirei, 23–VI–1972, M. S. LAI leg. (WSC); 4 exs., ditto, 24–VI–1972, M. S. LAI leg. (WSC); 1 ex., Chihpen Spa, Taitung Pref., 1–VI–1968, T. KIKUCHI leg. (WSC); 1 ex.,



Figs. 23–26. Male genitalia of *Campsosternus* spp., ventral view.——23–24. *C. auratus* (DRURY) from Kenting Park.——25–26. *C. mirabilis* FLEUTIAUX from central Taiwan. Scale: 2.0 mm for 23 and 25; 1.0 mm for 24 and 26.

ditto, 9~12–VI–1986, S. ÔSAWA leg. (WSC); 1♂, near Liukuei, Kaohsiung Pref., 8–V–1991, W. CHEN leg. (WSC); 3 exs., Jing Da Shan [京大山], near Liukuei, Kaohsiung Pref., 14–V–1991, W. CHEN leg. (WSC); 2 exs., Peiyuan, Taitung Pref., 7–VI–1968, T. KIKUCHI leg. (WSC); 1 ex., Lan Hsu Is., I~II–1972, Y. Y. QI leg. (WSC); 1♀, Yangmingshan, Taipei Pref., 28–VI–1986, K. MASUMOTO leg. (WSC).

Distribution. China, Hainan Is., Hong Kong Is., Taiwan, Lan Hsu Is., Vietnam, Cambodia, Laos.

Notes. This species is the commonest in Taiwan. The colour of the body is normally dark green, and rarely blue green or green coppery. The variety "*niger*", which has entirely black body, is recorded from the mainland of China and Indochina, but no such a type of colour variation has hitherto been known from Taiwan.

Campsosternus mirabilis FLEUTIAUX, 1930

(Figs. 5–6, 21–22 & 25–26)

Campsosternus mirabilis FLEUTIAUX, 1930, 409 (Ile Formose).——MIWA, 1931 a, 88; 1934, 191 (For-

mosa). —— HIRAYAMA, 1940, 74, pl. 27, fig. 37 (Mt. Wu-mao-tsu Shan). —— SAKAGUTI, 1981, 74–75, fig. 12 (Taiwan). —— JIANG, 1991, 276 [in key]. —— SUZUKI, 1999, 87–88.
Campsosternus milabilis [sic]: MIWA, 1931 b, 131 (Formosa).
Campsosternus sp.: TAKEDA *et al.*, 1977, pl. 8, fig. 59 (Juisui).
Campsosternus guishuni: KISHII, 1995, 2–3, fig. 8 (Wusha) [nec ÔHIRA, 1977].

Male. Length: 31.9–36.4 mm; width: 10.7–12.2 mm.

Antennae (Fig. 21) somewhat long, extending beyond the apex of posterior angles of pronotum by apical two segments; 3rd to 10th segments acutely serrate; 3rd triangular, 1.5 times as long as wide; 4th elongate trianglular, apparently longer than 3rd (1.32 : 1.00); 10th slightly shorter than 3rd; 11th the longest, 3.5 times as long as wide and 1.35 times as long as 4th.

Genitalia (Figs. 25–26) somewhat robust and sclerotized, 2.5 times as long as basal piece. Median lobe somewhat wider than the neck of paramere at apical third. Parameres subparallel in basal two-thirds and each weakly constricted just before apical enlarged portion, which is subtriangular and about 1.2 times as long as its width; apico-lateral angles obtusely pointed at each apex.

Female. Length: 36.5–39.4 mm; width: 11.7–12.7 mm.

Antennae (Fig. 22) extending a little beyond each apex of posterior angles of pronotum by apical segment; 4th to 10th segments somewhat acutely serrate; 3rd subcylindrical, gently dilated apicad, 1.82 times as long as wide; 4th elongate-triangular, remarkably longer than 3rd (1.8 : 1.0); 10th nearly as long as 3rd; 11th slender, 1.4 times as long as 10th, 3 times as long as wide, slightly longer than 4th (1.06 : 1.00).

Type material examined. Lectotype. Taiwan: sex undetermined, "*Campsosternus mirabilis* Fleut. type FLEUTIAUX det. / MUSEUM PARIS I. FORMOSE J. HARMAND 1906 / Type" (MNHN).

Other materials examined. 1♂, 1♀, C. Taiwan, VI–1966 (NSMT); 1♀, Taiwan, NSMT–I–C 04794 (NSMT); 1♀, Da Wu [大武], V–1966 (NSMT); 1♀, C. T. (NSMT); 1♂, Yuri, Taiwan, 5–VII–1972, Y. MAEDA leg. (HOC); 1♀, Mt. Kannon-zan, Taiwan, 7–VII–1970, T. ENDO leg. (WSC); 1♂, Nanshanchi, Nantou Pref., Taiwan, 18–V–1972, T. KAMAKARI leg. (WSC); 1♀, Rui Sui [瑞穗], Taiwan, 14–VIII–1973, M. MATSUMURA leg. (HAC); 1♂, Taiwan (HAC).

Distribution. Taiwan.

Campsosternus guishuni ÔHIRA, 1977

(Figs. 7–8, 20)

Campsosternus guishuni ÔHIRA, 1977, 34–35, fig. 3 (undefined locality, 730 m in alt., Kaohsiung Pref., S. Taiwan). —— JIANG, 1991, 276 [in key]; 1993, 137 (Taiwan). —— SUZUKI, 1999, 87.

Female. Length: 31.9 mm; width: 10.1 mm.

Antennae (Fig. 20) short, barely reaching each apex of posterior angles of pronotum; 3rd to 10th segments weakly serrate; 3rd 1.68 times as long as wide; 4th subtriangular, 1.34 times as long as 3rd and 1.67 times as long as wide, a little shorter than the two preceding segments together; 10th slightly shorter than 4th (1.00 : 1.13); 11th ovate, a little longer than 10th (1.22 : 1.00), 2.75 times as long as wide.

Male. Unknown.

Type material examined. Holotype, ♀, "HOLOTYPE / *Campsosternus guishuni* H. OHIRA Det. 1977 / FORMOSA 天龍椿 [Tian Long Zhuang] 南部横貫公路 [Nan Bu Heng Guan Gong Lu] Alt: 730 m 14–VIII–1975 林貴順 [G. S. LIN]" (HOC).

Distribution. Taiwan.

Notes. This species has not been rediscovered from Taiwan since ÔHIRA's original description. In the course of my study, I investigated the collections of the Taiwan Agricultural Institute, Taichung and the National Science Museum (Nat. Hist), Tokyo, both of which possess many specimens of *Campsosternus* from various parts of Taiwan. However, no additional specimens are found.

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New or Little-known Elateridae (Coleoptera) from Japan, XLII

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Abstract A new species of the elaterid beetle, *Melanotus* (*Melanotus*) *watanabei*, is described from Kuro-shima Is., off southern Kyushu, Japan. It is closely allied to *M.* (*M.*) *legatus legatus* Candèze, 1860, of the mainland of Japan and its accessory islands.

In the present paper, I am going to describe a new species of *Melanotus* from Kuro-shima Is. about 60 km south off the tip of the Satsuma Peninsula of Kyushu, Japan. The holotype to be designated in this paper is preserved in the collection of the National Science Museum (Nat. Hist.), Tokyo.

It is my pleasure to dedicate this short report to Prof. Dr. Yasuaki Watanabe in commemoration of his retirement from Tokyo University of Agriculture.

Before going further, I wish to express my sincere gratitude to Dr. Shun-Ichi Uéno of the National Science Museum (Nat. Hist.), Tokyo, for his kindly reading the manuscript and giving me various useful suggestions.

Melanotus (*Melanotus*) *watanabei* sp. nov. [Melanotinae]

[Japanese name: Watanabe-kushi-kometsuki]
(Figs. 1 A–B, 2 A–D)

Male (Fig. 1 A). Length 17–18 mm, width about 4–4.5 mm. Body stout and robust, moderately convex above; surface shining, entirely dark castaneous brown except for antennae and legs more or less lighter castaneous brown; vestiture pale yellowish brown and semi-decumbent, becoming longer on head and pronotum.

Head, gently convex between eyes, more or less depressed at each lateral portion inside clypeal margin (Fig. 2 A ↑); surface rather coarsely and densely punctate; clypeal margin well raised, gently rounded at middle (Fig. 2 A). Antenna elongate, extending beyond posterior angle of pronotum at least by apical segment; basal segment robust and subcylindrical, 2nd samll and subglobose, 3rd subclavate and about 1.6 times as long as 2nd, 4th about twice as long as 3rd, 4th to 10th rather weakly serrate (Fig. 2 D).

Pronotum trapezoidal, widest across base, with sides slightly sinuate just before posterior angles, subparallel in posterior half, thence gradually convergent towards anterior angles; disc rather gently convex, moderately densely and evenly punctate, but the punctures become coarser and rugoser laterad, without median longitudinal chan-

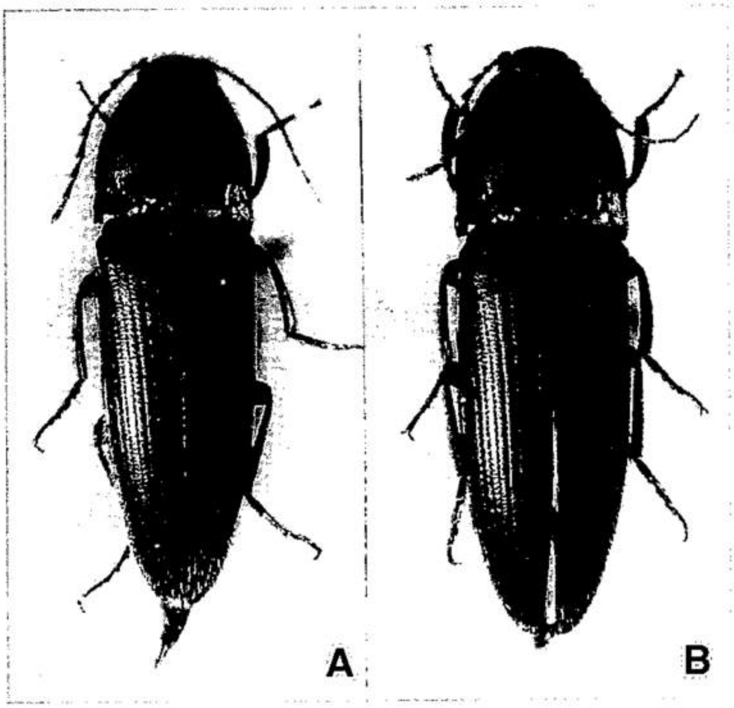

Fig. 1. *Melanotus* (*Melanotus*) *watanabei* sp. nov.; A, holotype (male), and B, paratype (female).

nel in middle; posterior angles projecting posteriad and slightly curved downwards, each with a distinct carina above. Scutellum flattened and subquadrate. Prosternal process in lateral aspect not incurved just behind procoxal cavities (Fig. 2 B).

Elytra about 2.4 times as long as its basal width, with sides almost parallel in basal halves, thence gradually convergent towards apices which are normally pointed; striae clearly defined, deeply and regularly punctate; intervals rather flattened, punctulate and finely rugose. Legs stout, claws pectinate, each with 7 or 8 denticles.

Apical portion of aedeagus (dorsal aspect) as illustrated (Fig. 2 C); median lobe narrow and gradually arcuate near apex which is obtusely pointed; apical portion of each lateral lobe subtriangular, with postero-lateral angle pointed and subrectangular.

Female (Fig. 1 B). Very similar to male, but the body is robuster and the antennae shorter, not attaining to the posterior angles of pronotum, with each 3rd segment smaller, more broadly serrate from 3rd to 10th segments.

Holotype: ♂, Kuro-shima Is. off Kyushu, 24~26–VII–2001, H. ÔHIRA leg. Paratypes: 1♂, 3♀♀, same collecting data as for the holotype.

Distribution. Kuro-shima Is., off Kyushu, Japan.

This new species is closely allied to *M.* (*M.*) *legatus legatus* CANDÈZE, 1860 from

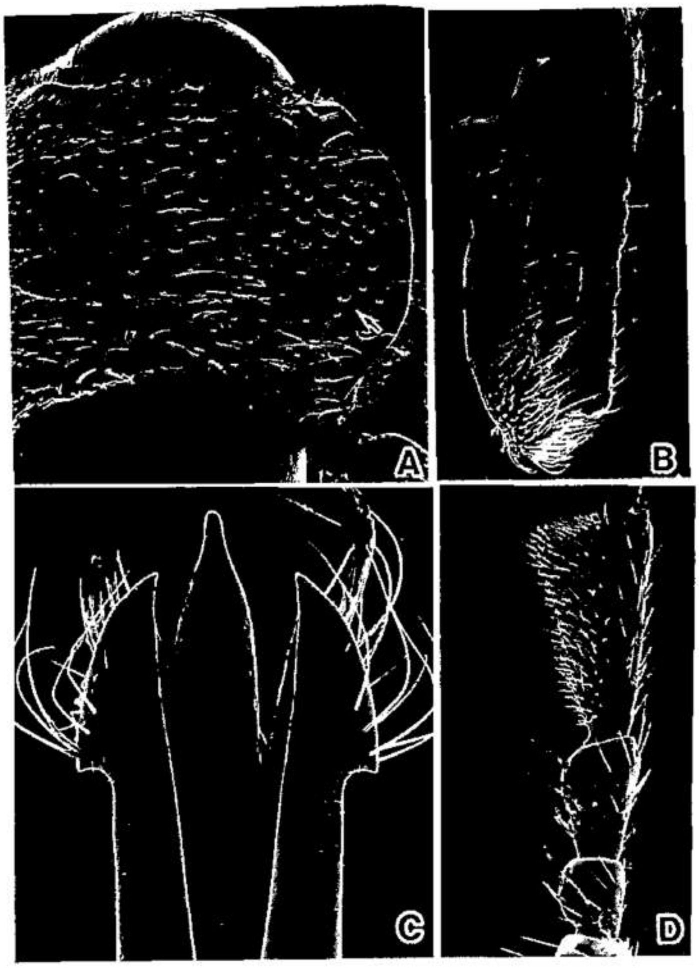

Fig. 2. Some body parts of *Melanotus* (*Melanotus*) *watanabei* sp. nov.; A, head, dorso-lateral aspect; B, prosternal process, lateral aspect; C, apical portion of aedeagus, dorsal aspect; D, 2nd to 4th segments of male antenna.

Japan, but can be distinguished from the latter by the robuster body, not incurved prosternal process, shorter antennae and differently shaped aedeagus.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 341–346, Mar. 31, 2002

Notes on the Blue-elytral Group of the Genus *Ischalia* (Coleoptera, Anthicidae, Ischaliinae) from Southeast Asia

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Abstract Some notes on the blue-elytral group of the anthicid genus *Ischalia* (s. str.) are given with a key to the Southeast Asian species. Two additional new species of the species-group are described under the names *I.* (s. str.) *yasuakii* sp. nov. and *I.* (s. str.) *zetteli* sp. nov.

The genus *Ischalia* contains 25 species and is divided into two subgenera, *Ischalia* s. str. and *Pseudohomalisus* PAULUS by the difference in the structure of mesepisternum. The former subgenus is divided into two groups by the color of the elytra, blue type and orange type. Up to the present, the blue-elytral group is rather rare and only three species have been known. Their type specimens are shown by photographs on this occasion. Fortunately, however, I have been able to examine many specimens of blue-elytral species collected from Southeast Asia and deposited in the Naturhistorisches Museum, Wien through the courtesy of Dr. M. JÄCH. Most of them belong to *I. indigacea* PASCOE, but one new species was recognized from Borneo and is described in the following lines. Additionally, one more new species was found out in my collection and is described together with the species mentioned above.

The abbreviations used in the present paper are as follows: TW – transverse diameter of each eye in dorsal aspect; HW – greatest width of head including eyes; PW – greatest width of pronotum; PL – length of pronotum along median line; EW – greatest width of elytra; EL – greatest length of elytra.

I wish to express my heartfelt thanks to Dr. Shun-Ichi UÉNO, Dr. Manfred JÄCH and Dr. Herbert ZETTEL for their kind support in many ways.

This paper is dedicated to Prof. Yasuaki WATANABE, a good friend of mine, in commemoration of his retirement from Tokyo University of Agriculture.

Ischalia (s. str.) ***yasuakii*** M. SATÔ, sp. nov.

(Fig. 1)

Female. Body elongate and sparsely covered with brownish pubescence, which is more erect and sparse on elytra than on the other parts. Color almost dark brown, with brownish legs and maxillary palpi. Head, pronotum and scutellum yellowish orange. Elytra tinged with weak blue metallic sheen.

Head suboval, transversely concave behind clypeus and shallowly longitudinally so between antennal sockets, sparsely microreticulate on the surface; labrum transverse, closely pubescent; clypeus distinct, its anterior margin straight with rounded angles; eyes lateral and moderately prominent; HW/TW 3.63. Antennae filiform, attaining to the middle of elytra, 1st segment stout and 3.3 times as long as 2nd, which is the shortest, 3rd as long as the 1st, 4th to 10th elongate, becoming slightly shorter towards apex, 11th pointed at apex and slightly longer than 10th.

Pronotum subtrapezoidal, irregularly concave postriad, gibbous anteriad; PW/HW 1.33, PW/PL 1.28; anterior margin distinctly emarginate; lateral margins ridged, trisinuate and distinctly constricted at basal fourth; front angles rounded, hind angles triangularly prominent; disc very finely and minutely punctate, provided with a median carina in full length, a pair of transverse impressions on lateral sides of the carina and ovate ones at postero-lateral margins; integument very finely microreticulate.

Elytra elongate, flat; EW/PW 2.00, EL/EW 2.00; shoulders somewhat obtuse; sides gently divergent posteriad, with rounded apices; surface strongly, contiguously and somewhat rugosely punctate; each elytron provided with a prominent costa which extends from humerus to near apex and is evenly curved, and with a short carina at humerus which is recognized in basal fourth.

Under surface brown to dark brown. Mesepisternum extending from side to apical portion of mesosternum, but not contiguous with each other.

Length: 7.1 mm; breadth: 2.2 mm.

Male. Unknown.

Holotype. ♀, Mt. Apo, Mindanao Is., Philippines, 26~30–III–1980, T. HIROWATARI & Y. FUNATSU leg. The holotype is preserved in the collection of the Entomological Laboratory, College of Agriculture, Ehime University.

The present new species resembles *I. bryanti* BLAIR, but can be easily distinguished from it by different shape of the pronotum, yellowish orange color of the head, and so on, as is pointed out in the key.

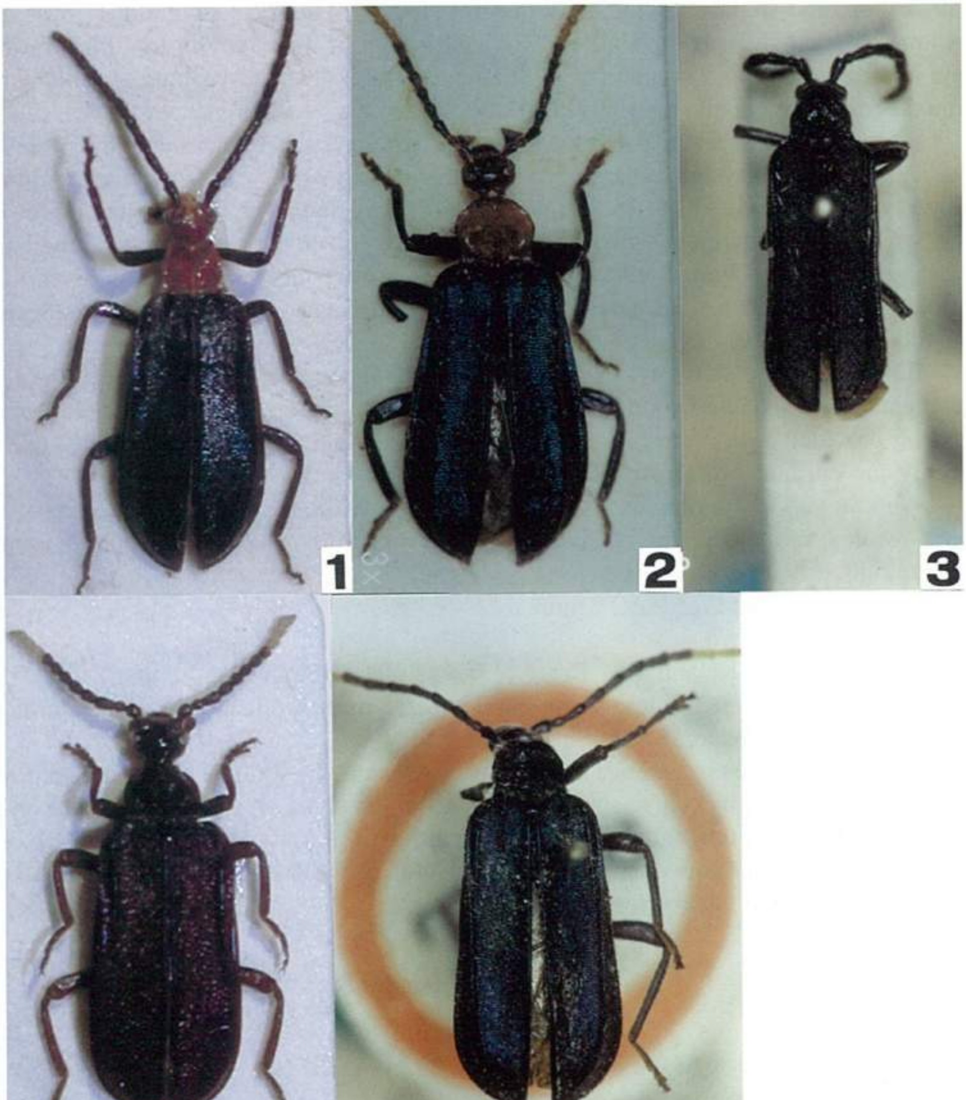
This species is named after Prof. Yasuaki WATANABE in honor of his great contribution to the coleopterology.

Ischalia (s. str.) ***zetteli*** M. SATÔ, sp. nov.

(Fig. 4)

Female. Body elongate, depressed and sparsely covered with brownish pubescence. Color almost dark brown to brown, but the elytra are tinged with weak metallic sheen.

Head suboval, transversely concave behind clypeus and less so between antennal sockets, smooth on the surface; labrum transverse, closely pubescent and slightly emarginate at anterior margin; clypeus distinct, its anterior margin straight with rounded angles; eyes lateral and rather small; HW/TW 5.00. Antennae moniliform,



Figs. 1–5. Habitus of *Ischalia* spp. —— 1, Holotype of *I.* (s. str.) *yasuakii* M. SATÔ, sp. nov.; 2, type of *I.* (s. str.) *bryanti* BLAIR; 3, syntype of *I.* (s. str.) *atricornis* PIC; 4, holotype of *I.* (s. str.) *zetteli* M. SATÔ, sp. nov.; 5, type of *I.* (s. str.) *indigacea* PASCOE.

rather loose and attaining to the basal third of elytra; 1st segment stout and 1.75 times as long as 2nd, which is the shortest, 3rd a little shorter than 1st, 4th to 10th suboval and becoming more or less shorter towards apex, 11th 1.40 times as long as 10th. Terminal segment of maxillary palpus distinct.

Pronotum subtrapezoidal, irregularly concave posteriad, gibbous anteriad; PW/HW 1.27, PW/PL 1.42; anterior margin strongly emarginate at the center; lateral margins ridged and evenly rounded, front angles somewhat rectangular, hind angles more or less triangularly prominent with obtuse apices; disc polished, provided with a median carina in full length, and a pair of deep transverse grooves at lateral sides of the carina at basal third, whose apical portions are much deeper and oval in shape; integument smooth.

Elytra elongate, flat; EW/PW 1.90, EL/EW 1.95; shoulders distinct; sides slightly divergent posteriad, with rounded apices; surface strongly and closely punctate; each elytron provided with a prominent costa which extends from humerus to apex and is evenly curved, and with a short distinct carina at basal third.

Ventral surface shining and sparsely pubescent. Mesosternum somewhat triangularly swollen; mesepisternum extending from the side to the apex of mesosternum, but not contiguous with each other.

Length: 6.1 mm; breadth: 2.2 mm.

Male. Unknown.

Holotype. ♀, Kelabit HL, Barco, 1,000–2,000 m, Sarawak, Borneo, 26–II~1–III–1993, H. ZETTEL leg. The holotype is deposited in the collection of the Naturhistorisches Museum, Wien.

This new species is somewhat allied to *I. indigacea* PASCOE, but can be discriminated from the latter by coarse strong punctures on the elytra, a pair of deep transverse grooves on the pronotum and different conformation of the antennae.

The new species is dedicated to Dr. H. ZETTEL of the Naturhistroisches Museum, Wien, who collected this interesting species.

Ischalia (s.str.) ***atricornis*** PIC

(Fig. 3)

Ischalia atricornis PIC, 1938, J. fed. Malay Sts. Mus., **18**: 286 (Malaysia).

Specimen examined. 1 ex., Malaya, Pahang, Cameron Highlands, 4,000–4,500 feet, 23–VI–1935, H. M. PENDLEBURY leg. (Syntype, British Mus. Nat. Hist.)

Note. No additional record.

Distribution. W. Malaysia.

Ischalia (s.str.) ***bryanti*** BLAIR

(Fig. 2)

Ischalia bryanti BLAIR, 1914, Ann. Mag. nat. Hist., (8), **14**: 318 (Sarawak).

Specimen examined. 1 ex., Mt. Matang, Sarawak, 2,000 feet, 8–II–1914. (Type, British Mus. Nat. Hist.)

Note. No additional record.

Distribution. Borneo.

Ischalia (s.str.) ***indigacea*** PASCOE

(Fig. 5)

Ischalia indigacea PASCOE, 1860, J. Ent., **1**: 54 (Borneo).—— SATÔ, 1992, Elytra, Tokyo, **20**: 86 (Malaysia).

Specimens examined. 1 ex., Borneo (Type, British Mus. Nat. Hist.); 2 exs., Kelabit HL, Barea, 1,000–1,200 m, Sarawak, 26–II~1–III–1993, H. ZETTEL leg.; 1 ex., 25 km E. of Kapit, Sarawak, III–1994, J. KODADA leg.; 1 ex., ca. 40 km SE. of Kapit, Sarawak, III–1994, J. KODADA leg.; 1 ex., Kelabit HL, Umg Bario, 1,000–1,200 m, Sarawak, 28–II–1993, M. JÄCH leg.; 1 ex., near Lambir, N. P. Miri, Sarawak, 20–II–1995, M. KAWANABE leg.; 1 ex., Nanga Sarawai env., Tontang, W. Kalimantan, 24–VII~2–VIII–1993, SCHNEIDER leg.; 1 ex., Ulu Gombak, W. of Kuala Lumpur, Selangor, W. Malaysia, 16–II–1993, H. ZETTEL leg.; 4 exs., 20 km NE. of Raub, Lata Jarom, Gg. Benom, Pahang, W. Malaysia, 19~22–II–1995, M. STRBA & R. HERGOVITS leg.

Note. This species seems to be common.

Distribution. Borneo, W. Malaysia.

Key to the Species of the Blue-elytral Group of the Genus *Ischalia* (s. str.)

1(4) Pronotum yellowish orange.
2(3) Head yellowish orange. Pronotum subtrapezoidal in shape. Antennae unicolorously bluish balck. . . . . *I.* (s. str.) *yasuakii* M. SATÔ
3(2) Head bluish black. Pronotum semicircular in shape. Three terminal segments of antennae whitish. . . . . *I.* (s. str.) *bryanti* BLAIR
4(1) Pronotum dark brown tinged with metallic blue sheen.
5(8) Three terminal segments of antennae whitish. Upper surface dark brown with metallic blue sheen.
6(7) Antennae moniliform. . . . . *I.* (s. str.) *zetteli* M. SATÔ
7(6) Antennae filiform. . . . . *I.* (s. str.) *indigacea* PASCOE
8(5) Antennae unicolorously black. Upper surface black with blue tinge. . . . . *I.* (s. str.) *atricornis* PIC

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 347–350, Mar. 31, 2002

A New Small Species of the Genus *Prothemus* (Coleoptera, Cantharidae) from Taiwan

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Abstract A new species of the cantharid genus *Prothemus* is described and illustrated from Taiwan, under the name of *P. watanabei*. This is the smallest species of the members of *Prothemus* known from Taiwan.

The genus *Prothemus* CHAMPION, 1926, is clearly distinguished from all the other cantharid genera by the rounded pronotum, the characteristic male genitalia which are mostly oval and provided with a pointed dorsal plate on each paramere, and so on.

Up to the present, seven species of the genus *Prothemus* have been known from Taiwan (WITTMER, 1984). Lately, OKUSHIMA and SATÔ (1997) recorded three species of the genus from the Ryukyu Islands, which ranges from Japan to Taiwan geographically. Of the seven Taiwanese species, *P. monochrous* (FAIRMAIRE, 1900) is also distributed to Fujian, China, and *P. kanoi* WITTMER, 1984, is to the Yaeyama group of the Ryukyu Islands. The other species are endemic to Taiwan.

Several years ago, one of the authors (OKUSHIMA) found a strange Taiwanese specimen of cantharid in the collection of Tokyo University of Agriculture. It should be a member of *Prothemus* in view of the morphological features mentioned above, though it is very small in the size of body for *Prothemus*. Though only a male specimen was available, our careful examination revealed that it was a new species beyond doubt. It will be described herein under the name of *Prothemus watanabei*.

We wish to express our deep gratitude to Dr. Yasuaki WATANABE, an eminent entomologist, who has kindly given us constant guidance and useful suggestions, and permitted us to examine the collection of Tokyo University of Agriculture. Our hearty thanks are also due to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for his critical reading of the original manuscript.

Prothemus watanabei OKUSHIMA et M. SATÔ, sp. nov.

(Figs. 1–4)

Male. Body elongate; mostly black or blackish brown; mandibles and claws reddish yellow or reddish brown. Body closely covered with brown pubescence; apical margin of clypeus fringed with pale bristles.

Head slightly shorter than its width; dorsum depressed along the apical margin of clypeus and in lateral areas before eyes, faintly hollowed along the mid-line between eyes, and slightly convex in posterior area; surface covered with coarse grains, but they become indistinct in anterior half; clypeus arcuate at apical margin; eyes somewhat large, globular and strongly prominent, ratio of the diameter of an eye to interocular space 1: 2.15; labial palpus with subtriangular apical segment; maxillary palpus with somewhat slender and rounded axe-shaped apical segment; antennae filiform and slender, 1st segment clavate, 2nd short and expanded apicad, 3rd to 7th subcylindrical (8th to 11th also probably so, though lacking in the holotype), each of 4th to 7th segments with a longitudinal groove on the dorso-external side, relative length of each segment as follows:— 20: 10: 23: 24: 26: 26: 27: —: —: —: —.

Pronotum transversely semicircular, somewhat strongly and roundly curved in the four corners of the circumference, 1.05 times as wide as head, 0.81 times as long as wide; disc convex, particularly so in the postero-lateral areas, strongly depressed along the posterior margin, antero-lateral areas hollowed; medio-longitudinal furrow indistinct; surface coarsely punctate and faintly rugose with faint lustre. Scutellum triangular with rounded apex.

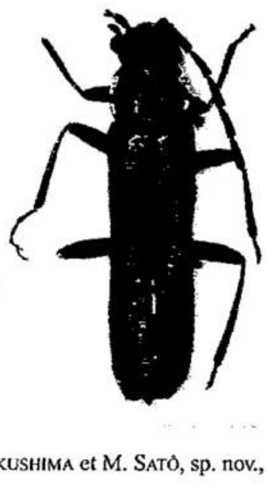
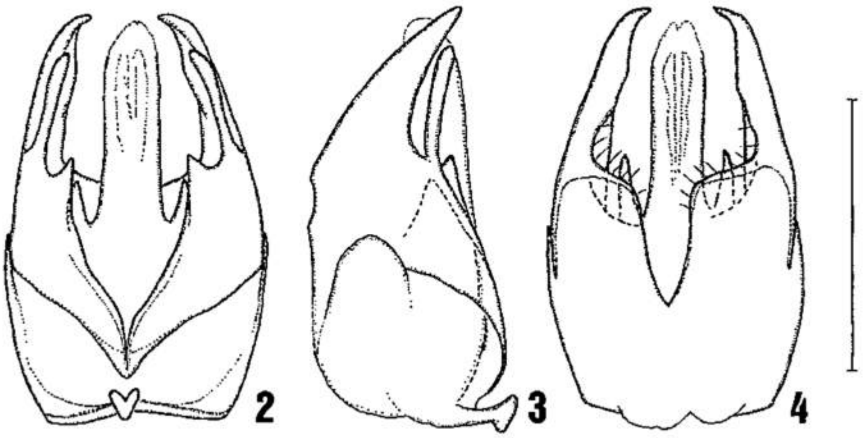


Fig. 1. *Prothemus watanabei* OKUSHIMA et M. SATÔ, sp. nov., ♂ (holotype), from Meifeng, Taiwan.



Figs. 2–4. Male genitalia of *Prothemus watanabei* OKUSHIMA et M. SATÔ, sp. nov.; 2, ventral view; 3, lateral view; 4, dorsal view. (Scale: 0.5 mm.)

Elytra conjointly 1.14 times as wide as pronotum, 3.13 times as long as wide, the sides subparallel though slightly convex at basal fourth; dorsum closely and rugosely punctate, though weakly so in basal part; two vague costae barely recognizable on each elytron.

Legs moderately slender; each femur mostly straight; each tibia mostly straight though feebly arcuate at the base; claws simple at least in middle legs.

Male genitalia:— Each paramere provided with short acute tooth on ventral side, ventral process of each paramere mostly straight and slightly leaning ventrad, with rounded apex, each dorsal plate narrowed apicad, with pointed apex towards inside, roundly emarginate at the base on inner side, and without distinct tooth. Each laterophysis not so long and somewhat stout with nearly pointed tip (Figs. 2–4).

Length of body: 5.23 mm (measured from the anterior margin of clypeus to the apices of elytra); breadth of body: 1.20 mm (measured at the widest part of conjoint elytra).

Female. Unknown.

Holotype. ♂, Meifeng, Nantou Hsien, Taiwan, 28–IV–1978, T. SENOH leg. The holotype is preserved in the collection of Tokyo University of Agriculture. Unfortunately, appendages are partly broken and some parts are missing.

Distribution. Taiwan.

Notes. This new species somewhat resembles *P. kanoi* WITTMER, 1984 from Taiwan, but can easily be distinguished from the latter by the smaller body, transverse pronotum and different structure of the male genitalia, particularly in having an acute tooth on each paramere.

This species is dedicated to Dr. Yasuaki WATANABE for commemorating his retirement from Tokyo University of Agriculture.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 351–355, Mar. 31, 2002

A New Species of the Genus *Mordellina* (Coleoptera, Mordellidae) from the Southern Ryukyus

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Abstract A new mordellid beetle, *Mordellina watanabei* sp. nov., is described from the Yaeyama Islands of the Ryukyus. It is similar to *Mordellina signatella* (MARSEUL) and its relatives in the pattern of maculation, but can be readily distinguished from them by having the slenderer antennae, and so on.

Introduction

The genus *Mordellina* was established by SCHILSKY (1908) for an African species, *M. gracilis* SCHILSKY, comprising about 50 known species at present, and the distributional range of the genus is widely stretching from Africa to East Asia through Southeast Asia. In Japan, eight species have hitherto been known from Honshu and the southern part, above all, from the Ryukyu Islands, where occur several indigenous species including undescribed ones. In this paper, I will describe a new species on the basis of nine female specimens from the Yaeyama Islands of the Ryukyus.

This short paper is dedicated to Prof. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

Mordellina watanabei sp. nov.

[Japanese name: Watanabe-mon-hime-hananomi]

(Figs. 1–3)

Female. Body mostly light reddish brown; pronotum with a dark brownish black spot at medio-basal portion; elytra decorated with more or less brownish black maculations as follows: a pair of small basal spots along suture, a pair of large longitudinal medio-lateral spots and apical fascia, the former two of which are often vestigial or obsolete, though the apical fascia is always distinct; metepisternum and lateral sides of metasternum usually dark brownish black; latero-posterior areas of each abdominal sternite and apical area of hypopygium generally dark brownish black.

Head strongly convex, about 1.3 times as wide as long; eyes large, slightly emarginate in front, very sparsely haired; tempora a little narrower than the diameter of a

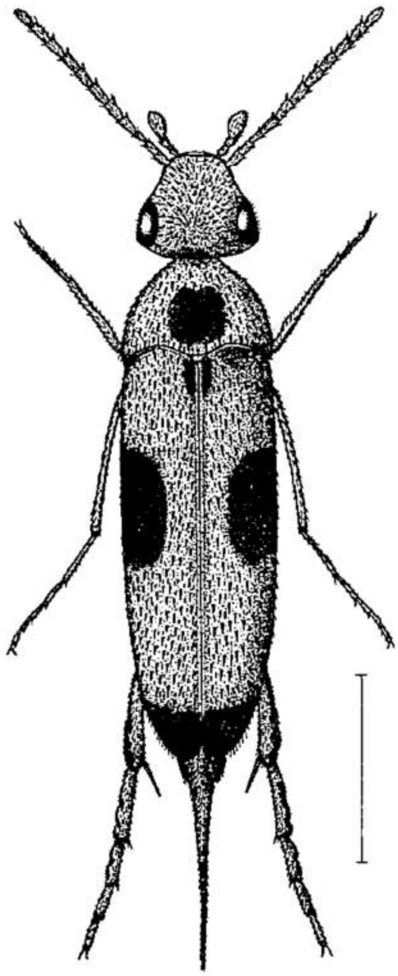

Fig. 1. *Mordellina watanabei* sp. nov., holotype, ♀. Scale: 1 mm.

facet. Antenna slender, about twice as long as length of head; 1st and 2nd segments almost cylindrical; 3rd broadened to the apex and a little longer than 2nd; 4th to 10th weakly serrate, each about twice as long as wide; terminal segment oblong, about 1.3 times as long as the penultimate. Terminal segment of maxillary palpus securiform, with apical margin a little shorter than inner one. Pronotum a little wider than long, slightly longer than head; lateral margins a little sinuate in profile, converging anteriorly when seen from above; anterior angles broadly rounded at each tip, posterior ones subrectangular with the tips somewhat rounded. Scutellum triangular, wider than long, with apex rounded. Elytra about 2.6 to 2.9 times as long as humeral width, about 3 times as long as pronotum, tapered posteriorly and broadly rounded at each apex. Apex of hypopygium projected without emargination. Pygidium extremely long and slender,

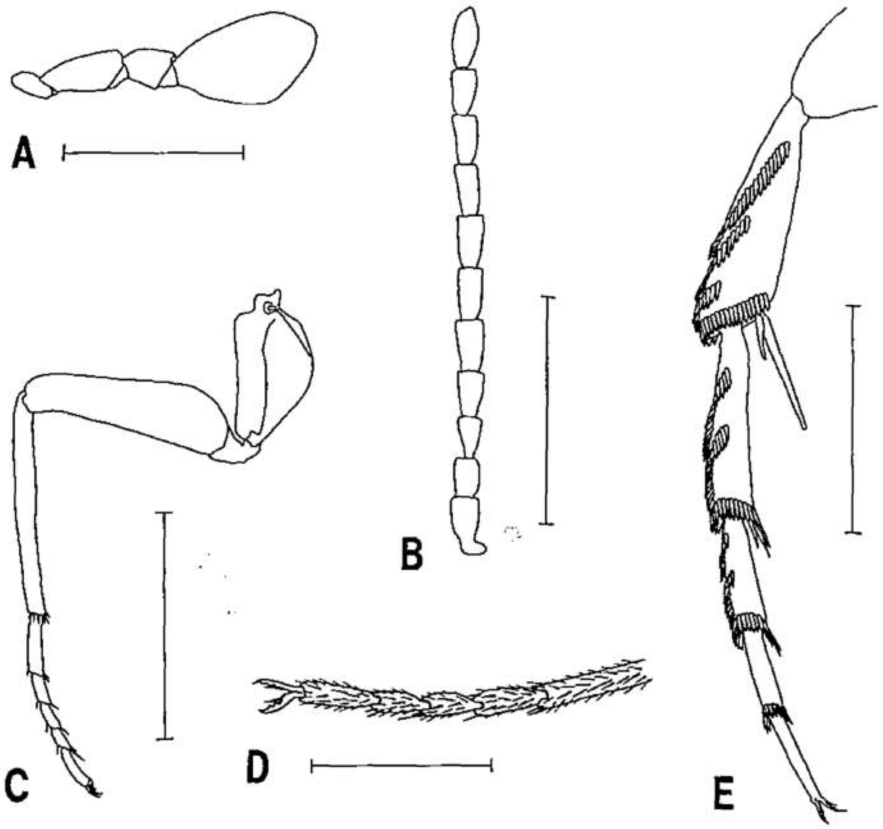

Fig. 2. *Mordellina watanabei* sp. nov., paratype, ♀. ——A, Maxillary palpus; B, antenna; C, fore leg; D, distal segments of fore tarsus; E, hind tibia and tarsus. Scales: A and D 0.2 mm; B, C and E 0.5 mm.

slightly curved downwards, about 3/5 as long as elytron. Legs slender; fore tibia nearly straight; penultimate segment of fore tarsus simple in shape and cylindrical, without emargination at dorso-apical margin, and jointed with terminal segment at the apical margin; terminal two segments of middle tarsus almost similar to those of fore tarsus. Combs of hind leg very long and oblique, formulated as 3, 2, 2, 0; tibia with basal comb the longest and nearly reaching femoral articulation, the middle one almost reaching medial axis, and the apical one the shortest and parallel to tibial apical edge; 1st and 2nd segments of tarsus each with two oblique combs, 3rd and 4th segments without comb. Inner spur of hind tibia about 3/5 as long as 1st segment of hind tarsus, and about 3 times as long as outer one.

Body length: 3.0–4.0 mm (excl. pygidium).

Male. Unknown.

Type series. Holotype: ♀, Hoshizuna Beach, Iriomote Is., Yaeyama Isls., Ryukyus,

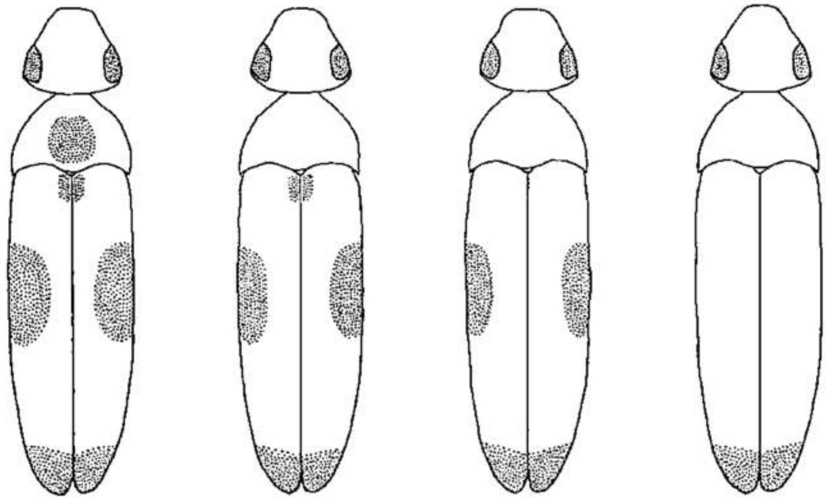

Fig. 3. *Mordellina watanabei* sp. nov., ♀, four patterns of maculation, dorsal view.

20–V–2001, at light trap, T. SHIMADA leg. Paratypes: 3 ♀♀, same data as the holotype; 1 ♀, Nakamagawa Path, Iriomote Is., 16–V–2001, T. TSURU leg.; 1 ♀, Urauchi, Iriomote Is., 28~31–V–2000, T. ISHIKAWA leg.; 1 ♀, Takeda Path, Ishigaki Is., Yaeyama Isls., 25–VI–2000, T. ISHIKAWA leg.; 1 ♀, Tarumai, Yonaguni Is., Yaeyama Isls., 20–V–2000, at light trap, H. MIZUSHIMA leg.; 1 ♀, Mt. Inbi-dake, Yonaguni Is., 18–VI–2001, K. TOYODA leg.

The holotype and paratypes are deposited in the collection of Tokyo University of Agriculture, Atsugi, Kanagawa Prefecture.

Distribution. Yaeyama Islands (Iriomote Is., Ishigaki Is., Yonaguni Is.), S. Ryukyus, SW. Japan.

Remarks. This new species is very closely similar to *Mordellina atrofusca* (NOMURA) from the Tokara Islands (N. Ryukyus), *M. signatella* (MARSEUL) from Japan and Taiwan, and *M. palleola* (NOMURA) from Yonaguni Is. (S. Ryukyus) in the pattern of maculation and other characters, but obviously differs from them mainly in the following respects: 1) antennae slenderer, particularly in 4th to 10th segments, each of which is about twice as long as wide, 2) hind tibia with outer spur, whereas it is absent in *Mordellina atrofusca* (NOMURA) and *M. palleola* (NOMURA), 3) 4th segments of fore and middle tarsi simple in shape and cylindrical, jointed to terminal segment at the apical margin, whereas they are jointed at the middle part of the terminal segments in *M. signatella* (MARSEUL).

Acknowledgement

I would like to express my hearty thanks to Prof. Yasuaki WATANABE, Tokyo University of Agriculture, for his continuous guidance and encouragement. I am also much indebted to Dr. Shun-Ichi UÉNO, Visiting Professor at Tokyo University of Agriculture, and to Dr. Masatoshi TAKAKUWA of the Kanagawa Prefectural Museum of Natural History, Odawara, for their critically reading the original manuscript. Deep thanks are also due to Messrs. Takashi SHIMADA, Tadashi ISHIKAWA, Hiroki MIZUSHIMA and Koji TOYODA for their kindness in offering valuable materials used in this paper.

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Glipa watanabeorum (Coleoptera, Mordellidae), a New Mordellid Beetle from the Southern Ryukyus

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Abstract A new mordellid species from the Yaeyama group of the Ryukyu Islands is described under the name of *Glipa (Macroglipa) watanabeorum* sp. nov. It is included in the group of *Glipa (Macroglipa) fasciata* KÔNO, but differs from all the members of that group particularly in having the characteristic male genitalia.

I have introduced twice as *Glipa* sp. a strange mordellid species allied to *Glipa (Macroglipa) fasciata* KÔNO collected from Ishigaki Is. of the Yaeyama Islands, southern Ryukyus. At first, the mordellid was figured in a list of the tribe Mordellini from the Ryukyu Islands (TAKAKUWA, 1976), and then it was briefly mentioned in a series of reviews of that tribe from Japan (TAKAKUWA, 2000). The reason why it was left unnamed is not difficult to explain — I was unable to find good opportunity to name it.

However, a golden opportunity was offered to me, and I am going to describe the mordellid under the name of *Glipa (Macroglipa) watanabeorum* sp. nov. in dedication to Prof. Dr. Yasuaki WATANABE and his wife Michiko on the occasion of his retirement from Tokyo University of Agriculture.

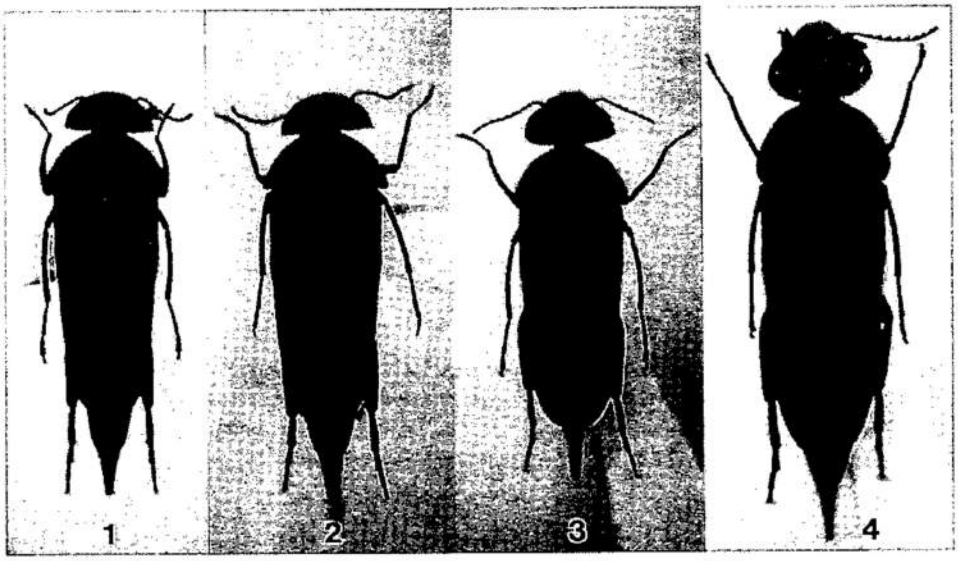
Before going further, I wish to express my heartfelt gratitude to Prof. Dr. Yasuaki WATANABE for his constant guidance and encouragement extended to me in the course of my study. My great appreciation is expressed to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for his critically reading the original manuscript of this paper. Thanks are also due to Messrs. Takeichiro HATAYAMA of Osaka, Tomoji MIKAGE of Fukuoka and Tomoyuki TSURU of Atsugi for their kind supply of valuable materials used in this paper.

Glipa (Macroglipa) watanabeorum sp. nov.

(Figs. 1, 2, 5–11)

Glipa sp.: TAKAKUWA, 1976, Elytra, Tokyo, **3**: 16, pl. 3, no. 3.
Glipa (Macroglipa) sp. 2: TAKAKUWA, 2000, Coleopterists' News, Tokyo, (130): 1, figs. 2 a–b.

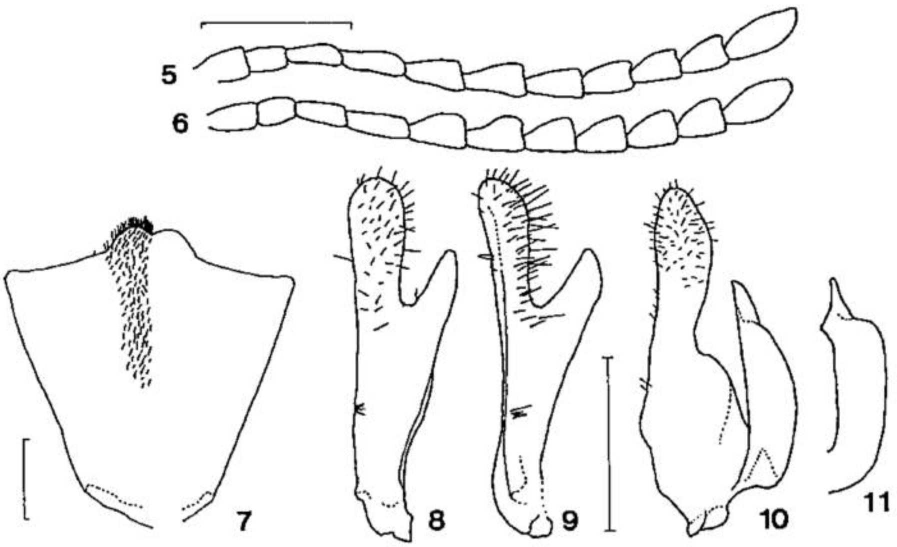
Male. Black; antennae and mouth-parts dull yellowish brown; fore femora and spurs of hind tibiae brown; each apical area of abdominal segments 1–4 more or less brownish; all tarsi dark red to blackish castaneous; all claws reddish brown. Dorsum



Figs. 1–4. Habitus of *Glipa* (*Macroglipa*) spp. —— 1, *G.* (*M.*) *watanabeorum* sp. nov., ♂, holotype; 2, same, ♀, paratype. —— 3, *G.* (*M.*) *fasciata* KÔNO from Okinawa Is., C. Ryukyus, ♂; 4, same, ♀.

covered with fuscous to blackish pubescence, and decorated with whitish to yellowish pubescence in general. Abdomen bearing pale whitish pubescence almost all over, except for apical half of anal sternite with yellowish to fuscous one; each apex of abdominal sternites 1–4 with more or less yellowish pubescence.

Head clothed with golden yellow pubescence; eyes elliptical, densely haired, not reaching hind margins of tempora; tempora relatively broad, roundly projected at the middle, visible from above. Terminal segment of maxillary palpus shaped like a rather broad subisosceles triangle with rounded inner angle; outer margin longer than inner one. Antennae rather slender, very slightly shorter than the width of head (0.97 : 1), moderately shorter than pronotal width (0.75 : 1), and relatively weakly serrate in 5–10 segments, which decreases in length towards apex; relative lengths of antennal segments in the holotype as follows:— 1.40 : 1 : 1.47 : 1.71 : 1.61 : 1.61 : 1.47 : 1.37 : 1.29 : 1.24 : 2.14 (measured almost along each outer margin); terminal segment 2.44 times as long as wide, fusiform with inner margin excavated behind apex which is dully angulate, the penultimate one 1.55 times as long as wide, 0.58 times as long as terminal one. Pronotum apparently wider than head (1.29 : 1), clothed with light yellow to golden yellow pubescence, decorated with three large black spots, of which a longitudinal median spot is apparently separated from a pair of lateral ones; lateral sides arcuately convergent anteriad, arcuate in profile; hind angles broadly rounded. Scutellum almost right-triangular with rounded apex, bearing whitish pubescence. Elytra about 2.22 times as long as wide, about 0.82 times as wide as pronotum, decorated with whitish hairs as illustrated; second fascia connected with the basal one along suture,



Figs. 5–11. *Glipa* (*Macroglipa*) *watanabeorum* sp. nov. —— 5–6, Right antenna; 7, eighth abdominal sternite in external view; 8, left paramere in inner view; 9, same, lateral view; 10, right paramere in inner view; 11, ventral sclerotized branch of right paramere in lateral view. —— 5, 7–11, ♂, holotype; 6, ♀, paratype. (Scales: 0.5 mm.)

and also connected with third fascia by a pair of thin longitudinal medio-dorsal stripes; fourth fascia situated near the middle, distinctly zigzagged, connected with both third and posterior fasciae along suture though faintly to the latter which is ω-shaped; interspace between second and third fasciae clothed with dusky chocolate pubescence all over; sides almost straightly, gently convergent posteriad; each apex broadly rounded. Pygidium relatively short, about 0.41 times as long as elytra, about 0.91 times as long as elytral width, about 1.83 times as long as anal sternite, clothed with pale whitish pubescence basally, and yellowish to fuscous one apically; dorsum very gently elevated, particularly in basal part; sides abruptly attenuate from behind the middle to apex which is rather narrowly truncate. Anal sternite a little longer than basal width, rather deeply, ovally concave in ventral aspect; apex very gently arcuate. Eighth abdominal sternite somewhat thickened, slightly longer than wide (1.03 : 1), sparsely clothed with fine hairs in medio-apical area; apical projection gently bilobed, densely provided with short setae at the margin; anterior angles narrowly rounded. Legs with fore femur obviously curved inwards and downwards, sparsely with a row of long erect setae on inner ridge; fore tibia with basal erect setae on inner side; hind tibia and 1st segment of hind tarsus each with a longitudinal dorsal ridge, though rather indistinctly in the former and very vaguely in the latter; inner spur of hind tibia about 1.75 times as long as outer one.

Genitalia short and stout. Left paramere distinctly broad, deeply concave in the inner aspect of basal piece; sclerotized branch fairly broad, subparallel-sided, curved inwards at apical portion, with very widely truncate apex; membranous lobe thickened, somewhat densely with long or short erect setae in inner aspect. Right paramere slightly shorter than left one (0.97 : 1), deeply, longitudinally concave in the inner aspect of basal piece; membranous lobe fairly broad, rather spatulate though weakly constricted before the base, distinctly distorted outwards near the base; ventral sclerotized branch short and extremely thick, gradually, slightly broadened before apex in lateral view, with apical plate short.

Female. Body robuster than in male; dorsal whitish to yellowish maculations much developed, generally faintly paler than in male. Antenna shorter and broader; 5–10th segments more strongly serrate though each inner angle is more or less rounded; terminal segment fusiform with widely rounded apex. Pronotum with lateral margins almost straight in profile. Elytra very gently attenuate apicad; posterior fascia usually uninterrupted, and usually firmly connected with median fascia, though slightly interrupted in medio-dorsal areas and not reaching median fascia respectively in one specimen. Pygidium about 1.8 times as long as anal sternite, clothed with whitish pubescence almost all over. Anal sternite wider than long, slightly concave in ventral aspect. Fore femora and tibiae without erect setae, and almost straight in the latter.

Body length: ♂: 7.4 mm; ♀: 7.7–8.5 mm (incl. head and excl. pygidium).

Type series. Holotype: ♂, Yonehara, Ishigaki Is., Yaeyama Isls., S. Ryukyus, 12–VI–1974, T. MIKAGE leg. Paratypes: same island as for the holotype: 1♀, Mt. Omoto, 31–V–1973, T. KOBAYASHI leg.; 1♀, Yonehara, 9–VI–1975, K. MASAKI leg.; 1♀, Yonehara, 12–VI–1993, N. OKUDA leg.; 1♀, Ohtake, 25~26–V–2001, T. TSURU leg.

The holotype is deposited in the collection of the Kanagawa Prefectural Museum of Natural History, Odawara. The paratypes are in Mr. HATAYAMA's and Mr. TSURU's private collections.

Distribution. Ishigaki Is., Yaeyama Isls., S. Ryukyus, SW. Japan.

The present new species is somewhat similar to *Glipa* (*Macroglipa*) *fasciata* KÔNO (see TAKAKUWA, 2000, figs. 2 c–d & 4 a–e) from SW. Japan, Taiwan and C. and S. China (though the record from China is probably caused by misidentification), but apparently differs from it particularly in the following characteristics: scutellum clothed with whitish pubescence (darkened one in *G. fasciata*); elytral maculations consisting of whitish hairs (whitish yellow to golden yellow ones in *G. fasciata*), the posterior one usually not connected with median one; right paramere of male genitalia distinctly stouter and shorter, with sclerotized branch extremely shorter and thicker. It is also closely allied to *Glipa pseudofasciata* FAN et YANG from Hainan Is. of South China in the maculate pattern and the features of the male genitalia, but is separated from the latter mainly by having the following character states: antennae distinctly narrower, for example, terminal segment of male 2.44 times as long as wide (3.2 times in the latter); pygidium with indistinct dorsal carina (obvious one in the latter); left paramere of male genitalia stouter with sclerotized branch distinctly longer, and the right paramere with membranous lobe narrower and weakly constricted before base (very strongly so, the constriction being about 0.38 times as wide as the widest part in the latter, judging from the figure given in the original description).

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Notes on the Genus *Artactes* (Coleoptera, Tenebrionidae), with Description of a New Species from Borneo

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Abstract A new species of the genus *Artactes* is described from Borneo Is. under the name of *A. watanabei*. Some notes on this genus and its component species are given; *Macroartactes theresae* PIC, 1948 is synonymized with *Artactes alutaceus* (PIC, 1924); *Tetraphyllus rondoni* ANDO, 2000 is transferred to the genus *Artactes*.

Introduction

Since PASCOE (1868) established the genus *Artactes*, 14 species were described under the genus. They have been known from the Malay Archipelago including Borneo, Sunda, Indochina and China (Hong Kong), but never reported from India and Sri Lanka. This distributional range suggests that the genus *Artactes* may be endemic to the middle of Southeast Asia. They are clearly separated into two species-groups: a group with alutaceous or sericeous elytra and a group with smooth and not alutaceous elytra.

In this paper I will described a new species belonging to the "alutaceous" group from Borneo Island. In addition, some notes on the generic characteristics, synonymy and a new combination will be given.

Before going into further details, I wish to express my hearty thanks to Prof. Dr. Nobuo OHBAYASHI, Entomological Laboratory of Ehime University, for reviewing the manuscript of this paper. I acknowledge extensive help extended by Dr. Kimio MASUMOTO, Otsuma Women's University and Dr. Wolfgang SCHAWALLER, Staatliche Museum für Naturkunde, Stuttgart.

I have to thank Professor Dr. Yasuaki WATANABE, Tokyo University of Agriculture, for his continuous advice given for my research. I will dedicate this short paper to him on the occasion of his retirement from Tokyo University of Agriculture.

The abbreviations of technical terms used herein are as explained in ANDO's previous paper. The holotype to be designated is preserved in the Entomological Laboratory of Ehime University.

Genus *Artactes* PASCOE, 1868

Artactes PASCOE, 1868, 12; 1869, 288. —— GEBIEN, 1935, 64; 1941, 1137 (696).
Macroartactes PIC, 1924, 24.

Notes. GEBIEN (1935) pointed out that the diagnostic characters of this genus are the bordered elytral base and the obviously bent pronotal base. However, the latter character state is common to the genus *Tetraphyllus*. I have detected some additional characteristics to separate *Artactes* from *Tetraphyllus*, as follows: male genitalia obviously shorter in length, less than 5/17 of the body length; male metafemora constantly produced beyond lateral margins of elytra.

Artactes cyaneolimbatus FAIRMAIRE, 1893

Artactes cyaneolimbatus FAIRMAIRE, 1893 a, 30. —— GEBIEN, 1935, 66; 1940, 1138 (697).

Notes. GEBIEN (1935, 1941) stated that this species originally came from "Indochina", attributed a Vietnamese specimen to this species (1935), and gave the characteristics of this "Vietnamese *A. cyaneolimbatus*". KASZAB (1980, 179) followed GEBIEN's opinion without any comment. According to my survey of the original description and the type specimen in the Paris Museum, however, the type locality of this species is not in Indochina but Hong Kong.

The Vietnamese specimen has greenish alutaceous elytra, and is absolutely identical with *A. nitidiceps* FAIRMAIRE and utterly different from *A. cyaneolimbatus*. The type of *A. nitidiceps* FAIRMAIRE (1893 b, 297) well accords with the specimen noted by GEBIEN (1935) under the name of *A. cyaneolimbatus*. According to my examination of FAIRMAIRE's type, *A. cyaneolimbatus* is readily separable from *A. nitidiceps* by the following characteristics: elytra with punctures in rows, which are much larger than in *A. nitidiceps*; the spaces along punctures more or less costate posteriorly, carinate along the 8th puncture row near the elytral apex; elytral intervals flat, smooth and shiny, never having alutaceous derm; body colour pigmented dark reddish brown instead of green.

Type examined. 1 ♀, Hong Kong. (MNHN).

Artactes alutaceus (PIC, 1924)

Macroartactes alutaceus PIC, 1924, 25.
Artactes alutaceus: GEBIEN, 1941, 1137 (696).
Macroartactes Theresæ PIC, 1948, 11. *Syn. nov.*

Notes. Both the type materials of *M. theresae* and *A. alutaceus* are teneral in different degrees, but there are no differences in morphological characteristics. As the result, I concluded that the former is a junior synonym of the latter, though the colour is not the same between the two types.

Types examined. 1 ♀?, Soekaboemi, W. Preanger, 2000′, 1893, H. FRUHSTORFER (type of *Macroartactes alutaceus* Pic); 1♀, Palembang, Sumatra (type of *Macroartactes theresae* Pic). Both deposited in MNHN.

Artactes insignatus Pic, 1948

Artactes insignatus Pic, 1948, 12.

Notes. I have examined the type of *Artactes insignatus* Pic, 1948, and also found a specimen labeled "*Tetraphyllus iodochalceus* Fairmaire, cum. typo. comp." in the Paris Museum. After a careful examination, I concluded that there are no specific differences between them. However, I cannot decide at the moment that *A. insignatus* Pic, 1948 is a junior synonym of *T. iodochalceus* Fairmaire, 1882, because I have been unable to find out the type specimen of *Tetraphyllus iodochalceus* Fairmaire in the Museum.

Artactes oblongus Pic, 1935

Artactes oblongus Pic, 1935, 20.
Tetraphyllus oblongus (Pic): Gebien, 1941, 1137 (696).

Notes. Though Gebien (1941) transferred this species to the genus *Tetraphyllus*, it actually belongs to the genus *Artactes* in view of the character state of the bordered basal margins of the elytra according to my examination of the type specimen.

Artactes rondoni (Ando, 2000), comb. nov.

Tetraphyllus rondoni Ando, 2000, 183.

Notes. I originally described this species under the genus *Tetraphyllus*. So far as I know, this species has some intermediate characteristics between the genera *Artactes* and *Tetraphyllus*. For example, form of the male metatibiae and shape of the male genitalia of this species exhibit the characteristics of the genus *Tetraphyllus*. On the other hand, length of the male genitalia, the sulci along the basal margins of the elytra and the characteristics of the head suggest that it belongs to the genus *Artactes*. At this opportunity, I examined the types of this species again, and concluded that it should be transferred to the genus *Artactes* provided that the most important character state to separate the two genera is the presence or absence of the bordered basal margins of the elytra.

Artactes watanabei sp. nov.

(Figs. 1–6)

General description. Body hemispherical, strongly convex above; dorsal surface and elytral epipleuron mat due to the shagreened microsculpture. Scutellum, ventral surface and legs feebly lustrous. Colour black, dorsal surface dark green; pronotum

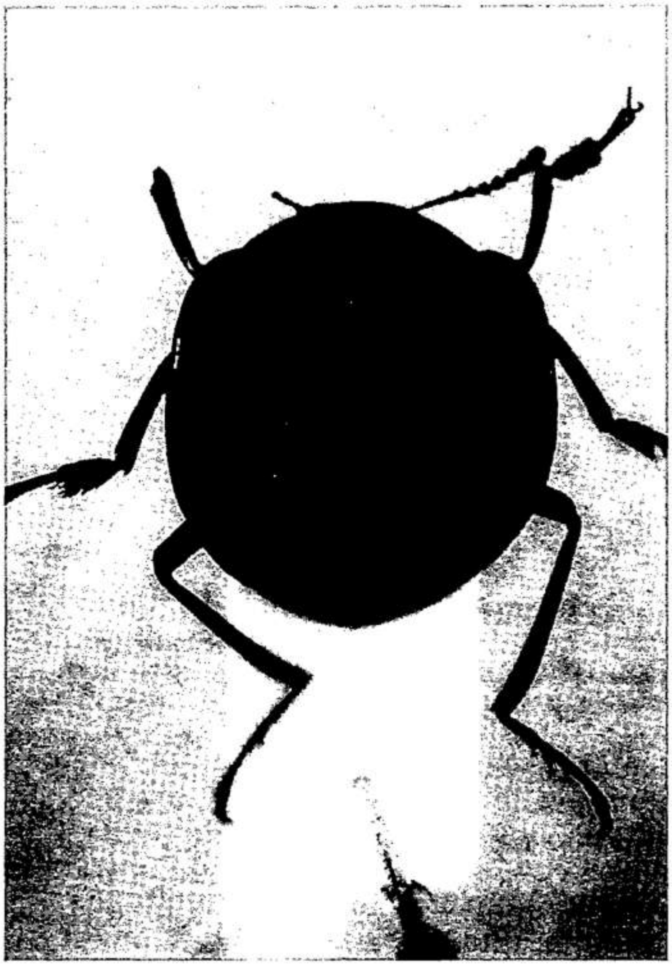


Fig. 1. *Artactes watanabei* sp. nov.; habitus.

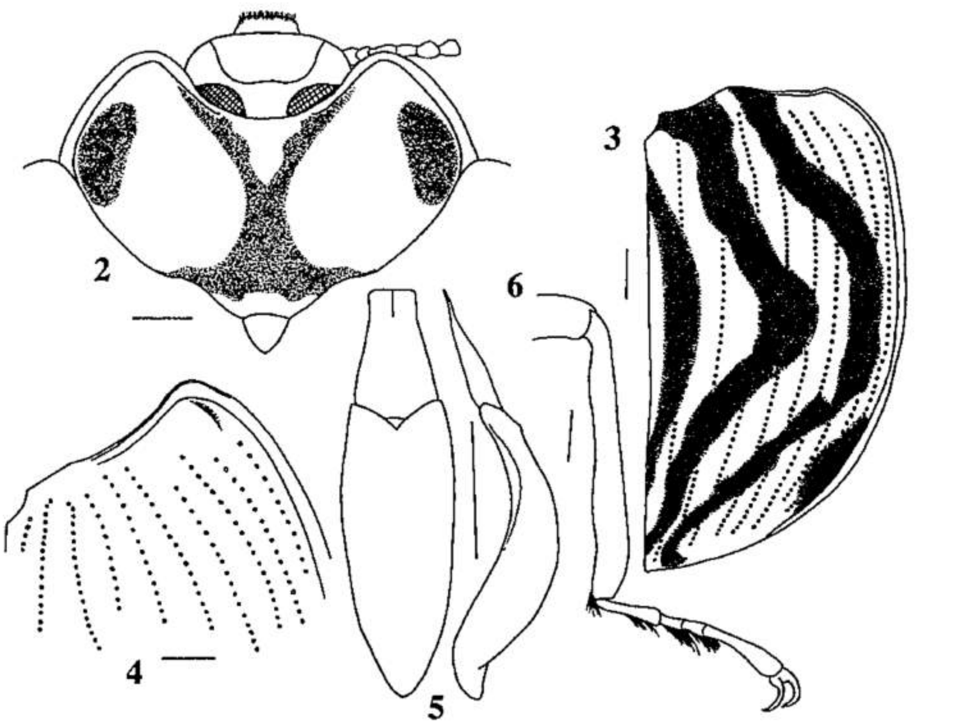
with dark reddish purple ypsiloidal fascia in middle and oval lateral fasciae of the same colour along lateral margins (Fig. 2); each elytron also with four undulate or arched dark reddish purple stripes (Fig. 3); all the fasciae on dorsal surface ambiguous, visible only under fluorescent lamp.

Male. Head quadrate with large eyes; clypeus well produced forwards, straight in middle of apex, weakly convex, sparsely punctate; fronto-clypeal suture finely engraved; genae reflexed at outer margins, minutely punctate, the punctures dense and hair-bearing in lateral areas; frons much narrower than eye, clearly depressed. Eyes oblong, mostly concealed by anterior part of pronotum. Antennae slender and not robust, reaching base of elytra; six distal segments hardly forming a distinct club; 5th and 6th segments each longer than wide, 7th to 10th each a little wider than long; 11th oblong-oval. Terminal segment of maxillary palpus short, right-angled triangular. Mentum cyathiform, strongly sloping posteriad, weakly raised along middle, depressed at sides and pubescent along anterior margin.

Pronotum transverse, U-shaped, covered with dense microsculpture, PW/PL=ca. 2.07, rather densely punctate, widely and shallowly sulcate along lateral margins, the sulci reaching lateral 1/3 of apical margin; apical margin deeply emarginate, with fine border interrupted at middle; lateral margins roundly produced, very finely bordered.

Elytra oval, strongly convex, covered with dense microsculpture, widest at middle, with lateral margins weakly covergent forwards from middle to behind humeri, EW/EL=ca. 1.04; sulci along lateral margins deepened near humeri, extending beyond middle of each elytral basal margin (Fig. 4); punctures in rows minute and sparse, space between them about two or three times the diameter of punctures, 9th row apart from lateral margin; intervals almost flat, hardly punctate; elytral epipleuron broad, strongly depressed, with weak and fine microsculpture; humeral callus reduced.

Prosternum short; prosternal process guttiform, strongly depressed in middle, and



Figs. 2–6. *Artactes watanabei* sp. nov.; 2, head and pronotum, showing the pattern of fasciae; 3, right elytron, showing the pattern of elytral stripes; 4, basal part of right elytron; 5, male genitalia (left: dorsal view; right: lateral view); 6, male hind leg, dorsal view. Scales: 1.0 mm.

strongly bent inwards in posterior half, moderately punctate. Mesosternal ridge weakly raised, short and U-shaped, each terminus with an apical protuberance which is directed downwards. Metasternum short, minutely and coarsely punctate in middle and obliquely rugose in lateral portions, with a pair of calli at the inner ends of transverse sulci. Abdominal sternites short and much transverse, finely and rather densely punctate on basal three sternites, minutely and densely so on apical two; 1st sternite densely rugose, with intercoxal process broad, campanulate, pointed at the apex; 5th sternite gently rounded at apex. Male genitalia (Fig. 5) short, with parameres dilated apicad in apical 1/4.

Legs robust; pro- and mesofemora not reaching lateral margins of elytra; pro- and mesotibiae short, weakly ancipital along outer margin, metatibae very long, about 1.21 times as long as metafemora, incurved apically and dilated in apical 1/4 (Fig. 6); protarsi with three basal segments strongly dilated, 4th segment minute and not dilated, 5th 1.25 times as long as the four preceding segments together, mesotarsi also dilated in basal three segments, 5th segment 1.33 times as long as the four preceding segments together, metatarsi simple, LM=14.5, 7.0, 6.7, 23.8.

Female. Genae with punctures not hair-bearing, the depression on frons shallower, clypeus with apical margin slightly sinuous in middle. Antennae shorter, and more distinctly clubbed. Mentum sparsely pubescent on disc. Elytra widest before middle, gently narrowed forwards from the widest point to behind humeri. Prosternal process shallowly depressed in middle, sparsely decorated with hair-bearing punctures; metasternum sparsely and microscopically punctate. Metasternum devoid of a pair of calli. Abdominal sternites evenly minutely punctate. Metatibiae simple and not long, neither incurved nor dilated; three basal segments of pro- and mesotarsi not dilated; LM=11.0, 7.4, 6.9, 24.0.

Measurements. Length: 11.0 mm; width: 10.0 mm (in male) and length: 8.3–9.6 mm; width: 7.1–8.4 mm (in females).

Type series. Holotype: ♂, Mt. Kinabalu, Mamut, N. Borneo, V–1980. (CAEU). Paratypes: 1♀, Mamut Copper Mine, near Ranau, Sabah, Borneo, 27–IV–1983, S. NAGAI leg. (CAEU); 1♀, Mt. Kinabalu N. P. Por. H. S. area, Langanan Fall, 900 m, Sabah, Borneo, 14–V–1987, A. SMETANA leg. (SMNS).

Distribution. North Borneo.

Diagnosis. This new species is similar to *A. alutaceus* PIC, 1924 in general appearance, but is clearly different from the latter by the following points: pronotum and elytra obviously fasciate or striped; pronotum more sparsely and obscurely punctate; frons in male distinctly depressed.

Etymology. The present new species is dedicated to Prof. Dr. Yasuaki WATANABE, Laboratory of Insect Resources, Tokyo University of Agriculture, in commemoration of his great exploit for the advancement of the Japanese Coleopterology.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 371–376, Mar. 31, 2002

Two New Species of the Genus *Allopezus* (Coleoptera, Tenebrionidae, Cnodalonini)

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Abstract Two new East Asian species of the tenebrionid genus *Allopezus* are described under the names *Allopezus watanabei* sp. nov. and *A. bhutanicus* sp. nov. *Allopezus malayensis* SCHAWALLER, 1994 is regarded as a junior synonym of *A. nishikawai* MASUMOTO.

The genus *Allopezus*, belonging to the tribe Cnodalonini of the family Tenebrionidae consists approximately of nine species distributed in East Asia.

I am going to describe herein two new species of the genus, one of which will be dedicated to Prof. Dr. Yasuaki WATANABE, Tokyo University of Agriculture, who guided my taxonomic study of the Coleoptera more than twenty years ago when I was a researcher of the University.

Before going into further details, I would like to express my sincere thanks to Dr. Shun-Ichi UÉNO, who critically read through the manuscript of this paper. Appreciation is due to Dr. Wolfgang SCHAWALLER, Staatliches Museum für Naturkunde, Stuttgart, who gave me an opportunity to study invaluable materials of beetles from East Asia and to Mr. Seiji MORITA, Tokyo, for taking photographs inserted in this paper.

Genus *Allopezus* GEBIEN, 1921

Allopezus GEBIEN, 1921, Philipp. J. Sci., **19**: 504. Type species: *Allopezus miritarsis* GEBIEN.
Asbolodomimus PIC, 1921, Mél. exot.-ent., Moulins, (34): 20.

Allopezus watanabei sp. nov.

(Figs. 1, 3 & 4)

Dark reddish brown, protuberances on elytra nearly black, two patches on elytra brownish yellow, the anterior patch nearly transverse at basal 2/5 and the posterior one oblique at apical 1/3, hairs on surface yellow; head and pronotum rather alutaceous, scutellum and elytra feebly sericeously shining; dorsal surface with fine scale-like hairs. Oblong-ovate, strongly convex above in posterior portion.

Head somewhat transversely elliptical, gently inclined apicad, rugoso-punctate, each puncture with a short scale-like hair; clypeus subtrapezoidal, weakly bent ventrad in front, truncate at apex, fronto- and geno-clypeal borders deeply sulcate; genae somewhat obliquely auriculate, rather strongly raised towards outer margins; frons wide, gently inclined anteriad; diatone about 3 times the width of transverse diameter of an eye, ocular sulci deepened only in parts behind eyes. Eyes medium-sized, slightly oblique, moderately convex above and roundly produced laterad. Antennae subclavate, reaching base of elytra, 11th segment subovate and largest, ratio of the length of each segment from base to apex: 0.32, 0.2, 0.37, 0.23, 0.27, 0.38, 0.44, 0.51, 0.49, 0.5, 0.62.

Pronotum subquadrate, 1.43 times as wide as long, widest at the middle; apex widely emarginate, feebly produced and arcuate in middle; base feebly bisinuous, bordered, slightly emarginate opposite to scutellum; sides moderately declined to lateral margins, which are gently produced, slightly explanate and tridentate; front angles rather triangularly produced apicad, each with rounded apex, hind angles subrectangular; disc moderately convex, rugoso-granulate, each granule with a grain-like scale, feebly depressed in basal 1/4, gently impressed at basal 1/4 on each side. Scutellum triangular, slightly elevated, flattened, almost glabrous, feebly microsculptured in basal part.

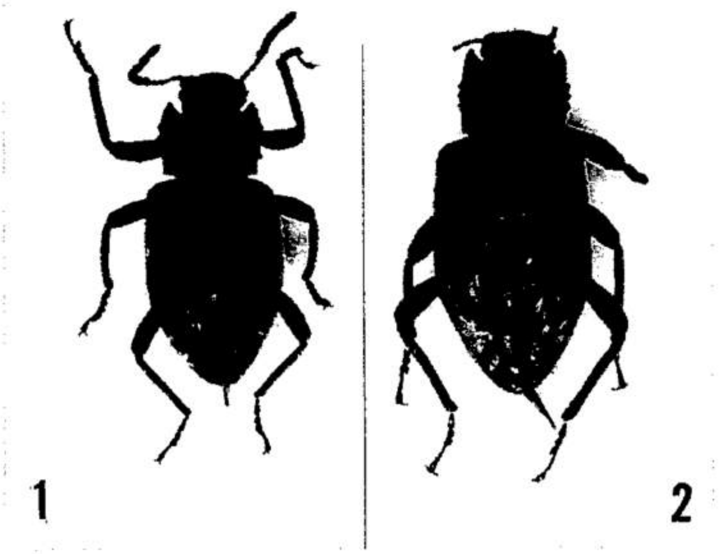
Elytra subovate, 1.54 times as long as wide, a little more than 2.94 times the length and 1.38 times the width of pronotum, widest slightly behind the middle, weakly narrowed anteriad and moderately, roundly so posteriad; dorsum strongly convex, highest at basal 2/5, feebly depressed in area inside scutellar striole; disc deeply but not widely punctato-striate, the punctures somewhat elongate and micro-granulate at upper edges, 5th stria deepened close to base; intervals very feebly convex, irregularly microsculptured, sometimes micro-granulate, rather densely covered with lingulate scales, the scaled stripe on each interval narrow, sparsely protuberant, the protuberances not so large, rounded, glabrous, unevenly arranged, and becoming somewhat keel-like in lateral parts; sides steeply declined to lateral margins, which are bordered by punctate grooves and micro-crenulate; humeri gently, somewhat longitudinally swollen; apices slightly produced.

Anal sternite isodiametrically sculptured, sparsely micro-granulate, covered with fine scale-like hairs. Legs closely punctate, each puncture with a fine scale-like hair; tarsal segments more or less dilated towards each apex, with penultimate segment asymmetric at the apex, protarsus more strongly produced forwards on inner side than on outer side, meso- and metatarsi more or less so on outer sides; ratios of the lengths of pro-, meso- and metatarsomeres: 0.3, 0.26, 0.25, 0.51, 1.2; 0.27, 0.23, 0.25, 0.46, 1.17; 0.47, 0.26, 0.38, 1.16.

Male genitalia slender, 1.7 mm in length, 0.26 mm in width, with basal part gently curved in lateral view; fused lateral lobes 0.65 mm in length, gradually narrowed anteriad, with noticeably spatulate apices.

Body length: 4.5 mm.

Holotype: ♂, "Si Phangnga N. P. / Phangnga-Prov. / South Thailand / 22 IV 2000 / S. TSUYUKI leg." (NSMT).



Figs. 1–2. Habitus.——1, *Allopezus watanabei* sp. nov., holotype, ♂; 2, *A. bhutanicus* sp. nov., holotype, ♂.

Note. This is the first record of the genus from Thailand.

Allopezus bhutanicus sp. nov.

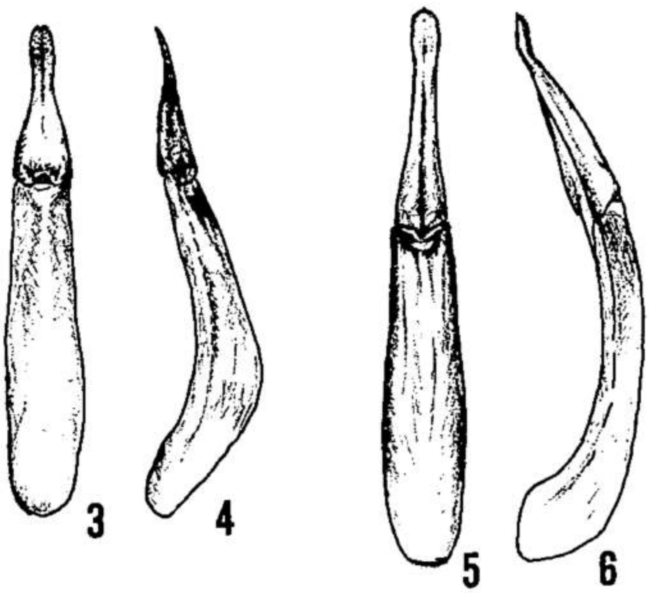
(Figs. 2, 5 & 6)

Dark brown, major parts of head and pronotum, basal and sutural parts and protuberances on elytra, and major parts of femora almost black, hairs on surface dusty yellow; dorsal surface weakly shining, ventral surface somewhat alutaceous; dorsal surface and legs covered with fine scale-like hairs, abdomen with fine hairs. Oblong-ovate, gently convex above in posterior portion.

Head rather transversely elliptical, feebly inclined apicad, slightly isodiametrically sculptured, rather closely punctate, each puncture with a short scale-like hair; clypeus transversely subhexagonal, scattered with fine rounded punctures, gently bent ventrad in front, truncate at apex, fronto-clypeal border curved and deeply sulcate; genae almost flattened, depressed in posterior parts before eyes, defined from clypeus by shallow grooves, with outer margins roundly produced; frons wide, gently inclined anteriad, scattered with somewhat ovate punctures, each of which is furnished with a scale-like hair; diatone about 3.5 times the width of transverse diameter of an eye, ocular sulci distinctly deepened behind eyes. Eyes medium-sized, slightly oblique, moderately convex above and roundly produced laterad. Antennae somewhat clavate, reaching basal 1/7 of elytra, ratio of the length of each segment from base to apex: 0.31, 0.2, 0.43, 0.33, 0.32, 0.33, 0.38, 0.43, 0.44, 0.43, 0.51.

Pronotum subquadrate, 1.18 times as wide as long, widest at the middle; apex widely emarginate, feebly produced in medial part, finely bordered on each side; base gently bisinuous, clearly bordered, slightly emarginate opposite to scutellum; sides moderately declined to lateral margins, which are slightly produced, explanate and tridentate; front angles projected apicad, hind angles subrectangular; disc weakly convex, feebly depressed in basal 1/4, rather closely punctate in major part, each puncture with a decumbent lanceolate scale, with impunctate areas at the middle and lateral parts of basal 2/5. Scutellum triangular with rounded sides, flattened, feebly microsculptured, sparsely scattered with microscopic punctures, each with a fine scale-like hair.

Elytra subovate, 1.52 times as long as wide, a little more than 3.01 times the length and 1.46 times the width of pronotum, widest at the middle, weakly narrowed anteriad and moderately, roundly so posteriad; dorsum rather strongly convex, highest at basal 2/5, feebly depressed in area between scutellar strioles and obliquely so in basal 1/3, with a pair of low swellings at basal 1/6; disc punctato-striate, the striae shallow and fine, the punctures small but deep, somewhat longitudinally ovate, each often with a minute granule at upper edge on each side, 5th stria deepened close to base; intervals feebly convex, irregularly microsculptured, sometimes micro-granulate, sparsely protuberant, the protuberances not large, rounded, glabrous and distinct in odd intervals and becoming larger in lateral parts, rather densely, irregularly covered with



Figs. 3–6. Male genitalia.——3–4, *Allopezus watanabei* sp. nov.; 3, dorsal view; 4, lateral view.——5–6, *A. bhutanicus* sp. nov.; 5, dorsal view; 6, lateral view.

decumbent lanceolate scales, which become denser on even intervals; sides steeply declined to lateral margins, which are bordered by punctate grooves; humeri normal; apices slightly roundly produced.

Anal sternite micro-granulate, covered with fine scale-like hairs. Legs closely punctate, each puncture with a fine seta, though in the holotype one of the fore legs is entirely lost and the other is lost from the midst of the tibia to the apex; metatibia with interior face feebly notched and widened near the extremity; meso- and metatarsi more or less dilated towards each apex, with penultimate segment asymmetrical at the apex; ratios of the lengths of pro-, meso- and metatarsomeres: –, –, –, –, –; 0.27, 0.23, 0.22, 0.31, 1.2; 0.45, 0.27, 0.34, 1.21.

Male genitalia slender, 1.9 mm in length, 0.32 mm in width, gently curved in lateral view; fused lateral lobes 0.8 mm in length, gradually narrowed anteriad, with noticeably elongated spatulate apices.

Body length: 5.8 mm.

Holotype: ♂, "Bhutan / Dorjee Khandu D // 2.X.1980 / 9.II.1081" (SMNS).

Note. This new species occurs in the northwesternmost part of the distributional range of this genus.

Allopezus nishikawai MASUMOTO, 1986

Allopezus nishikawai MASUMOTO, 1986, Ent. Rev. Japan, Osaka, **41**: 4.
Allopezus malayensis SCHAWALLER, 1994, Entomofauna, Ansfelden, **15**: 261–280. (*Syn. nov.*)

Key to the Species of the Genus *Allopezus*

1(8) Elytra with pale patches.

2(3) Elytra with large and small protuberances on each interval; pronotum covered with ovoid scales, elytra also with fusiform scales*; 5.7 mm; Malay Peninsula .... *A. nishikawai* MASUMOTO.

3(2) Elytra with small protuberances or granules on each interval.

4(5) Anterior patch on each elytron transversely crescent and lying from 3rd to 9th intervals, 3rd interval with small protuberances, which are almost of the same size and evenly arranged with one another; pronotum covered with short ovoid scales, which are rather grain-like, elytra also with ovate scales, which are relatively sparse; 5.5 mm; Philippines (Luzon Is.).......... .... *A. miritarsis* GEBIEN.

5(4) Anterior patch on each elytron transverse with anterior and posterior margins sinuate.

* Members of this genus are usually covered with variously shaped scales, which furnish one of the good characteristics for identification of the species.

6 (7) Pronotum with front angles more strongly produced, elytra covered with ovate scales, scaled stripe on each interval wider; 5 mm; N. Borneo.. *A. satoi* MASUMOTO.

7 (6) Pronotum with front angles less strongly produced, elytra covered with lingulate scales, scaled stripe on each interval narrower; 4.5 mm; S. Thailand... *A. watanabei* sp. nov.

8 (1) Elytra without pale patches.

9(12) Elytra without large protuberances.

10(11) Pronotum narrower, covered with decumbent lanceolate scales, elytral intervals covered with decumbent lanceolate scales, which are rather irregularly arranged; 5.8 mm; Bhutan.. *A. bhutanicus* sp. nov.

11(10) Pronotum wider, covered with small and short lingulate scales, elytral intervals covered with suberect lingulate scales, which are arranged in rows; 5.3 mm; S. Sumatra.. *A. shigeoi* MASUMOTO.

12 (9) Elytra with large protuberances.

13(14) Pronotum with apex obviously narrower than base, covered with broad ovate scales; elytra more densely protuberant, covered with lingulate scales; 5.65 mm; S. Sumatra.. *A. tsuge* MASUMOTO.

14(13) Pronotum with apex and base of almost the same width, elytra less densely protuberant.

15(16) Dorsum more strongly convex, pronotum covered with minute erect scales, elytra covered with minute decumbent and lingulate scales, punctures in striae rounded and more closely set; 6.3 mm; N. Borneo (Kina Balu).. *A. subcarinatus* (PIC).

16(15) Dorsum less strongly convex, pronotum covered with erect broad-ovate scales, elytra also with suberect, broad and ovate scales, punctures in striae somewhat ovoid and less closely set; 5.8–6.3 mm; Malay Peninsula.. *A. sakaii* MASUMOTO.

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A New Species of *Plesiophthalmus* (Coleoptera, Tenebrionidae) from Japan

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Abstract A new species of the tenebrionid genus *Plesiophthalmus* is described from northern Honshu, Northeast Japan, under the name *P. kikutii*. This new species is obviously different from any Japanese species of the genus.

This short paper is dedicated to Professor Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture. He and I studied together for two years at the same entomological laboratory. He gave me and the other fellows quite many precious advice. The specific name of the new species to be described herein is given after Mr. KIKUTI. He studied entomology under the supervision of Professor WATANABE.

Plesiophthalmus kikutii sp. nov.

[Japanese name: Semizo-kimawari]

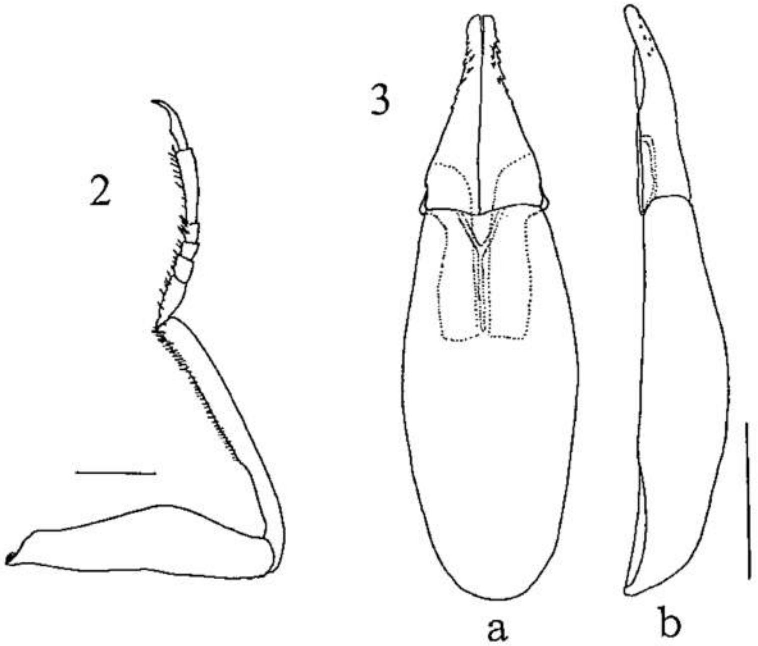
(Figs. 1–3)

Upper surface black with a faint gloss shine; antennae and legs black but more or less brownish.

Head roughly and coarsely punctate, antennal orbits raised and sparsely covered with punctures, each puncture bearing yellow pubescence in it; interocular space very narrow. Clypeus coarsely punctate, with yellow pubescence like head, but it is longer than on the latter; apical area smooth and blackish red brown; clypeal suture slight. Labrum transversely, sparsely punctate and with yellow pubescence; lateral sides slightly arcuate, frontal side straight; apical area blackish red brown and smooth. Antennae filiform though apical two segments are missing in the holotype, more or less covered with punctures and yellowish hairs; ratio of the length of each segment from basal to apical: 0.35, 0.25, 1.1, 0.6, 0.75, 0.9, 0.9, 0.7, 0.6, —, —.

Pronotum a little broader than long, widest behind the middle, with the sides slightly arcuate; lateral and anterior margins bordered, posterior margin not bordered, dorsum most highly convex behind central area, somewhat depressed transversely before the posterior margin; surface rather closely scattered with plain punctures, which bear very short yellow hairs.

Fig. 1. *Plesiophthalmus kikutii* sp. nov. (holotype).



Figs. 2–3. *Plesiophthalmus kikutii* sp. nov.——2, Male foreleg (scale: 1 mm); 3, male genitalia, dorsal view (a) and lateral view (b) (scale: 1 mm).

Scutellum triangular, its surface smooth, scattered with some fine punctures.

Elytra elongate, widest at basal fifth, narrowed posteriorly, with lateral margins sinuate at about middle; each elytron with nine striae, strial punctures not distinct; inner two striae irregular, interstices convex, with their surface transversely rugose.

Legs black though the tarsi and claws are brownish; each tarsal segment except claw segment gradually decreasing in length towards the apex. Fore legs:— inner margin of femur with a feebly produced tooth at middle, tibia slender with inner side concave at basal one-third. Middle legs:— femur slender with the outer side slightly concave at middle, tibia slightly arcuate; left claw segment and right leg lost. Hind legs:— femur as illustrated for mesofemur, tibia more strongly arcuate than mesotibia; right leg lost.

Ventral surface blackish brown with slight shine; prothorax black.

Abdomen rugose accompanied at both sides with sparsely scattered punctures; 5th abdominal segment subtruncate at the apex.

Median lobe of male genitalia provided with several thorns on each side at the apex.

Length 11 mm, width 5 mm.

Female unknown.

Distribution. Japan (Honshu).

Holotype: ♂, Tsuta Spa (Oirase drainage, Aomori Pref.), 30–VII–1955, Takahiko KIKUTI leg.

The holotype will be donated to the National Science Museum, Tokyo, Japan.

The present new species is different from any species of the genus in the following peculiarities: meso- and metafemora concave at middle on the outer side, meso- and metatibiae arcuate; pronotum closely and plainly punctate, and convex behind central area; interstices of elytra transversely rugose, etc.

Reference

MASUMOTO, K., 1989. *Plesiophthalmus* and its allied genera (Coleoptera, Tenebrionidae, Amarygmini), (Part 5). *Jpn. J. Ent.*, **57**: 536–564.

Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 381–391, Mar. 31, 2002

Phylogeny of the *Leptura arcuata* Complex (Coleoptera, Cerambycidae) as Deduced from Mitochondrial ND5 Gene Sequences

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Abstract *Leptura arcuata* PANZER, one of the lepturine longhorn beetles possessing distinct eight brownish yellow spots on the elytra, is widely distributed in the Eurasian Continent. In Japan, several populations closely related to this species are distributed and respectively treated as subspecies of *L. arcuata* or independent species.

In the present article, phylogenetic relationships have been estimated by analysing a large part of the mitochondrial NADH dehydrogenase subunit 5 (ND5) gene of 31 examples of *L. arcuata*, *L. mimica* BATES and *L. modicenotata* PIC from the Far East including Japan, Korea, China and Russia. The clustering of these species (hereafter called the *L. arcuata* complex) on the trees is largely linked to their geographic distribution and does not correlate with morphological characters, suggesting that the morphological characters, particularly elytral coloration, are more or less linked to geography, and not to the phylogeny of this species-complex. The species-complex is separated into three geographical clusters: the members of the first cluster are distributed in the continent (Group C); those of the second cluster occur in western Japan and Ullungdo Island off Korea (Group W); and those of the third cluster are restricted to eastern Japan (Group E). This result suggests that the continental ancestors (Group C) invaded Japan both from west and north presumably in the

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Glacial Age.

The ancestral form (Group C) would have possessed eight brownish yellow patches on the elytra and the individuals from Hokkaido (Group E) have maintained the ancestral character, and the eastern group that invaded Honshu (Group E) has a tendency to have blackish elytral color. The western group (Group W) has become differentiated predominantly to have brownish yellow elytral color.

Key words: *Leptura arcuata*, Cerambycidae, mitochondrial ND5 gene, phylogeny, morphology.

Introduction

Leptura arcuata PANZER, one of the lepturine longhorn beetles possessing distinct eight brownish yellow spots on the elytra, is widely distributed in the Eurasian Continent. Also in Japan, the populations closely related to this species are distributed and regarded either as a subspecies of *L. arcuata* or an independent species (Table 1). In this study, we collectively call *L. arcuata* and its related taxa the *L. arcuata* complex.

This complex is generally divided into four morphs based on the color pattern of the elytra as follows. Morph–1 (Fig. 1 A): Elytra are generally brownish yellow with black apices. Almost all individuals from the lowland areas of Japan except for the Tohoku district and Hokkaido belong to Morph–1. Morph–2 (Fig. 1 B): Elytra are almost black, sometimes with small brownish yellow spots. It frequently appears in eastern Japan. Morph–3 (Fig. 1 C): The elytra have eight brownish yellow spots, with the uppermost left spot "┐" shaped. It frequently appears in the highland areas of eastern Japan. It also occurs in western Japan, Oki Island, the Kii Peninsula, and so on. Morph–4 (Fig. 1 E): The elytra bear eight brownish yellow spots, with the uppermost spot "∩" shaped. This morph is distributed in the Eurasian Continent. Since many intermediate types apparently connecting different morphs appear in the Japanese inhabitants, many names have been proposed to them (OHBAYASHI, 1957, 1958, 1963). Prior to 1985, these four morphs had long been classified into three subspecies. *Leptura arcuata arcuata* (Morph–4) is distributed in the Eurasian Continent and its adjacent islands such as Ullungdo Island, Jejudo Island, and Sakhalin. The inhabitants of Ullungdo Island, off Korea, are rather peculiar morphologically because of possessing shorter elytra, and yet they were regarded as the same subspecies as the continental one, *L. arcuata arcuata*. The Japanese inhabitants were regarded as *L. a. mimica* BATES (Morphs–2 and 3), and *L. a. tsumagurohana* OHBAYASHI (Morph–1).

Table 1. Taxonomy of the *Leptura arcuata* complex.

Before MAKIHARA & SAITO (1985)	MAKIHARA & SAITO (1985), MAKIHARA *et al.* (1991)
L. arcuata (s. str.)	*L. arcuata*
L. a. mimica	*L. mimica*
L. a. tsumagurohana	*L. modicenotata*

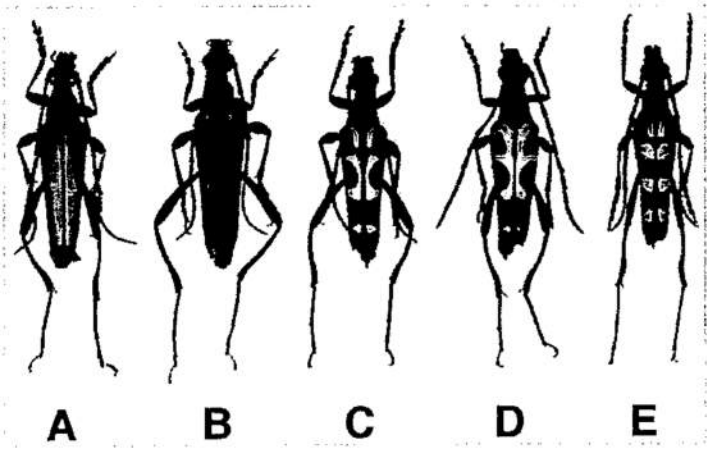

Fig. 1. The *Leptura arcuata* complex. A, *Leptura modicenotata* (Awaji Is.) (=Morph–1); B, *L. modicenotata* (Yamanashi Pref.) (=Morph–2); C, *L. mimica* (Shizuoka Pref.) (=Morph–3); D, *L. arcuata* (Ullungdo Is.); E, *L. arcuata* (S. Korea) (=Morph–4). For explanation of the morphs, see the text.

MAKIHARA and SAITO (1985) regarded Morphs–4 and 3 as separate species, *L. arcuata* and *L. mimica*, respectively, in view of the differences in the male hind femora, the lateral lobes of the male genitalia, and the spermathecae and spermathecal ducts of the female genitalia. Later, MAKIHARA, SAITO and SATÔ (1991) considered that Morphs–1 and 2 represented the same taxon with a full specific status, according to the elytral coloration, the color of the elytral pubescence, and the inner basal angle of lateral lobes. They revived the name *L. modicenotata* PIC for this taxon and synonymized *L. tsumagurohana* with it. IMASAKA (1991) considered that the differences between these morphs were merely of subspecific level. Several authors reported that the individuals having the *L. mimica*–type morphology occurred sympatrically with those having the *L. modicenotata*–type morphology in Wakayama, Chiba and Mie Prefectures, and so on.

A rather confusing taxonomic and phylogenetic situation of the *L. arcuata* complex based on morphology needs to be reexamined by more explicit procedures, such as molecular evolution studies, and we have analysed the phylogenetic relationships of *L. arcuata* and its related taxa on the basis of the sequence comparisons of the mitochondrial (mt) NADH dehydrogenase subunit 5 (ND5) gene. We have determined 910-bp nucleotide sequences of the ND5 gene for 31 specimens, and the phylogenetic trees have been constructed.

In the present paper, we tentatively adopted the scientific names following MAKIHARA *et al.* (1991).

This paper is dedicated to Professor Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture.

Materials and Methods

Sampling

The scientific names and localities of the specimens used are shown in Table 2 and Fig. 2. Five *L. arcuata* specimens from the Far East Asian Continent and Ullungdo Island off Korea, 19 *L. modicenotata* and 7 *L. mimica* specimens of various localities in Japan were analysed. The morph of each specimen was shown by shape of the symbol in Fig. 2. *Leptura aethiops* PODA from Honshu, Japan (one of the closely allied species to *L. arcuata*) was used as an outgroup species. To prevent degradation of DNA, the beetles were immediately killed in 95% ethanol and stored in it until use. A single adult individual of each species was used for DNA extraction.

DNA Extraction, PCR amplification and DNA sequencing

Total DNA was extracted from thorax muscle (10–25 mg) using the QIAamp Tissue Kit (QIAGEN GmbH, Germany). Total DNA was used as a template for amplification of ND5 DNA fragment by the polymerase chain reaction (PCR) (SAIKI *et al.*, 1988). The 910-bp DNA fragment was amplified by ver Ao-3 primer (5′–ATA TTC ATT TCA ACC TTG ATC–3′) (SU *et al.*, 1998) and ver 1.06 primer (5′–CCT GTT TCT GCT TTA GTT CA–3′) (SU *et al.*, 1996). Mostly the two primers used for PCR were sufficient to read 910 bp of the ND5 sequences. PCR amplifications were carried out in a 50–μl mixture containing 5 μl of 10×Ex Taq Buffer (Takara), 4 μl (2.5 mM each) of dNTP Mixture, 0.5 μl (25 pmol/μl) of each primer, and 1.25 units of Taq polymerase (TaKaRa EX–Taq, Takara). PCR was performed for 50 cycles of denaturation at 94°C for 1 min, primer annealing at 50°C for 1 min, and extension at 70°C for 2 min using a DNA Thermal Cycler Model 2400 (Perkin Elmer). The final single cycle was performed under the same conditions but with an extension step at 70°C for 7 min. The PCR product was purified by QIAquick PCR Purification Kit (QIAGEN GmbH, Germany).

Direct sequencing was performed by an automated ABI PRISM 377 DNA Sequencer using the dideoxy chain-termination method (SANGER, NICKLEN & COULSON, 1977). The reaction mixture for cycle sequencing consisted of 6 μl of dRhodamine terminator cycle sequencing Ready Reaction with AmpliTaq, DNA Polymerase, FS (Applied Biosystems, Foster City, Calif.), 0.1–0.3 pmol of DNA, 2.4 μl (1 pmol/μl) of sequencing primer, and distilled water to a total volume of 15 μl. The cycle-sequencing conditions were 25 cycles of 96°C for 10 sec, 50°C for 5 sec, and 60°C for 4 min, and an indefinite hold at 4°C using a GeneAmp PCR system 9600 (Perkin Elmer). The DNA product was cleaned with Centri-Sep spin columns (Applied Biosystems) and vacuum-dried before applying. The nucleotide sequence data reported in this paper will appear in the DDBJ, EMBL, and GenBank nucleotide sequence databases with the accession numbers shown in Table 2.

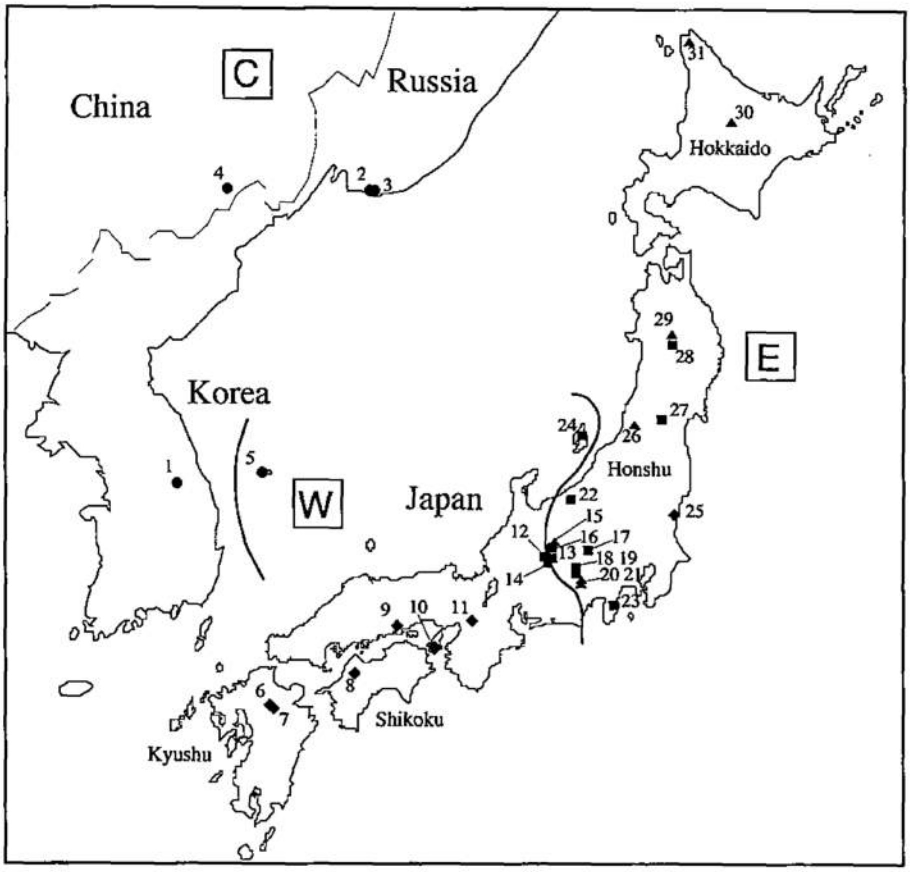

Fig. 2. Localities of specimens used in the present study. —— ◆: *L. modicenotata* (=Morph–1), ■: *L. modicenotata* (=Morph–2), ▲: *L. mimica* (Morph–3), ●: *L. arcuata* (=Morph–4). Locality numbers correspond to those shown in Table 2 and phylogenetic trees in Fig. 3. Large character surrounded by square indicates group (E: Group E, W: Group W, C: Group C). Approximate distribution boundaries for three groups are shown by lines. For explanation of the morphs and groups, see the text.

Phylogenetic analysis

The ND5 sequences were aligned and compared using Clustal W (THOMPSON *et al.*, 1994). The evolutionary distances (D) were computed by KIMURA's two-parameter method (KIMURA, 1980), and the phylogenetic trees were constructed by the neighbor-joining (NJ) method (SAITOU & NEI, 1987) and the maximum parsimony (MP) method. All these procedures for phylogenetic analyses were carried out using the PAUP* 4.0b8 (SWOFFORD, 1999). Bootstrap analysis was performed for all the trees (FELSENSTEIN, 1985) based on 1000 resamplings. The gene sequences of *Leptura aethiops* were used for an outgroup species.

Table 2. Specimens analysed in this study.

Scientific Name (by morphology)	Code	Morph	Site in Map	Locality	DDBJ/EMBL/ GenBank Accession No.
L. arcuata	ACA	4	1	Mt. Chi-ak-san, Kangwon-do, South Korea	AB077954
L. arcuata	ACA	4	2	Anisimovka, Primorsky, Russia	AB077955
L. arcuata	ACA	4	3	Anisimovka, Primorsky, Russia	AB077956
L. arcuata	ACA	4	4	Yanji, Jilin Province, China	AB077957
L. arcuata	ACA	4	5	Mt. Son-in-bong, Ullungdo Is., South Korea	AB077958
L. modicenotata	MDN	1	6	Mt. Taisenzan, Shounai-machi, Ooita Pref.	AB077959
L. modicenotata	MDN	1	7	Mt. Taisenzan, Shounai-machi, Ooita Pref.	AB077960
L. modicenotata	MDN	1	8	Mt. Takanawasan, Houjyou-shi, Ehime Pref.	AB077961
L. modicenotata	MDN	1	9	Mt. Yugasan, Kurashiki-shi, Okayama Pref.	AB077962
L. modicenotata	MDN	1	10	Sakiyama, Sumoto-shi, Awaji Is., Hyogo Pref.	AB077963
L. modicenotata	MDN	1	11	Hagitani, Takatsuki-shi, Osaka Pref.	AB077964
L. modicenotata	MDN	2	12	Tanohara, Mt. Ontake, Ootaki-mura, Nagano Pref.	AB077965
L. modicenotata	MDN	2	13	Tsukiyosawa Pass, Kaida-mura, Nagano Pref.	AB077966
L. modicenotata	MDN	2	14	Myoujinbashi, Mt. Ontake, Kaida-mura, Nagano Pref.	AB077967
L. mimica	MIC	3	15	Mt. Abou, Azumi-mura, Nagano Pref.	AB077968
L. modicenotata	MDN	2	16	Mt. Abou, Azumi-mura, Nagano Pref.	AB077969
L. modicenotata	MDN	2	17	near Inagoyu, Mts.Yatsugatake, Koumi-machi, Nagano Pref.	AB077970
L. modicenotata	MDN	2	18	Sasayama rindo, Oojika-mura, Nagano Pref.	AB077971
L. modicenotata	MDN	2	19	Shirabiso Pass, Kami-mura, Nagano Pref.	AB077972
L. mimica	MIC	3	20	Hirogawara, Shizuoka-shi, Shizuoka Pref.	AB077973
L. mimica	MIC	3	21	Tashiro, Shizuoka-shi, Shizuoka Pref.	AB077974
L. modicenotata	MDN	2	22	Otomiyama Pass, Myoukoukougen-machi, Niigata Pref.	AB077975
L. modicenotata	MDN	2	23	Mt. Amagi, Nakaizu-machi, Shizuoka Pref.	AB077976
L. modicenotata	MDN	2	24	Irikawa keikoku, Aikawa-machi, Sado Is., Niigata Pref.	AB077977
L. modicenotata	MDN	1	25	Jyoubankaigan Park, Hitachi-shi, Ibaraki Pref.	AB077978
L. mimica	MIC	3	26	Sarutagawa, Asahi-mura, Niigata Pref.	AB077979
L. modicenotata	MDN	2	27	Mt. Sanpouaragami, Mts. Zao, Yamagata-shi, Yamagata Pref.	AB077980
L. modicenotata	MDN	2	28	Mt. Mitsuishi, Matsuo-mura, Iwate Pref.	AB077981
L. mimica	MIC	3	29	Jyukai Line, Matsuo-mura, Iwate Pref.	AB077982
L. mimica	MIC	3	30	Mikuni Pass, Kamikawa-cho, Hokkaido	AB077983
L. mimica	MIC	3	31	Wakkanai-shi, Hokkaido	AB077984
L. aethiops				Mt. Eboshidake, Tazawako-machi, Akita Pref.	AB077985

The sequences of 1 and 4, 2 and 3, 6 and 7, 17 and 23, 28 and 29 are the same, respectively.

Results and Discussion

Sequence divergence and G+C content of the ND5 DNA

The maximum sequence divergence of the ND5 gene was 3.4% for all of the *L. arcuata* complex, and 10.54% for all including *Leptura aethiops*, which is the most closely allied species to the *L. arcuata* complex. The fact indicates that each population belonging to the *L. arcuata* complex is much more closely related to each other as compared with the other allied species in Japan. There were no insertions/deletions and no length variations for the ND5 gene throughout the species examined. The G+C content for the ND5 gene was 19.4±0.5% for the populations from Japan and Ullungdo Island, and 18.4% for the population from the continent. The genetic distances between the species estimated by KIMURA's two-parameter model of base substitution (KIMURA, 1980) ranged from 0 to 3.40% for all sites, and 0 to 7.74% for codon third

Table 3. KIMURA's 2-parameter distances (×100).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	ACA (S.Korea 1)		0.22	0.22	0	2.70	2.82	2.82	3.05	2.47	2.94	2.59	2.59	2.47	2.36	2.94	2.59	2.70	2.59	2.70	2.94	2.47	2.94	2.70	2.70	2.70	2.47	2.82	2.82	2.82	2.82	3.17	9.26
2	ACA (Russia 2)	0.33		0	0.22	2.70	2.82	2.82	3.05	2.47	2.94	2.59	2.59	2.47	2.36	2.94	2.59	2.70	2.59	2.70	2.94	2.47	2.94	2.70	2.70	2.70	2.47	2.82	2.82	2.82	2.82	3.17	9.26
3	ACA (Russia 3)	0.33	0		0.22	2.70	2.82	2.82	3.05	2.47	2.94	2.59	2.59	2.47	2.36	2.94	2.59	2.70	2.59	2.70	2.94	2.47	2.94	2.70	2.70	2.70	2.47	2.82	2.82	2.82	2.82	3.17	9.26
4	ACA (China 4)	0	0.33	0.33		2.70	2.82	2.82	3.05	2.47	2.94	2.59	2.59	2.47	2.36	2.94	2.59	2.70	2.59	2.70	2.94	2.47	2.94	2.70	2.70	2.70	2.47	2.82	2.82	2.82	2.82	3.17	9.26
5	ACA (Ulungdo Is. 5)	5.14	5.50	5.50	5.14		1.90	1.90	2.13	1.33	2.01	1.45	1.45	2.93	1.22	3.40	3.05	3.17	3.28	3.40	3.17	3.17	3.17	3.17	1.56	3.16	3.17	3.28	3.28	3.28	3.28	3.40	9.64
6	MDN (Ooita 6)	5.89	6.26	6.26	5.89	3.38		0	0.22	1.22	0.11	1.33	1.11	2.93	1.11	3.16	2.81	2.93	3.05	3.16	3.16	2.93	2.93	2.93	1.45	3.16	3.16	3.28	3.05	3.05	3.05	3.16	10.03
7	MDN (Ooita 7)	5.89	6.26	6.26	5.89	3.38	0		0.22	1.22	0.11	1.33	1.11	2.93	1.11	3.16	2.81	2.93	3.05	3.16	3.16	2.93	2.93	2.93	1.45	3.16	3.16	3.28	3.05	3.05	3.05	3.16	10.03
8	MDN (Ehime 8)	5.89	6.26	6.26	5.89	3.38	0	0		1.45	0.11	1.56	1.11	2.93	1.33	3.16	2.81	2.93	3.05	3.16	3.16	2.93	2.93	2.93	1.67	3.16	3.16	3.28	3.05	3.05	3.05	3.16	10.28
9	MDN (Okayama 9)	4.79	5.15	5.15	4.79	1.67	2.35	2.35	2.35		1.33	0.33	0.33	2.70	0.11	3.16	2.81	2.93	2.81	3.16	3.16	2.70	2.93	2.93	0.44	2.93	2.93	3.04	3.05	3.05	3.05	3.16	9.39
10	MDN (Awaji Is. 10)	5.89	6.26	6.26	5.89	3.38	0	0	0	2.35		1.45	1.22	2.81	1.22	3.05	2.70	2.81	2.93	3.05	3.05	2.81	2.81	2.81	1.56	3.04	3.05	3.16	2.93	2.93	2.93	3.04	10.15
11	MDN (Osaka 11)	4.79	5.15	5.15	4.79	1.67	2.35	2.35	2.35	0	2.35		0.44	2.59	0.22	3.05	2.70	2.82	2.70	3.05	3.05	2.59	2.82	2.82	0.55	2.81	2.82	2.93	2.93	2.93	2.93	3.05	9.52
12	MDN (Nagano 12)	4.79	5.15	5.15	4.79	1.67	2.35	2.35	2.35	0	2.35	0		2.82	0.22	3.05	2.70	2.82	2.70	3.05	3.05	2.59	2.82	2.82	0.55	3.05	2.82	3.16	2.93	2.93	2.93	3.05	9.52
13	MDN (Nagano 13)	5.53	5.89	5.89	5.53	5.89	6.23	6.23	6.23	5.51	6.23	5.51	5.51		2.59	0.44	0.33	0.22	0.55	0.44	0.66	0.44	0.66	0.22	2.93	0.22	0.44	0.33	0.55	0.55	0.33	0.89	10.03
14	MDN (Nagano 14)	4.79	5.15	5.15	4.79	1.67	2.35	2.35	2.35	0	2.35	0	0	5.51		3.05	2.70	2.82	2.70	3.05	3.05	2.59	2.82	2.82	0.33	2.81	2.82	2.93	2.93	2.93	2.93	3.05	9.26
15	MIC (Nagano 15)	6.26	6.63	6.63	6.26	6.63	6.97	6.97	6.97	6.24	6.97	6.24	6.24	0.66	6.24		0.55	0.44	0.55	0.66	0.66	0.44	0.89	0.44	3.39	0.66	0.66	0.77	0.78	0.78	0.55	1.11	10.54
16	MDN (Nagano 16)	5.53	5.89	5.89	5.53	5.89	6.23	6.23	6.23	5.51	6.23	5.51	5.51	0.66	5.51	1.33		0.11	0.44	0.33	0.78	0.33	0.55	0.11	3.04	0.33	0.33	0.44	0.44	0.44	0.22	0.77	10.15
17	MDN (Nagano 17)	5.89	6.26	6.26	5.89	6.26	6.60	6.60	6.60	5.88	6.60	5.88	5.88	0.33	5.88	1.00	0.33		0.55	0.22	0.66	0.44	0.44	0	3.16	0.22	0.22	0.33	0.33	0.33	0.11	0.66	10.28
18	MDN (Nagano 18)	5.53	5.89	5.89	5.53	6.63	6.97	6.97	6.97	5.51	6.97	5.51	5.51	1.33	5.51	1.33	1.33	1.67		0.78	0.78	0.11	1.00	0.55	3.04	0.77	0.55	0.89	0.89	0.89	0.66	1.00	9.90
19	MDN (Nagano 19)	5.89	6.26	6.26	5.89	7.01	7.34	7.34	7.34	6.61	7.34	6.61	6.61	1.00	6.61	1.67	1.00	0.66	2.36		0.89	0.66	0.66	0.22	3.39	0.44	0.44	0.55	0.55	0.55	0.33	0.89	10.41
20	MIC (Shizuoka 20)	6.26	6.63	6.63	6.26	6.63	6.97	6.97	6.97	6.24	6.97	6.24	6.24	1.33	6.24	1.33	2.01	1.67	2.01	2.36		0.66	1.11	0.66	3.39	0.89	0.89	1.00	1.00	1.00	0.78	1.33	10.28
21	MIC (Shizuoka 21)	5.16	5.53	5.53	5.16	6.26	6.60	6.60	6.60	5.15	6.60	5.15	5.15	1.00	5.15	1.00	1.00	1.33	0.33	2.01	1.67		0.89	0.44	2.93	0.66	0.44	0.77	0.78	0.78	0.55	1.11	10.03
22	MDN (Niigata 22)	6.63	7.01	7.01	6.63	6.26	6.60	6.60	6.60	5.88	6.60	5.88	5.88	1.67	5.88	2.36	1.67	1.33	3.05	2.01	3.05	2.70		0.44	3.04	0.66	0.66	0.77	0.78	0.78	0.55	0.22	10.15
23	MDN (Shizuoka 23)	5.89	6.26	6.26	5.89	6.26	6.60	6.60	6.60	5.88	6.60	5.88	5.88	0.33	5.88	1.00	0.33	0	1.67	0.66	1.67	1.33	1.33		3.16	0.22	0.22	0.33	0.33	0.33	0.11	0.66	10.28
24	MDN (Sado Is. 24)	5.50	5.86	5.86	5.50	2.34	3.03	3.03	3.03	0.66	3.03	0.66	0.66	6.23	0.66	6.97	6.23	6.60	6.23	7.34	6.97	5.86	6.23	6.60		3.16	3.16	3.27	3.28	3.28	3.28	3.27	9.64
25	IMDN (Ibaraki 25)	5.89	6.26	6.26	5.89	6.26	6.60	6.60	6.60	5.88	6.60	5.88	5.88	0.33	5.88	1.00	0.33	0.00	1.67	0.66	1.67	1.33	1.33	0	6.60		0.44	0.33	0.55	0.55	0.33	0.89	10.28
26	MIC (Niigata 26)	5.16	5.53	5.53	5.16	6.26	7.34	7.34	7.34	5.88	7.34	5.88	5.88	1.00	5.88	1.67	1.00	0.66	1.67	1.33	2.36	1.33	2.01	0.66	6.60	0.66		0.55	0.55	0.55	0.33	0.89	10.03
27	MDN (Yamagata 27)	6.61	6.99	6.99	6.61	6.99	7.33	7.33	7.33	6.60	7.33	6.60	6.60	0.99	6.60	1.67	0.99	0.66	2.35	1.33	2.35	2.01	2.01	0.66	7.33	0.66	1.33		0.66	0.66	0.44	1.00	10.15
28	MDN (Iwate 28)	6.63	7.01	7.01	6.63	7.01	7.34	7.34	7.34	6.61	7.34	6.61	6.61	1.00	6.61	1.67	1.00	0.66	2.36	1.33	2.36	2.01	2.01	0.66	7.34	0.66	1.33	1.33		0	0.44	0.89	10.15
29	MIC (Iwate 29)	6.63	7.01	7.01	6.63	7.01	7.34	7.34	7.34	6.61	7.34	6.61	6.61	1.00	6.61	1.67	1.00	0.66	2.36	1.33	2.36	2.01	2.01	0.66	7.34	0.66	1.33	1.33	0		0.44	0.89	10.15
30	MIC (Hokkaido 30)	6.26	6.63	6.63	6.26	6.63	6.97	6.97	6.97	6.24	6.97	6.24	6.24	0.66	6.24	1.33	0.66	0.33	2.01	1.00	2.01	1.67	1.67	0.33	6.97	0.33	1.00	0.99	1.00	1.00		0.77	10.15
31	MIC (Hokkaido 31)	7.36	7.74	7.74	7.36	6.99	7.33	7.33	7.33	6.60	7.33	6.60	6.60	2.35	6.60	3.04	2.35	2.01	3.04	2.70	3.74	3.39	0.66	2.01	6.95	2.01	2.70	2.69	2.35	2.35	2.35		10.02
32	*L. aethiops*	20.34	20.79	20.79	20.34	22.15	23.08	23.08	23.08	20.81	23.08	20.81	20.81	23.08	20.81	24.03	23.08	23.55	22.15	24.03	24.03	22.61	23.08	23.55	21.89	23.55	22.61	23.52	23.55	23.55	23.08	22.58	

Upper-right matrix: distance calculated for all nucleotide sites. Lower-left matrix: distance calculated for codon third positions. In both cases, the distances were computed by Kimura's two-parameter method. The three-letter code and the number correspond to the scientific name (following Makihara et al., 1991) and the locality number in table 2, respectively.

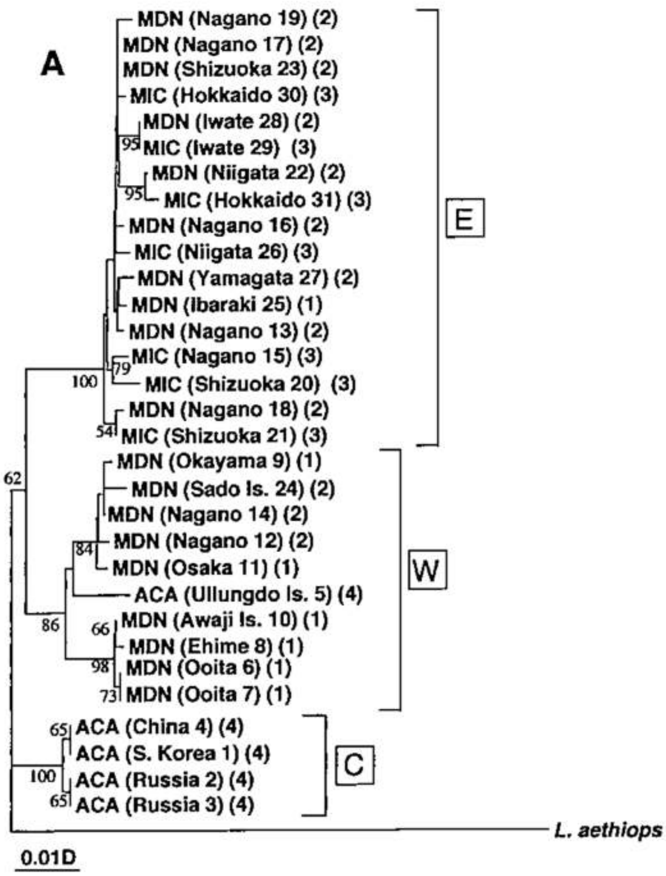

Fig. 3 A.

positions (Table 3).

Phylogeny of the Leptura arcuata *complex*

Figure 3 shows two kinds of the ND5 phylogenetic trees for the specimens analysed. Two major lineages are recognized in both the NJ- and MP-trees (Fig. 3 A and B). Lineage 1 is composed of the inhabitants of Japan and Ullungdo Island, and may be divided into two subclusters, one consisting of the inhabitants of eastern Honshu and Hokkaido (Group E), and the other the inhabitants of western Honshu, Shikoku, Kyushu and Ullungdo Island (Group W). Lineage 2 consists of the continental population (Group C). Both the NJ- and MP-trees yielded essentially the same topologies, although some of the nodes of these lineages and sublineages were supported by not-high bootstrap scores.

The morphs of the individuals analysed are shown in Fig. 2. Group E: 1 specimen

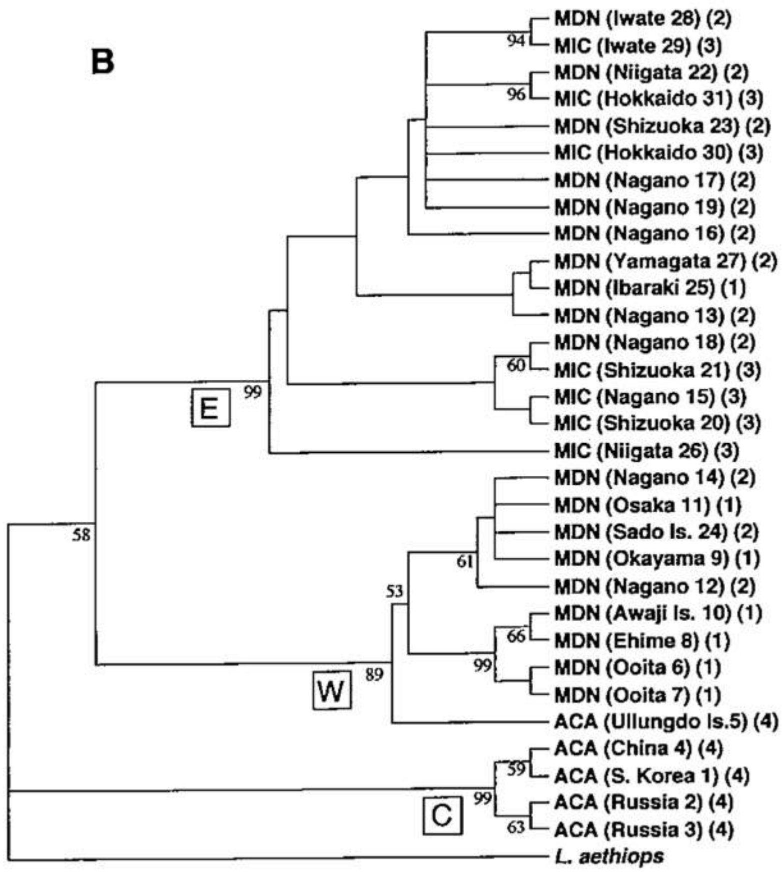

Fig. 3B.

Fig. 3. Phylogenetic trees of the mitochondrial ND5 gene of the *L. arcuata* complex. —— A. NJ-tree. D indicates KIMURA's two-parameter evolutionary distance. The number at each branching point indicates the bootstrap percentage of more than 50% obtained from 1000 replicates. —— B. MP-tree obtained by heuristic search of 10 random addition analysis with tree-bisection-reconnection (TBR) branch-swapping, the number at each branching point indicates the bootstrap percentage obtained from 1000 replications (heuristic search of 10 random addition analysis with TBR branch-swapping, described more than 50%). The sequences of *Leptura aethiops* was taken as an outgroup for these phylogenetic analyses. The three-letter code and the number correspond to the scientific name (following MAKIHARA *et al.*, 1991) and the locality number in Table 2, respectively. The morph number is indicated following the locality number in parenthesis. Squared capital letter indicates group. For explanation of the morphs and groups, see the text.

of Morph–1, 9 specimens of Morph–2 and 7 specimens of Morph–3. Group W: 6 specimens of Morph–1, 3 specimens of Morph–2 and 1 specimen of Morph–4. The specimen from Ullungdo Island (the site 5 in Fig. 2) belongs to this group, although it possesses distinct yellow markings on elytra, and has been included in *L. arcuata*.

Group C: 4 specimens of Morph–4. Thus, the clustering of the "species" on the trees is largely linked to their geographic distribution and does not correlate with morphological characters.

The approximate borders between those three groups are shown by the solid lines in Fig. 2. It is evident that the specimens which have been regarded as different morphological species are clustered in the same groups (lineage) notably in Group E, and the same morphological species such as *L. modicenotata* appear in parallel in two different groups, E and W. The facts suggest that the morphological characters are not appropriate to distinguish the taxa of the groups. Several alternative, but not necessarily mutually exclusive, possibilities exist to account for the results obtained. However, because of lack of substantial evidence for them, only one of these possibilities will be presented below. A gene family for determining the morphological (particularly color) pattern exists commonly in all the members in the *L. arcuata* complex. Some factors would affect the genome so as to express a certain gene(s) in the gene family. In Group C (the continental inhabitants) and some others (inhabitants of Ullungdo Island and Hokkaido), the gene expression would be stringently controlled so that only the *L. arcuata*–type morphology can be developed. On the other hand, in Groups W and E, particularly in the inhabitants of Japan excluding Hokkaido, the stringent control is relaxed so as to express various phenotypes depending on some factors. Then, what factors have had operated to bring about the expression of the morphological characters? Because of more or less geographically dependent development of various phenotypes (see Fig. 2), the involvement of certain ecological or environmental factors must be postulated as its cause, though this is only a matter of speculation.

Judged from the ND5 phylogenetic trees, the continental Group C would be the ancestral form in the *L. arcuata* complex, which invaded Japan both from west and north to form Groups W and E, respectively, with formation of a border approximately along the Itoigawa–Shizuoka tectonic line (see Fig. 2). The nearest localities, where the specimens belonging to Groups E and W were collected, are the site 12 (Tanohara, Mt. Ontake), the site 13 (Tsukiyosawa Pass, 1,700 m in altitude), and the site 14 (Myoujinbashi, 1,450 m in altitude). The site 13 is about 10 kilometers northeast of the site 14, both located in Kaida-mura, Nagano Prefecture. Since these localities are nearly on the borderline between Groups E and W, it is possible that the examples from the sites 12 and 14 are the derivatives of the hybrids between Group W and Group E. The invasions would have occurred at the time when the continent and Japan were connected by land-bridges in the Glacial Age. In the western inhabitants (Group W), the type of elytral color has been switched from eight-spotted mostly to brownish yellow, although some individuals bear blackish and some others eight-spotted elytra. In Group E, most of the inhabitants of Hokkaido maintained the ancestral eight-spotted type character, while the elytral color of the invaders to Honshu became blackish with occasional appearance of the eight-spotted form in the areas of high altitude in eastern Japan.

From the phylogenetic analyses reported in this paper, it may be appropriate *ten-*

tatively to regard the members of the *L. arcuata* complex as a single species, *L. arcuata*, because 1) individuals with indistinguishable morphological characters appear in different phylogenetic lines, and 2) the evolutionary history of the *L. arcuata* complex is not very old.

Acknowledgments

We thank the following colleagues for supply of the invaluable specimens used in this study: M. HASEGAWA, H. HIRAYAMA, M. KANEKO, K. KONDO, T. MATSUMOTO, Y. NAGAHATA, T. NONAKA, Y. OKUSHIMA, T. SHINKAWA and M. SHIRAKAWA. We are grateful to Hideko TANAKA for skillful technical assistance. This study was partially supported by a Grant-in-Aid for Scientific Research (C) from the Ministry of Education, Science, Sports and Culture of Japan (No.11640706).

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A New *Paramimistena* (Coleoptera, Cerambycidae) from Northern Borneo

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Abstract A new species of the cerambycine genus *Paramimistena* is described from northern Borneo under the name of *P. watanabei* nov. This species is a third member of the genus from Borneo, and has close similarity to *P. brevis* NIISATO et MAKIHARA described from eastern Kalimantan.

Paramimistena is one of the most peculiar groups of the Cerambycinae in having markedly large elongate prothorax, and also shows unique modification of elytral reduction and extension of abdominal segments. The genus has so far been known from eight species of the Himalayas, Indochina and Borneo, and is provisionally classified into three species-groups, so-called the groups of *P. polyalthiae*, *P. enterolobii* and *P. subglabra*, respectively. In this paper, I will introduce a new member of the group of *P. enterolobii* from northern Borneo.

It is about two decades ago that I first met Professor Yasuaki WATANABE at a regular meeting of the Coleopterologists' Assosiation, Tokyo. After that, I was matriculated as a research student in his laboratory during 1985–1987. I have invariably received his guidance and kindliness for my study since that student time. In commemoration of his retirement from Tokyo University of Agriculture, I am going to dedicate this short paper and to give his name to a new charming cerambycid beetle.

I am also deeply indebted to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for his continuous guidance and kindly reviewing the manuscript of this paper.

The abbreviations used in the description follow those explained in my previous papers.

Paramimistena watanabei sp. nov.

(Fig. 1)

Similar in facies to *P. brevis* NIISATO et MAKIHARA of the group of *P. enterolobii* described from eastern Kalimantan, but the prosternum is almost flattened and not concave near the apex, with externally visible prosternal process, the elytra are fairly short, attaining to apical third of the tergite 6 and more conspicuously haired on the surface, and the abdomen is more densely pubescent.

Colour almost as in *P. brevis*, even in a broad pale yellow band on the elytra which is located at a level between basal eighth and basal 7/20; slightly more darkish in general, moderately shiny.

Female. Head moderately voluminous, well convex, a little wider than the apical width, distinctly narrower than the maximum width of pronotum, strongly constricted just behind eyes, arcuate at neck, provided with large distinct reticulations throughout, and rather densely clothed with erect pale hairs, HW/PA 1.10, HW/PW 0.99; frons strongly transverse, weakly raised throughout, gently narrowed apicad, arcuately emarginate at sides, with a fine median line, somewhat irregularly reticulate (9–10 reticulations in a transverse line near middle), with anterior margin moderately arcuate, FL/FB 0.56; clypeus depressed, arcuately emarginate at anterior margin, CL/CB 0.17; genae deep, 3/4 the depth of lower eye-lobes, with ventral angles briefly toothed in frontal view; vertex gently raised, gradually declined to frons, hardly raised towards antennal cavities; eyes moderate in size, with lower lobes strongly prominent laterad, upper lobes weakly so and separated from each other by a little more than 3/5 the width of occiput. Antennae fairly long, a little longer than body, relatively slender, hardly thinner towards apical segments, rather sparsely clothed with irregular-sized (mostly long) erect pale hairs, and with dense minute pubescence on apical seven segments; scape rather weakly clavate, the longest, nearly as long as segment 5, 1.12 times as long as segment 3, segment 2 slightly elongate and weakly thickened apicad, segment 3 a little longer than segment 4, both hardly thickened at apices, terminal segment gently arcuate, bluntly pointed.

Pronotum cylindrical though gently arcuate at sides, not so elongate, weakly contracted to base, widest just before middle, fairly narrower than the humeral width of elytra, PL/PA 1.52, PB/PA 0.94, PL/PW 1.36, PW/EW 0.91, PL/EL 0.60; apex gently emarginate, indistinctly bordered, slightly wider than base; base narrowly though distinctly bordered near middle, gently emarginate; sides more or less arcuate for a short distance from apex, gently arcuate to just before basal fifth, then roundly narrowed to arcuate basal fifth; disc moderately raised in apical 4/5, slightly depressed along apical margin, shallowly and transversely depressed on apical 2/5, with depressed basal collar moderately convex at middle; surface provided with medium to large-sized reticulations except near apical margin and on basal collar, scattered with long erect pale hairs, and with dense silvery white pubescent bands on basal collar, and also sparser though similar pubescence at sides. Scutellum large and transverse, rounded at apex, strongly convex, densely clothed with silvery white pubescence.

Elytra slightly reduced, attaining to the apical third of tergite 6, rather distinctly ample posteriad, widest at apical 2/7, dehiscent in apical fifth, very narrowly bordered along both sutural and external margins, EL/EW 2.06; sides with weakly expanded humeri, weakly arcuately emarginate to basal 3/8, then rather strongly divergent to apical 2/7 and convergent to completely rounded apices; disc gently convex, flattened above, deeply concave near suture just behind scutellum, sparsely scattered with shal-

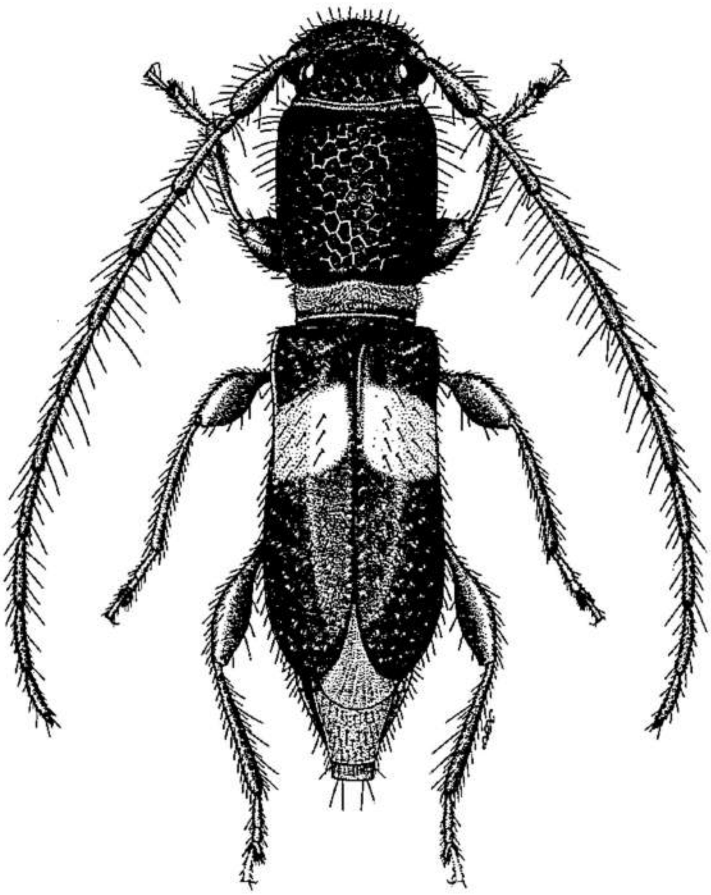

Fig. 1. *Paramimistena watanabei* sp. nov., from northern Borneo.

low medium-sized punctures, rather sparsely though almost uniformly clothed with medium-sized pale erect hairs.

Prosternum gently raised, depressed along apical margin, almost straight in lateral view, slightly rugose or almost smooth, partly with some weak reticulations at the parts before coxal cavities, almost glabrous in middle, rather densely clothed with silvery white pubescence at sides; prosternal process very strongly compressed, though visible from above between fore coxae. Meso- and metathoraces almost smooth, densely clothed with silvery white pubescence at sides of mesosternum, apical third of metepisterna, and sides of metasternum, and also thinly haired elsewhere. Abdomen moderately reduced, strongly narrowed apicad, 1.4 times as long as the basal width, provided with a few punctures on basal sternite, thinly haired, and densely clothed with silvery white pubescence at sides of sternites 3–6; sternite 3 (ventrite 1) 2/3 the length of basal width, slightly narrowed apicad, arcuate at sides, sternites 4–5 (ventrites 2–3) a little less than 3/10 the length of basal width, sternite 5 (ventrite 3) 1/4 the length of basal width, weakly straightly narrowed apicad, anal sternite (ventrite 5) slightly bent ventrad, a little longer than the basal width, strongly narrowed apicad, and weakly emarginate at apical margin.

Legs short and fairly thin; femora with clubs distinctly swollen, remarkably compressed, with hind one arcuate near base and swollen in apical 5/8; tibiae slender, weakly thickened apicad; tarsi thin, with 1st segment of hind tarsus 1.3 times as long as the following two segments combined.

Body length 4.05 mm.

Type specimen. Holotype ♀, Kimanis Road, 10.5 miles from Keningau, Crocker Range, 1,100 m in alt., Sabah, Borneo, E. Malaysia, 8–IV–1984, M. ITO leg. The holotype will be preserved in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Distribution. Borneo.

Notes. Among the congeners of *Paramimistena*, this new species may have closer relationship to *P. brevis* NIISATO et MAKIHARA rather recently discovered from eastern Kalimantan as a member of the group of *P. enterolobii*. As was mentioned in the above description, this new species has in common with *P. brevis* such characteristic features as the dense transverse pubescent band on the base of pronotum, the broad and relatively short elytra provided with a similar pale band on basal third, and the long antennae which are surpassing the body in the female. In spite of such similarities, this new species is clearly discriminated from that eastern Kalimantan species in the shorter elytra which barely reach the apical third of the tergite 6, the flattened prosternum and more densely haired abdominal sternites.

This new species seems very rare like the other Bornean congeners of the genus, since only a single female specimen was available for this study. The collecting site of this species, 10.5 miles point from Keningau on the Kimanis Road in the Crocker Range of northern Borneo, is a very famous collecting site for both natives and foreigners. I have never seen additional specimens of this species in an enormous lot of cerambycid specimens brought forth from that locality in the last decade or more.

This new species, *P. watanabei*, is dedicated to Professor Yasuaki WATANABE for commemorating his contribution to the entomology, especially the biology of staphylinid beetles and also to upbringing of younger coleopterologists including myself.

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Taxonomic Notes on the Genus *Pseudocalamobius* (Coleoptera, Cerambycidae, Lamiinae) of Japan

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Abstract The Japanese species of the genus *Pseudocalamobius* Kraatz are revised with illustrations of male genitalia and some taxonomic features. *Pseudocalamobius japonicus tsushimae* Breuning and *P. leptissimus okinawanus* Samuelson are raised to the species rank, respectively. *Pseudocalamobius montanus* Hayashi is revived from a synonym of *P. japonicus*.

The genus *Pseudocalamobius* was erected by Kraatz (1879) based on the Amur specimen of *Calamobius japonicus* which was originally described by Bates (1873) from Nagasaki, Japan. Up to the present, about 30 species of its members have been known from Asia. As for the Japanese representatives after Kraatz (1879), Hayashi (1959) added a second species, *P. montanus*, which has been regarded as a junior synonym of *P. japonicus* after Kusama and Takakuwa (1984). In 1961, Breuning described a subspecies, *P. japonicus tsushimae*, from Tsushima Is. Successively in 1965, Samuelson also described a subspecies of *P. leptissimus* from Okinawa Is., the Ryukyus, under the name *P. leptissimus okinawanus*, of which the nominotypical subspecies is distributed in high mountainous area of Taiwan.

Recently, we had an opportunity to examine a number of specimens of this genus from various areas of Japan and also Taiwan and Korea through the courtesy of our friends. As the results, it became clear that *P. montanus* Hayashi was a distinct species, and that *P. japonicus tsushimae* and *P. leptissimus okinawanus* should be recognized as an independent species, respectively. Taking this opportunity, we are going to review the Japanese species of the genus in the present paper.

It is a great pleasure for us to dedicate this paper to Professor Dr. Yasuaki Watanabe for commemorating his retirement from Tokyo University of Agriculture. He had been a supervisor of the first author, and also one of the excellent leader in the entomology of Japan.

Before going further, we wish to express our hearty thanks to Mr. S. SHIYAKE of the Osaka Museum of Natural History, for the loan of the type materials of *Pseudocalamobius montanus* under his care. We are also indebted to the following entomologists for their kind offer or loan of valuable materials used in this study: Messrs. or Drs. S.-M. LEE, T. MAENAMI, T. SENOH, N. KANIE, M. SAWAI, K. AKITA, M. TAKEDA, H. YOSHITAKE, R. TOYOSHIMA, M. SHIRAISHI, S. INADA, S. SAITO, A. SAITO, F. HIROKAWA, M. FURUKAWA and K. ESAKI.

The abbreviations used in this paper are as follows; IEL – length of inferior eye lobe, measured in sublateral view; GL – length of gena, measured in sublateral view; PL – length of pronotum; PB – basal width of pronotum; EL – length of elytra; EW – width of elytra across humeri; TL – total length of body, from tip of head to elytral apices.

Genus *Pseudocalamobius* KRAATZ, 1879

Pseudocalamobius KRAATZ, 1879, 116 (type species: *Calamobius japonicus* BATES, 1873). —— MATSUSHITA, 1933, 382. —— BREUNING, 1966, 87. —— KOJIMA & HAYASHI, 1969, 105. —— HAYASHI, 1984, 94. —— KUSAMA & TAKAKUWA, 1984, 394. —— HASEGAWA, 1992, 563.

Body slender, elongate. Head with frons convex, vertical and not oblique; vertex not protruding. Antenna slender and fairly long, usually more than 2.5 times as long as body length, densely clothed with long erect hairs beneath; scape elongate, not reaching base of pronotum; 3rd segment longer than scape and shorter than 4th.

Pronotum cylindrical, longer than broad, without any tubercles or granules on disc. Elytra slender and elongate, usually more than 3.5 times as long as basal width.

Legs short, hind leg not reaching apex of elytra; femora linear.

Male provided with a pair of large semicircular concavities fringed with hairs at the base of 4th and 5th abdominal sternites (Figs. 9–12), but female without such structure.

Pseudocalamobius japonicus (BATES, 1873)

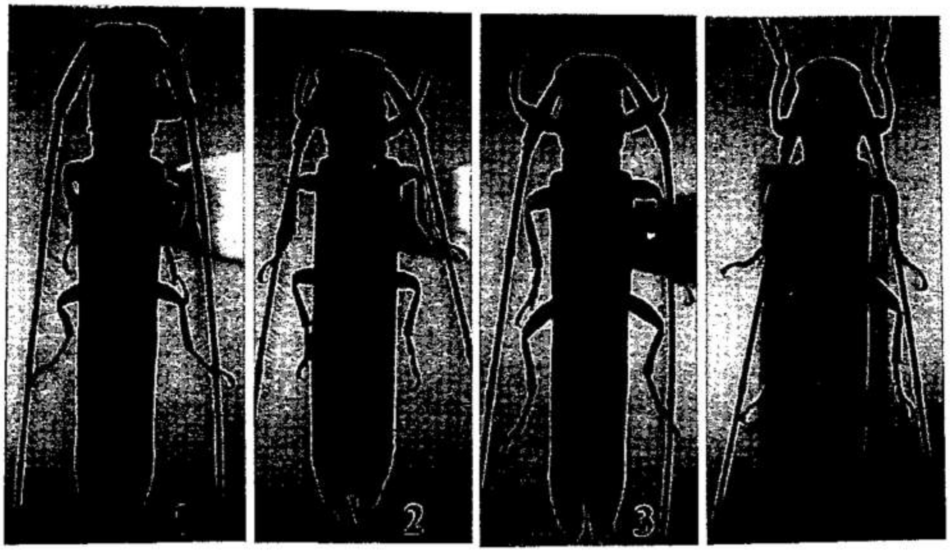
[Japanese name: Douboso-kamikiri]

(Figs. 1, 6, 10, 13, 15)

Calamobius japonicus BATES, 1873, 383–384 (type locality: Nagasaki, Kyushu, Japan).
Pseudocalamobius japonicus: KRAATZ, 1879, 116, pl. 1, fig. 7. —— MATSUSHITA, 1933, 386. —— BREUNING, 1961, 156; 1966, 89. —— K. OHBAYASHI, 1963, 312, pl. 156, fig. 19. —— KOJIMA & HAYASHI, 1969, 107, pl. 32, fig. 11. —— HAYASHI, 1984, 96, pl. 18, fig. 26. —— KUSAMA & TAKAKUWA, 1984, 400, pl. 59, figs. 429, 429 b. —— HASEGAWA, 1992, 563.

Male. Length (from tip of head to elytral apices) 7.58–10.73 mm. Width (maximum width of elytra) 1.40–1.87 mm.

Head black; antenna dark brown except for blackish scape; pronotum black except for apical and basal margins which are dark brown; elytra dark brown; legs light



Figs. 1–4. Habitus of *Pseudocalamobius* spp.—— 1, *P. japonicus* (BATES); 2, *P. tsushimae* BREUNING; 3, *P. montanus* HAYASHI; 4, *P. okinawanus* SAMUELSON.

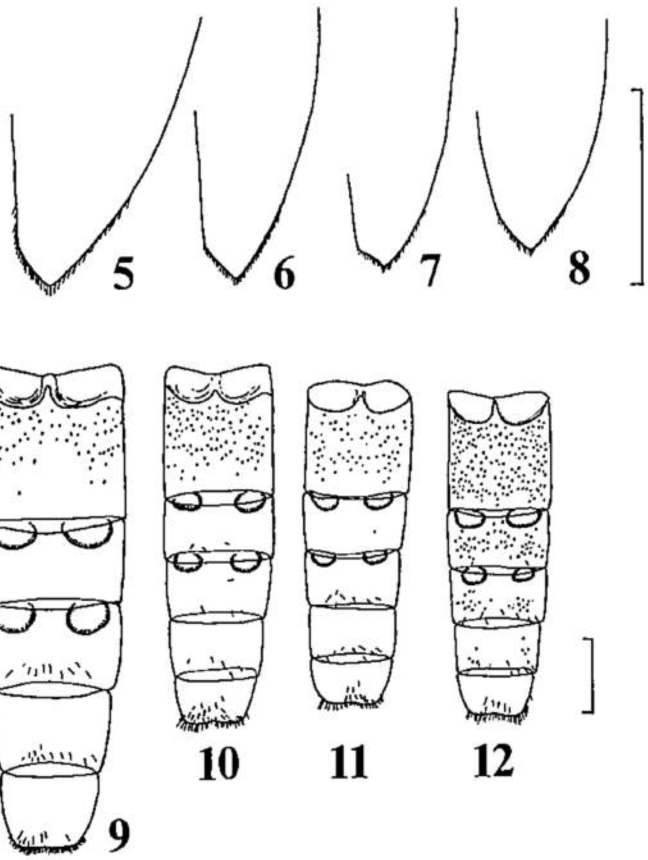
brown except for blackish femora. Body sparsely covered with rather short gray pubescence; the dense pubescence on the disc of pronotum forming a median longitudinal stripe.

Head as broad as maximum width of pronotum, frons squarish and strongly convex; disc rather sparsely punctured; eyes moderately convex, large in size with cubic triangular inferior eye lobe; IEL/GL 1.38–1.73; antennae about three times as long as body length, end of 5th segment passing the elytral apex; relative length of each segment as follows:— 15: 1: 19: 27: 30: 32: 29: 29: 27: 25: 45.

Pronotum moderate in length, rather strongly constricted at apical 1/4 and basal 1/6; PL/PB 1.07–1.18, EW/PB 1.38–1.47, EL/PL 5.05–5.47; surface densely punctured.

Elytra relatively long and elongate, EL/EW 4.00–4.48, EL/TL 0.74–0.77; surface densely and strongly punctured; sides almost parallel in basal 7/8–8/9, then convergent towards obliquely truncate apices (Fig. 6); 4th to 7th abdominal segments without punctures (Fig. 10).

Male genitalia as in Fig. 15; median lobe about 0.25 times as long as abdominal length, weakly arcuate, sides almost parallel in basal 1/3, then strongly convergent towards apex; ventral plate hardly longer than dorsal plate; viewed dorsally, sides of ventral plate gently convergent towards rounded apex; dorsal plate rounded at apex. Tegmen elongate-fusiform, geniculated at basal 4/7; lateral lobes about 1/8 the whole length of tegmen, about 2.0 times as long as the maximum width, each provided with



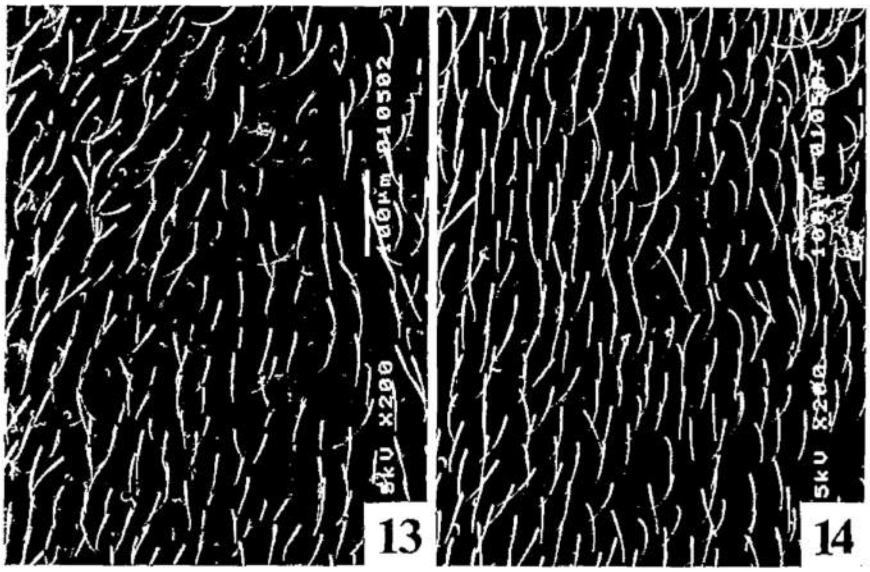
Figs. 5–12. Elytral apex and male abdomen of *Pseudocalamobius* spp. —— 5, 9, *P. montanus* HAYASHI; 6, 10, *P. japonicus* (BATES); 7, 11, *P. tsushimae* BREUNING; 8, 12, *P. okinawanus* SAMUELSON. —— 5–8, Elytral apex; 9–12, abdominal sternites of male. (Scale: 1 mm.)

short erect hairs on ventral surface and 4–5 rather long setae at apex, which are shorter than the length of lateral lobes.

Female. Length (from tip of head to elytral apices) 7.08–10.13 mm. Width (maximum width of elytra) 1.25–1.83 mm.

Very similar to male, but relatively large; abdomen sometimes sparsely provided with punctures on lateral margins of 4–6 sternites. The ratios of body parts: IEL/GL 1.3–1.8, PL/PB 1.0–1.17, EW/PB 1.33–1.47, EL/PL 4.91–5.80, EL/EW 4.00–4.35, EL/TL 0.74–0.77.

Specimens examined. 1♂, Shindenbara, Tateiwa-mura, Fukushima Pref., 17~19–VI–1983, S. SAITO leg.; 2♂♂, Ôwada-rindô, Narusawa-mura, Yamanashi Pref., 24–VII–1984, M. HARADA leg.; 1♂, Hikawa-rinô, Enzan-shi, Yamanashi Pref., 28–V–



Figs. 13–14. Elytral pubescence of *Pseudocalamobius* spp.——13, *P. japonicus* (BATES); 14, *P. tsushimae* BREUNING.

1983, M. HASEGAWA leg.; 2♂♂, Mt. Ena-san, Nakatsugawa-shi, Gifu Pref., 9–VII–1978, N. KANIE leg.; 2♀♀, Tarumi-tôge Pass, Neo-mura, Gifu Pref., 25–VII–1987, N. KANIE leg.; 1♂, 1♀, Mt. Tsurugi, Tokushima Pref., 11~12–VII–1993, N. OHBAYASHI leg.; 1♂, 3♀♀, Komenono, Matsuyama-shi, Ehime Pref., 23–V–1965, N. OHBAYASHI leg.; 1♂, Hiratani, 350 m alt., Kashima-shi, Saga Pref., 1~2–VII–2000, M. FURUKAWA leg.; 2♀♀, Mt. Kurodake, Kujû, Ôita Pref., 18–V–1985, N. OHBAYASHI leg.

Distribution. Japan (Honshu, Shikoku, Kyushu). Many authors recorded this species from various localities of East Asia, *viz.* Russia (Amur, Ussuri-Primorye region, Sakhalin, Kunashir Is.), Korea and eastern China (GRESSITT, 1951; LEE, 1979; CHEREPANOV, 1984, etc.), but we were unable to examine any specimen from outside Japan perfectly identical with *P. japonicus.* The materials previously recorded must be re-examined in the future.

Host plant. Many species of the genus *Hydrangea* (Saxifragaceae).

Pseudocalamobius tsushimae BREUNING

[Japanese name: Tsushima-douboso-kamikiri]

(Figs. 2, 7, 11, 14, 16)

Pseudocalamobius japonicus tsushimae BREUNING, 1961, 156 (type locality: Is. Tsushima, Kyushu, Japan); 1966, 89.——K. OHBAYASHI, 1963, 312.——KOJIMA & HAYASHI, 1969, 107, pl. 32, fig. 11 a.——HAYASHI, 1984, 96.——KUSAMA & TAKAKUWA, 1984, 400, pl. 59, fig. 429 c.——HASEGAWA, 1992, 563.

Male. Length (from tip of head to elytral apices) 7.17–10.08 mm. Width (maximum width of elytra) 1.29–1.88 mm.

Head black; antenna dark brown except for blackish scape; pronotum black except for apical and basal margins which are dark brown; elytra dark brown; legs light brown except for blackish femora. Body rather densely covered with whitish gray pubescence.

Head slightly broader than the maximum width of pronotum, frons square and moderately convex; disc rather sparsely punctured; eyes moderately convex, large in size with cubic triangular inferior eye lobe; IEL/GL 1.57–1.72; antennae about three times as long as body length, end of 5th segment passing the elytral apex; relative length of each segment as follows:— 15: 1: 17: 21: 30: 32: 29: 29: 28: 24: 42.

Pronotum moderate in length, rather strongly constricted at apical 1/4 and basal 1/6; PL/PB 1.06–1.18, EW/PB 1.32–1.45, EL/PL 5.00–5.23; surface densely punctured.

Elytra relatively long and elongate, EL/EW 4.00–4.25, EL/TL 0.74–0.76; surface densely and strongly punctured; sides almost parallel in basal 7/8–8/9, then convergent towards obliquely truncate apices, the outer angle of which is sometimes slightly pointed (Fig. 7); 4th to 7th abdominal sternites without punctures (Fig. 11).

Male genitalia as in Fig. 16; median lobe about 0.25 times as long as abdominal length, weakly arcuate, widest at basal 1/3, then strongly narrowed towards apex; ventral plate shorter than dorsal plate; apex of ventral plate rounded; dorsal plate weakly projected apicad, with apex rather narrowly rounded. Tegmen elongate-fusiform, geniculated at basal 4/7; lateral lobes about 1/10 the whole length of tegmen, about 2.0 times as long as the maximum width, each provided with short erect hairs on ventral surface and 2–3 long setae at apex, which are longer than the length of lateral lobes.

Female. Length (from tip of head to elytral apices) 7.75–11.29 mm. Width (maximum width of elytra) 1.33–2.04 mm.

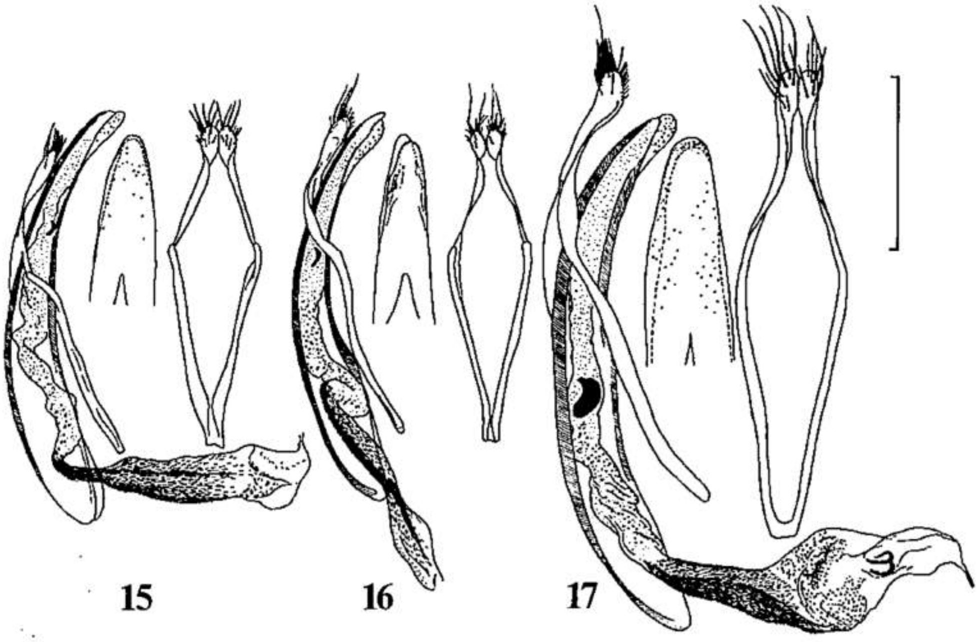
Very similar to male, but relatively large; abdomen sometimes sparsely provided with punctures on lateral margins of 4–6 sternites. The ratios of body parts: IEL/GL 1.25–1.74, PL/PB 1.06–1.19, EW/PB 1.33–1.5, EL/PL 5.05–5.82, EL/EW 3.95–4.47, EL/TL 0.75–0.77.

Specimens examined. 1♂, 2♀♀, Mine, Mine-chô, Tsushima Is., 19~20–V–1984, S. SAITO leg.; 1♀, same data, T. SENOH leg.; 1♀, Mt. Ôboshi-yama, Mine-chô, Tsushima Is., 6–VII–1983, A. SAITO leg.; 3♀♀, same locality, 20~23–V–1984, S. SAITO leg.; 1♂, same locality, 6–V–1978, H. MAKIHARA leg.; 1♀, same data, T. SENOH leg.; 1♂, Anagizawa, Izuhara, Tsushima Is., 23~24–V–1984, T. SENOH leg.; 1♀, Mt. Mokkoku, Izuhara, Tsushima Is., 24–V–1982, Y. NOTSU leg.; 1♂, same locality, 13–VII–2000, J. OGAWA leg.

Distribution. Japan (Tsushima Is., Nagasaki Prefecture).

Host plant. Unknown.

Notes. This species was originally described by BREUNING (1961) as a subspecies of *P. japonicus*. He distinguished it from the nominotypical subspecies by the shape of elytral apex, which is obliquely truncated and its outer angle slightly pointed



Figs. 15–17. Male genitalia of *Pseudocalamobius* spp.——15, *P. japonicus* (BATES); 16, *P. tsushimae* BREUNING; 17, *P. montanus* HAYASHI. (Left: median lobe and tegmen in lateral view; center: apex of median lobe in ventral view; right: tegmen in ventral view.) (Scale 0.5 mm.)

(Fig. 7). Though this character state is subject to individual variation according to MAKIHARA and SAITO (1987), we concluded that *P. japonicus tsushimae* should be regarded as an independent species by the following morphological differences in comparison with *P. japonicus*: pubescence on elytra longer and denser (Figs. 13–14), and the color more whitish; ventral plate of male genitalia shorter than dorsal plate; viewed dorsally, sides of dorsal plate scarcely projected apicad; parameral setae longer and denser.

Pseudocalamobius montanus HAYASHI, stat. rev.

[Japanese name: Miyama-douboso-kamikiri]

(Figs. 3, 5, 9, 17)

Pseudocalamobius montanus HAYASHI, 1959, 58–59 (type locality: Kamikôchi, Nagano, Japan).——KOJIMA & HAYASHI, 1969, 107, pl. 32, fig. 12.——HAYASHI, 1984, 96, pl. 18, fig. 25.

Pseudocalamobius japonicus (part): KUSAMA & TAKAKUWA, 1984, 400, pl. 59, fig. 429 a.——HASEGAWA, 1992, 563 [nec BATES, 1873].

Male. Length (from tip of head to elytral apices) 10.7–13.0 mm. Width (maximum width of elytra) 1.89–2.44 mm.

Body relatively large and flattened. Head black; antenna light brown except for blackish scape; pronotum black except for apical and basal margins which are light brown; elytra light brown; legs light brown except for blackish femora. Body sparsely covered with rather short gray pubescence, the dense pubescence on the disc of pronotum forming a median longitudinal stripe. Pubescence on each elytron also forming indistinct three longitudinal stripes (Fig. 3), of which one is along sutural margin, another is on the middle of disc and the other is just inside of lateral margin. Meso- and metasterna and abdominal sternites sparsely clothed with gray pubescence.

Head as broad as maximum width of pronotum, frons squarish and strongly convex; surface rather sparsely punctured; eyes strongly convex, relatively small in size with cubic triangular inferior eye lobe; IEL/GL 1.04–1.17; antennae about three times as long as body, middle to end of 5th segment passing the elytral apex; relative length of each segments as follows:— 14: 1: 16: 21: 24: 25: 24: 24: 20: 19: 33.

Pronotum relatively long, moderately gibbous, rather strongly constricted at apical 1/4 and basal 1/6; PL/PB 1.08–1.21, EW/PB 1.33–1.47, EL/PL 4.71–5.29; surface rather weakly punctured.

Elytra moderate in length, EL/EW 4.05–4.29, EL/TL 0.74–0.77; disc densely punctured but the area of the longitudinal stripes without punctures; sides almost parallel in basal 7/8–8/9, then convergent towards obliquely truncate apices (Fig. 5); 4th to 7th abdominal segments without punctures (Fig. 9).

Male genitalia as in Fig. 17; median lobe about 0.23 times as long as abdominal length, rather large, weakly curved at basal and apical 1/4, sides almost parallel in basal 3/4 then gently convergent towards apex; ventral plate scarcely longer than dorsal plate; viewed dorsally, sides of ventral plate gently convergent towards widely rounded apex. Tegmen elongate fusiform, widest before middle; lateral lobes elongate, about 1/10 the whole length of tegmen, each provided with 2–3 short erect hairs on ventral surface and 7–8 long setae at apex.

Female. Length (from tip of head to elytral apices) 10.06–13.78 mm. Width (maximum width of elytra) 1.78–2.56 mm.

Very similar to male, but relatively large; abdomen sometimes sparsely provided with punctures on lateral margins of 4–6 sternites. The ratios of body parts: IEL/GL 1.00–1.25, PL/PB 1.00–1.23, EW/PB 1.29–1.54, EL/PL 5.03–5.83, EL/EW 4.11–4.50, EL/TL 0.75–0.78.

Type specimens examined. Types of *P. montanus* HAYASHI preserved in the Osaka Museum of Natural History: 1♂, Kamikôchi, Nagano Pref., 26–VII–1953, M. HAYASHI leg. (holotype); 1♀, same locality as the holotype, 1–VIII–1951, T. TUZIMOTO leg. (paratype).

Other specimens examined. 1♂, Kamikôchi, Nagano Pref., 25–VII–2000, K. AKITA leg.; 1♀, same locality, 5–VII–2000, K. AKITA leg.; 3♂♂, 1♀, Hatajuku, Hakone, Kanagawa Pref., 11–V–1983, T. MAENAMI leg.; 2♀♀, same locality, 15–V–1983, T. MAENAMI leg.; 1♀, same locality, 5–VI–1983, T. MAENAMI leg.; 1♂, Mt. Komagatake, Hakone, Kanagawa Pref., 15–VI–1983, T. MAENAMI leg.; 1♀, Mt. Mikuniyama, Hakone, Kanagawa Pref., 22–VI–1983, T. MAENAMI leg.; 2♀♀, Mt. Takatori-yama, Zushi-shi, Kanagawa Pref., 11–V–1973, H. FUJITA leg.; 1♂, 1♀, same locality, 23~24–IV–1950, H. HATTORI leg.; 1♂, 1♀, Yunotani-rindô, Shiramine-mura, Ishikawa Pref., 15–VIII–2000, K. ESAKI leg.; 1♂, 1♀, Mennoki-tôge Pass, ca. 1,200 m alt., Inabu-chô, Aichi Pref., 26–VI–1991, M. HASEGAWA leg.; 5♂♂, 2♀, from Tsuchigoya to Mt. Misen, Mt. Ishizuchi, Ehime Pref., 7~8–VI–1997, N. OHBAYASHI leg.; 2♀♀, Mt. Ishizuchi-san, Saijô-shi, Ehime Pref., 13–VII–1997, M. SHIRAISHI leg.; 1♂, Momiki, Izumi-mura, Kumamoto Pref., 6–VI–1990. F. HIROKAWA leg.; 1♂, same locality, 28–VI–1989, F. HIROKAWA leg.

Distribution. Japan (Honshu, Shikoku, Kyushu).

Host plant. *Ribes japonicum* (Saxifragaceae).

Notes. This species is very similar to *P. japonicus*, but differs from the latter in the following features: body large and flattened, elytral coloration light brown and each elytron provided with thee densely pubescent longitudinal stripes; male genitalia with median lobe weakly curved at basal and apical 1/4 and not strongly narrowed towards apex; lateral lobes more elongate and apical setae longer than in *P. japonicus*.

Pseudocalamobius okinawanus SAMUELSON, stat. nov.

[Japanese name: Kouzan-douboso-kamikiri]

(Figs. 4, 8, 12, 18)

Pseudocalamobius leptissimus okinawanus SAMUELSON, 1965, 126 (type locality: Chinen, Okinawa Is., Japan).——KOJIMA & HAYASHI, 1969, 108, pl. 32, fig. 13.——HAYASHI, 1984, 96.——KUSAMA & TAKAKUWA, 1984, 400, pl. 59, figs. 430, 430 a.——HASEGAWA, 1992, 564.

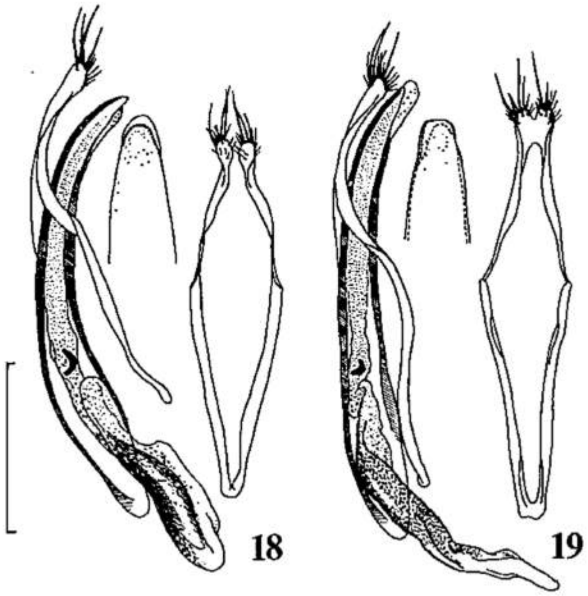
Male. Length (from tip of head to elytral apices) 7.67–10.00 mm. Width (maximum width of elytra) 1.33–1.75 mm.

Head black; antenna dark brown; pronotum black except for basal margin which is reddish brown; elytra dark brown with shoulders reddish; legs dark brown to reddish brown. Body rather densely covered with whitish gray pubescence, the dense pubescence on the disc of pronotum forming a median longitudinal stripe.

Head as broad as maximum width of pronotum, frons squarish and strongly convex; disc rather densely punctured; eyes very strongly convex, relatively large in size with cubic triangular inferior eye lobe; IEL/GL 1.27–1.60; antennae more than three times as long as body length, middle of 5th segment passing the elytral apex; relative length of each segment as follows:— 15: 1: 17: 25: 28: 29: 28: 28: 26: 24: 42.

Pronotum long, weakly constricted at basal 1/6; PL/PB 1.25–1.31, EW/PB 1.39–1.50, EL/PL 4.67–5.00; surface densely punctured.

Elytra relatively elongate, EL/EW 4.05–4.38, EL/TL 0.74–0.76; surface densely and strongly punctured; sides slightly contracted towards basal 7/8–8/9, then covergent to obliquely truncate apices (Fig. 8); the 3rd to 7th abdominal segments provided with punctures (Fig. 12).



Figs. 18–19. Male genitalia of *Pseudocalamobius* spp. —— 18, *P. okinawanus* SAMUELSON; 19, *P. leptissimus* GRESSITT. (Left: median lobe and tegmen in lateral view; center: apex of median lobe in ventral view; right: tegmen in ventral view.) (Scale 0.5 mm.)

Male genitalia as in Fig. 18; median lobe about 0.28 times as long as abdominal length, weakly arcuate, rather strongly curved at apical 1/7, widest at basal 1/4, then gently attenuate towards apex; ventral plate shorter than dorsal plate, with rather widely rounded apex; dorsal plate rounded at apex. Tegmen elongate, geniculated before middle; lateral lobes small, about 1/11 the whole length of tegmen, each provided with short erect hairs on ventral surface and 4–5 long setae at apex, which are about twice as long as the length of lateral lobes.

Female. Length (from tip of head to elytral apices) 8.50–11.08 mm. Width (maximum width of elytra), 1.67–2.08 mm. Very similar to male, but relatively large, with the sides of elytra almost parallel. The ratios of body parts: IEL/GL 1.16–1.38, PL/PB 1.21–1.31, EW/PB 1.50–1.60, EL/PL 4.81–5.12, EL/EW 3.85–4.14, EL/TL 0.75–0.76.

Specimens examined. 2♂♂, 1♀, Haneji, Okinawa Is., 16–IV–1984, M. SAWAI leg.; 1♂, same locality, 10–VI–1986, M. SAWAI leg.; 1♂, 1♀, Oku-daiichi-rindô, Okinawa Is., 2–IV–1978, K. KATO leg.; 1♂, Yona, Okinawa Is., 25–III–1985, S. TAKEUCHI leg.; 1♀, Yona-rindô, Okinawa Is., 25–IV–1986, M. SAWAI leg.; 1♀, Benoki, Okinawa Is., 17–IV–1997, H. YOSHITAKE leg.; 1♀, Mt. Nekumachiji, Ôgimi-son, Okinawa Is., 4–IV–1999, N. OHBAYASHI leg.; 1♂, same locality, 8–IV–1999, S. INADA leg.; 1♂, Benoki, Kunigami-son, Okinawa Is., 4–IV–1989, T. ITÔ leg.

Table 1. Measurements of the specimens of *Pseudocalamobius* spp. (arithmetic mean±SD; n: number of materials).

Species	*P. japonicus*	*P. tsushimanus*	*P. montanus*	*P. okinawanus*
♂	(n=8)	(n=3)	(n=5)	(n=4)
Length (mm)	8.74±1.20	8.28±1.58	11.51±0.89	9.00±0.97
Width (mm)	1.54±0.18	1.50±0.33	2.09±0.21	1.60±0.18
IEL/GL	1.52±0.12	1.63±0.08	1.10±0.06	1.44±0.14
PL/PB	1.14±0.04	1.14±0.07	1.17±0.05	1.29±0.03
EW/PB	1.43±0.04	1.40±0.07	1.39±0.05	1.46±0.07
EL/PL	5.37±0.24	5.08±0.13	4.98±0.26	4.81±0.14
EL/EW	4.27±0.17	4.15±0.13	4.17±0.10	4.23±0.14
EL/TL	0.76±0.01	0.75±0.01	0.76±0.01	0.75±0.01
♀	(n=8)	(n=8)	(n=9)	(n=4)
Length (mm)	8.87±0.92	9.86±1.25	12.18±1.07	9.57±1.11
Width (mm)	1.60±0.18	1.79±0.25	2.19±0.23	1.79±0.20
IEL/GL	1.50±0.17	1.49±0.18	1.14±0.08	1.30±0.10
PL/PB	1.11±0.06	1.13±0.04	1.12±0.07	1.27±0.04
EW/PB	1.40±0.05	1.43±0.05	1.42±0.07	1.55±0.04
EL/PL	5.31±0.32	5.31±0.25	5.40±0.27	4.93±0.15
EL/EW	4.20±0.15	4.21±0.19	4.28±0.14	4.03±0.13
EL/TL	0.75±0.01	0.76±0.01	0.77±0.01	0.75±0.01

Distribution. Japan (Okinawa Is., Okinawa Prefecture). According to KUSAMA and TAKAKUWA (1984), this species was recorded from Tokunoshima Island, but we were unable to verify it.

Host plant. Unknown.

Notes. This species was originally described as a subspecies of *P. leptissimus*. The nominotypical subspecies is a Taiwanese beetle, the type locality of which is Mt. Ari-san, Taiwan. The population of Okinawa Island is easily separable from *P. leptissimus* by having reddish marking on the shoulders, male genitalia with median lobe moderately arcuate (almost straight and weakly bent near the apex in *P. leptissimus*); and ventral plate shorter than dorsal plate and rounded at the extremity (longer than dorsal plate and truncated at the extremity in *P. leptissimus*) (Figs. 18–19). In view of these morphological differences, the Okinawan beetle should be regarded as an independent species.

Key to the Japanese Species of the Genus *Pseudocalamobius*

1. Pronotum long, more than 1.25 times as long as basal width; elytra with shoulders reddish; male abdominal sternites 3–5 strongly punctured (Fig. 12).................... ....*P. okinawanus* SAMUELSON.

— Pronotum short, less than 1.25 times as long as basal width; elytra with shoulders not reddish; abdomen provided with punctures only on 3rd sternite in male (Figs. 9–11) ....2.

2. Elytra light brown; each elytron provided with three longitudinal pubescent stripes; inferior eye lobe usually less than 1.3 times as long as gena .... *P. montanus* HAYASHI.

— Elytra dark brown; each elytron uniformly pubescent without longitudinal stripes; inferior eye lobe usually more than 1.3 times as long as gena ....3.

3. Pubescence on elytra grayish, sparse and irregularly ranged (Fig. 13); ventral plate of median lobe longer than dorsal plate ....*P. japonicus* (BATES).

— Pubescence on elytra whitish, dense and uniformly ranged (Fig. 14); ventral plate of median lobe shorter than dorsal plate ....*P. tsushimae* BREUNING.

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 409–412, Mar. 31, 2002

Pantorhaenas yasuakii (Coleoptera, Anthribidae), a Peculiar New Anthribid from the Malay Peninsula

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Abstract A new species of the anthribid genus *Pantorhaenas* is described from the Malay Peninsula under the name of *P. yasuakii*. It is readily recognized on the characteristic humps on the broad elytra and the maculations on the dorsal side.

The genus *Pantorhaenas* JORDAN contains two described species, *P. conspersus* JORDAN from Borneo and *P. xylinus* JORDAN from the Islands of Banggai, east of Sulawesi.

In graduate school days of Tokyo University of Agriculture, I made several long collecting trips to Southeast Asia. Early in the summer of 1983, I visited Mt. Jasar, Pahang, the Malay Peninsula, and collected a peculiar anthribid bearing four conspicuous humps on the depressed elytra. Unlike other anthribids collected at that time, it was not agile when found out. After a careful examination, it has become clear that this anthribid is a third new species belonging to the genus *Pantorhaenas*.

The present paper as well as the specific name of the new species described herein are dedicated to Professor Yasuaki WATANABE in commemoration of his retirement from the Chief Professor of Tokyo University of Agriculture. He has continuously encouraged and supported my researches of beetles from my student days.

Before going further, I wish to express my sincere gratitude to Professor Y. WATANABE of the Laboratory of Insect Resources, Tokyo University of Agriculture, and Emeritus Professor K. MORIMOTO of Kyushu University, for their constant guidance and encouragement. I am much indebted to Dr. S.-I. UÉNO of the National Science Museum (Nat. Hist.), Tokyo, for kindly reading the original manuscript of the present paper, and to Mr. I. KAWASHIMA for his assistance in preparing the excellent illustrations of *Pantorhaenas yasuakii* SENOH, sp. nov.

Pantorhaenas yasuakii SENOH, sp. nov.

(Figs. 1–2)

Length: 7.6 mm (from apical margin of rostrum to apex of pygidium).

Female. Body relatively broad, about 2.1 times as long as wide, including rostrum and pygidium. Colour entirely black with the exception of antennae, the lateral

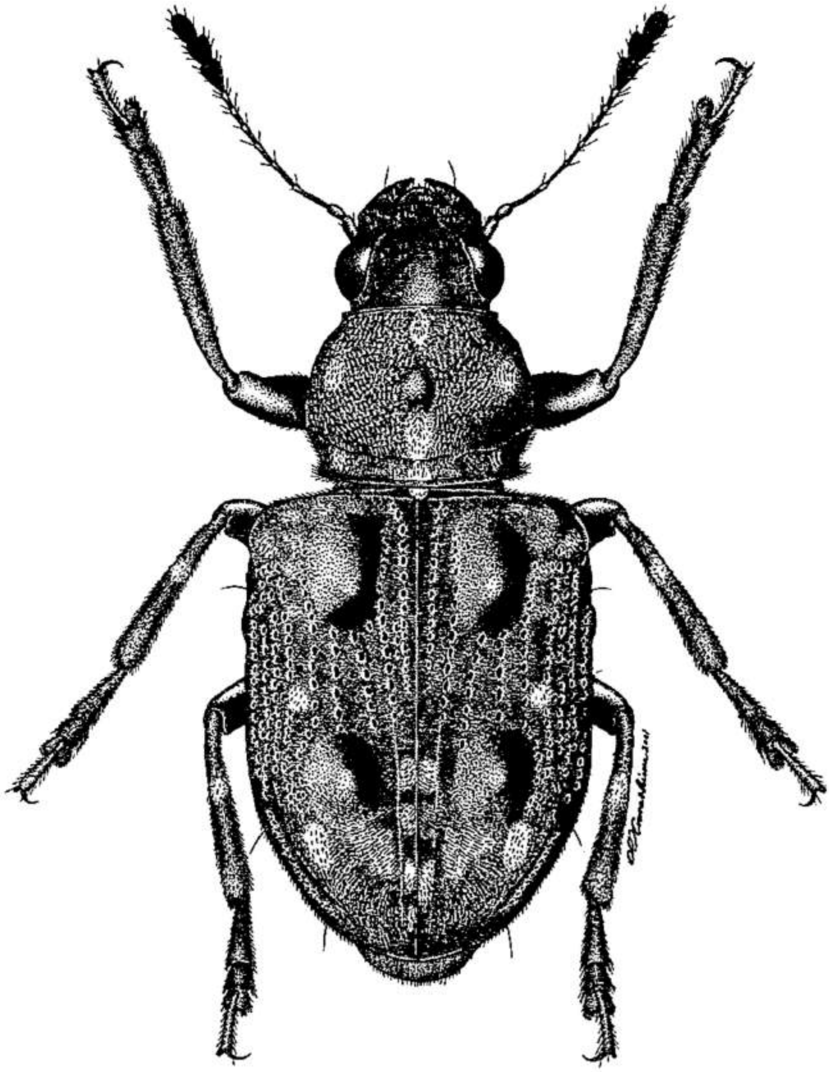

Fig. 1. *Pantorhaenas yasuakii* SENOH, sp. nov., ♀, from Gunong Jasar (alt. about 1,600 m), Pahang, Malay Peninsula.

sides of subbasal parts of elytra and legs, which are reddish brown to dark brown. Pubescence relatively dense, blackish and whitish; whitish hairs forming the following patches: oblong ones before the middle of dorsal transverse carina and behind the middle of anterior margin of pronotum, a pair of small round ones on the middle of the lateral sides of pronotum, a pair of oblong ones behind the middle of 6th intervals of elytra, a pair of small round ones before the middle of 6th intervals of elytra, and many

Fig. 2. *Pantorhaenas yasuakii* SENOH, sp. nov., ♀, left lateral view.

small irregular ones on the underside.

Head flat, with a longitudinal keel from upper margin of each eye to basal third of rostrum; eyes strongly convex above, expanded latero-posteriorly; rostrum transverse, about 2.2 times as wide as long, gradually widened towards the bases of mandibles, strongly emarginate at the middle of anterior margin; disc with a shallow depression at the middle of basal parts; maximum width of rostrum about 1.8 times as wide as the shortest distance between eyes. Antennae short, hardly reaching the basal margin of elytra, basal two segments ovate, 3rd the longest, 8th the shortest, 9th triangular, apically dilated, about 1.3 times as long as wide, 10th also triangular, about 1.1 times as long as wide, 11th oval, about 1.4 times as long as wide, proportions in length from 2nd to 11th about 8 : 17 : 12 : 9 : 8 : 8 : 7 : 12 : 10 : 12. Labrum semicircular, with a pair of very long hairs. Labium deeply divided.

Pronotum barrel-shaped, and convex above, about 1.3 times as wide as long, widest at basal two-fifths; disc with a remarkable hump at the centre; dorsal transverse carina uneven, broadly rounded; lateral carina and carinula obscure. Scutellum small, clothed with whitish hairs. Elytra broad, about 1.28 times as long as wide, widest at basal fourth, subparallel-sided in basal three-fifths, then narrowed posteriorly, basal margins almost straight; disc somewhat depressed, and with two pairs of conspicuous humps in subbasal and middle areas, which are longer than broad, and are distinctly larger than pronotal one; strial punctures small, deep, intervals flat except for the parts of humps, distinctly wider than diameter of strial punctures. Pygidium subtrapezoidal, extending backwards, about 1.45 times as wide as long, gradually narrowed towards truncated apex; disc depressed in sublateral parts.

Prosternum coarse, deeply punctate; mesosternal process transverse, as wide as the width of coxa, metasternum deeply punctate. Sternites weakly punctate; viewed from side, 1st to 4th visible sternites conjointly horizontal, the terminal one somewhat slanting. Legs relatively slender; anterior femur shorter than the median which is a little shorter than the posterior; anterior, median and posterior tibiae subequal in length to one another; anterior, median and posterior tarsi subequal in length to one another.

Male. Unknown.

Holotype ♀, Gunong Jasar (alt. about 1,600 m), Pahang, W. Malaysia, 28~29–V–1983, Toshio SENOH leg. The holotype is deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Distribution. West Malaysia (Pahang).

Notes. Because of the presence of four conspicuous humps on the elytra, this species is similar to *Pantorhaenas conspersus* JORDAN (1928, p. 126) from Sarawak, Borneo, but can be distinguished from the latter by the following characteristics: frons between eyes flat, not depressed; pronotum with a remarkable hump at the centre; two pairs of conspicuous humps on elytra not pointed; a pair of posterior humps located near the centre of elytra; punctures on metasternum larger and deeper than those on sternites, and so on.

This sluggish beetle looked like certain species of tenebrionid beetle when I caught it on my beating net.

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A New Genus of the Oriental Tribe Mecysmoderini (Coleoptera, Curculionidae, Ceutorhynchinae), with Descriptions of Two New Species from Indonesia and Malaysia[1)]

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Abstract *Watanabesaruzo*, a new genus, is established in the Oriental tribe Mecysmoderini of the subfamily Ceutorhynchinae with descriptions of two new species: *W. taimeii* sp. nov. (Bali, Indonesia) and *W. malayanus* sp. nov. (Perak, W. Malaysia).

Introduction

The tribe Mecysmoderini belonging to the subfamily Ceutorhynchinae of the family Curculionidae is composed of 93 known species sharing such characteristics as the antennal funicle with 6 segments and the pronotum acutely projected posteriad at the middle of its basal margin (COLONNELLI, 1992; KOROTYAEV, 1992). They were recorded mainly from the Oriental Region and have been classified into the following five genera: *Mecysmoderes* SCHOENHERR, *Coeliosomus* MOTSCHULSKY, *Belonnotus* SCHULTZE, *Cysmemoderes* COLONNELLI and *Xenysmoderes* COLONNELLI (COLONNELLI, 1992). However, the generic classification of the tribe by COLONNELLI (1992) is provisional as he himself mentioned. In fact, there are a considerable number of undescribed species, some of which cannot be applied to the current classification system of the tribe (YOSHITAKE, unpubl.).

In this paper, we intend to establish a new genus in the tribe Mecysmoderini based on two new species from Indonesia and Malaysia. We believe that the establishment of the new taxa is essential to construct more appropriate classificatory system of

[1)] Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. 5, No. 70).

the tribe.

It is our great pleasure to dedicate this paper to Professor Dr. Yasuaki WATANABE on the commemorative occasion of his retirement from Tokyo University of Agriculture in March 2002.

Materials and Methods

This study is mainly based on the specimens collected by us from Indonesia in October 2000. We visited there as members of the expedition team from Kyushu University for the field survey of the entomofauna of Lombok Island, Bali Island, the Krakatau Islands, and in Ujung Kulon (see YUKAWA *et al.*, 2001). In addition, a specimen collected by Mr. M. HATA from West Malaysia in April 1976 was also examined for this study. Methods used herein for descriptions are the same as those explained in YOSHITAKE (2000). Details of some external structures were observed with a scanning electron microscope (HITACHI 3000-N). The holotype of *W. taimei* sp. nov. is deposited in the Museum Zoologicum Bogoriense, Research Centre for Biology, LIPI, Cibinong, Indonesia (MZB), and the paratypes are in the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan (ELKU). The holotype of *W. malayanus* sp. nov. is temporarily preserved in ELKU.

Taxonomy

Watanabesaruzo YOSHITAKE et YAMAUCHI, gen. nov.

Type species: *Watanabesaruzo taimeii* sp. nov. (See description below).

Description. Male. Body broadly ovate, 3.24–4.04 mm in length. Habitus as shown in Fig. 1 A, B, E & F. Integument dark brown, opaque, thinly squamose, mainly clothed with fine brownish hair-like scales; ventral surface rather densely covered with light-colored ovate to lanceolate scales.

Head with a median carina extending from vertex to basal part of forehead, sulcate along posterior margin of each eye, coarsely and reticulately punctured; forehead depressed, fringed with 1–3 rows of linear to lanceolate scales along inner margin of each eye. Eyes rather strongly prominent from outline of head, approaching anteriorly. Rostrum (Fig. 3 A & D) considerably slender, 1.75–1.89 times as long as pronotum, evenly curved. Antennae (Fig. 3 C & E) slender; scape slightly shorter than funicle, clavate, produced in a short lamina and bearing two slender setae at apex; funicle with 2nd and 3rd segments notably longer than others; club lanceolate, finely pubescent.

Pronotum (Fig. 2 A) subrhomboidal, transverse, 1.23–1.38 times as wide as long (measured from base of 2nd elytral stria), widest before middle, shallowly and reticulately punctured; each puncture bearing a scale and with bottom opaque; interstices between punctures narrow, shining; dorsum foveate at apical 1/3, deeply sulcate on apical 3/4; sulcus flanked by two short keels on apical 1/4; sides widely and rather strongly compressed, each with a T-shaped patch; each patch distorted, composed of brownish

Fig. 1. Habitus photographs of *Watanabesaruzo* spp. —— A–D, *W. taimeii* sp. nov.; E–F, *W. malayanus* sp. nov.; A, B, E & F, male; C & D, female.

lanceolate scales; pronotal process moderate in length, 0.41–0.45 times as long as elytral suture, acutely projected, bearing a distinct median carina running from tip to basal 1/4 of pronotum.

Elytra (Fig. 2 B) cordiform, 1.06–1.09 times as wide as long, 1.57–1.60 times as wide as pronotum, widest just behind humeri, subparallel-sided to middle, then almost straightly convergent toward subapical calli and broadly rounded at apices; subapical calli moderate; dorsum with a velvety black patch of oval scales on basal 1/4 of 1st intervals; striae linear, sinuous, shining; each puncture round, separated by distance twice or 3 times as long as its diameter; intervals opaque, each with 1 to 4 rows of minute granules; each granule bearing a scale; odd numbered intervals wider and more prominent than even numbered ones. Hind wings (Fig. 3 F) long, mostly infuscate due to long hairs of high density.

Legs (Fig. 4 A & B) slender; each femur armed with a small subtriangular tooth; metafemoral spring as in Fig. 4 C; tibiae with relatively long corbels; mid and hind tibiae each mucronate at apex; mucrones of mid tibiae more conspicuous than those of hind ones; claws slender, minutely appendiculate.

Sterna finely and densely punctured; each puncture with a scale; prosternum with a deep pectoral canal; mesosternum and anterior part of metasternum depressed medially for reception of rostrum. Metendosternite as in Fig. 3 G.

Venter finely and densely punctured; each puncture with a scale; ventrite 1 shallowly and widely concave on disc; basal margin fringed with a row of large and deep punctures; apical margin emarginate medially; ventrite 2 shorter than 1, subequal in length with ventrites 3 and 4 combined, concave on disc; ventrites 3 and 4 subequal in length to one another, flat on disc; ventrite 5 subequal in length with ventrites 3 and 4 combined, shallowly concave on disc.

Tergite 7 with a pair of plectral flanges along basal margin concealed by elytra. Tergite 8 shallowly and reticulately punctured, with a median carina extending from upper flange to center, depressed medially in lower half; each puncture with a scale; upper flange with a triangular projection on each side. Spiculum gastrale (Fig. 5 B & E) with an apodeme longer than aedeagal body or its apodeme. Tegmen (Fig. 5 C & F) ringed, without parameres; apodeme a half as long as width of tegminal ring. Aedeagal body (Fig. 5 A & D) broad, as long as or slightly longer than its apodemes. Endophallus (Fig. 5 A & D) with broad, complex sclerites and conical spicules; spicules forming spiculate areas in anterior half of endophallus.

Female. Body 3.88–3.92 mm in length. Rostrum much more slender, 2.35–2.41 times as long as pronotum; antennal insertion more distant from apex of rostrum. Tibiae simple, lacking mucro. Ventrites 1 and 2 slightly inflated; ventrite 5 simple, lacking concavity. Tergite 7 shallowly and reticulately punctured, with a median carina extending from upper flange to lower 1/3, lacking depression; upper flange with a pair of triangular projections; basal margin concealed by elytra with a pair of plectral flanges. Otherwise practically as in male.

Distribution. Indonesia and Malaysia.

Remarks. *Watanabesaruzo* can be distinguished from other genera of the tribe by a combination of the following ten characteristics: 1) rostrum considerably slender; 2) pronotum laterally with T-shaped patches; 3) pronotum sulcate, with a median carina that runs from tip of pronotal process to basal 1/4 of pronotum; 4) pronotal

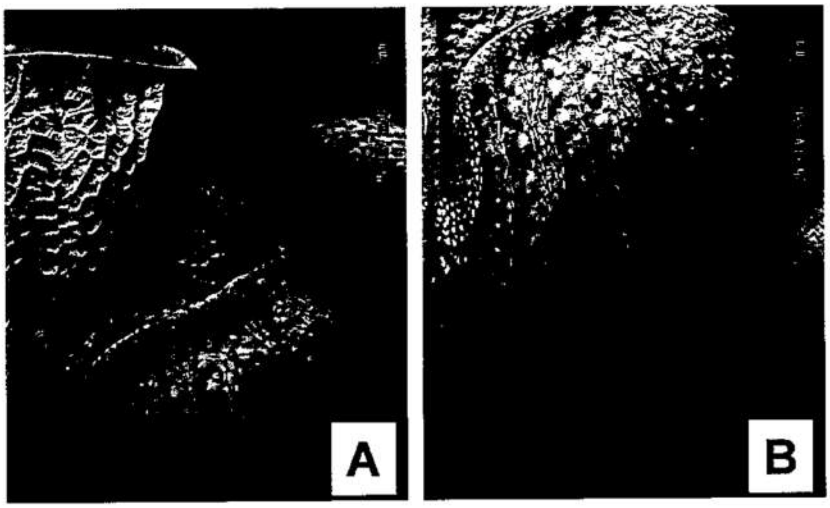

Fig. 2. *Watanabesaruzo taimeii* sp. nov.; A, pronotum; B, elytron.

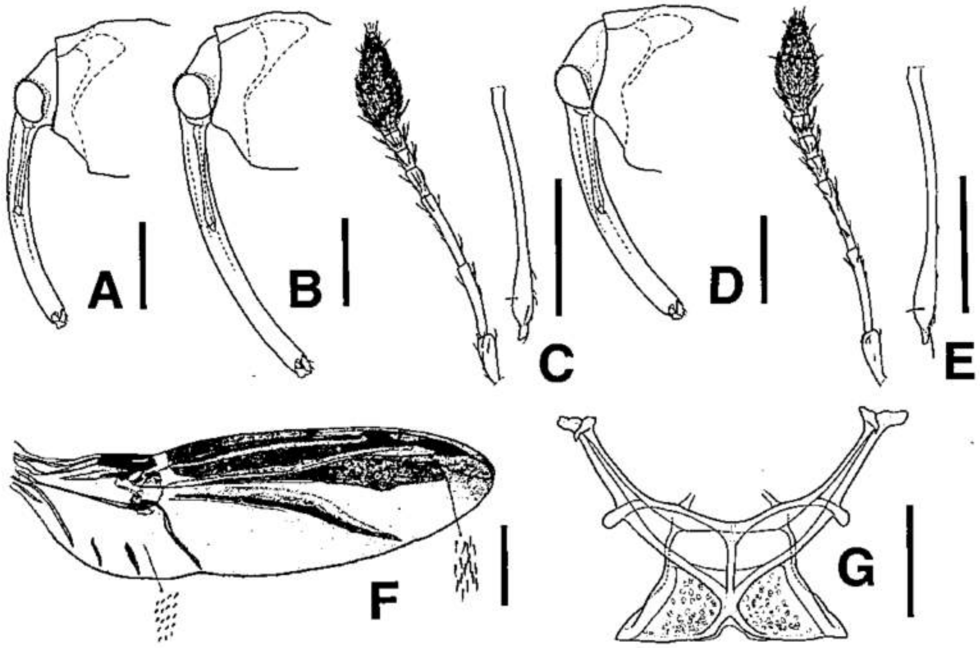

Fig. 3. *Watanabesaruzo* spp.——A–C & F–G, *W. taimeii* sp. nov.; D–E, *W. malayanus* sp. nov.; A & D, head, lateral view, male; B, ditto, female; C & E, antenna; F, hind wing; G, metendosternite. Scale line=1.0 mm for A, B, D & F, 0.5 mm for C, E & G.

process acutely projected in moderate length; 5) 1st elytral intervals with a velvety black patch; 6) odd numbered elytral intervals wider and more prominent than even numbered ones; 7) elytral striae sinuous; 8) legs slender, with long corbels and minutely appendiculate claws; 9) pectoral canal deep only on prosternum; 10) pygidium armed with a pair of triangular projections along basal margin.

This new genus resembles *Xenysmoderes* in having the slender rostrum, the strongly compressed and reticulately punctured pronotum, the alternate elytral intervals being wider than the others, the evident pectoral canal on prosternum, and so on. However, *Xenysmoderes* lacks the pronotal sulcus and has a complete pronotal carina that runs from the tip of pronotal process to the anterior margin of pronotum, whereas in *Watanabesaruzo* the pronotum is sulcate on apical 3/4 and the carina extends only to basal 1/4. *Watanabesaruzo* also shows some resemblance to *Cysmemoderes* in having the sulcate pronotum and the sinuous elytral striae, though *Watanabesaruzo* cannot be confused with *Cysmemoderes* by the pronotum and elytra lacking any definite prominence, the longer pronotal process, and the pectoral canal being evident only on prosternum.

We cannot find any other mecysmoderine genera that are more closely related to *Watanabesaruzo* than to *Xenysmoderes*, but further investigation is needed to clarify the systematic position of this new genus.

Etymology. The generic name, which is masculine in gender, is a combination of *Watanabe*, the surname of Dr. Yasuaki WATANABE, and *saruzo*, a Japanese word that means ceutorhynchine weevils.

Watanabesaruzo taimeii YOSHITAKE et YAMAUCHI, sp. nov.

(Figs. 1 A–D, 2, 3 A–C & F–G, 4 A & C, 5 A–C, 6)

Description. Male. See Table 1 for all measurements. Habitus as shown in Fig. 1 A, B.

Dark brown to blackish in general appearance. Head, rostrum, antennae, anterior margin of pronotum, elytral humeri, fore and mid legs, and all tarsi tinged with red.

Head clothed with linear to lanceolate light brown scales; scales denser on periphery and sparser medially, forming cordiform, somewhat bare area. Rostrum 1.83–1.89 times as long as pronotum, thinly clothed with brownish linear scales; each scale directed basally and internally, becoming minute apically from basal 1/4. Antennae inserted at middle of rostrum (Fig. 3 A); antennal funicle (Fig. 3 C) with 1st segment 0.72 times as long as 2nd, 3rd 1.05 times as long as 2nd, 4th 0.39 times as long as 3rd, 1.36 times as long as 5th, 5th and 6th subequal in length to one another.

Pronotum 1.34–1.38 times as wide as long, sparsely clothed with dark brown hair-like scales on disc; each scale directed internally; sides mainly with dark brown hair-like scales and with linear to narrow light brown ones along anterior margin; each scale directed apically; pronotal process (Fig. 2 A) 0.44–0.45 times as long as sutural length.

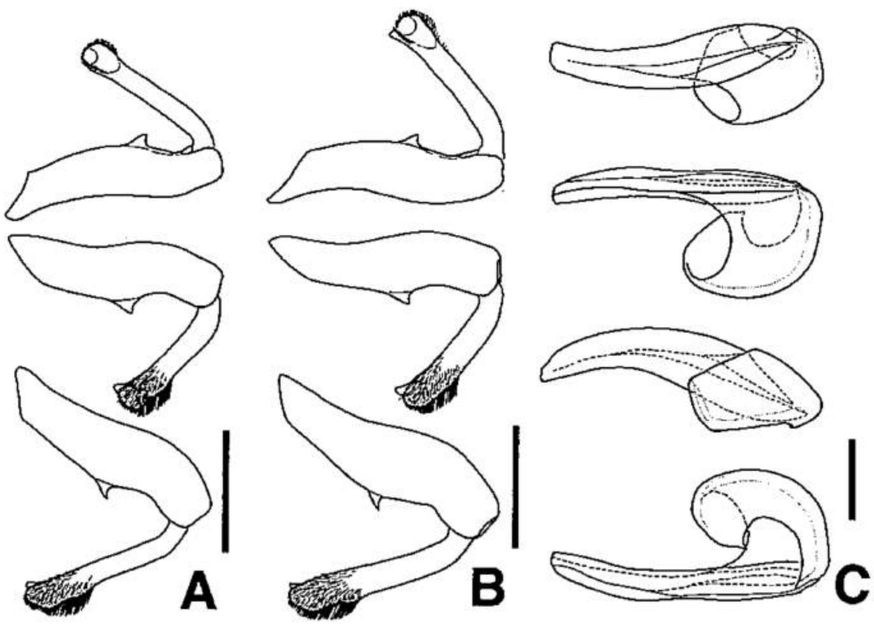

Fig. 4. Legs of *Watanabesaruzo* spp.——A & C, *W. taimeii* sp. nov.; B, *W. malayanus* sp. nov.; A & B, femora & tibiae; C, metafemoral spring. Scale line=1.0 mm for A & B, 0.5 mm for C.

Elytra 1.07–1.09 times as wide as long, with 1–4 rows of dark to light brown hair-like scales; humeri with light brown linear scales; scales becoming darker and minute posteriorly.

Fore coxae with light brown linear scales and whitish gray lanceolate ones; mid and hind coxae covered with yellowish and whitish gray lanceolate scales. Trochanter covered with whitish gray lanceolate scales. Femora mostly clothed with light brown linear to lanceolate scales; fore femora covered with whitish gray scales on ventral surface; mid and hind femora with whitish scales on posterior surface; hind femora dominantly with dark brown linear to hair-like scales on anterior surface. Tibiae clothed with light brown linear scales and dark brown hair-like ones; fore tibiae (Fig. 4 A) simple, lacking mucro.

Prosternum densely clothed with yellowish gray lanceolate scales behind coxae, and sparsely with slender hairs along apical margin. Meso- and metasterna rather densely clothed with yellowish to whitish gray lanceolate scales, except for sides of metasternum moderately covered with light brown linear to lanceolate scales. Lateral pieces of meso- and metasterna moderately covered with light brown linear to lanceolate scales, except for anterior half of mesepimera.

Venter rather densely covered with whitish gray oval to lanceolate scales; scales replaced by dark to light brown hair-like ones on sides of basal two ventrites.

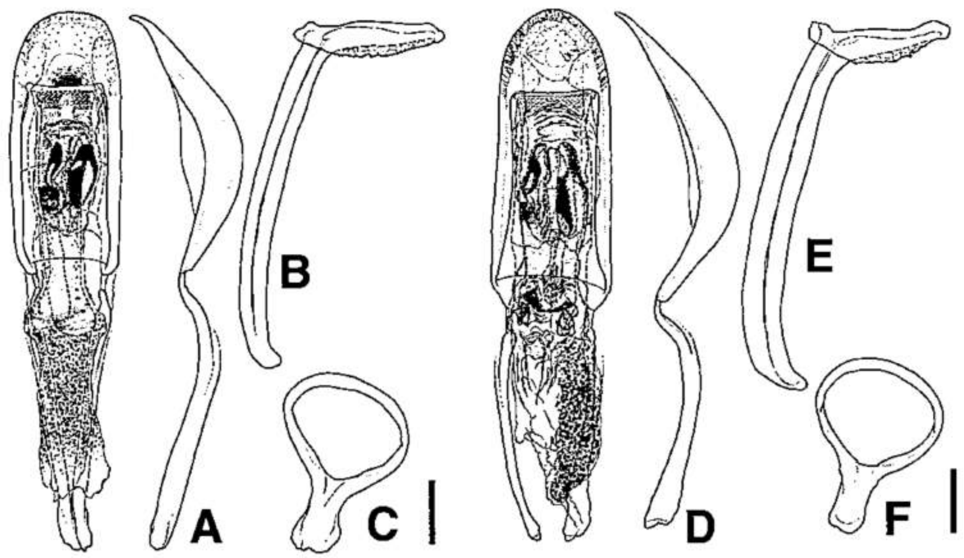

Fig. 5. Male genitalia of *Watanabesaruzo* spp.——A–C, *W. taimeii* sp. nov.; D–F, *W. malayanus* sp. nov.; A & D, aedeagus; B & E, sternite 9; C & F, tegmen. Scale line=0.2 mm.

Table 1. *Watanabesaruzo* spp.; measurements (in mm) of body, rostrum, pronotum and elytra.

	W. taimeii sp. nov.		*W. malayanus* sp. nov.
	male (n=3)	female (n=2)	male (n=1)
Body length	3.24–3.80	3.88–3.92	4.04
Length of rostrum	2.18–2.56	3.38–3.42	2.80
Maximum width across pronotum	1.60–1.88	1.88–1.90	1.96
Pronotal length	1.16–1.40	1.42–1.44	1.60
Length of pronotal process	0.62–0.72	0.72–0.76	0.76
Maximum width across elytra	2.56–3.00	3.00–3.10	3.08
Elytral length	2.40–2.76	2.80–2.86	2.90
Sutural length	1.42–1.60	1.72–1.74	1.74

Tergite 8 moderately clothed with dark brown hair-like scales. Genitalia (Fig. 5 A–C) with aedeagal body truncate at apex.

Female. See Table 1 for all measurements. Habitus as shown in Fig. 1 C, D.

Rostrum 2.35–2.41 times as long as pronotum. Antennae inserted slightly before middle of rostrum (Fig. 3 B). Ovipositor (Fig. 6 B) with coxites relatively slender, almost 3 times as long as broad; styli moderate in length, about twice as long as broad, more sclerotized than coxites. Sternite 8 (Fig. 6 A) with arms about a half as long as apodeme and about 1.5 times as long as coxite and stylus combined. Spermatheca

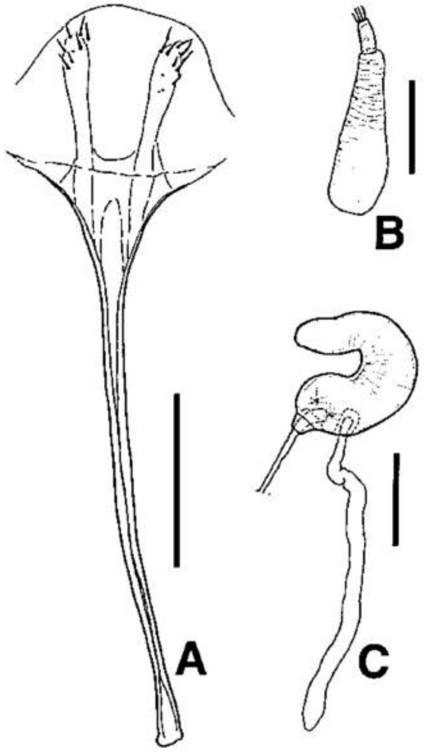

Fig. 6. Female genitalia of *Watanabesaruzo taimeii* sp. nov.; A, sternite 8; B, coxite & stylus; C, spermatheca. Scale line=0.5 mm.

(Fig. 6 C) relatively robust, hoof-shaped; cornu long, broadly rounded at apex; collum short; ramus not well marked. Otherwise practically as in male.

Type series. Holotype male (MZB), [Indonesia] Lake Tamblingan (1,250 m alt. ca.), N. Bali, 4~5–X–2000, H. YOSHITAKE. Paratypes (ELKU): 2 males and 2 females, [Indonesia] Botanical Garden (1,350 m alt. ca.), N. Bali, 3~4–X–2000, H. YOSHITAKE.

Distribution. Indonesia (Bali).

Remarks. *Watanabesaruzo taimeii* is characterized by the antennal funicle with the 3rd segment slightly longer than the 2nd, the male fore tibiae lacking mucro, and the aedeagus truncate at the apex.

Biological note. Collecting sites of this species lie in a secondary submountain forest dominated by *Vernonia arborea* (Asteraceae), *Omalanthus* (Euphorbiaceae), and *Bischofia javanica* (Euphorbiaceae) in the upper, and *Laportea stimulans* (Urticaceae) in the lower canopy layers (Mustaid SIREGAR, 2001, pers. comm.). The adults were collected by sweeping leaves of trees using an insect net with a 7 meter long handle.

Etymology. This species is named after Dr. Y. WATANABE whose nickname is "Taimei".

Watanabesaruzo malayanus YOSHITAKE et YAMAUCHI, sp. nov.

(Figs. 1 E–F, 3 D–E, 4 B, 5 D–F)

Description. Male. See Table 1 for all measurements. Habitus as shown in Fig. 1 E & F.

Rostrum much more reddish, somewhat shorter, 1.75 times as long as pronotum. Antennae inserted at middle of rostrum (Fig. 3 D); antennal funicle (Fig. 3 E) with 1st segment 0.65 times as long as 2nd, 3rd 0.9 times as long as 2nd, 4th 0.33 times as long as 3rd, 1.09 times as long as 5th, 5th and 6th subequal in length to one another. Pronotum 1.34–1.38 times as wide as long; pronotum somewhat narrower, 1.23 times as wide as long; pronotal process 0.44 times as long as sutural length. Elytra 1.06 times as wide as long. Tibiae much more reddish; each fore tibia mucronate at apex (Fig. 4 B). Genitalia with aedeagal body round at apex (Fig. 5 D). Otherwise practically as in *W. taimeii*.

Female. Unknown.

Type series. Holotype male (Type No. 3141, ELKU), [W. Malaysia] 19 miles from Tapah, Perak, 9–IV–1976, M. HATA.

Distribution. W. Malaysia (Perak).

Remarks. *Watanabesaruzo malayanus* is considered to be closely related to *W. taimeii*, but differs from the latter in having the antennal funicle with the 3rd segment slightly shorter than the 2nd, the male fore tibiae mucronate at the apex, and the aedeagal body round at the apex.

Etymology. The specific name is derived from the type locality, Malaya (=the Malay Peninsula).

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Study on the Malaysian *Pinacopus* (Coleoptera, Curculionidae, Molytinae)

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Abstract Malaysian species of the genus *Pinacopus* are studied taxonomically. Seven species including two new species, *P. watanabei* sp. nov. and *P. intermedius* sp. nov. are recognized from the Peninsula Malaysia. Key to the Malaysian species is provided and the distribution of *Pinacopus* in the Peninsula Malaysia is discussed.

Pinacopus is an apterous weevil established by MARSHALL (1932) as an aberrant genus in the Hylobiinae, now called Molytinae. In total, seven species have so far been described by him (1932, 1942) from Malaysia, Thailand and North India.

Nothing is known for their biology on record, but in the Peninsula Malaysia *Pinacopus* species are usually found in mountainous rainforests on such branches as covered with lichens as far as we know. They have cryptic colour and vestiture of moss green to dark coloured scaly integument, often with erect scales. The dark coloured integument with erect scales is common to other weevils inhabiting on scaled, often dead branches. However, some *Pinacopus* have moss green coloured scales, sometimes provided with a pair of apical prominences on the elytra. Interestingly, in the Cameron Highlands, Pahang, Peninsula Malaysia, some beetles with similar habitus to those *Pinacopus* are found sympatrically through the families Cerambycidae, Anthribidae and entimine Curculionidae. They seem to have evolved common cryptic features independently as a camouflage adapting to the special habitat, probably on branches covered with lichens in the mountainous rainforests (KOJIMA, in prep.).

The complete lack of hind wing and their discontinuous habitats in mountainous rainforests will restrain their movement. As a result, *Pinacopus* is localized in their distribution, and is interesting as a material to study the speciation and biogeography in Southeast Asia. However, *Pinacopus* has not been studied well taxonomically. An undescribed species is known from Borneo, beyond the previous range of distribution as was mentioned by MARSHALL (1942). And a number of undescribed species are also present in our collection. On the systematic position, *Pinacopus* has been treated as an isolated genus. Though MARSHALL (1932) tentatively assigned it to the Anchonini: Cycloterina in the Hylobiinae (=Molytinae), ASLAM (1963) removed *Pinacopus* from the Hylobiinae and transferred it to the Cryptorhynchinae. However, *Pinacopus* was again assigned to the Molytinae: Molytiini in the recent catalogue (ALONSO-ZARAZAGA & LYAL, 1999). Systematic position is still controversial and need to refer in the future.

First part of the study on *Pinacopus* will deal with the Malaysian species. Four of the seven *Pinacopus* species have ever been known from Malaysia, all from the peninsular part. In this study, two new species are discovered from there by close examination of the collection and the comparison with the type materials preserved in the Natural History Museum, London. They are frequently confused with other congeners owing to their external similarity and sympatrical occurrence in the routine sorting.

Abbreviations used in this study are as follows: BMNH: The Natural History Museum, London and ELKU: Entomological Laboratory, Kyushu University, Fukuoka. Asterisk (*) in the distribution of each species means the record from references, not examined.

Pinacopus caudatus MARSHALL

(Figs. 1, 2, 7, 13–17, 23, 63, 64)

Pinacopus caudatus MARSHALL, 1932, 349; 1942, 386 (key).

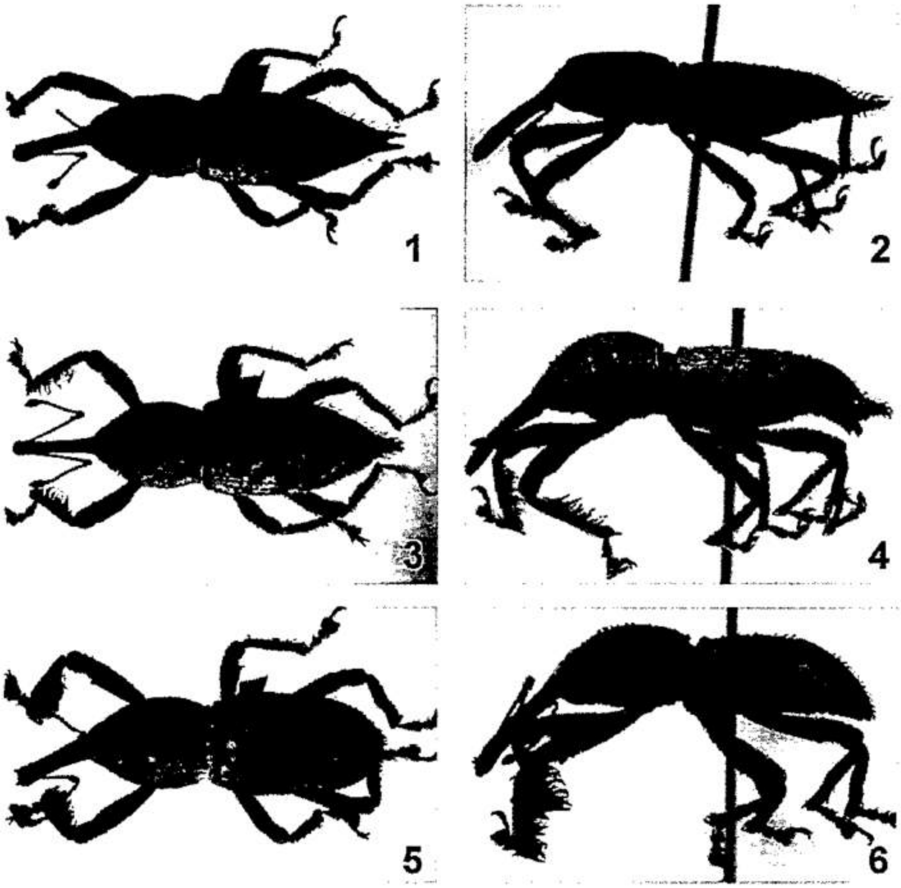
Description of terminalia. Male (Figs. 13–17). Aedeagus (Fig. 13) subtruncate at apex, internal sac with a pair of sclerites, basal part of median lobe (Fig. 15) with subtriangular process ventrally; tegmen (Fig. 16) with short and broad apophysis.

Female. Not examined.

Specimens examined. Malaysia: Pahang, Cameron Highlands, 1 male (Holotype, BMNH). Cameron Highlands, Gunung Jasar, 1 male, 24–IV–1990, K. MATSUMOTO; 1 male, 21–II–1992, K. MATSUMOTO; 1 male, 15~22–IV–1998, H. YOSHITAKE.

Distribution. Malaysia: Pahang (Cameron Highlands–Gunung Jasar; G. Benom*).

Comments. This species has been characterized by having the large body and the elytra provided with long sharp apical processes, but it is easily confused with the next species described in the following line. The type series may be a mixture of these species, though KOJIMA did not notice it when he examined them in London. This doubt arose after the next species was recognized recently through a close examination of a series of our collection and comparison with type photos taken by KOJIMA (see the comments of the next species in detail).



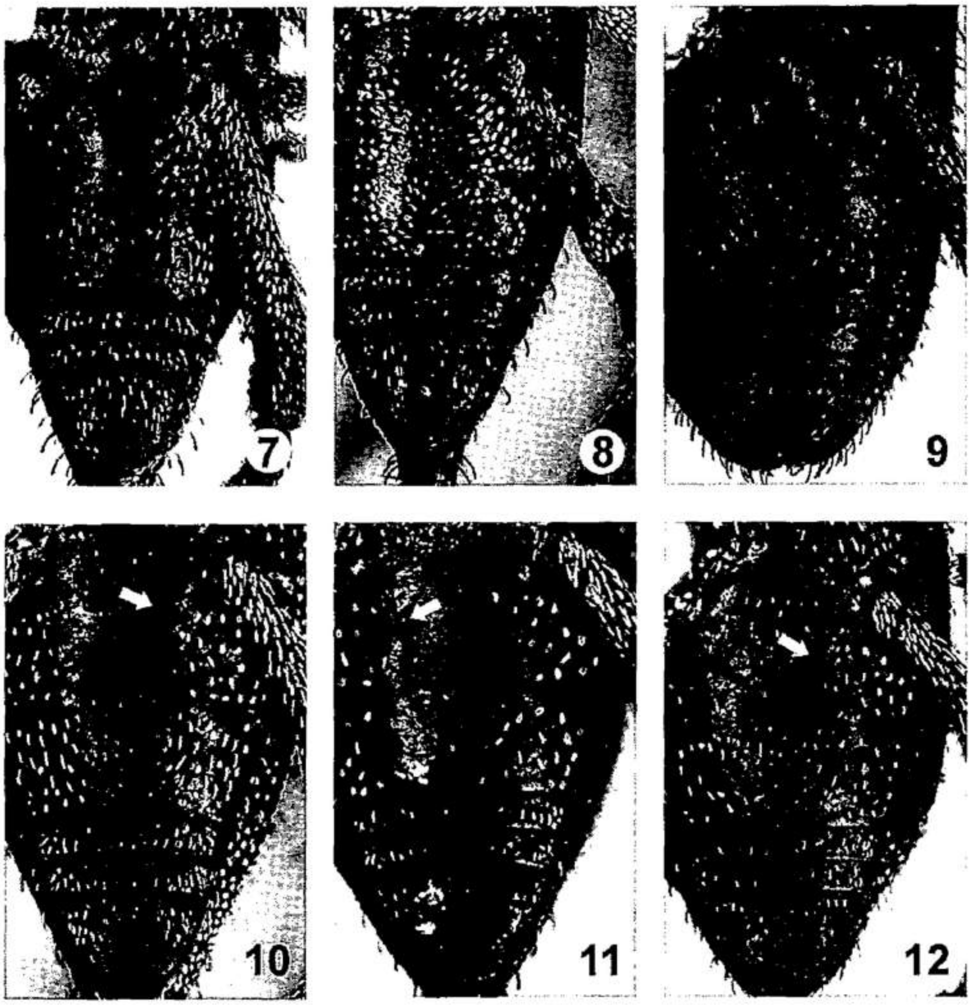
Figs. 1–6. Habitus photographs of males of *Pinacopus* spp.——1, 2, *P. caudatus* MARSHALL; 3, 4, *P. watanabei* sp. nov.; 5, 6, *P. dentirostris* MARSHALL.

Pinacopus watanabei KOJIMA et MORIMOTO, sp. nov.

(Figs. 3, 4, 8, 18–22, 24, 53, 54, 55, 61, 63, 64)

Description. Male. Length: 9.5–12.5 mm. Breadth: 3.1–4.1 mm. Dull black, with round brownish grey, sometimes greyish green scales above, and sparser and narrower scales beneath, elytra with dark indefinite maculae (Fig. 3), where the scales are darker, smaller and sparser than those of the remaining.

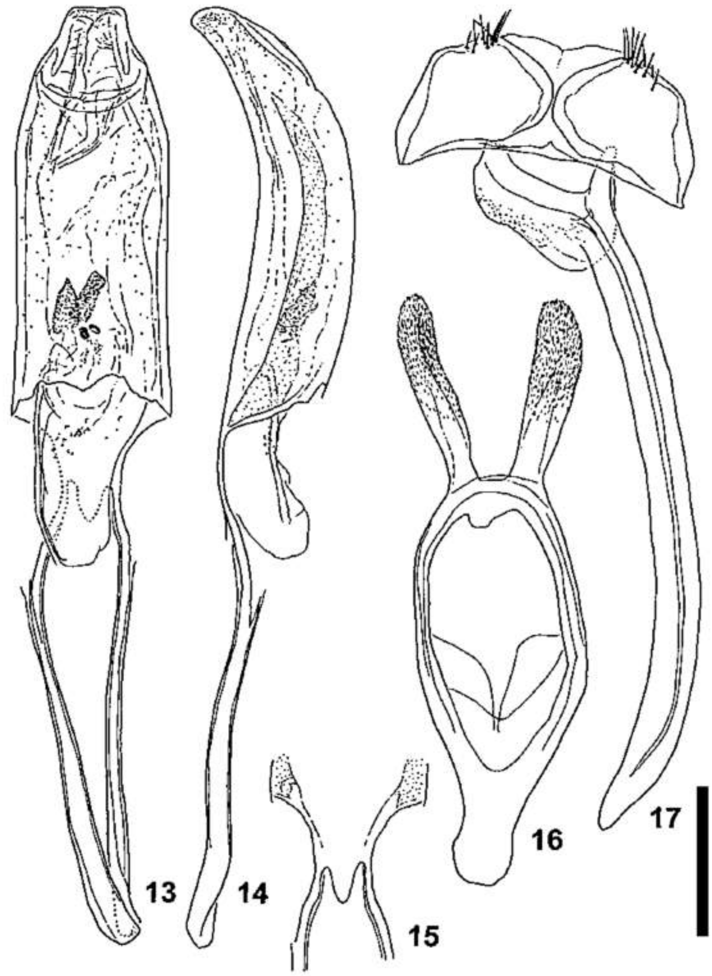
Head with round scales, several suberect scales adjoining eyes. Rostrum a little shorter than pronotum, hardly widening toward apex, with rather irregular shallow reticulation forming three rows on each side, narrow, rather irregular intervals between these rows bearing small spaced granules and uniting above antennal insertion, then continuing to apex as single carina bearing a few more granules, of which the apical



Figs. 7–12. Male abdominal ventrites of *Pinacopus* spp.——7, *P. caudatus* MARSHALL; 8, *P. watanabei* sp. nov.; 9, *P. dentirostris* MARSHALL; 10, *P. caudulus* MARSHALL; 11, *P. intermedius* sp. nov.; 12, *P. dolosus* MARSHALL. Arrow shows tubercle or process.

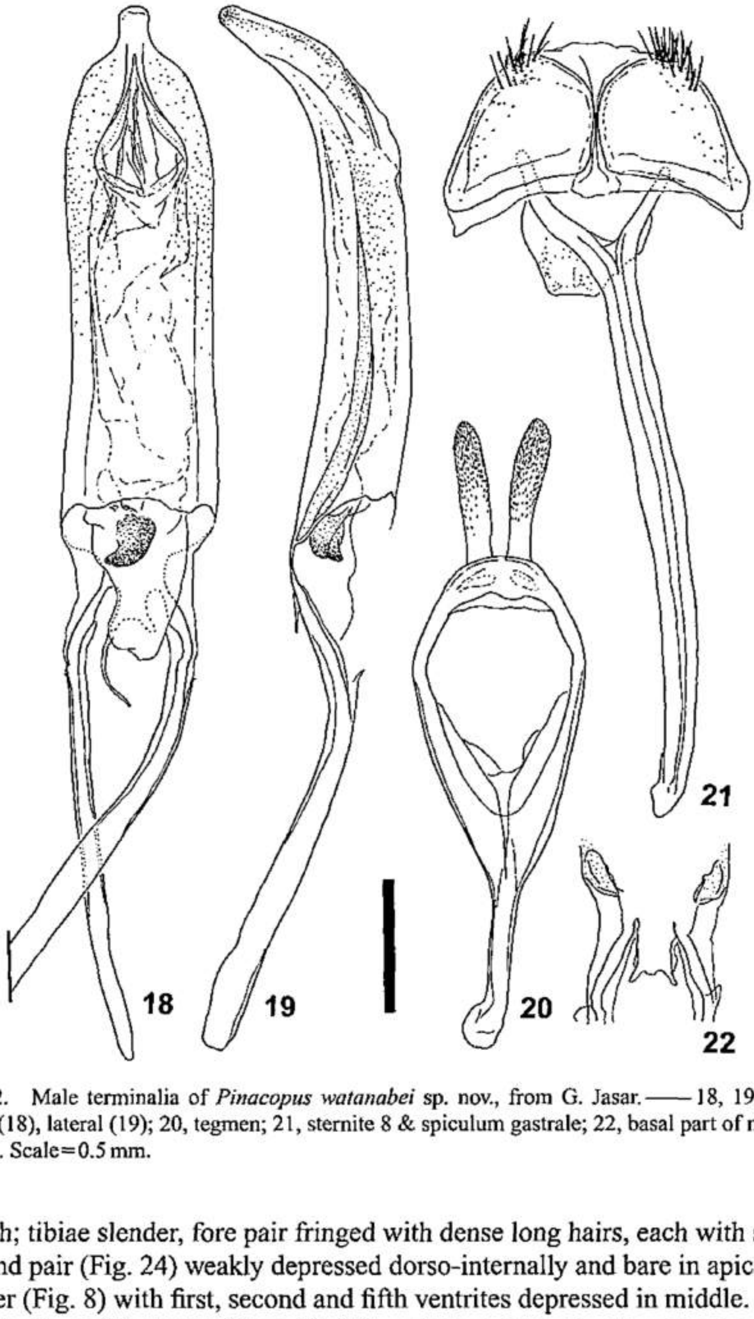
one is the largest, set with round scales and subrecumbent oblong-ovate scales. Antennae with 2nd funicle 1.5 times or a little more as long as 1st, 3rd to 6th slightly diminishing distally, 7th as long as 6th.

Prothorax 1.1 times as long as broad, rounded laterally, widest at or behind middle, more narrowed in front than behind, feebly constricted at base and near apex, apical margin weakly arcuate dorsally; dorsum convex longitudinally, with fine median carina (Fig. 3) and weak fovea on each side around middle, each puncture filled with



Figs. 13–17. Male terminalia of *Pinacopus caudatus* MARSHALL, from G. Jasar.—— 13, 14, Aedeagus, dorsal (13), lateral (14); 15, basal part of median lobe, ventral; 16, tegmen; 17, sternites 8 & spiculum gastrale. Scale=0.5 mm.

round scale, the scales are getting larger laterally, some of them being irregularly replaced by subrecumbent oblong-ovate scales. Elytra about 1.90–1.95 times as long as broad, each elytron with long sharp process just above actual apex, the process contiguous except for apical part shortly divergent; substriate, with regular large shallow separated punctures, which are almost concealed when large rounded scales are intact; intervals with remote, indistinct granules, each bearing ovate scales, which are subrecumbent near base and more erect and longer and narrower at apex. Legs clothed with round recumbent scales and subrecumbent scale-like setae; femora each with small

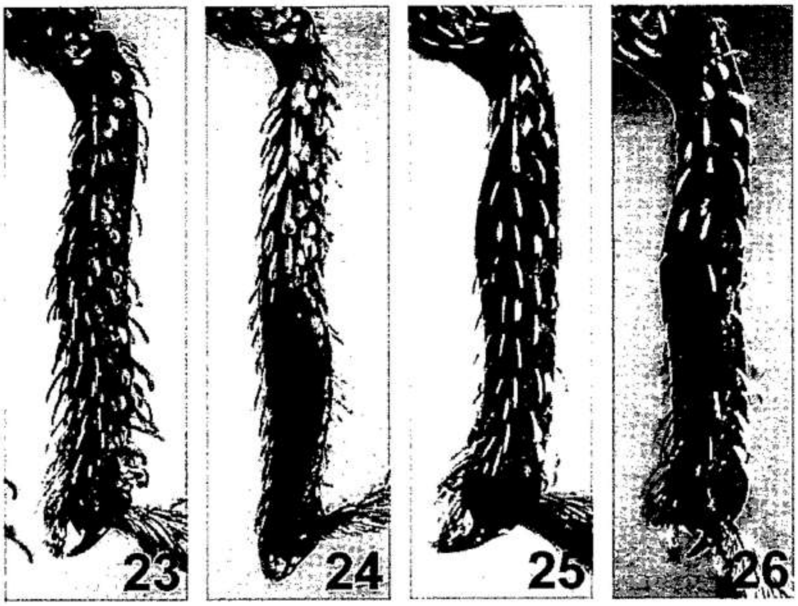


Figs. 18–22. Male terminalia of *Pinacopus watanabei* sp. nov., from G. Jasar. —— 18, 19, Aedeagus, dorsal (18), lateral (19); 20, tegmen; 21, sternite 8 & spiculum gastrale; 22, basal part of median lobe, ventral. Scale = 0.5 mm.

sharp tooth; tibiae slender, fore pair fringed with dense long hairs, each with small premucro, hind pair (Fig. 24) weakly depressed dorso-internally and bare in apical half.

Venter (Fig. 8) with first, second and fifth ventrites depressed in middle.

Terminalia as illustrated (Figs. 18–21), aedeagus abruptly attenuate at apex, internal sac with a pair of sclerites, basal part of median lobe (Fig. 22) with subquadrate



Figs. 23–26. Male hind tibiae of *Pinacopus* spp., dorsal. ——23, *P. caudatus* MARSHALL; 24, *P. watanabei* sp. nov.; 25, *P. caudulus* MARSHALL; *P. intermedius* sp. nov.

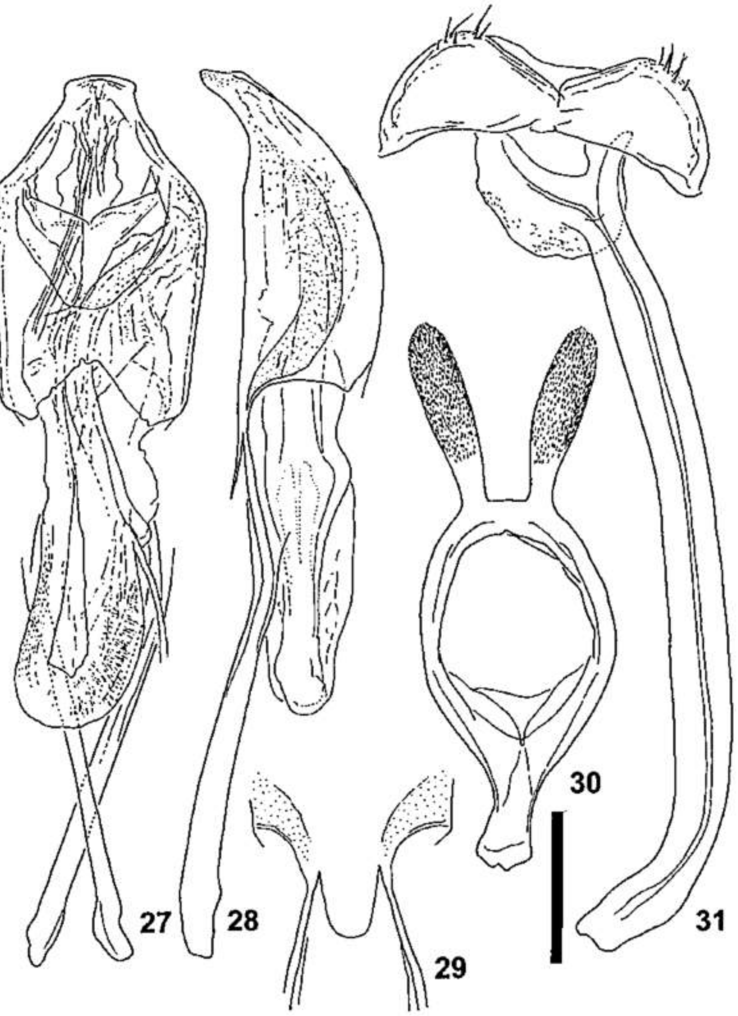
process ventrally.

Female. Length: 10.5–13.0 mm. Breadth: 3.7–4.3 mm. Resembles male, except rostrum a little longer than pronotum, dorsum almost bare, without carinae or granules; prothorax nearly as broad as long; fore tibiae without fringe of long hairs, hind pair without any bare depression dorso-internally; venter with first and second ventrites weakly depressed in middle.

Terminalia as illustrated (Figs. 53–55, 61), spermatheca J-shaped.

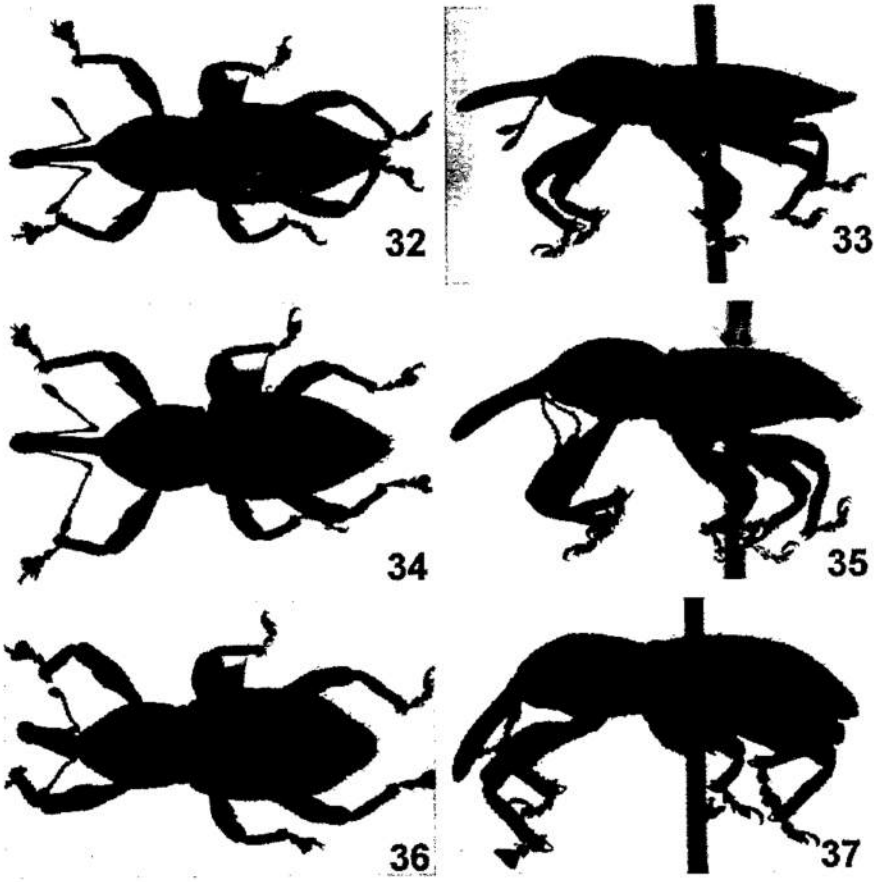
Type materials. Holotype male (Type No. 3142, ELKU), Malaysia: Pahang, Cameron Highlands, 25–VIII–1990, T. NONAKA. Paratypes: 1 male, Malaysia: Pahang, Camreon Highlands, Tanah Rata, 16–III–1976, T. SHIMOMURA. 2 males and 2 females, Gunung Jasar, 7–IV–1976, M. HATA; 1 male, 24–IV–1990, K. MATSUMOTO; 2 males and 5 females, 15~22–IV–1998, H. YOSHITAKE.

Comments. This species is similar to *P. caudatus*, and easily confused with it in sharing the large body provided with long apical processes of elytra and almost occurring sympatrically. The type series of *P. caudatus* may be a mixture of these species because at least one female paratype, KOJIMA took photos at BMNH has a fine longitudinal median carina on the dorsally, roundly convex prothorax, which is regarded as a character seen in *P. watanabei*. However, we do not know the true female of *P. caudatus* at the moment since in our collection, all female specimens possess a median carina on the prothorax, and we have concluded that they are the females of *P. watanabei*.



Figs. 27–31. Male terminalia of *Pinacopus dentirostris* MARSHALL, from Bukit Larut.——27, 28, Aedeagus, dorsal (27), lateral (28); 29, basal part of median lobe, ventral; 30, tegmen; 31, sternite 8 & spiculum gastrale. Scale=0.5 mm.

Pinacopus caudatus differs from *P. watanabei* in the following points: prothorax (Figs 1, 2; cf. Figs. 3, 4) about 1.2 times as long as broad and more weakly rounded laterally and dorsally, dorsum without median carina (about 1.1 times as long as broad and more rounded laterally and dorsally, dorsum with fine median carina in *P. watanabei*); apical processes of the elytra divergent from base (contiguous at base in *P. watanabei*); elytra 2.00–2.10 times as long as broad (1.90–1.95 times as long as broad in *P. watanabei*); in male fore tibiae fringed with long setae, which are nearly as long



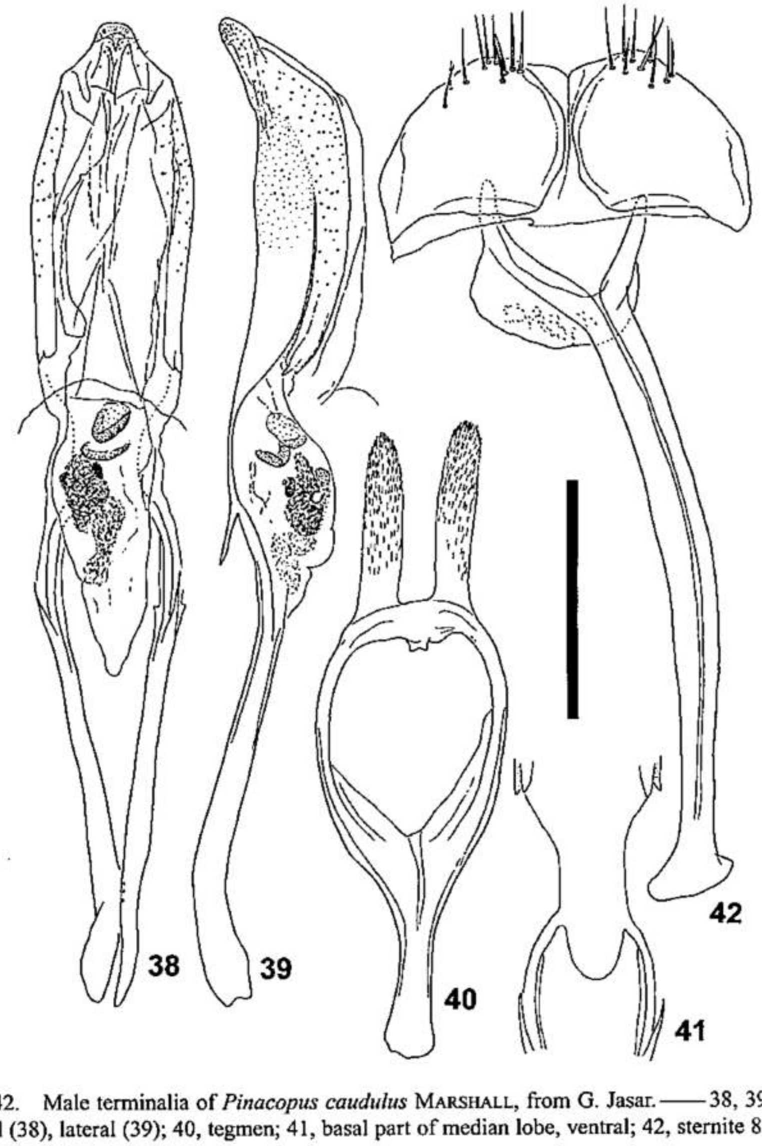
Figs. 32–37. Habitus photographs of males of *Pinacopus* spp. —— 32, 33, *P. caudulus* MARSHALL; 34, 35, *P. intermedius* sp. nov.; 36, 37, *P. dolosus* MARSHALL.

as or a little longer than breadth of tibiae (longer than breadth of tibiae in *P. watanabei*); in male hind tibiae (Fig. 23; cf. Fig. 24) do not have any bare depression dorso-internally (have bare depression in apical half dorso-internally in *P. watanabei*) and abdominal ventrites (Fig. 7; cf. Fig. 8) depressed medially on basal two segments in male (more broadly depressed on basal two and fifth segments in *P. watanabei*). They are also distinguishable easily on the structures of the male terminalia (Figs. 13–17; cf. Figs. 18–22).

Pinacopus productus MARSHALL

Pinacopus productus MARSHALL, 1942, 386.

Specimens examined. Malaysia: Selangor (Bukit Kutu), 1 male and 1 female

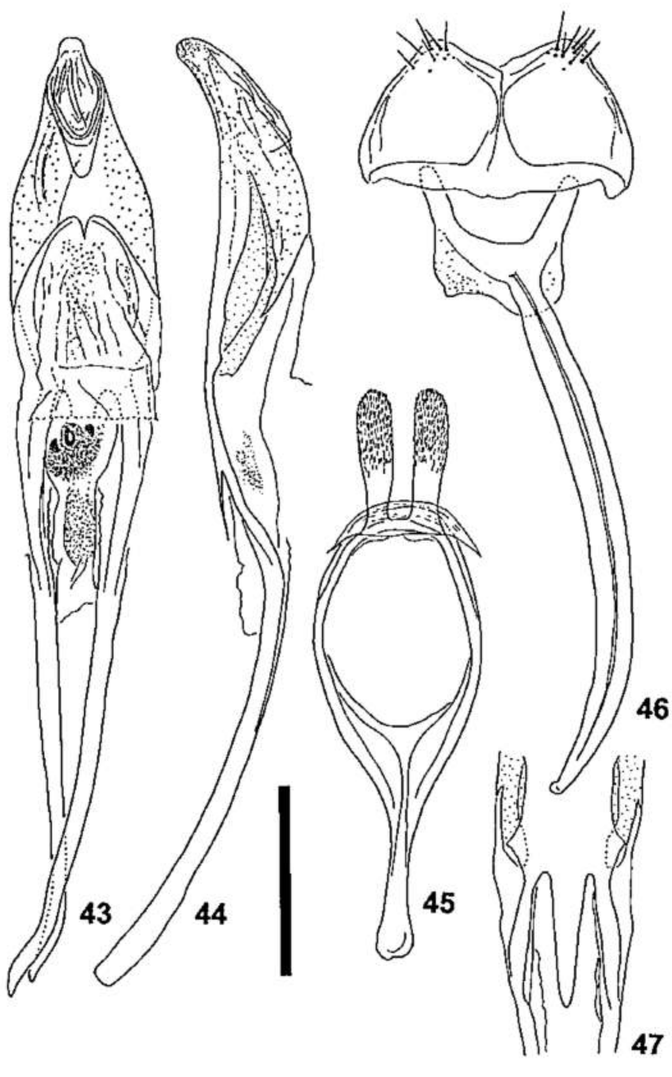


Figs. 38–42. Male terminalia of *Pinacopus caudulus* MARSHALL, from G. Jasar. —— 38, 39, Aedeagus, dorsal (38), lateral (39); 40, tegmen; 41, basal part of median lobe, ventral; 42, sternite 8 & spiculum gastrale. Scale=0.5 mm.

(Holo- and paratypes, BMNH).

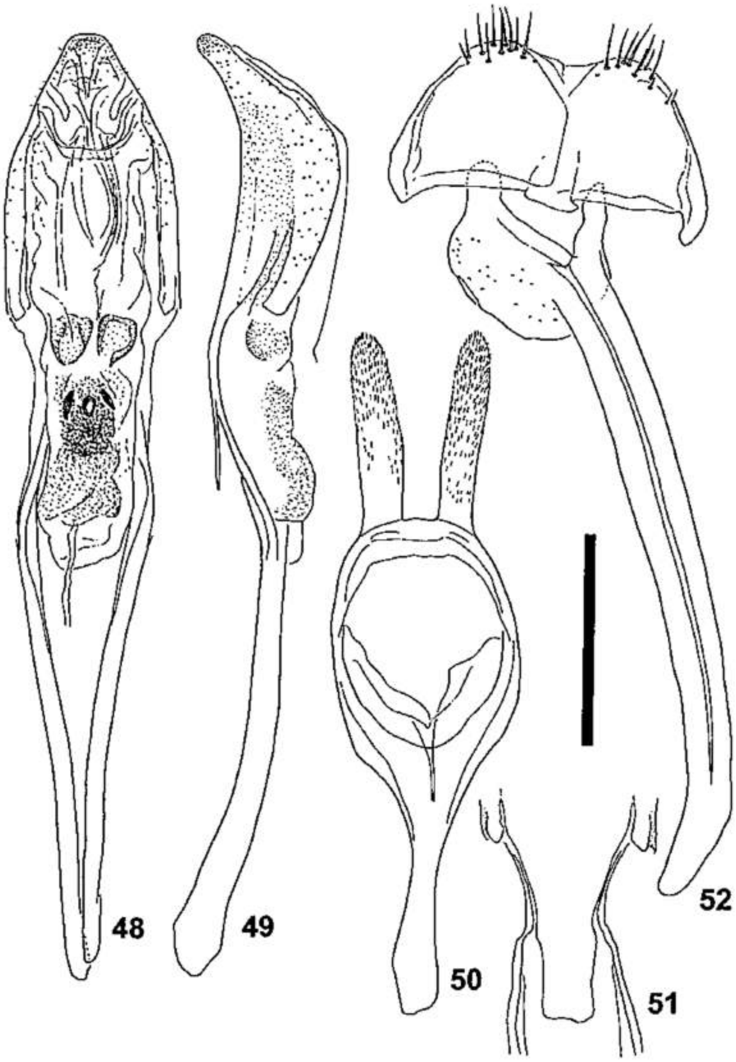
Distribution. Malaysia: Pahang (Fraser's Hill*), Selangor–Pahang (the gap*), Selangor (Bukit Kutu).

Comments. This species has the short obtuse processes on elytral apices like the species described in this paper below as *P. intermedius* sp. nov. However, *P. productus*



Figs. 43–47. Male terminalia of *Pinacopus intermedius* sp. nov., from G. Jasar. —— 43, 44, Aedeagus, dorsal (43), lateral (44); 45, tegmen; 46, sternite 8 & spiculum gastrale; 47, basal part of median lobe, ventral. Scale=0.5 mm.

is similar to *P. caudulus* and *P. watanabei* sp. nov. in having the large body, the integument clothed with long erect setae, the rostrum provided with rows of denticles in male and the 2nd funicular segment longer than 1st. *Pinacopus productus* is, however, distinguishable from them in the characters noted in the key.



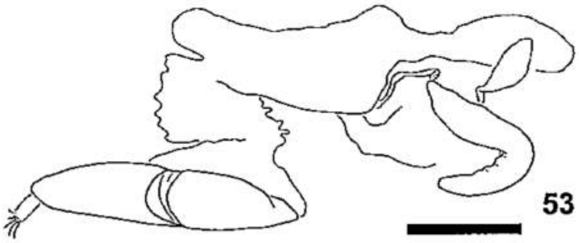
Figs. 48–52. Male terminalia of *Pinacopus dolosus* MARSHALL, from Bukit Larut.——48, 49, Aedeagus, dorsal (48), lateral (49); 50, tegmen; 51, basal part of median lobe, ventral; 52, sternite 8 & spiculum gastrale. Scale=0.5 mm.

Pinacopus dentirostris MARSHALL

(Figs. 5, 6, 9, 27–31, 56, 62, 63)

Pinacopus dentirostris MARSHALL, 1932, 350; 1942, 386 (key).

Description of terminalia. Male (Figs. 27–31). Aedeagus with median lobe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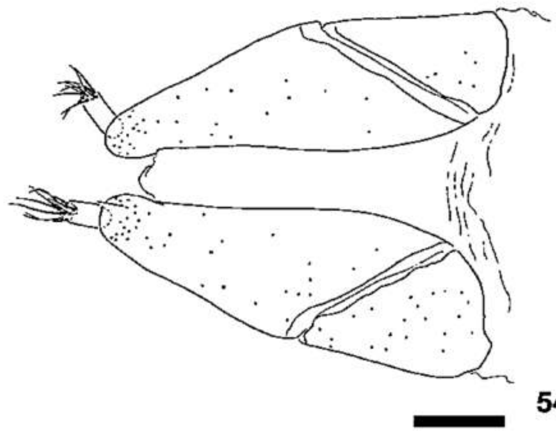
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Figs. 53–54. Female terminalia of *Pinacopus watanabei* sp. nov. —— 53, genitalia (Scale=0.1 mm); 54, hemisternites, ventral (Scale=0.2 mm).

short, broad and subtruncate at apex; tegmen (Fig. 30) with short apophysis.

Female (Figs. 56, 62). Spermathecal body (Fig. 62) distinctly bent toward duct.

Specimens examined. Malaysia: Perak, mountains, 1 male and 1 female (Holo- and paratypes, BMNH). Bukit Larut, 1 male and 4 females, 2~7–I–1990, R. NODA & K. YAHIRO; 4 males and 5 females, 25~27–VII–1995, H. KOJIMA.

Distribution. Malaysia: Perak (Taiping*, mountains, Bukit Larut).

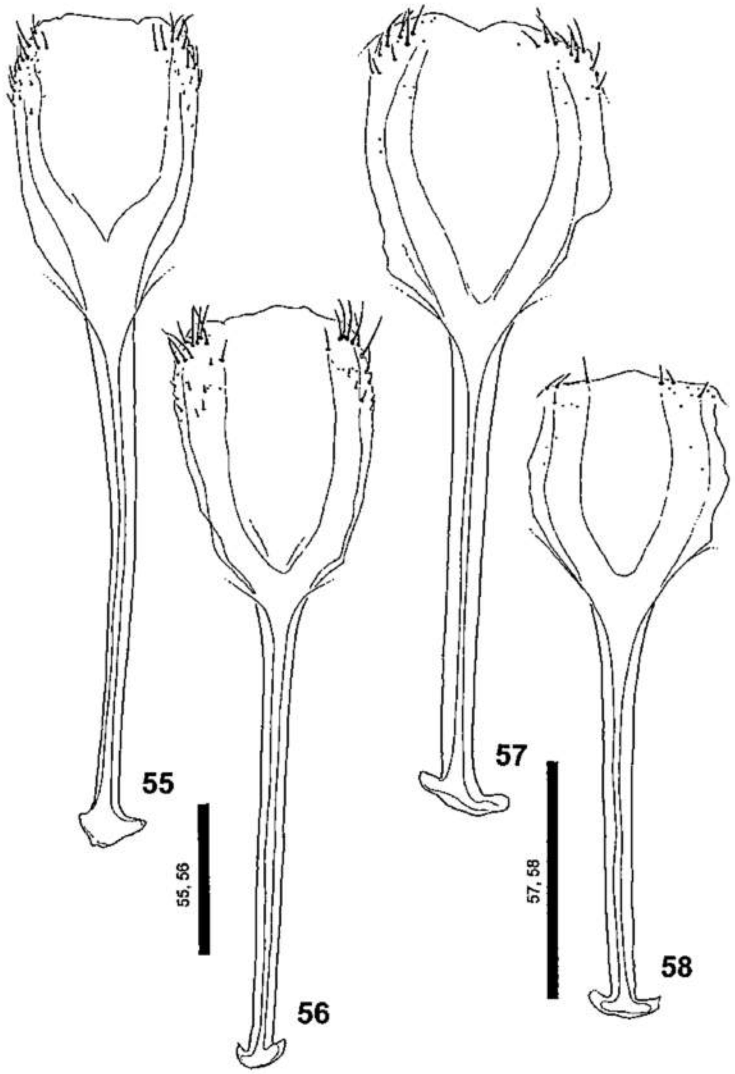
Comments. This species is easily recognized on having the large body, the conjointly rounded elytral apices and on the male, the denticulate rostrum dorsally and the fore tibiae densely fringed with long hairs. The spermatheca (Fig. 62 cf. Figs. 59–61) is also characteristic among congeners as far as we examined.

Pinacopus foveolatus MARSHALL described from the peninsular part of Thailand is similar to *P. dentirostris*, but is separable in the key provided by MARSHALL (1942).

Pinacopus caudulus MARSHALL

(Figs. 10, 25, 32, 33, 38–42, 57, 59, 63, 64)

Pinacopus caudulus MARSHALL, 1942, 386 (key), 387.

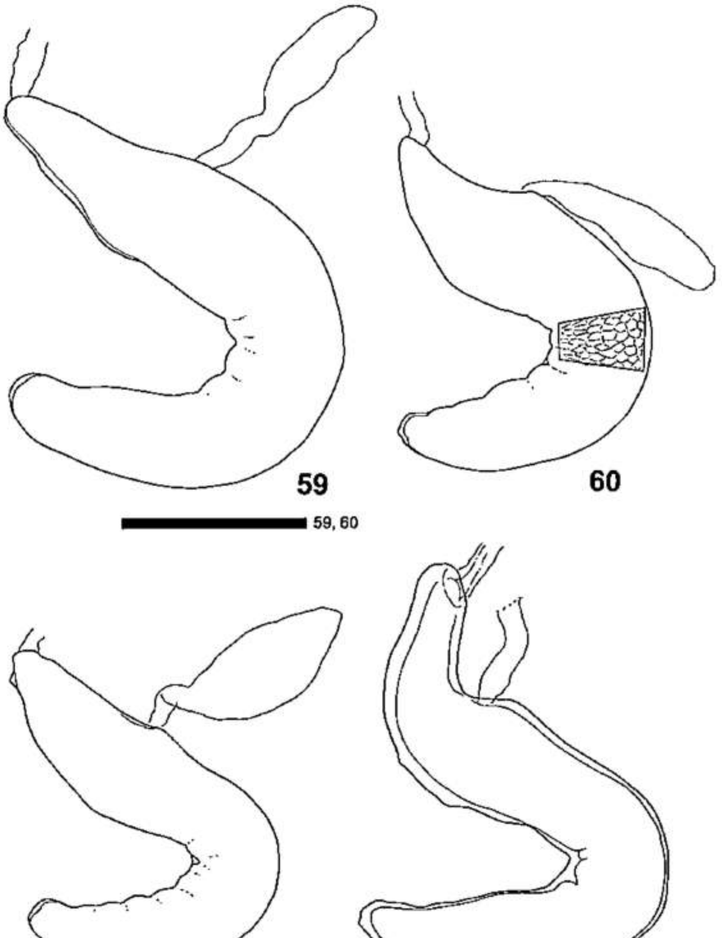


Figs. 55–58. Sternite 8 of female of *Pinacopus* spp., ventral. —— 55, *P. watanabei* sp. nov.; 56, *P. dentirostris* sp. nov.; 57, *P. caudulus* MARSHALL; 58, *P. intermedius* sp. nov. Scale=0.5 mm.

Description of terminalia. Male (Figs. 38–42). Internal sac of aedeagus with a pair of round sclerites, basal part of median lobe (Fig. 41) with round process ventrally.

Female (Figs. 57, 59). Spermatheca J-shaped, distance between duct and gland longer than breadth of body.

Specimens examined. Malaysia: Pahang, Cameron Highlands, Berinchang [sic;



Figs. 59–62. Spermathecae of *Pinacopus* spp.——59, *P. caudulus* MARSHALL; 60, *P. intermedius* sp. nov.; 61, *P. watanabei* sp. nov.; 62, *P. dentirostris* MARSHALL. Scale=0.2 mm.

Brinchang?], 1 male and 1 female (Holo- and paratypes, BMNH). Gunung Brinchang, 9 males and 1 female, 30–III–1976, Y. MIYAKE; 1 male and 1 female, 18–V–1973, S. MIYAKAWA; Gunung Beremban, 3 males, 26~28–II–1992, K. MATSUMOTO; 1 female, 22–VII–1995, H. KOJIMA; Gunung Jasar, 1 male, 7–IV–1976, M. HATA; 2 males, 12–III–1989, H. KARUBE & Y. OKUSHIMA; 1 male, 14–XII–1998, H. INOUE; 1 male and 1 female, 15~22–IV–1998, H. YOSHITAKE.

Distribution. Malaysia: Pahang, Cameron Highlands (Tanah Rata, Gunung

Brinchang, G. Beremban, G. Jasar).

Comments. This species has apical processes on the elytra like *P. caudatus* and *P. watanabei* sp. nov. However, in *P. caudulus*, the processes are not so sharp as the latter species and the body is smaller in size, the 2nd funicular segment is not longer than 1st, and the rostrum has non-denticulate narrow carinae in the male.

Pinacopus intermedius KOJIMA et MORIMOTO, sp. nov.

(Figs. 11, 26, 34, 35, 43–47, 58, 60, 63, 64)

Description. Male. Length: 5.0–7.5 mm. Breadth: 2.0–2.8 mm. Dull black, with subcontiguous round grey to greyish green scales above, and sparse narrower scales beneath, sometimes with faint dark oblique maculae on elytra (Fig. 34), where the round scales are smaller than those of the remaining.

Head with small spatulate scales, several suberect scales adjoining eyes. Rostrum as long as pronotum, somewhat widened at apex, with five fine complete carinae, the outer ones uniting behind antennal insertion, without any denticulations, interspaces with row of shallow confluent punctures. Antennae with basal two funicle segments subequal in length, 3rd to 7th each subequal in length, 2/3 times as long as 2nd.

Prothorax almost as broad as long, rounded laterally, widest around middle, slightly constricted at base but not at apex; dorsum with dense small subreticulate punctures, each filled with round scale, leaving intervals bare, sometimes with very faint median carina on apical third, with sparse recumbent to subrecumbent oblong-ovate to lanceolate scales. Elytra 1.5–1.6 times as long as broad, widest before middle, apices separately produced into faint processes involving actual apical margin; shallow striae and punctures mostly concealed dorsally by dense scaling, intervals each with row of small distant granules, each bearing short subrecumbent scale. Legs clothed with recumbent scales and subrecumbent scale-like setae; femora each with short sharp tooth; tibiae each with distinct premucro, fore pair each dilated internally about middle, without distinct fringe of long setae, hind pair each dilated internally around middle, with narrow bare space dorso-internally (Fig. 26).

Venter (Fig. 11) with first and second ventrites depressed medially, with longitudinal flat process curved inward on each side of it on first ventrite, fifth ventrite broadly, roundly depressed and raised ventrad just behind it.

Terminalia as illustrated (Figs. 43–47); aedeagus (Fig. 43) attenuate apically, median lobe much shorter than apophysis, basal part of median lobe (Fig. 47) with long process ventrally.

Female. Length: 5.4–7.5 mm. Breadth: 2.1–3.0 mm. Resembles male, except rostrum a little longer than pronotum, venter with first and second ventrites inflated, fifth faintly depressed.

Terminalia as illustrated (Figs. 58, 60); spermatheca with distance between duct and gland nearly as long as breadth of body.

Type materials. Holotype male (Type No. 3143, ELKU), Malaysia: Pahang,

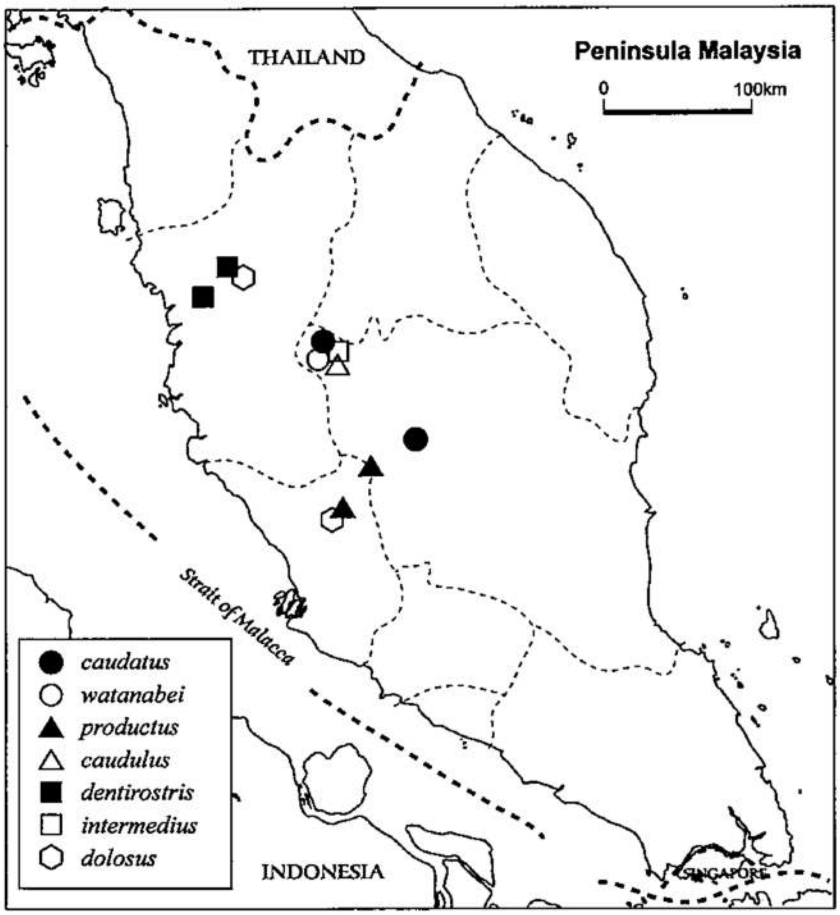


Fig. 63. Distribution of *Pinacopus* spp. in Malaysia.

Cameron Highlands, Gunung Jasar, 15~22–IV–1998, H. YOSHITAKE. Paratypes: Malaysia: Pahang; 2 males, Cameron Highlands, 17–19 miles from Tapah, 4~8–III–1976, T. SHIMOMURA; 1 male, same locality as holotype, 7–IV–1976, M. HATA; 3 males and 3 females, 8–IV–1976, M. HATA; 1 female, 12–III–1989, H. KARUBE; 5 males, 25–IV–1990, K. MATSUMOTO; 2 males and 2 females, 21–II–1992, K. MATSUMOTO; 8 males and 11 females, same data as holotype, H. YOSHITAKE; 1 female, 12–XII–1998, H. INOUE; 3 males, Cameron Highlands, Gunung Beremban, 26–II–1992, K. MATSUMOTO; 1 male, 22–VII–1995, H. KOJIMA; 1 male, Cameron Highlands, 27–VIII–1990, T. NONAKA.

Comments. This species is similar to *P. caudulus*, but is easily separable by a combination of the following characters: prothorax almost as long as broad (a little longer than broad in *P. caudulus*), more rounded laterally; elytra shorter, 1.5–1.6 times as long as broad, with less prominent apical process (1.7–1.8 times as long as broad, with a little more developed process in *P. caudulus*); hind tibiae (Fig. 26, cf. Fig. 25) each dilated internally around middle, with narrow bare area dorso-internally (dilated internally before middle, without bare area in *P. caudulus*); first ventral tubercle (Fig. 11, cf. Fig. 10) on each side of depression well developed to longitudinal flat process curved inward in male (less developed as weak tubercle in *P. caudulus*).

This species is also somewhat confused with *P. dolosus*, but can be separable by having the following points: elytra widest before middle, each with faint apical process (widest at middle, almost evenly rounded at apices, without process in *P. dolosus*); first ventrite (Fig. 11, cf. Fig. 12) with well developed longitudinal flat process on each side of depression in male (with small tubercle in *P. dolosus*).

The male aegeadus is also characteristic and easily distinguishable from *P. caudulus* and *P. dolosus* in having the attenuate apex of the median lobe (Fig. 43; cf. Figs. 38, 48) and the long process at the base of the median lobe (Fig. 47; cf. Figs. 41, 51).

Pinacopus dolosus MARSHALL

(Figs. 12, 36, 37, 48–52, 63)

Pinacopus dolosus MARSHALL, 1932, 352; 1942, 386 (key).

Description of terminalia. Male (Figs. 48–52). Internal sac of aedeagus with a pair of sclerites, median lobe much shorter than apophysis, basal part of median lobe (Fig. 51) with quadrate process ventrally. Female. Not examined.

Specimens examined. Malaysia: Perak, Bukit Larut (Maxwell Hill), 2~7–I–1990, R. NODA; 1 male, Perak, mountains (Holotype, BMNH).

Distribution. Malaysia: Perak (Perak mountains, Bukit Larut), Selangor (Bukit Kutu*).

Comments. Of the Malaysian congeners, this species and *P. dentirostris* are devoid of the apical processes on the elytra completely. Interestingly they occur sympatrically in Bukit Larut and mountains in Perak. They are easily distinguishable in the characters noted in the following key.

Pinacopus dolosus is similar to *P. caudulus* in the structures of the male genitalia (Fig. 48; cf. Fig. 38), though the median lobe is shorter and broader in *P. dolosus* than in *P. caudulus*.

Key to the Malaysian Species

1(10) Elytra with apical processes, which are obtuse in *P. productus* and *P. intermedius*.

2(7) Antennae with 2nd funicle longer than 1st. Elytra and legs with long erect scale-like setae. Rostrum in male with rows of denticles dorsally.

3(6) Apical processes of elytra comparatively long (Figs. 1–4) and very sharp.

Front tibiae in male with fringe of long hairs internally.

4(5) Prothorax without complete median carina (Fig. 1). Apical processes of elytra divergent from base (Fig. 1). Hind tibiae (Fig. 23) in male without bare depression dorso-internally. ....*P. caudatus* MARSHALL

5(4) Prothorax with fine, complete median carina (Fig. 3). Apical processes of elytra contiguous and weakly divergent posteriorly (Fig. 3). Hind tibiae (Fig. 24) in male each with bare depression dorso-internally on apical half. ....*P. watanabei* sp. nov.

6(3) Apical processes of elytra less than a half as long and very obtuse. Front tibiae without fringe internally. ....*P. productus* MARSHALL

7(2) Antennae with 2nd funicle not longer than 1st. Elytra and legs with short subrecumbent scale-like setae. Rostrum in male with narrow non-denticulate carinae.

8(9) Elytra with short, but distinct apical processes (Figs. 32, 33). Hind tibiae (Fig. 25) each dilated internally before middle, without bare area in male. First abdominal ventrite (Fig. 10) with weak longitudinal tubercles on each side of median depression. ....*P. caudulus* MARSHALL

9(8) Elytra with very obtuse apical processes (Figs. 34, 35). Hind tibiae (Fig. 26) each dilated internally around middle, with narrow bare area dorso-internally in male. First abdominal ventrite (Fig. 11) with longitudinal flat process curved inward on each side of median depression. ....*P. intermedius* sp. nov.

10(1) Elytra without any trace of apical processes (Figs. 5, 6, 36, 37).

11(12) Antennae with 2nd funicle much longer than 1st. Rostrum in male denticulate dorsally. Front tibiae each with fringe of long hairs internally. ....*P. dentirostris* MARSHALL

12(11) Antennae with 2nd funicle not longer than 1st. Rostrum in male not denticulate dorsally. Front tibiae without fringe of long hairs. ....*P. dolosus* MARSHALL

Distribution of *Pinacopus* in the Peninsula Malaysia

In this study, seven of the nine known species of *Pinacopus* are recognized from Malaysia. They are all endemic and known from mountainous areas of the Peninsula Malaysia (Fig. 63). Among them, four of the seven Malaysian species are recognized from the Cameron Highlands, Pahang. The Cameron Highlands are a famous place as highland resort in the Peninsula Malaysia with elevation of 1,500–2,000 m. There, *Pinacopus* is one of the common weevils we encountered through collecting by beating and sweeping methods of shrubs. Their distributions in the Cameron Highlands are shown in Fig. 64. *Pinacopus caudatus* and *P. watanabei* sp. nov. occur sympatrically and almost all the collections of them are from Gunung Jasar. *Pinacopus caudulus* and *P. intermedius* sp. nov. occur sympatrically at Gunung Jasar and G. Beremban, but *P.*

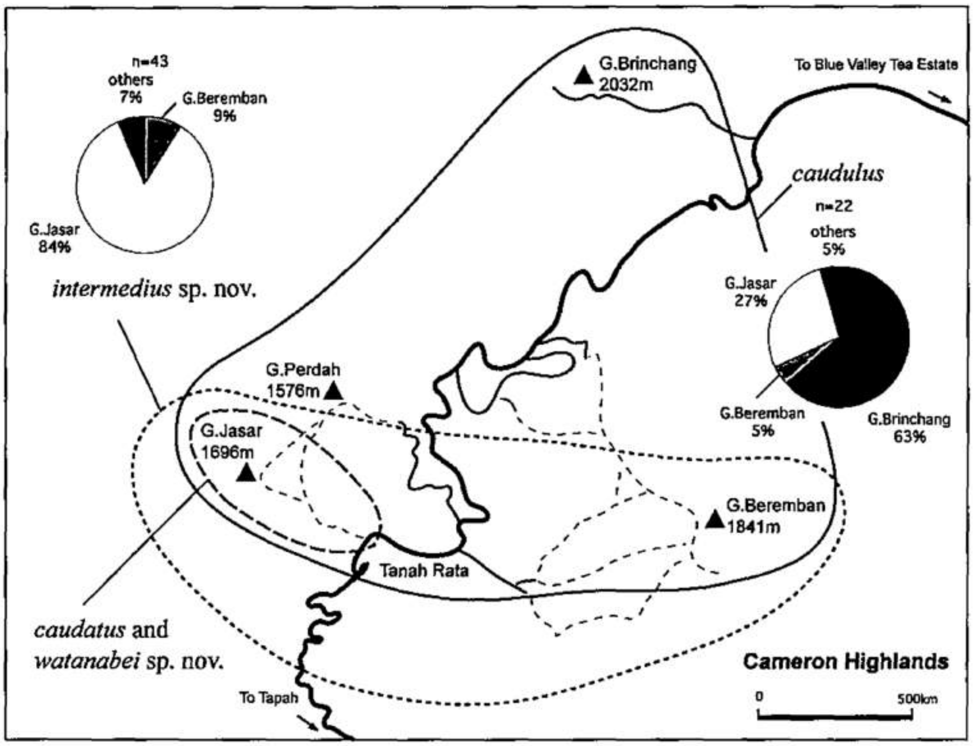


Fig. 64. Distribution of *Pinacopus* spp. in the Cameron Highlands, Pahang, Malaysia.

caudulus frequently occus at G. Brinchang and *P. intermedius* is at G. Jasar, not known from G. Brinchang.

When we compare the fauna of the Cameron Highlands with Bukit Larut of Perak, which is about 50 km apart to the northwest, no species overlaps between them. All the four species from the Cameron Highlands (mentioned above) are provided with apical processes of the elytra, whereas two species from Bukit Larut (*P. dentirostris* and *P. dolosus*) have the rounded elytral apices. Thus, with the exception of a few species, their distributional ranges seem to be restricted within the peninsula probably due to their limited vagility imposed by the atrophy of the hind wing. It is likely that more species will be found through further surveys within the peninsula as well as beyond the previous range of distribution in Southeast Asia.

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Mr. M. HATA, Mr. H. INOUE, Dr. H. KARUBE, Dr. K. MATSUMOTO, Mr. Y. MIYAKE, Mr. R. NODA, Dr. T. NONAKA, Dr. Y. OKUSHIMA and Mr. H. YOSHITAKE. KOJIMA also thanks Drs. C. H. C. LYAL and R. T. THOMPSON for their kind support during his stay in London. This study is supported by a Grant-in-Aid from the Ministry of Education, Science, Sports and Culture of Japan (No. 13740491) and a UK98 Grants from the British Council (to KOJIMA).

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Spec. Bull. Jpn. Soc. Coleopterol., Tokyo, (5): 447–452, Mar. 31, 2002

Watanabezo, a New Genus of the Cryptorhynchini (Coleoptera, Curculionidae) from the Ogasawara Isls., Japan

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Abstract *Watanabezo unguiculatus* gen. et sp. nov. is described from Hahajima Is. of the Ogasawara Isls., Japan. This new genus belongs to the *Acalles*-complex of the subtribe Tylodina in the tribe Cryptorhynchini, and characterized in having the minute claws, prominent and vertical receptacle of rostrum close to the anterior margin of mesosternum, obsolete episternal sutures on meso- and metathoraces, and dentate tibiae near base at exterior margins. Weevils are soil-inhabiting and are taken by sifting litter in the forests of Hahajima Is. of the Ogasawara Isls., Japan.

It is my great pleasure to dedicate this paper to Prof. Y. Watanabe on the occasion of his retirement from Tokyo University of Agriculture. In the course of my studies on Curculionoidea, Prof. Y. Watanabe kindly entrusted me a number of specimens of weevils taken by himself and his co-workers from the Ogasawara and Izu Islands including many soil-inhabitants. Of these, an interesting species apparently belonging to a new genus is dealt with in this paper. The name of the new genus is dedicated to Prof. Y. Watanabe as a memory of his ever continuing study of Staphylinidae and many other beetles. I wish to express my gratitude to Prof. Y. Watanabe, Dr. S. Nomura and Dr. S. Miyakawa for their favors on materials, and to Prof. J. Yukawa and Dr. H. Kojima of Kyushu University for their kindness in various ways.

Watanabezo gen. nov.

Type species: *Watanabezo unguiculatus* sp. nov.

Head including eyes hemispherical, forehead between eyes faintly depressed transversely in lateral view, as wide as rostrum at the narrowest point. Eyes lateral, ovate, flat, roughly faceted, partly concealed by pronotum when rested. Rostrum evenly curved, coarsely punctate, with a median and a pair of lateral carinae in entire length, lateral margins above scrobes costate, curved downwards around the apex of scape and reaching the middle of eye. Mandibles with a notch and two blunt teeth, with two minute setae. Prementum ovate, about as long as broad; labial palpi 3-segmented, basal segment with a stout seta, second segment with a little smaller seta. Postmentum narrower than prementum, about twice as long as broad. Antennae inserted approximately halfway along rostrum, scape shorter than funicle; funicle with 7 segments; club ovate, compact, first segment more than half the whole length.

Prothorax wider than long, widest before the middle, anterior margin incurved from dorsum to anterolateral corner of prosternal canal in lateral view; prosternal canal deep, bare, sharply carinate on both sides before coxae, sternellum bare, shallowly concaved, without lateral carinae. Mesosternal receptacle vertical, prominent ventrad from the level of metasternum, lying in front of mesocoxae and touching procoxae at side margins, V-shaped at posterior margin in ventral aspect, with a median carina and a pair of hollows on posterior surface. Meso- and metepisternal sutures absent. Metasternum shorter than the diameter of a coxa. Scutellum absent. Elytra with rounded humeri, evenly rounded at sides from base to posterior third, then a little prolonged caudad and broadly rounded at conjoint apex; striae with coarse punctures, 1st to 5th striae regular, reaching the base, 6th to 8th abbreviated at base, 9th ultimate, entire; undersurface without sutural flange, submarginal ridge distinct in entire length, widely distant from apex, wide area between the ridge and apex finely strigulate. Hind wings completely degenerated.

Legs stout; femora hardly swollen, unarmed, shallowly sulcate in entire length for receiving tibiae, hind femora not reaching the apex of elytra; tibiae flattened, with a sharp tooth in front of the base; tarsi with second segment transverse, third segment transverse ovate, much wider than second, median notch short, not reaching the middle, fifth segment small, about as long as third, cylindrical, weakly bent; claws minute, simple, free.

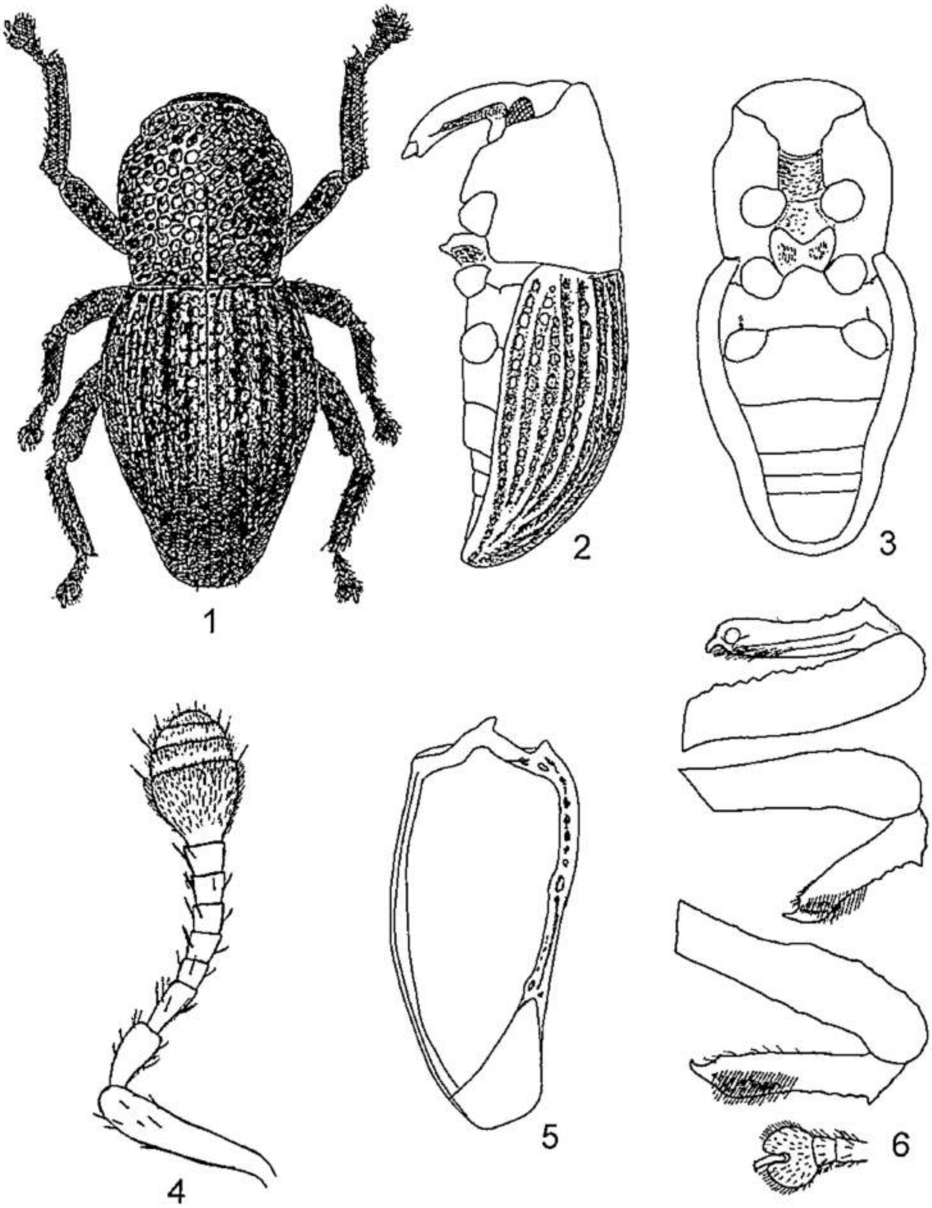
Metendosternite transverse, without lateral arms, anterior tendon widely distant.

Venter with first ventrite broad at base, about as long as second behind coxa, third and fourth short, their combined length as long as second. Eighth tergite subquadrate and uncovered with seventh in greater part in male, narrowed caudally and serrate at apex in female. Eighth sternite weakly sclerotized and paired with membranous intervention in male; semicircular with spiculum ventrale in female. Ninth sternite in male membranous, spiculum gastrale narrow Y-shaped, straight, with two pairs of triangular and lightly sclerotized expansions, almost as long as whole aedeagus.

Male aedeagus with long apodemes reaching mesothorax, tegmen ringed, parameres absent, aedeagal body broader than thick, flagellum filiform, very long, with a spherical sclerite in the middle. Female ovipositor short, with a pair of coxites and styli from membranous vulva.

Etymology. The genus is named after Prof. WATANABE+*zo* (weevil and elephant in Japanese), and masculine.

Comparison. This new genus belongs to the *Acalles*-complex in the subtribe Tylodina of the tribe Cryptorhynchini in having the following features: pectoral canal on prosternum open posteriorly, without lamellae laterally behind procoxae; rostrum not touching middle coxae, but ending in receptacle on mesosternum; mesosternal receptacle short, vertical, close to the anterior margin of mesosternum, with a median carina



Figs. 1–6. *Watanabezo unguiculatus* gen. et sp. nov., male.—— 1–3, Habitus, dorsal, lateral and ventral views; 4, antennae; 5, left elytron, ventral, showing widely distant submarginal ridge from apex; 6, femora, tibiae and hind tarsus.

and a pair of hollows on posterior wall; metasternum short, shorter than the diameter of a coxa; elytra with round humeri; and femora edentate, sulcate in entire length for receiving tibiae. This genus is, however, unique in having dentate tibiae externally near the base, smaller fifth segment of tarsi, minute claws, and narrow Y-shaped spiculum gastrale conjuncting broadly with connecting membrane in male. The last condition is seen in Erirhininae (see ZIMMERMAN, 1993) and somewhat similar condition is present in some genera of Cryptorhynchini (see LYAL, 1993). This genus can be separable from the relatives without scutellum by the characters in the following key.

1(10) Metepisternal sutures absent.

2 (9) Femora sulcate in entire length for receiving tibiae with delimited carinae on both margins.

3 (4) Body smooth, shiny; metasternum with sharp ridge between meso- and metacoxae on each side. .... *Trigonopterus* FAUVEL, 1867

4 (3) Body coarsely punctate; metasternum with ridges indefinite.

5 (8) Mesosternal receptacle vertical, close to anterior margin of mesosternum, with a median keel and a pair of hollows on posterior wall.

6 (7) Tibiae not dentate externally in front of the base; tarsi with fifth segment longer than third, deeply bilobate; claws of normal size; hind femora broadest at base, junction of trochanter at right angles to dorsal and ventral margins of femur; elytra strongly convex dorsad. .... *Crooktacalles* LYAL, 1993

7 (6) Tibiae dentate externally in front of the base; tarsi with fifth segment small, as long as third segment; claws minute; hind femora more or less narrowed basally, junction of trochanter oblique; elytra in side view with length much greater than total depth. .... *Watanabezo* gen. nov.

8 (5) Mesosternal receptacle not keeled and not hollowed on ventral wall; tarsi with fifth segment longer than third, clavate; claws of normal size; elytra in side view with length at most a little greater than total depth. .... *Acalles* SCHOENHERR, 1825

9 (2) Femora not sulcate for receiving tibiae; mesosternal receptacle terminated between middle coxae, U-shaped; small in size. .... *Microcryptorhynchus* LEA, 1908

10 (1) Metepisternal sutures visible throughout their length.

11(12) Forehead between eyes as broad as the base of rostrum; elytra without ultimate (10th) striae; mesosternal receptacle close to anterior margin, prominent, costate at the middle of posterior wall. .... *Simulatacalles* MORIMOTO, 1978

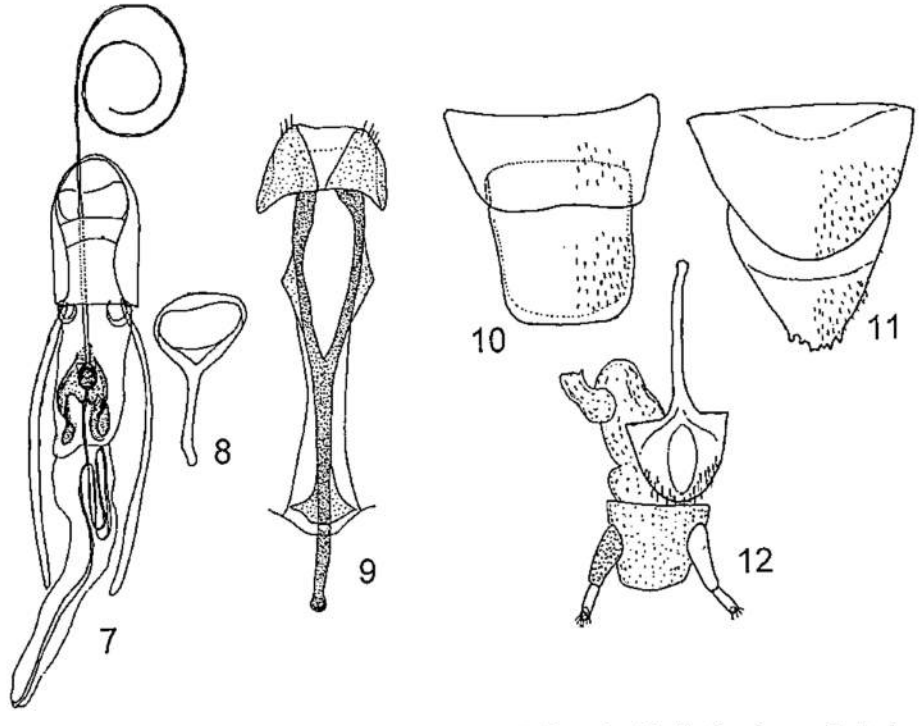
12(11) Forehead between eyes narrower than the base of rostrum; elytra with 10th striae; mesosternal receptacle U-shaped, not costate on posterior wall. .... *Miocalles* PASCOE, 1883

Watanabezo unguiculatus sp. nov.

Reddish brown to dark reddish brown, antennae paler, underside a little darker; coarsely punctate, each puncture filled with earthy substance and bearing an appressed grayish short setae in general, but the setae are almost lost on pronotum and head.

Head densely punctate, without median fovea. Rostrum weakly and evenly arcuate, with a median and two pairs of lateral carinae on dorsum from base to a little beyond antennal insertion, the outermost one along antennal scrobes, with two pairs of punctures in rows, which continue up to forehead and irregular at apex. Antennae with length/width of segments from scape to club as 137/30 : 56/26 : 40/20 : 22/20 : 20/22 : 18/23 : 21/26 : 24/30 : 99/63.

Pronotum about as long as wide, widest at a third from apex, then straightly narrowed posteriorly, arcuate anteriorly to subapical constriction; disc reticulately provided with coarse punctures, their interstices shiny, impunctate, with a weak median carina on basal half; appressed setae usually scattered in latero-dorsal areas between anterior and posterior corners and in basal area in the middle, less than 30 in number on each side.



Figs. 7–12. *Watanabezo unguiculatus* gen. et sp. nov.; 7–10: male, 11–12: female.——7, Aedeagus, dorsal; 8, tegmen, dorsal; 9, 8th and 9th sternites, notice the Y-shaped slender spiculum gastrale; 10, 7th and 8th tergites; 11, 7th and 8th tergites; 12, ovipositor and 8th sternite.

Elytra longer than wide (10 : 7), widest at basal third, somewhat constricted at a quarter from apex, then broadly rounded at conjoined apex; striae with a row of coarse punctures, which become shallower behind declivity, each puncture bearing a short appressed seta, first and second striae entire, reaching apex, third and fourth striae reaching submarginal striae at apex; fifth stria extending from base to declivity, sixth to eighth striae not reaching base and ending at declivity, ninth (ultimate) stria entire; intervals convex, narrower than striae, with a row of distant small punctures and weak tubercles, each tubercle bearing an appressed short seta, 5th, 7th and 9th intervals joined together behind declivity, then joined again with 3rd interval before apex.

Femora with coarse setiferous punctures. Tibiae with posterior face (ventral in fore legs, dorsal in middle and hind legs in specimens) flat, smooth, costate along both exterior and interior margins, anterior face punctate in three rows, punctures weaker on middle and hind tibiae.

Underside coarsely punctate; metasternum between meso- and metacoxae with a puncture; first ventrite with three punctures behind coxa and four in the middle on a longitudinal line; second ventrite with three irregular rows of punctures, third and fourth ventrite each with a row of punctures.

Length: 1.9–2.2 mm (head to apex of elytra when viewed dorsally).

Holotype: ♂ (Type no. 3140, Kyushu Univ.), Mt. Kuwanokiyama, Haha-jima Is. (250 m), Ogasawara Isls., 1–IX–1997, S. NOMURA leg. (ex litter). Paratypes: 2♂♂, same data as holotype; 1♂, same locality as holotype, 27–IX–1977, T. TANOKUCHI leg.; 1♀, Mt. Sakaigatake, Haha-jima Is., 1–IX–1997, S. NOMURA leg.; 1♂, Mt. Chibusayama, Haha-jima Is., Ogasawara Isls., 27–VII–1976, T. AOYAMA leg.

Materials dissected. 1♂, 1♀, same data as holotype.

Distribution. Haha-jima, Ogasawara Isls.

Specimens were all collected by sifting litter.

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Gaphara conspersa (Lepidoptera), a Tineid Moth Preying on Ant Larvae

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Abstract The larva of the Japanese tineid *Gaphara conspersa* lives in an 8-shaped silk case, and has been considered a dead-plant feeder. We found larvae of this species in and around nests of the ants *Lasius spathepus*, *L. fuliginosus*, *L. japonicus* and *Pristomyrmex pungens*. Laboratory and field observations showed that the moth larvae prey on larvae of these ants. Fragments of larval epidermis of the ants were detected from the intestine of some moth larvae. When the silk case was removed, naked larvae of *G. conspersa* were attacked by workers of the associated ant. It is concluded that the silk case and the claw-shaped forelegs of the larva of *G. conspersa* are an adaptation for preying on ant larvae.

Introduction

The genus *Gaphara* (Tineidae, Myrmecozelinae) consists of 25 Old World species, and five of them are known from Southeast Asia (Robinson *et al.*, 1994). A great variety of myrmecophily or social parasitism on termites, bumble bees or paper wasps has been reported in *Gaphara* and other related genera of the family Tineidae. They are scavengers, detritus feeders and occasional or obligate predators on host larvae (Busck, 1935; Hinton, 1951; Makino, 1983; Moriuti, 1982; Pierce, 1995). One of the well-documented examples of myrmecophily is the case of *G. dolichoderella* in Java (Roepke, 1925). Roepke (1925) described the biology of *G. dolichoderella* in detail, the larvae of which prey on larvae of the ant *Dolichoderus bituberculatus* in its nest. The moth larva lives in a flattened 8-shaped portable silk case woven with rubbish, and ROEPKE (1925) suggested that the silk case could be a camouflage to help the moth larva escape from attack by the ants.

Gaphara conspersa (MATSUMURA) is the only species of the genus so far recorded from Japan. The larva of *G. conspersa* is known to live under bark of decaying trees. The larva has been considered to feed on dead plant tissue (MORIUTI, 1982; SUGI, 1997), but no detail of its food habit has been documented. The larva lives in an 8-shaped portable case, as does the larva of *G. dolichoderella*. The case is made of silken threads, very tough and completely flat, with a slit at each end, and hides the entire body of the larva. When the moth larva moves, it protrudes its well-sclerotized head and thorax from one end of the case (Fig. 1).

We found many larvae of *G. conspersa* in and around nests of a few ant species, and observed that the moth larva preyed on larvae of the ant species, as reported below.

Material and Methods

Field observations and collection of materials were made from May 2000 to September 2001, at six sites of Kanto district, central Japan: 1) campus of Tokyo University of Agriculture (TUA), Atsugi, Kanagawa Pref., 2) Kodomo-Shizen Park, Yokohama, Kanagawa Pref., 3) Minamihonjuku Park, Yokohama, 4) Shiraishizawa, Yamakita, Ashigara, Kanagawa Pref., 5) Suna-shinden, Kawagoe, Saitama Pref., and 6) Higashi, Tsukuba, Ibaraki Pref.

In order to know how ants respond to naked larvae of *G. conspersa*, we carried out a field experiment with a natural nest of *Lasius japonicus* under a large rotten log on the campus of TUA on 9 and 10 July 2001. After removing the log, we introduced ten larvae of *G. conspersa* into the nest, one by one, and seven larvae of the tortricid *Eucoenogenes ancyrota* MEYRICK, under the same conditions, as control. The larvae of *G. conspersa* were about 9–14 mm in length, and were collected around the ant nest. The silk case was removed from each larva before introduction. The tortricid larvae were non-myrmecophilous and about 9–12 mm in length, and were collected in Yokohama. Each larva was observed for at least three minutes after introduction.

To observe the interaction between larvae of *G. conspersa* and ants in detail, we carried out another experiment with ants in an artificial nest in the laboratory. We prepared a shallow plastic container (295×185×70 mm) paved with a mixture of plaster and charcoal to maintain moisture. In the middle of the plaster, we hollowed out a shallow rectangular chamber (65×40 mm), covered with a transparent acrylic plate, which was able to serve as a nest for the ants (cf. HÖLLDOBLER & WILSON, 1990, p. 632). The chamber was connected to the remaining space in the container through a tunnel, 13 mm in diameter. On 2 December 2000, approximately 100 workers and approximately 50 larvae of *Lasius japonicus* were confined in the chamber, and three larvae of *G. conspersa* were introduced into the container. On 27 December, other 11 larvae of *G. conspersa* were added to the container. These ants and the moth larvae were collected from in and around a single ant nest at Kodomo-Shizen Park. Cereals, pieces of fruits and biscuits were occasionally placed in the container as food for ants. The colony was kept until 21 February 2001.

To ascertain if larvae of *G. conspersa* prey on ant larvae, we kept a few (2–11) moth larvae in an opaque plastic container (85×55×18 mm) and introduced a few (1–7) living larvae of *Lasius japonicus* (or *L.* sp.). This experiment was repeated five times between 23 October 2000 and 1 June 2001. The ants and the moth larvae were collected at Sutama, Yamanashi Pref., Japan, the campus of TUA, and Minamihonjuku. The moth larvae were kept with cereals until the introduction of ant larvae.

We dissected 27 larvae of *G. conspersa*, collected from within ant nests on the campus of TUA and Suna-shinden, Saitama in 2001, to examine the contents of the intestine: 18 were collected from a nest of *Lasius fuliginosus* on 26 April, eight from a nest of *L. japonicus* on 27 June and the remaining one from a nest of *Pristomyrmex pungens* on 7 July. These larvae were deposited in 80% ethanol just after collecting. The gut contents were heated in 10% KOH (or NaOH) solution, sorted out under a dissecting microscope, stained with Evans' blue, mounted in balsam, and examined under a light microscope.

Results

1. *Ant species*

Larvae of *Gaphara conspersa* in the silk case are commonly found in Kanto district nearly throughout the year. We collected more than 150 larvae of *G. conspersa* from a total of 19 ant colonies (Table 1). They were found in and around the ant nests. In 17 cases (89%), the associated ant species were of the genus *Lasius*: *L.* (*Dendrolasius*) *spathepus* Wheeler, *L.* (*Dendrolasius*) *fuliginosus* (Latreille) and *L.* (*Lasius*) *japonicus* Santschi. The nests of these species were found mostly at the bases of deciduous trees or in narrow spaces under fallen tree trunks. Larvae of *G. conspersa* were often found inserting themselves into entrances to, or tunnels of, the ant nests (Fig. 3). They were sometimes found in the middle of chambers where ants kept their larvae and pupae (Fig. 2).

In the remaining two cases, the ants were *Pristomyrmex pungens* Mayr. This species does not construct an elaborate subterranean nest, but colonizes under dead leaves and keeps its larvae and pupae there (Tsuji, 1988; Hölldobler & Wilson, 1990). We found many ant larvae on dead leaves, and larvae of *G. conspersa* near the ant larvae. In one case, a moth larva and pupa were among ant larvae on a dead leaf. In the other, 10 moth larvae were found under or on dead leaves on which ant larvae were placed.

We found larvae of *G. conspersa* twice in a pile of dead plant tissues without nearby ant colonies: eight larvae at the base of a chestnut tree (*Castanea crenata*) at Minamihonjuku Park on 3 March 2001; two larvae at the base and on the trunk of an oak tree (*Quercus* sp.) on the campus of TUA on 20 April 2001.

Table 1. Collection data of *Gaphara conspersa* and the associated ant species.

Locality	Date	Ant species	No. of *Gaphara* larvae collected in the nest	around the nest
Minamihonjuku Park	3 Mar. 2001	*Lasius japonicus*	0	18
TUA	26 Apr. 2001	*L. fuliginosus*	8	11
Shiraishizawa	20 May 2000	*L. spathepus*	0	3
TUA	30 May 2001	*L. japonicus*	3	0
TUA	10 Jun. 2000	*L. fuliginosus*	0	4
Tsukuba	11 Jun. 2001	*L. japonicus*	1	1
Tsukuba	13 Jun. 2001	*L. japonicus*	2	5
Minamihonjuku Park	24 Jun. 2001	*L. japonicus*	0	2
Kodomo-Shizen Park	24 Jun. 2001	*L. japonicus*	0	9
Kodomo-Shizen Park	24 Jun. 2001	*L. japonicus*	18	4
Kodomo-Shizen Park	24 Jun. 2001	*L. japonicus*	2	13
Kodomo-Shizen Park	24 Jun. 2001	*Pristomyrmex pungens*	10	0
TUA	25 Jun. 2001	*L. japonicus*	6	0
TUA	27 Jun. 2001	*L. japonicus*	13	0
Suna-shinden	7 Jul. 2001	*P. pungens*	2	0
TUA	9 Jul. 2001	*L. japonicus*	0	10
TUA	17 Aug. 2001	*L. japonicus*	0	7
TUA	19 Sep. 2001	*L. japonicus*	0	5
Minamihonjuku Park	13 Nov. 2000	*L. japonicus*	0	7

2. *Ant reaction to* Gaphara *larvae: field observation*

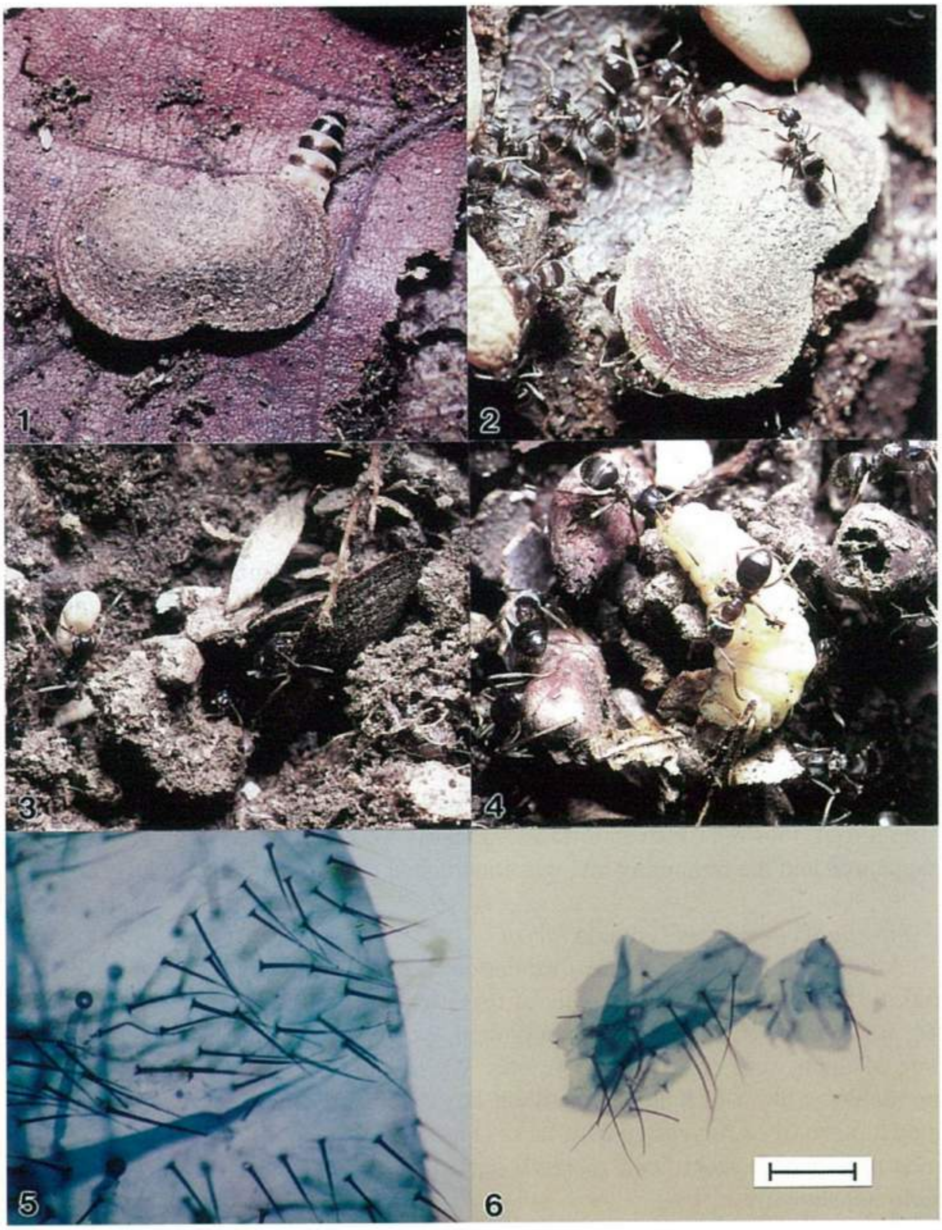
When we introduced tortricid larvae into the field colony of *Lasius japonicus*, ant workers became extremely aggressive and bit the larvae with their mandibles. The tortricids became paralyzed immediately after being bitten. In five of the seven cases, we picked up the dying larvae, but in the remaining two cases, we were unable to collect the larvae, which were carried by the ant workers into the tunnel within three minutes.

When we introduced naked larvae of *G. conspersa*, whose silk case had been removed, into the ant colony, the same situation occurred. Worker ants were very aggressive against the naked larvae. They soon began to bite the larva with their mandibles (Fig. 4), and the bites were effective in causing fatal damage to the larva. We ascertained that all ten introduced larvae were paralyzed after being bitten.

Under natural conditions, when ant workers encountered larvae of *G. conspersa* in the silk case, they did not show any particular aggressive behavior against the larvae. Sometimes, however, worker ants seemed to be cautious about them. They got on the silk case (Fig. 2), or inspected the slits carefully with their antennae. We often observed that, when a moving larva with its head and thorax exposed (Fig. 1) encountered an ant, it quickly withdrew the entire body into the case.

3. *Ant reaction to* Gaphara *larvae: laboratory observation*

While we were keeping larvae of *G. conspersa*, with the silk case, in a plastic



Figs. 1–6. —— 1. A larva of *Gaphara conspersa* living in the 8-shaped silk case. —— 2. A larva of *Gaphara conspersa* in a brood chamber of *Lasius japonicus*. —— 3. Two larvae of *Gaphara conspersa* invading a nest of *Lasius japonicus*. —— 4. A naked larva of *Gaphara conspersa* attacked by ant workers. The silk case was artificially removed. —— 5. Epidermis of a larva of *Lasius fuliginosus*. —— 6. A fragment of a larval epidermis of *Lasius fuliginosus* found in the intestine of a larva of *Gaphara conspersa*. Scale: 0.1 mm for Figs. 5 and 6.

container together with a colony of *Lasius japonicus* (workers and larvae), we never observed any aggressive behavior of the ants toward the moth larvae. Sometimes, the ants even tried to draw moth larvae into their brood chamber. This may have been due to shortage of nest materials under experimental conditions, not by manipulation of the larvae, as is well known in the lycaenid genus *Maculinea* (WILSON, 1971; PIERCE, 1995).

Larvae of *G. conspersa* were quiescent during the day, but became very active after the sunset. Most of the larvae introduced into the container entered the chamber where ant workers kept their larvae. Sometimes ants nervously tapped the moth larvae in the chamber with their antennae, or exhibited warning behavior by shaking their antennae. On 7 December 2000, a friend of ours happened to observe that a moth larva preyed on an ant larva. This was the only direct observation on preying on ant larvae by *G. conspersa*. However, by 51 days after the introduction of moth larvae, all ant larvae disappeared from the chamber. Because we did not find any cocoons of the ant, the moth larvae must have eaten the ant larvae in the chamber.

4. *Preying on ant larvae*

When we gave ant larvae to larvae of *G. conspersa* confined in a small plastic container, we were able to ascertain that larvae of *G. conspersa* preyed on ant larvae. In two of the five trials, four and six moth larvae consumed all seven and one introduced larvae, respectively, within one hour after introduction. In these cases, we actually observed a moth larva preying on an ant larva three times; the former came close to the latter and touched the body with its mandibles, captured the larva with its claw-shaped forelegs and drew the larva into its silk case.

In two other trials, all ant larvae (9 in total) were eaten by the next day. In the remaining trial, four out of seven introduced larvae were consumed within 24 hours, two disappeared and the remaining one was found dead two days after introduction.

5. *Intestinal contents of* Gaphara *larvae*

All 27 larvae of *G. conspersa* we dissected had various kinds of fragmentary material in their intestine. The contents of the intestine included, in addition to plant tissues, fragments of insect bodies: compound eyes, sclerotized genital parts, tarsi, etc. Some of them were clearly of adult ants. We found pieces of epidermis which were identifiable as those of the associated ant larva from four moth larvae. Two each contained a piece of *Lasius fuliginosus* larva (Fig. 6; cf. Fig. 5). The other two larvae contained pieces of *Pristomyrmex pungens* larva and *Lasius japonicus* larva, respectively (photo not shown).

Discussion

Our laboratory observations made it clear that larvae of *Gaphara conspersa* actually prey on ant larvae, and our field observations indicated that it is usual for them to do this under natural conditions. Although larvae of *G. conspersa* were found twice without ants, it is possible that the associated ants had disappeared. The silk case of *G. conspersa* enables the larva to escape attack from ants in and around the ant nest. As is well known, it is advantageous for an organism to live in ant nests, because ants are extremely aggressive against intruders, including natural enemies of the organism. Moreover, ant nests have a rich storage of foods. Larvae of *G. conspersa* well accepted oats, nuts and dried fruits as food. Preference for such cereals reflects their innate omnivorous or scavenging food habit in the ant nest. However, they are well adapted to prey on ant larvae; their well-developed claw-shaped forelegs seem to be an adaptation for capturing ant larvae. It is noteworthy that, when larvae of *G. conspersa* are eating cereals, they usually protrude their head out of the silk case for a considerable period. On the other hand, after capturing an ant larva, they quickly retreat into the silk case. ROEPKE (1925) even observed a remarkable case in *G. dolichoderella*; a moth larva snatched an ant larva that was being carried by a worker ant, and dragged it rapidly into the silk case. Such a snatch might also be found in *G. conspersa*.

Many larvae of *G. conspersa* had fragments of adult ants, including compound eyes, in the intestine. They might have preyed on teneral workers, but it seems more likely that they ate dead adult ants. ROEPKE (1925) reported that larvae of *G. dolichoderella* brought ant cocoons into the silk case and ate the pupae. It remains to be ascertained whether larvae of *G. conspersa* prey on pupae and living adults of the associated ant species.

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Moths of the Genus *Andraca* (Lepidoptera, Bombycidae, Prismostictinae) from Vietnam

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Abstract Three species of the bombycid genus *Andraca* are recorded from Vietnam, *Andraca bipunctata* WALKER, 1865, *A. olivacea* MATSUMURA, 1927 (new record) and *A. nabesan* KISHIDA et OWADA, sp. nov. *Andraca roepkei* BRYK, 1945 from Myanmar and *A. henosa* CHU et WANG, 1993 from Yunnan are synonymized with *A. bipunctata*. *Andraca olivacens* MELL, 1958 from Fujian and *A. hedra* CHU et WANG, 1993 from Hainan and Fujian are synonymized with *A. olivacea*. A checklist of the species of *Andraca* is given. An available genus group name, *Pseudoeupterote* SHIRAKI, 1911, is revised and synonymized with *Andraca*.

Key words: Lepidoptera, Bombycidae, Prismostictinae, *Andraca*, *Pseudoeupterote*, checklist, new species, new synonymy, Vietnam.

Introduction

The genus *Andraca* was erected by WALKER (1865) on the basis of the monotypic species *A. bipunctata* WALKER, 1865, and placed in the family Bombycidae. Although some authors considered this genus or allied genera (*Mustilia*, *Oberthueria*, *Prismosticta* and *Pseudandraca*) to belong to the Eupterotidae (SHIRAKI, 1911; SONAN, 1924; FORBES, 1955) or Notodontidae (ROEPKE, 1924; MELL, 1958), those genera are genuine members of the Bombycidae even in larval features (MIYATA, 1970), and form the subfamily Prismostictinae FORBES, 1955 (=Oberthueriinae KUZNETZOV et STEKOLNIKOV, 1985, ="the *Mustilia* lineage" of HOLLOWAY, 1987; see MINET, 1994, LEMAIRE & MINET, 1999, HOLLOWAY *et al.*, 2001).

WALKER (1865) described *A. bipunctata* from Hindustan, India. MOORE (1865) recorded the species from Darjeeling and described *A. trilochoides* from the same locality. HAMPSON [1893] synonymized the latter taxon with the former, though STRAND (1922) retained it with the specific status. SWINHOE (1907) described *A. apodecta* from Sumatra.

MATSUMURA (1909) described *Oreta theae* from Formosa (=Taiwan) as a member of Drepanidae, and later, he regarded this taxon as a variety or forma of *Andraca bipunctata* (MATSUMURA, 1921, 1931). SHIRAKI (1911) listed it as "*Pseudoeupterote bipunctata* SHIR. [sic]" in the family Eupterotidae. SONAN (1924) delineated the history of taxonomic status and biology of this species as a pest of tea trees under the name of *A. bipunctata*. MIYATA (1979) illustrated the male genitalia of this species and of *A. bipunctata*, and revalidated the specific status of this taxon as *A. theae*.

HAMPSON (1910) described *A. albilunata* from Assam, which was designated as the type species of the genus *Sesquiluna* FORBES, 1955 in the family Eupterotidae, but was considered by KISHIDA (1993a) to be a close relative of *Bombyx* of the Bombycidae.

MATSUMURA (1927) described *A. olivacea* from Formosa (=Taiwan). MIYATA (1977) redescribed it, illustrated its male genitalia, hindtibia and wing venation, and discussed the relationship of the genera *Andraca* and *Pseudandraca* MIYATA, 1970.

BRYK (1945) described *A. roepkei* from Burma (=Myanmar), and MELL (1958) described *A. olivacens* [sic] from Fukien (=Fujian), which will be synonymized in this paper with *A. bipunctata* and *A. olivacea*, respectively.

KISHIDA (1993 a) described *A. angulata* from Nepal and India (Sikkim), which is closely related to *A. bipunctata* and discriminated from it by the genitalia and the shape of wing margin, the latter of which is markedly dentate and angulate.

ZHU [CHU] and WANG (1993) recorded *A. bipunctata* from vast areas of central and southern China, and described two new species, *A. henosa* from Yunnan and *A. hedra* from Hainan and Fujian, which will also be synonymized in this paper with *A. bipunctata* and *A. olivacea*, respectively. In the same paper, they recorded and illustrated an interesting moth from Yunnan under the name of "*Andraca gracilis* Butler, 1885" (ZHU [CHU] & WANG, 1993, p. 243, fig. 27, pl. 2, fig. 27, p. 248). They illustrated the moth again in colour (ZHU [CHU] & WANG, 1996, pp. 57–58, fig. 41, pl. 3, fig. 9). Judging from those illustrations of the genitalia and the adult moth, however, it is not conspecific with *Pseudandraca gracilis* (BUTLER), and besides, does not belong to *Andraca*. In this paper, we can only suggest that the moth may belong to the genus *Mustilia* WALKER, 1865, though its forewing apex is round.

In Vietnam, JOANNIS (1927) recorded *A. bipunctata* from Phu Tho. During the joint research on the insect fauna of Vietnam by the National Science Museum, Tokyo (NSMT), the Institute of Ecology and Biological Resources, Hanoi (IEBR) and Hanoi Agricultural University (HAU), we were able to collect three species of the genus *Andraca* from northern and central Vietnam, that is, *A. bipunctata*, *A. olivacea* and an undescribed species. Taking this opportunity, we will record, revise and describe these species in the following lines.

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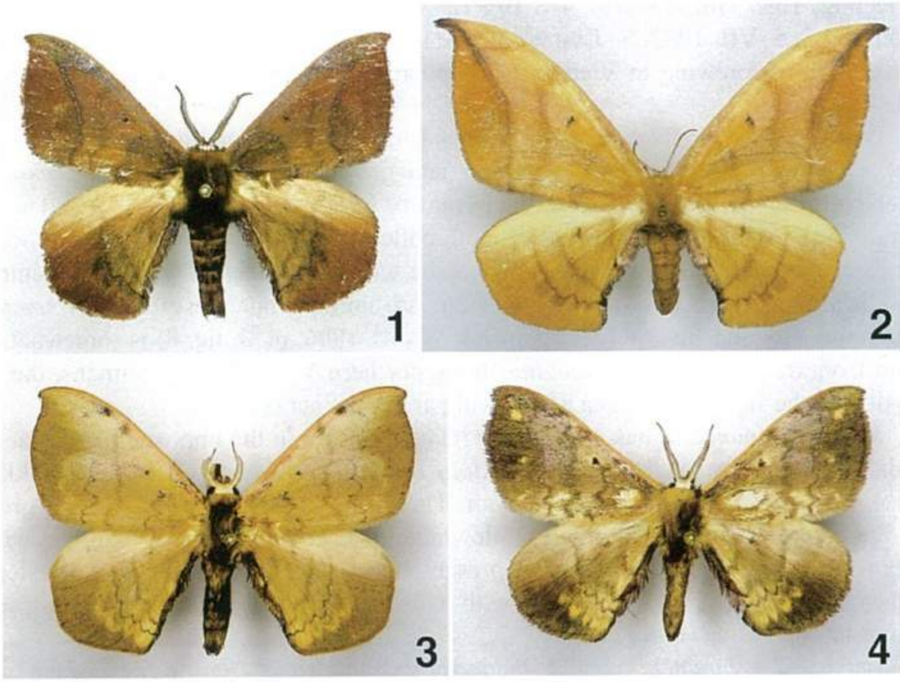

Figs. 1–4. *Andraca* spp. —— 1, *A. bipunctata*, ♂, Sa Pa, N. Vietnam; 2, *A. bipunctata*, ♀, Deo Pha Din, Son La, N. Vietnam; 3, *A. olivacea*, ♂, Bach Ma, C. Vietnam; 4, *A. nabesan*, ♂, holotype, Cao Bang, N. Vietnam.

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Andraca bipunctata WALKER

(Figs. 1–2, 5)

Andraca bipunctata WALKER, 1865, p. 582. —— MOORE, 1865, p. 820. —— HAMPSON, [1893], p. 40, fig. 23. —— STRAND, 1922, pp. 440–441, pl. 57-f. —— JOANNIS, 1927, p. 528. —— CHU [ZHU] & WANG, 1993, pp. 241–241, fig. 25, p. 248, pl. 2, fig. 25; 1996, pp. 55–56, fig. 39, pl. 3, fig. 7.
Andraca trilochoides Moore, 1865, p. 820–821. —— STRAND, 1922, p. 441.
Andraca röpkei [sic] BRYK, 1945, p. 17, pl. 3, fig. 21. *Syn. nov.*
Andraca henosa CHU et WANG, 1993, pp. 242–243, fig. 26, p. 248, pl. 2, fig. 26; ZHU [CHU] & WANG, 1996, pp. 56–57, fig. 40, pl. 3, fig. 8. *Syn. nov.*

Material examined. [Vietnam]: Lao Cai, Sa Pa, 1,500 m, 1♂, 11~17–V–1995, M. OWADA leg., Sa Pa, Deo Tram Ton, 1,700–1,900 m, 2♂, 27~29–VI–1997, M. OWADA leg.; Son La, Deo Pha Din, 950–1,000 m, 1♀, 24–VI–1997, M. OWADA leg. [China]: Sichuan, Dafeishui (Dayi), 1,400 m, 2♂, 1–VI–1993. [India]: West Bengal, Darjeeling, Tiger Hill, 2,400 m, 4♂, 10~12–VII–1986, W. THOMAS leg., same locality, 2,500 m, 1♂, 5–VII–1987, S. TAMANG, same locality, 1♂, VI~VII–1976.

Length of forewing in Vietnamese population: 21–23 mm in male; 28 mm in female.

Notes. This widely distributed species is rather variable in the coloration and the size. MOORE (1865) described a brighter and greyish individual as *A. trilochoides*, which had been collected at Darjeeling (STRAND, 1922). BRYK (1945) described and illustrated (pl. 3, fig. 22) a rather small moth collected at Kambaiti (2,000 m) in Myanmar as *A. roepkei*, which is clearly conspecific with *A. bipunctata*. The male genitalia of *A. henosa* CHU et WANG (1993, fig. 26) are nothing but those of *A. bipunctata*, though the wing maculation (ZHU [CHU] & WANG, 1996, pl. 3, fig. 8) is somewhat different from that of typical *bipunctata*. In the northern Vietnamese specimens, the two pail dots in the subterminal area of forewing are indistinct (Fig. 1).

Andraca bipunctata has two closely related species in the opposite peripheries of its distributional range, that is, *A. angulata* KISHIDA from Nepal and India (Sikkim) and *A. theae* (MATSUMURA) from Taiwan. These three species form a species-group, the *bipunctata* group, by sharing the following characteristics: 1) male hindtibia with a pair of spurs; 2) two rising projections present in the subdistal part of valva; 3) external surface of aedeagus partially covered with hair-like spines; 4) a cluster of strong spinose cornuti on vesica (Fig. 5).

Larvae of *A. bipunctata* and *A. theae* are well known as a serious pest of tea trees, *Thea sinensis* (Theaceae). The body is densely covered with short hairs, and lacks the anal horn on A8. Those characteristics are exceptional in the family Bombycidae. The immature stages of *A. angulata* are not known.

A sibling species of the *bipunctata* group is *A. apodecta* SWINHOE from Sumatra and Borneo, the hindtibia of which has a pair of spurs. The uncus of *apodecta* is thick and pointed as in that of *theae*, while it is flattened, and round or notched in *bipunctata* and *angulata*. In *apodecta*, there is one rising projection in the subdistal part of valva, instead of two in the *bipunctata* group, the external surface of aedeagus is smooth, and the cornuti are absent (see HOLLOWAY, 1976, p. 85, fig. 674; 1987, p. 89, fig. 121).

Andraca olivacea MATSUMURA

(Figs. 3, 6)

Andraca olivacea MATSUMURA, 1927, p. 50, pl. 3, fig. 7; 1931, p. 734. —— MIYATA, 1977, p. 554. —— Wang, 1995, p. 21.

Andraca olivacens [sic] MELL, 1958, pp. 211–212. *Syn. nov.*

Andraca hedra CHU et WANG, 1993, pp. 243–244, fig. 28, p. 248, pl. 2, fig. 28; ZHU [CHU] & WANG, 1996, pp. 56–57, fig. 40, pl. 3, fig. 10. *Syn. nov.*

Material examined. [Vietnam]: Vinh Phu, Tam Dao, 930m, 2♂, 22~24–IX–1995, S. NOMURA leg., same locality, 1♂, no date, 2000; Thua Thien Hue, Back Ma, 1,200 m, 6♂, 24~28–VII–2001, Y. KISHIDA leg., same locality, 2♂, 2~6–IX–2001, U.

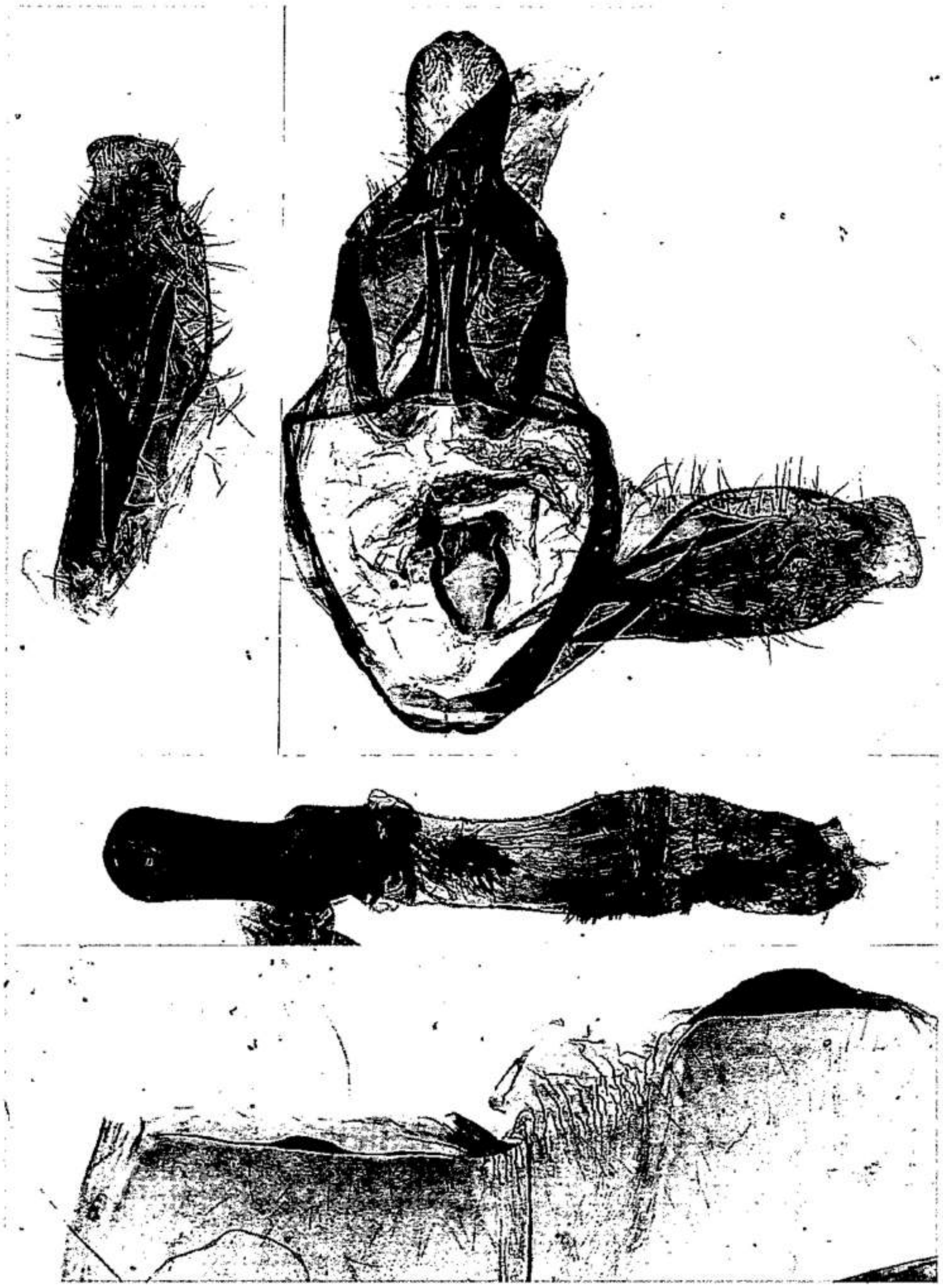

Fig. 5. Male genitalia and 8th abdominal segment (left: sternite) of *A. bipunctata*, N. Vietnam, Genitalia Slide No. NSMT–2491♂.

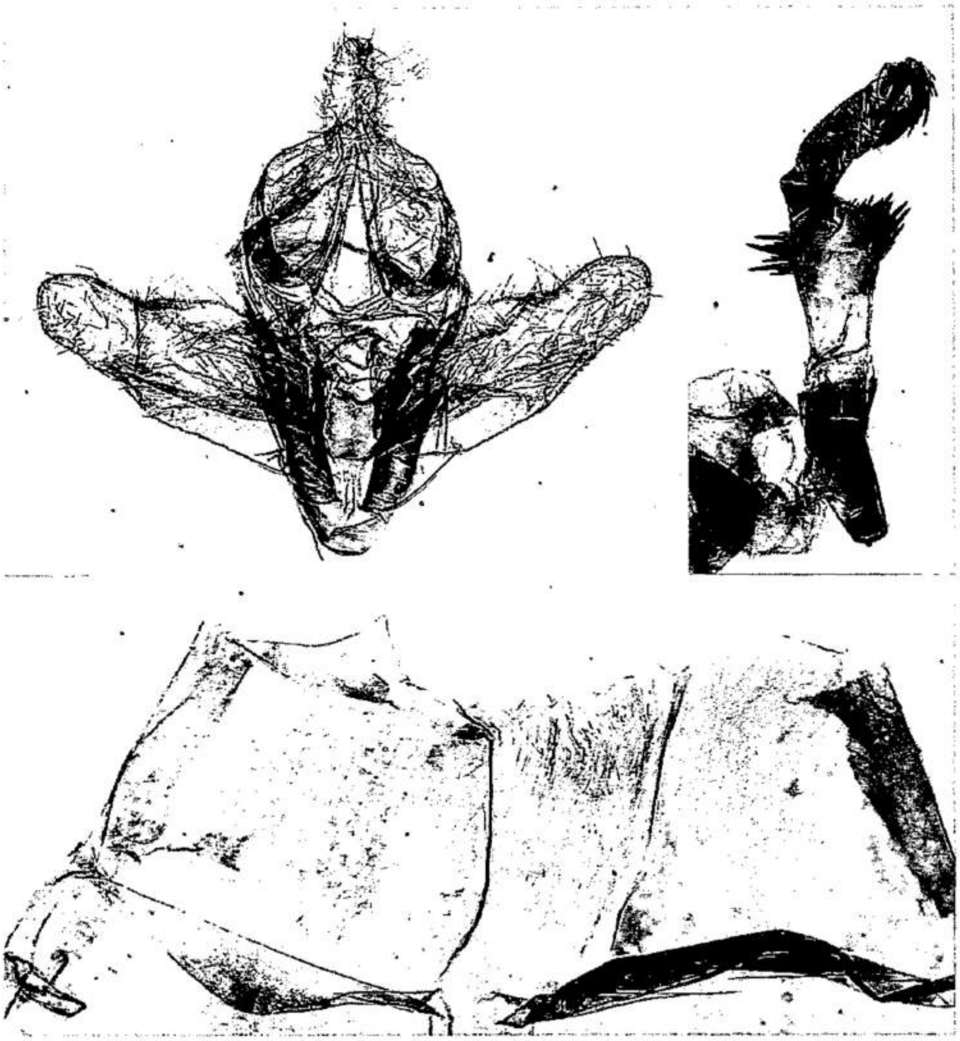

Fig. 6. Male genitalia and 8th abdominal segment (left: sternite) of *Andraca olivacea*, Bach Ma, C. Vietnam, Genitalia Slide No. NSMT–2492♂.

JINBO & M. OWADA leg.

Length of forewing: 20–22 mm in male.

Notes. WANG (1995) illustrated a fresh living male in fine colour. The ground colour of Vietnamese specimens is rather dark (Fig. 3).

Andraca hedra CHU et WANG, 1993 is described from three males collected in Hainan and Fujian, and is unquestionably a junior synonym of *A. olivacea* MATSUMURA. MELL (1958) also described *A. olivacens* from Fukien (Fujian) on the basis of a male and a female, which are also unmistakably identical with *A. olivacea*. Since we were able to discover this species in northern and central Vietnam, the distributional range of *A. olivacea* is proved to be fairly wide.

As was pointed out by MIYATA (1977), the hindtibia of this species has two pairs of spurs, instead of one pair in the *bipunctata* group and *A. apodecta*. The similar hindtibia with two pairs of spurs is found in *Pseudandraca gracilis* (BUTLER, 1885), which was segregated from *Andraca* as the monotypic species of *Pseudandraca* MIYATA, 1970 by the features of the larva and wing venation, that is, 1) larva with a long spiny anal horn and without hairy secondary setae; 2) hindtibia with two pairs of spurs; 3) hindwing with Rs and M1 connate. The larva of *A. olivacea* is not known as yet.

In the male genitalia (Fig. 6), the uncus is thick and pointed as in that of *theae* and *apodecta*, while it is flattened, and round or notched in *bipunctata*, *angulata* and *Pseudandraca gracilis*. The valva is simple, and the rising projection in the subapical part is wanting. The distal margin of aedeagus bears strong spines at the lateral sides, and the vesica has a cluster of spinous cornuti.

ZHU [CHU] and WANG (1996) recorded *Ficus benjamina*, Moraceae, as the host plant of *A. hedra* (=*A. olivacea*). HOLLOWAY (1987) pointed out as host-plants of the *Mustilia* lineage, that there was predominance of the records from the related families Symplocaceae and Theaceae. It is worth noting that SONAN (1937) recorded as the host-plants of Taiwanese "*A. bipunctata*" (=*A. theae*) *Thea sinensis*, *Camellia* spp., *Cleyera ochnacea* and *Eurya japonica*, Theaceae, and *Melastoma candidum*, Melastomataceae. Similar host preference, Theaceae – Symplocaceae – Melastomataceae, is found in the chalcosiine moth *Eterusia aedea*, Zygaenidae (MURASE, 1995).

Andraca nabesan KISHIDA et OWADA, sp. nov.

(Figs. 4, 7)

Type series. Holotype (Fig. 4), male, labeled "Vietnam, Cao Bang, Cao Lang, Feb. 2000", preserved in the National Science Museum, Tokyo. Paratypes, same data as for the holotype, 4♂, preserved in the Institute of Ecology and Biological Resources, Hanoi, and the National Science Museum, Tokyo.

Male. Length of forewing: 21–23 mm. Hindtibia with two pairs of spurs. Wings clothed roughly with long scale hairs, cilia rough, longer than those of *A. olivacea*, wing shape and maculation similar to those of *olivacea*. Ground colour of wings olivaceous grey, darker than that of *olivacea*; dorsum yellow, reticulate, postmedial line broader and more wavy, subterminal line broader, a series of orange dots present on the outside of subterminal line, a rather large orange dot present before apex of forewing.

Male genitalia (Fig. 7):— Uncus small, flattened laterally. Gnathos short, broadened in base. Valva rather sclerotized, apex protruding dorsally, a triangular sclerotized process present on basal part of sacculus. Aedeagus with a cluster of strong spines at

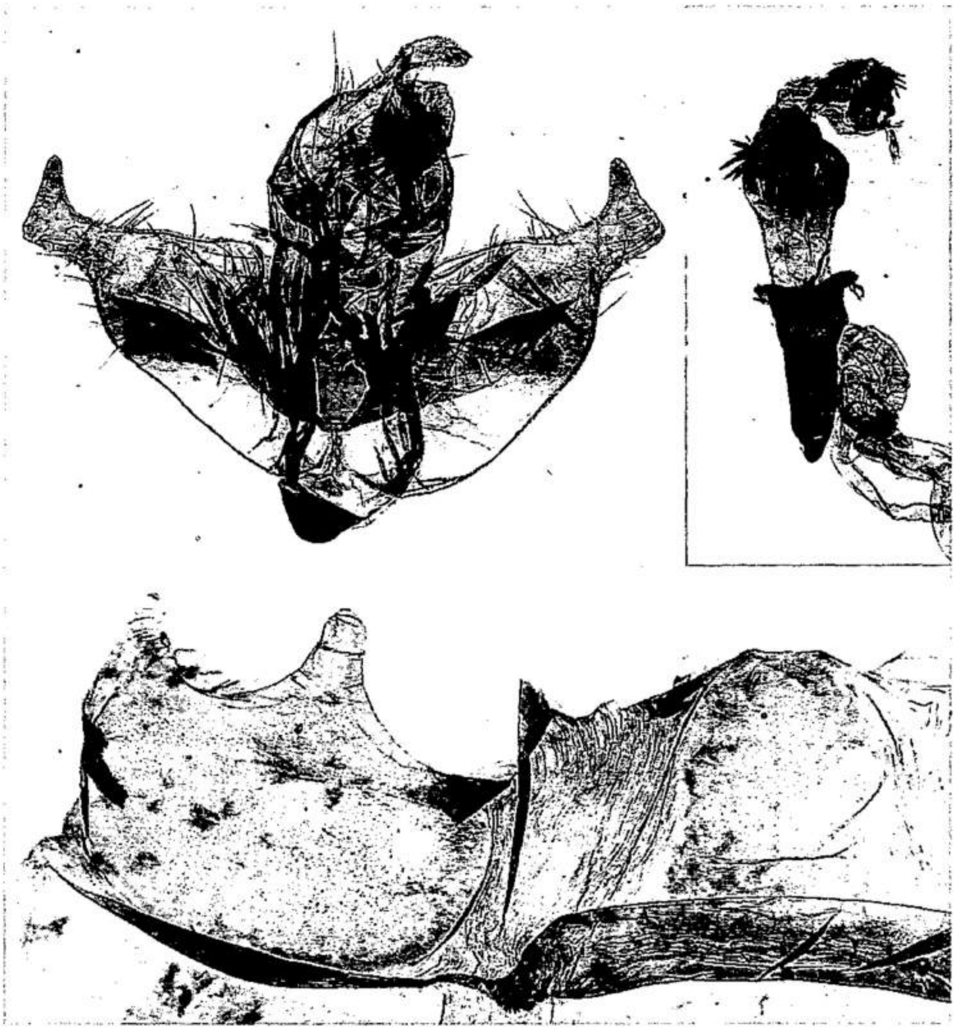

Fig. 7. Male genitalia and 8th abdominal segment (left: sternite) of *Andraca nabesan*, Cao Bang, N. Vietnam, Genitalia Slide No. NSMT–2493♂, paratype.

the left distal portion in dorsal view, another cluster of spines on vesica. Distal margin of 8th sternite sclerotized, markedly protruding at middle.

Female. Unknown.

Notes. This species is closely related to *A. olivacea* MATSUMURA, 1929. On the other hand, the short gnathos and the process of sacculus of *A. nabesan* are similar to those of *Pseudandraca gracilis* (BUTLER), though the shape of uncus, aedeagus and 8th sternite are considerably different. As was discussed by MIYATA (1970, 1977), the genus *Pseudandraca* is mainly separated from *Andraca* by larval features, and the discovery of immature stages of *A. olivacea* and *A. nabesan* will contribute to clarifying the interrelationship of the *Andraca* complex.

In spite of our extensive researches on the insect fauna of Vietnam, this new species has not been collected from the spring to autumn seasons, but only in February. *Andraca nabesan* seems to be one of the winter moths. It is well known that some geometrid moths fly only in the winter season (NAKAJIMA, 1998). Similar noctuid moths are also found not only in the temperate zone of the Holarctic Region but also in mountainous areas of the Oriental warm-temperate zone, *e.g.*, the Himalayas, Taiwan, Vietnam, etc. (OWADA, 1983, OWADA *et al.*, 1993; HREBLAY *et al.*, 1999). A few winter moths of the Bombycoidea were also recorded in the families Sphingidae (CADIOU & KITCHING, 1990; KITCHING *et al.*, 1997), Lasiocampidae (KISHIDA, 1991), Eupterotidae (KISHIDA, 1993 b) and Bombycidae (KISHIDA, 1993 c).

Etymology. This species is dedicated to Professor Dr. Yasuaki WATANABE in commemoration of his retirement from Tokyo University of Agriculture. We used to call him "Nabe-san", with great esteem and warm friendship. The specific name *nabesan* is a noun in the nominative singular standing in apposition to the generic name *Andraca*.

Checklist of the Genus *Andraca* WALKER

Genus ***Andraca*** WALKER, 1865

Type species: *Andraca bipunctata* WALKER, 1865

=*Pseudoeupterote* SHIRAKI, 1911. *Syn. nov.*

Type species: *Pseudoeupterote bipunctata* SHIR. [sic], by monotypy. Incorrect authorship of WALKER, 1865, and misidentification of *Oreta theae* MATSUMURA, 1909.

Andraca bipunctata WALKER, 1865

=*Andraca trilochoides* MOORE, 1865

=*Andraca roepkei* BRYK, 1945. *Syn. nov.*

=*Andraca henosa* CHU et WANG, 1993. *Syn. nov.*

Distribution. India, Myanmar, Vietnam, China.

Andraca angulata KISHIDA, 1993

Distribution. Nepal, India (Sikkim).

Andraca theae (MATSUMURA, 1909)

Oreta theae MATSUMURA, 1909

=*Pseudoeupterote bipunctata* SHIR.[sic.]: SHIRAKI, 1911, misidentification and incorrect authorship, nec WALKER, 1865.

=*Andraca bipunctata*: Auct., see MIYATA, 1979, misidentification, nec WALKER, 1865.

Distribution. Taiwan.

Andraca apodecta SWINHOE, 1907

Distribution. Sumatra, Borneo.

Andraca olivacea MATSUMURA, 1927

=*Andraca olivacens* [sic] MELL, 1958. *Syn. nov.*

=*Andraca hedra* CHU et WANG, 1993. *Syn. nov.*

Distribution. Vietnam, China, Taiwan.

Andraca nabesan KISHIDA et OWADA, 2002. *Sp. nov.*

Distribution. Vietnam.

Notes. SHIRAKI (1911, p. 48) listed *Oreta theae* MATSUMURA, 1909 under the name "*Pseudoeupterote bipunctata* SHIR. [sic]" in the family Eupterotidae. The authorship of the listed scientific name is apparently incorrect, should be read WALKER, 1865, and the species can be specified by the attached Japanese common name "Futatenkagiba", which is of *Oreta theae* MATSUMURA, 1909. The generic name, *Pseudoeupterote*, can be considered available for a genus group name under the Article 12.2.5 of the Code, and the type species is *Oreta theae* MATSUMURA, 1909, which was long considered a synonym of *A. bipunctata* WALKER, 1865. MIYATA (1979) found that the Taiwanese population is specifically different from Himalayan *A. bipunctata*, and revalidated the species name, *Andraca theae* (MATSUMURA, 1909) for the former. *Andraca theae* is a member of the *bipunctata* group, and *Pseudoeupterote* SHIRAKI, 1911 is a junior synonym of *Andraca* WALKER, 1865.

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Armitarsus watanabei, a New Sawfly (Hymenoptera, Tenthredinidae) from Central Honshu, Japan

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Abstract A new tenthredinid sawfly, *Armitarsus watanabei*, is described and illustrated from central Honshu, Japan. It resembles *A. albicinctus* TAKEUCHI, 1933, in color pattern, but the smooth surfaces of the vertex and propodeum distinguish the new species from *A. albicinctus*. The genus *Armitarsus* is now represented by seven Northeast Asian species, five of which occur in Japan.

Key words: Tenthredinidae, *Armitarsus watanabei*, new species, Honshu, Japan.

Armitarsus MALAISE, 1931, is a small genus of tenthredinid sawflies distributed in northeastern Asia. MALAISE (1931) originally described the genus as a member of his tribe Tenthredinini, whereas TAKEUCHI (1952) placed it in his tribe Sioblini of the subfamily Tenthredininae. Recently LACOURT (1996), putting emphasis on its close relationship to the Nearctic genus *Dimorphopteryx* ASHMEAD, 1898, regarded it as belonging to his tribe Dimorphopterygini of the subfamily Sioblinae.

TAKEUCHI (1951) gave a key to six world species, of which three were known from Japan: *A. punctifemoratus* MALAISE, 1931 (Hokkaido and Honshu; TAKEUCHI, 1936), *A. albicinctus* TAKEUCHI, 1933 (Honshu), and *A. albicoxis* TAKEUCHI, 1951 (Shikoku). TOGASHI (1968) recorded *A. minutus* ZHELOCHOVTSEV, 1934, from Hokkaido, thus adding a fourth species of *Armitarsus* to the Japanese fauna. OKUTANI (1954) first recorded *A. albicoxis* from Honshu and TOGASHI (1997) gave the first record of *A. albicinctus* from Hokkaido.

In the following lines, I will describe a new species of *Armitarsus* from central Honshu, Japan. In coloration, the new species resembles *A. albicinctus*, but the former is easily recognized on its smooth, nearly impunctate upper surfaces of the head and propodeum.

I wish to thank Dr. S.-I. UÉNO, National Science Museum, Tokyo, for his critical review of the manuscript and Dr. I. TOGASHI, Tsurugi-machi, for his helpful information on the literature.

Armitarsus watanabei sp. nov.

(Figs. 1, 2 A, C, E–G, 3, 4)

Female (holotype, Fig. 1 A, B). Length about 9 mm. Head capsule entirely black; labrum brownish black; mandible reddish brown, with basal 1/2 black. Antenna blackish brown, with scape and pedicel black. Thorax black, with outer 2/3 of tegula pale brown. Legs black, with hind coxa (except for its basal part), hind trochanter, fore and mid tibiae, basal 2/3 of hind tibia, and all tarsi yellowish white; fore and mid femora somewhat reddish on their posterior surfaces. Wings hyaline, very slightly blackish, veins and stigma blackish brown to black; veins C and R pale brownish. Abdomen black, with 2nd and 3rd abdominal terga yellowish white.

Clypeus deeply roundly emarginate, lateral lobes rounded at apices; malar space about 1/2× diameter of median ocellus; inner margins of eyes weakly convergent below; OCL : OOL : POL=5 : 5 : 2. Vertex nearly smooth, with sparse, indistinct, very shallow, irregular punctures (Fig. 2 A); frons and clypeus rather densely irregularly punctate; gena nearly smooth, posterior and ventral parts densely irregularly punctate. Hind basitarsus slightly longer than the following tarsal segments combined (ratio about 21 : 19), with rather short apical projection dorsally (Fig. 2 F). Propodeum smooth, anterior part with very sparse, rather large, irregular punctures (Fig. 2 C). Sawsheath as in Fig. 2 G; saw of a topotypic paratype as in Fig. 3.

Male (a paratype collected with the holotype, Fig. 1 C, D). Length about 9 mm. Head capsule entirely black; labrum brownish black; mandible reddish brown, with basal 1/2 black. Antenna blackish brown, with scape and pedicel black. Thorax black, with outer 3/4 of tegula pale brown. Legs black, with apex of hind coxa, hind trochanter, and all tarsi very pale brown to yellowish white, and fore femur (except for its narrow base), mid femur (except for its narrow base and apex and elongate spot on its anterodorsal surface), posterior surface of hind femur, fore and mid tibiae, hind tibia (except for its narrow base and dorsal spot on its apex) pale reddish brown. Wings hyaline, very slightly blackish, veins and stigma blackish brown to black; veins C and R pale brownish. Abdomen black, with posterior part of 2nd, 3rd (lateral parts darkened), and anterior part of 4th terga pale reddish brown, and with 2nd to 5th and base of 6th sterna very pale brown to yellowish white.

Structure similar to that of female. OCL : OOL : POL=15 : 17 : 8. Hind basitarsus longer than the following tarsal segments combined (ratio about 7 : 6). Each of 5th to 7th abdominal terga with large transverse, heavily coriaceous area along posterior margin medially; 8th tergum with median longitudinal ridge (or convex fold); subgenital plate broadly rounded apically. Genitalia as in Fig. 4.

Distribution. Japan (Honshu).

Holotype: ♀, Kamiange, 400 m, Mt. Jinbayama, Tokyo Met., 11–V–1973, A. SHINOHARA. Kept in the National Science Museum, Tokyo.

Paratypes: 1♀, 3♂♂, same data as for holotype except for 10–V–1973; 7♀♀, 2♂♂, same data as for holotype; 2♀♀, same data except for 20–V–1973; 2♂♂, same data except for 12–V–1974; 1♀, 1♂, same data except for 8–V–1977; 1♀, 1♂, same

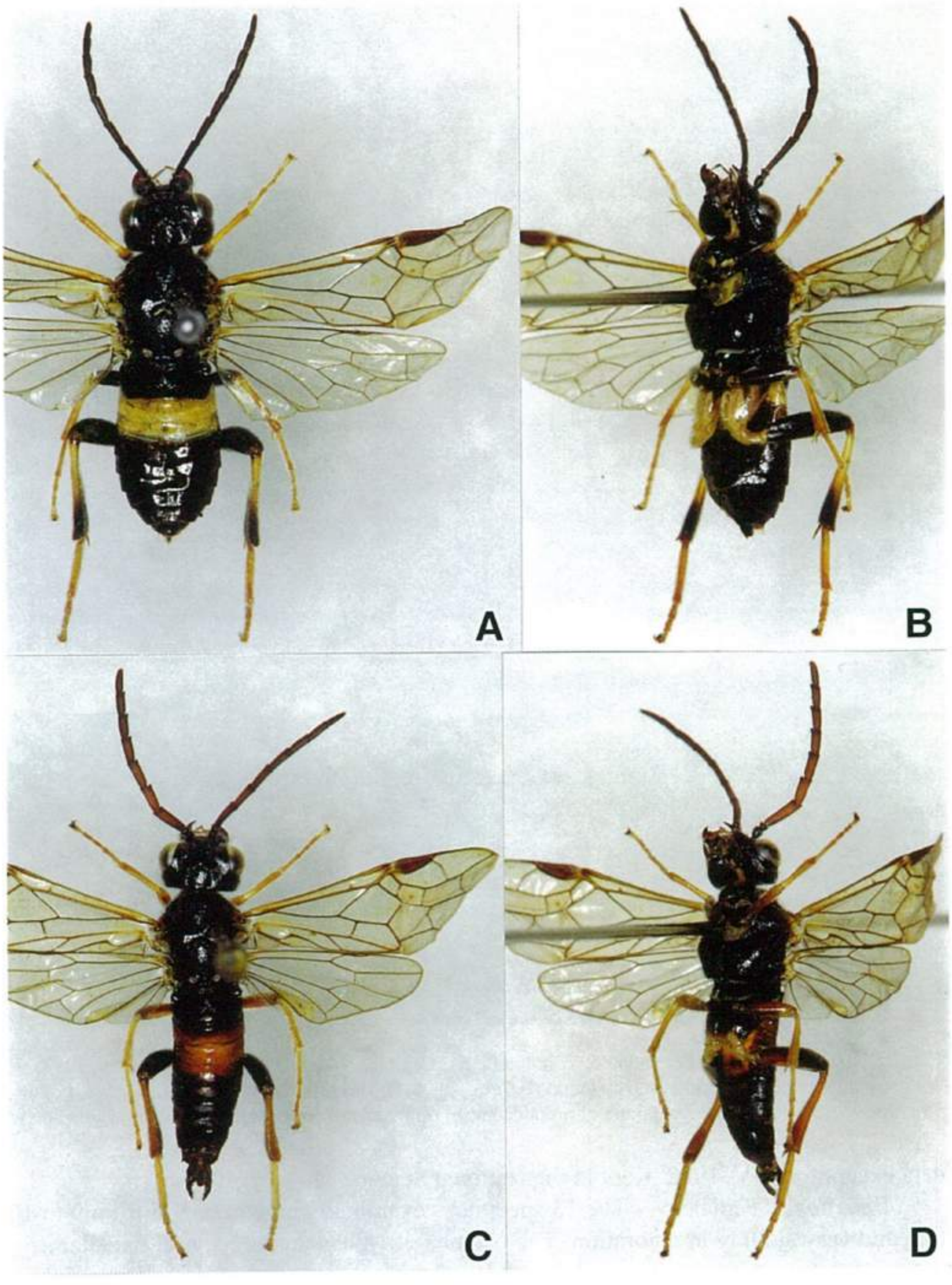

Fig. 1. *Armitarsus watanabei* sp. nov.; A, B, ♀, holotype; C, D, ♂, topotypic paratype.

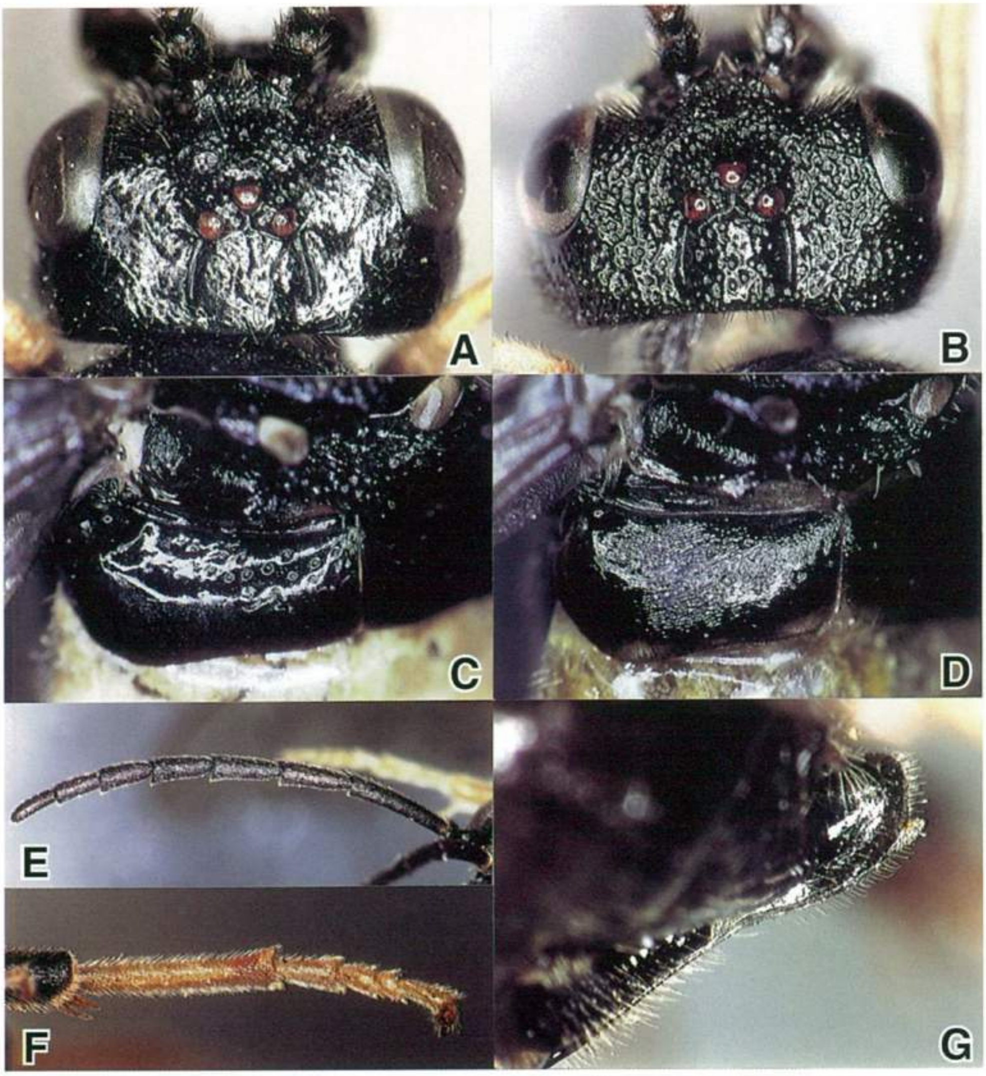

Fig. 2. *Armitarsus watanabei* sp. nov., ♀, holotype (A, C, E–G), and *A. albicinctus* TAKEUCHI, 1933, ♀, Asahidake-onsen, Kamikawa, Hokkaido (B, D). —— A, B, Head, dorsal view; C, D, basal part of abdomen, showing surface sculpture of propodeum; E, right antenna; F, left hind tarsus; G, sawsheath.

data except for 8–V–1982. Kept in the National Science Museum, Tokyo.

Variation. Females:— The 13 specimens examined range in length from 9 to 10 mm and vary slightly in coloration. The antenna often has the three basal flagellar segments largely reddish brown, and the abdomen sometimes has the lateral margins of the second and third terga and the narrow posterior margin of the third tergum black-

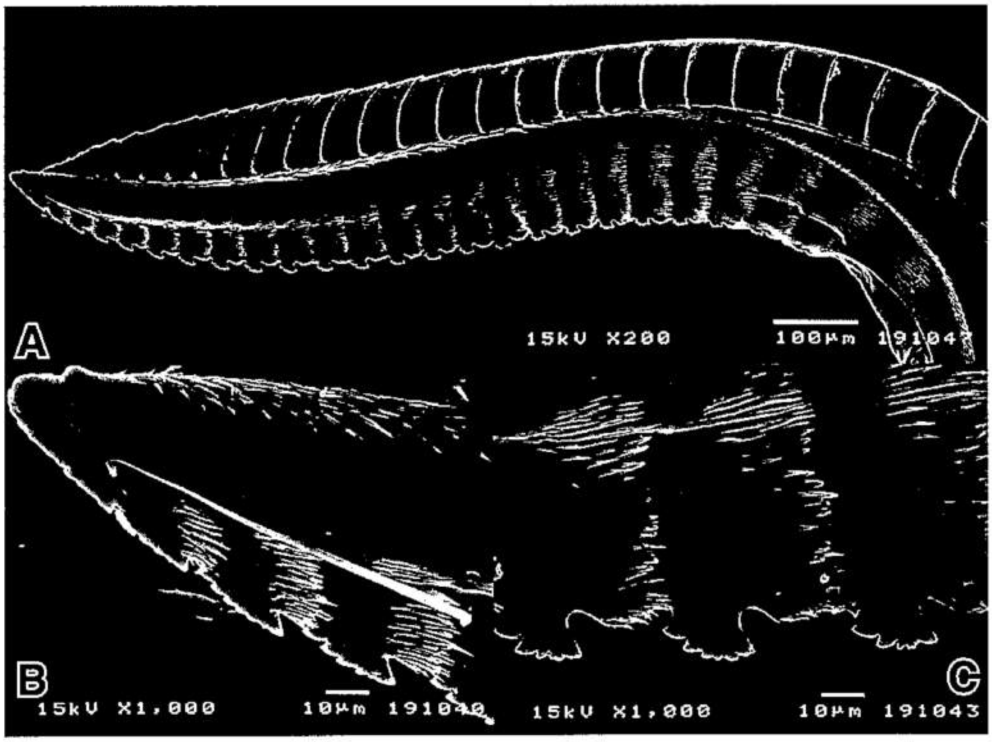

Fig. 3. *Armitarsus watanabei* sp. nov., ♀, topotypic paratype, saw.—— A, Lateral view; B, apex; C, 10th to 12th serrulae from apex.

marked. Males:— The nine specimens examined range in length from 8 to 9 mm. The antennal flagellum is usually dark reddish brown. The black marks on the femora and hind tibia are often reduced or even missing. The dorsal reddish brown area of the abdomen often become narrowed, but most specimens examined have the large coriaceous areas in the posterior parts of the 5th to 7th terga also marked with reddish brown. The 5th and 6th sterna often become blackish, leaving only the anterior margin of the former very pale brown.

Host-plant. Unknown.

Etymology. This new species is named in honor of a renowned coleopterologist, Professor Yasuaki WATANABE, Tokyo University of Agriculture.

Remarks. *Armitarsus watanabei* is similar in color pattern to *A. albicinctus* TAKEUCHI, 1933, distributed in Honshu and Hokkaido, Japan. The new species runs to *A. albicinctus* in TAKEUCHI's (1951) key to the world species. The two species are easily separable by the different surface sculpture on the vertex and the propodeum. In *A. watanabei*, the vertex is nearly smooth, with sparse, indistinct, irregular punctures (Fig. 2 A), and the anterior part of the propodeum is very smooth between sparse punc-

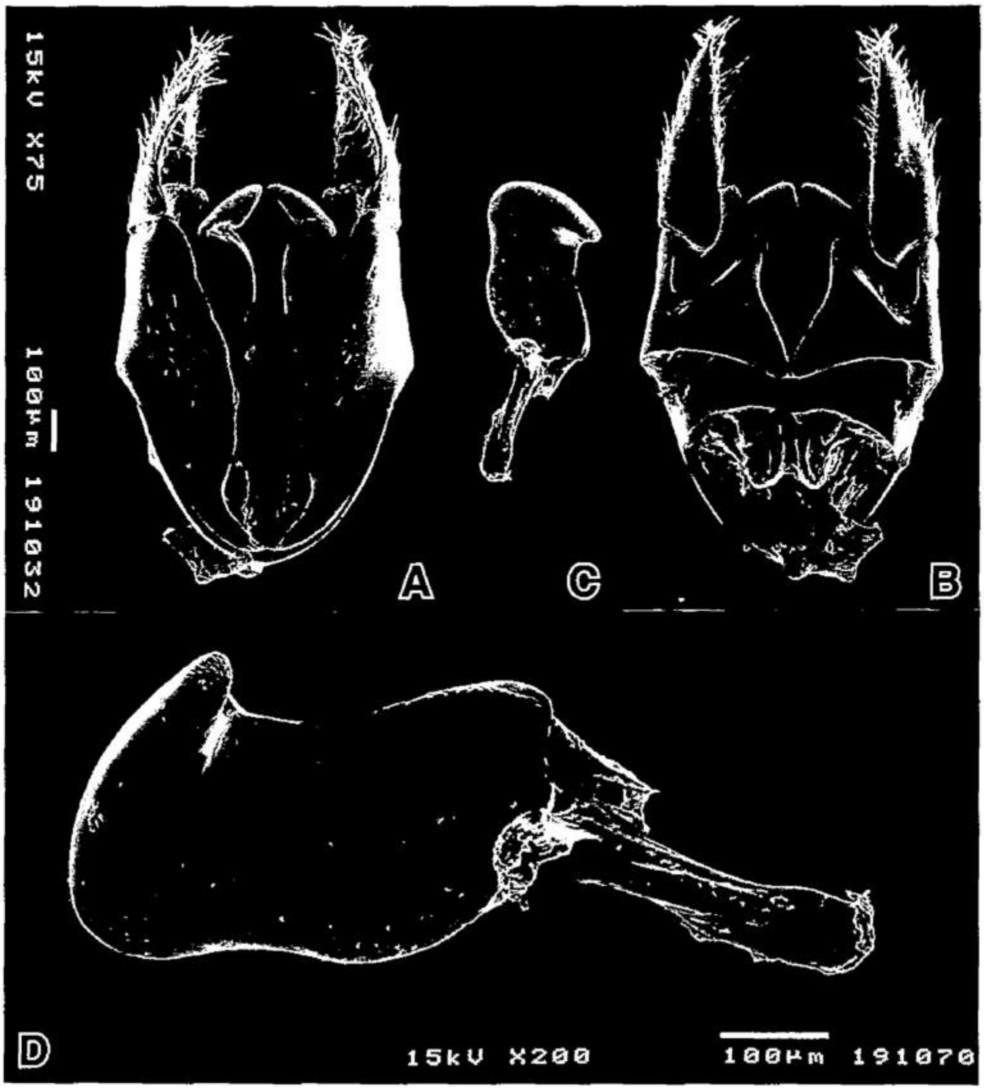

Fig. 4. *Armitarsus watanabei* sp. nov., ♂, topotypic paratype, genitalia.——A, Dorsal view; B, ventral view; C, D, penis valve, lateral view.

tures (Fig. 2 C), whereas in *A. albicinctus*, the vertex is densely covered with deep, distinct punctures (Fig. 2 B), and the anterior part of the propodeum is distinctly transversely coriaceous (Fig. 2 D).

All the known specimens of *A. watanabei* were collected from or near a small group of cherry trees (*Prunus yedoensis*) at the type locality, 16 specimens in 1973 and two specimens each in 1974, 1977, and 1982. I visited the site in the same season every year from 1973 to 2001 except 1975 and 1976, but this sawfly has never been found since 1982.

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Discovery of the Genus *Hinatara* Benson (Hymenoptera, Tenthredinidae, Heterarthrinae) from Japan, with Description of a New Species

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Abstract *Hinatara hakusana* sp. nov. is described and illustrated from Japan. This is the first record of *Hinatara* in Japan.

Key words: Symphyta, Tenthredinidae, Heterarthrinae, *Hinatara*, new species, Japan.

The small genus *Hinatara* Benson was known from three European species (Benson, 1936). It belongs to the tribe Fenusini, the larvae of which are all leaf miners. In Europe the recorded hosts are *Acer* spp. Recently, I have found one species of this genus in Japan. It is described below and represents the first record of *Hinatara* for Japan.

This paper is dedicated to Professor Yasuaki Watanabe in commemoration of his retirement from Tokyo University of Agriculture.

Genus *Hinatara* Benson

Hinatara Benson, 1936, p. 626; type species: *Fenusa excisa* Konow, original designation. —— Smith, 1976, p. 257.

Generic characters. Clypeus truncate; malar space present; postorbital groove distinct; postgenal carina distinct (Fig.1). Second antennal segment longer than broad (Fig. 2); third antennal segment longer than fourth (Fig. 2). Mesepisternum with epicnemium (Fig. 3). Sawsheath, in dorsal view, with lateral apical projection (Fig. 9). Forewing with stub of vein 2A and 3A straight at apex (Fig. 4). Hindwing without cells *Rs* and *M* (Fig. 5); anal cell present (Fig. 5); cell *R*1 open (Fig. 5). Tarsal claws simple (Fig. 7).

Hinatara hakusana sp. nov.

(Figs. 1–10)

Female. Length 4 mm. Body including antenna black. Wings hyaline, stigma and veins dark brown to black. Legs black.

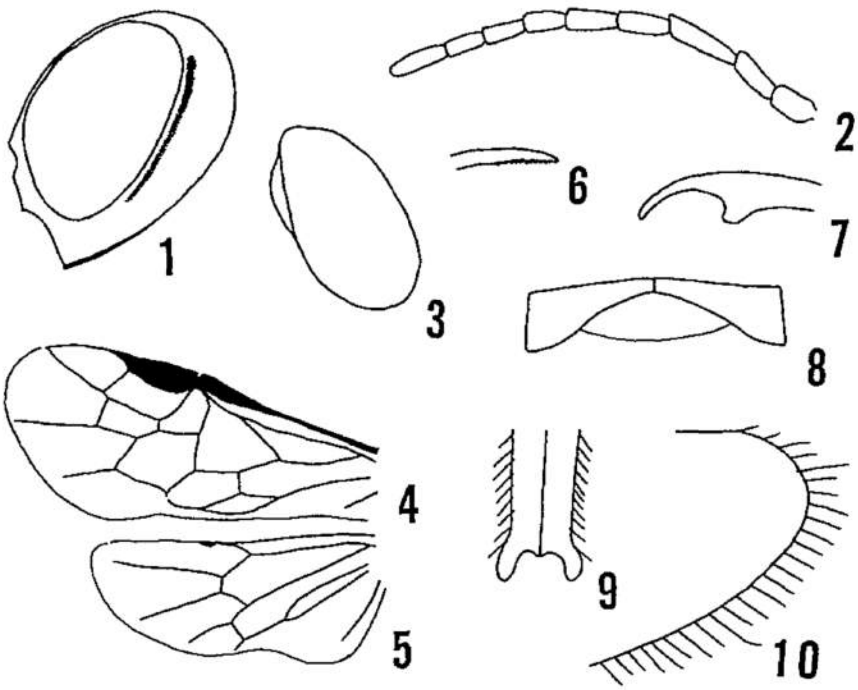
Head transverse; OOL : POL : OCL = 0.8 : 1.0 : 0.9; postocellar area transverse, slightly convex; interocellar and postocellar furrows distinct; lateral furrows parallel, distinct and deep; frontal area convex; median fovea deep, circular in outline; lateral fovea deep and circular; antenno-ocular distance nearly as long as distance between antennal sockets; clypeus slightly convex, anterior margin truncate; labrum small; malar space distinct, nearly 1/2 as long as diameter of front ocellus; postorbital groove distinct (Fig. 1); postgenal carina distinct (Fig. 1).

Antenna shorter than costa of forewing; relative lengths of segments about 0.9 : 1.0 : 1.4 : 1.0 : 1.0 : 0.7 : 0.7 : 0.7 : 1.1; pedicel nearly twice as long as its breadth.

Thorax: mesoscutellum slightly convex; mesepisternum with distinct epicnemium (Fig. 3); cenchrus large, distance between them nearly 1/2 as long as breadth of cenchrus. Wing venation as in Figs. 4 and 5. Legs: fore inner tibial spur simple (Fig. 6); hind basitarsus nearly as long as the following three segments combined; tarsal claw as in Fig. 7.

Abdomen: posterior margin of 1st tergite emarginate (Fig. 8); sawsheath, in dorsal and lateral views, as in Figs. 9 and 10.

Punctation:— Head covered with fine setigerous punctures, lower half of inner



Figs. 1–10. *Hinatara hakusana* sp. nov. (holotype). —— 1, Head, lateral view; 2, antenna, lateral view; 3, mesepisternum with epicnemium, lateral view; 4, venation of forewing; 5, venation of hindwing; 6, inner tibial spur, lateral view; 7, claw, lateral view; 8, 1st abdominal tergite, dorsal view; 9, sawsheath, dorsal view; 10, do., lateral view.

orbits covered with moderate and close punctures, denser than on vertex; clypeus covered with large and sparse punctures; occiput moderately and closely punctured. Thorax covered with fine setigerous punctures; mesoscutellum and mesoscutellar appendage nearly impunctate; epicnemium nearly impunctate, shining. Abdominal tergites shagreened.

Male. Unknown.

Host plant. Unknown.

Holotype: female, Mt. Rokuman, foot of Mt. Hakusan, Ishikawa Pref., Honshu, Japan, 15–V–2001, I. TOGASHI leg. Paratype: one female, same data as for holotype. Types are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Remarks. This new species is closely allied to the three European species of this genus. It is easily distinguished from *H. excisa* (KONOW) by the truncate clypeus (in *excisa*, the front margin of the clypeus is emarginate), and by the black legs (in *excisa*, the fore knee and the fore tibia are dirty white). From *recta* (THOMSON), it is easily separated by the black legs (in *recta*, the fore knee and the fore tibia are dirty yellow). From *nigripes* (KONOW), it is easily distinguished by the rounded margin of the sawsheath in lateral view (in *nigripes*, the apical portion of the sawsheath, in lateral view, has a backward projection), and by the black legs (in *nigripes*, the fore knee and the front side of the tibia are brown).

Acknowledgment

I thank Dr. David R. SMITH, USDA, Washington, D.C., for reviewing the manuscript.

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Discovery of the Nearctic Empidid Genus *Hoplocyrtoma* MELANDER (Diptera, Brachycera) from Japan

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Abstract Two new species of the Nearctic empidid genus *Hoplocyrtoma* MELANDER, 1927, *H. watanabei* and *H. japonica*, are described from Japan. A revised description and a key to the species of *Hoplocyrtoma* are given.

The genus *Hoplocyrtoma* MELANDER, 1927, was founded based on two Nearctic empidid species hitherto assigned to the genus *Cyrtoma* MEIGEN, 1824 (=*Bicellaria* MACQUART, 1823). *Hoplocyrtoma* is very similar to *Bicellaria* in every morphological character including the characteristic wing venation lacking in the discal cell and the short, ventrally directing proboscis. However, they are quite different in the hind legs, which are simple in *Bicellaria*, while in *Hoplocyrtoma* distinctly raptorial in structure (MELANDER, 1927). Since it was founded, no further species have been added to it even from the Nearctic Region (MELANDER, 1902, 1965). Through our survey of the Japanese fauna of the Empididae, we have found many specimens of this genus from Honshu, Shikoku and Kyushu. In Japan this genus is more diversified than in the Nearctic Region, and represented by several morphologically much differentiated species. In this paper we describe two out of them. Other Japanese species are represented by a few specimens in our collection, and will be described elsewhere when more material is obtained.

The present discovery of *Hoplocyrtoma* in Japan is a further addition to a list of empidids that are distributed only in the Nearctic Region and Eastern Asia. The list includes the subgenus *Calorhamphomyia*, the *umbilicata* gp. and *umbrosa* gp. of *Rhamphomyia*, *Proclinopyga* and *Trichoclinocera*. The last genus was recently known to occur in northern Europe by one circumpolar species (SINCLAIR, 1994). In addition, some unnamed species of *Hesperempis* and *Megagrapha* from Eastern Asia are also represented in SAIGUSA's collection. These empids seem to be descendants of the ancestors that had the Arcto-Tertiary distribution in the Holarctic Region. This inference is supported by the fossil records of some higher plants that have present distributional ranges similar to those of the above-mentioned empidids (*e.g.*, *Liliodendron*, section *Rubra* of *Acer*) (HOTTA, 1974).

The holotypes of the following new species are deposited in SAIGUSA's collection in the Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, Fukuoka.

Genus *Hoplocyrtoma* MELANDER, 1927

Hoplocyrtoma MELANDER, 1927, Gen. Ins., fasc. 185, Empididae, 78. Type species: *Cyrtoma procera* LOEW, 1864.

Morphological characters. Head spherical, slightly shorter than high; compound eyes touching on frons, narrowly separated on face, with upper facets enlarged; ocellar tubercle prominent with a pair of long ocellar bristles; occiput with a row of postocular bristles and scattered setae more densely clothed ventrally. Antenna nearly as long as head, basal two segments short, 3rd antennal segment oval, gently tapering apically or ending in a slender apical prolongation; style moderately thick, shorter than 3rd antennal segment. Proboscis short and vertical; labrum curved posteriorly at tip; labellum short and fleshy; palpus short and rounded with a few setae. Thorax strongly raised dorsally, greyish or brownish pollinose on notum, greyish brown pollinose on pleura. Chaetotaxy:— Acrostichals short and irregularly biserial, dorsocentrals uniserial and short, ending posteriorly in 1–2 strong bristles; humerus with weak setae; 2–3 notopleurals with or without a few weaker setae; 1 (rarely 2) supra-alar bristle with or without a few fine setae; 1 postalar with a minute setula; scutellum with 4 to several marginal bristles. Fore- and midleg slender and short setose, without strong bristles; t1 somewhat swollen subbasally. Hind leg raptorial, trochanter elongate and clavate; femur strongly incrassate, beneath with 4 rows of bristles or spines, middle two rows of short spinules, outer two rows of long strong spine-like bristles, anteroventrally with a few strong bristles; tibia geniculate, more or less laterally compressed, carinate ventrally, apically more or less thickened and obliquely truncate. Wing broad, alula undeveloped or weakly developed; alular incision nearly right-angled; axillary lobe well developed; venation almost as in *Bicellaria*; discal cell open, stalk of M_1 and M_2 and their bases almost disappearing. Halter yellowish white. Abdomen moderately elongate, entirely or partly pollinose; male genitalia similar to those of *Bicellaria*; surstyli asymmetrical, distal lobes of hypandrium broad and rounded apically; female abdomen gradually tapered apically, with slender cerci.

Included species and distribution. This genus has hitherto included only two Nearctic species, *H. procera* (LOEW, 1964) from Northwestern North America and *H. femorata* (LOEW, 1964) from Eastern North America (MELANDER, 1902, 1927, 1965). In this paper two new species are described from Japan. The genus is distributed in the Nearctic Region and Japan (Honshu, Shikoku and Kyushu). Although the genus is found even in the alpine zone of central Honshu, it is not found in Hokkaido, the northernmost main island of Japan. It has not been discovered in Taiwan, Korea, Ussuri, central and southern China, and the Himalayas, where rather extensive faunal surveys for empidids have been carried out by one of us, SAIGUSA.

Bionomics. Both sexes of *H. japonica* sp. nov. were found sitting on the upper side of leaves of shrubs or low trees in forests. When they found a small insect, mostly dipteron, flying near them, they started to pursue it. After they caught the prey, they alight on upperside of a leaf usually grasping it with their raptorial hind legs, and feed on it keeping their posture of almost "handstand" (Fig. 1). Neither mating behaviour nor swarming flight has been observed. As *H. watanabei* sp. nov. was collected in the alpine area (2,700–3,000 m) on Mt. Kitadake, it almost certainly inhabits grassy slopes. The Japanese species are univoltine, and appear in late spring to early summer.

Key to Species of the Genus *Hoplocyrtoma*

1. Abdomen extensively pollinose except for small areas on lateral portions of 1st to 4th terga .... 2.
— Abdomen extensively polished on posterior 1/2 or wide lateral portions of 2nd to 5th terga .... 3.
2. Larger species, length of body 4.2–5.1 mm in male, 4.2–4.9 mm in female; length of wing 4.5–5.0 mm in male, 4.5–4.9 mm in female; dorsal setae of f3 almost erect or suberect; compound eyes more or less flattened dorsally .... *H. procera* (LOEW), Western North America.
— Smaller species, length of body 2.9–3.0 mm in male, 3.3–3.8 mm in female; length of wing 3.2–3.3 mm in male, 3.6–3.9 mm in female; dorsal setae of f3 subdecumbent; compound eyes rounded dorsally .... *H. watanabei* sp. nov., Japan.
3. Abdominal terga densely pollinose on anterior 1/2; upper facets strongly enlarged, larger than 2× of lower ones .... *H. femorata* (LOEW), Eastern North America.
— Abdominal terga extensively polished except for a thinly greyish pollinose small dorsomedian portion; upper facets slightly enlarged, 1.2× as large as lower ones .... *H. japonica* sp. nov., Japan.

Hoplocyrtoma watanabei sp. nov.

(Fig. 2)

Male. Head spherical; in profile, anterior margin of compound eye evenly curved; the level of antennal socket at 2/3 head height; frons rather short and linear on upper 2/3; face rather long, narrow, nearly as wide as anterior ocellus, and subshining; all postocular and occipital setae blackish. Compound eye continuous for a short distance on frons, with upper facets moderately enlarged, 1.7× as large as lower one, and its diameter 0.7× width of anterior ocellus. Antenna slightly shorter than head; 2.5 times as long as two basal segments together, gently thickened to slightly before the

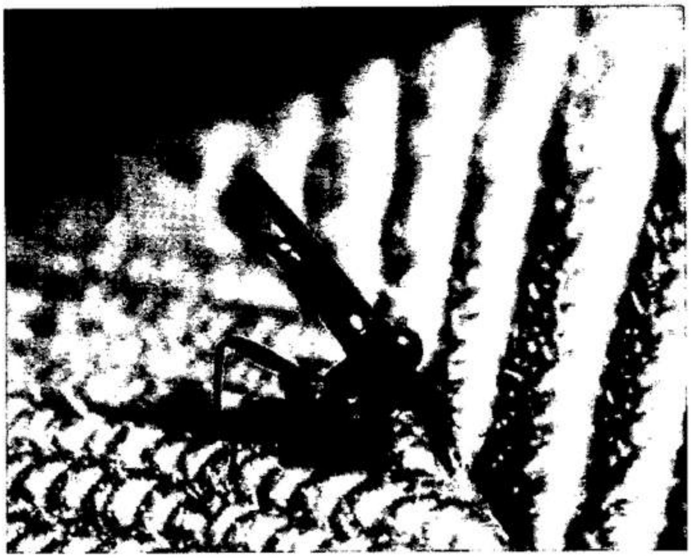

Fig. 1. *Hoplocyrtoma japonica* sp. nov.; femal feeding in a cecidomyiid.

middle, then strongly tapered to evenly slender apical 1/4; style 2/3 as long as 3rd segment, its basal segment 2× as long as thick, apical segment 5× as long as basal segment.

Thorax. Mesonotum thinly brownish pollinose; pleura thinly greyish pollinose. Legs blackish brown to black; basal 1/4 of t3 paled towards base. Vestiture of legs black. Hind femur 1.6× as long as mesothorax, 6.3× as long as thick, moderately swollen, thickest around 2/3, with dorsal margin rather evenly arched; f3 clothed with short subdecumbent setae 0.3–0.35× as long as thickness of f3; t3 0.8× as long as f3, 0.11, 0.07, 0.12× as thick as long at subapical, middle and subbasal portion, respectively; metatarsus somewhat slender, 0.35× as long as f3, 0.13× as thick as long.

Wing 2.8× as long as wide, moderately broad and almost clear; costa weakly bisinuate from base to tip of R_1, incurved on basal 1/3, then strongly rounded to tip; alula almost straight; alular incision rather obtuse, nearly 130°: axillary lobe strongly developed; cell R_1 only slightly narrowed towards subapical portion; R_{4+5} very weakly bisinuate, stalk of M_1 and M_2 moderately long, 2nd basal cell moderately wide. Halter yellowish while.

Abdomen rather short, blackish brown; extensively thinly greyish pollinose on terga; pollinose-free areas confined to the followings: narrow lateral portions of 1st tergum, lateral portions of anterior 1/3 of 2nd tergum, small posterolateral corners of 3rd tergum. Tergal vestiture including strong bristles along posterior margins of 1st and 2nd terga yellow, but some setae on posterior terga darker.

Male genitalia:— Directing dorsally. Epandrium strongly constricted to base of

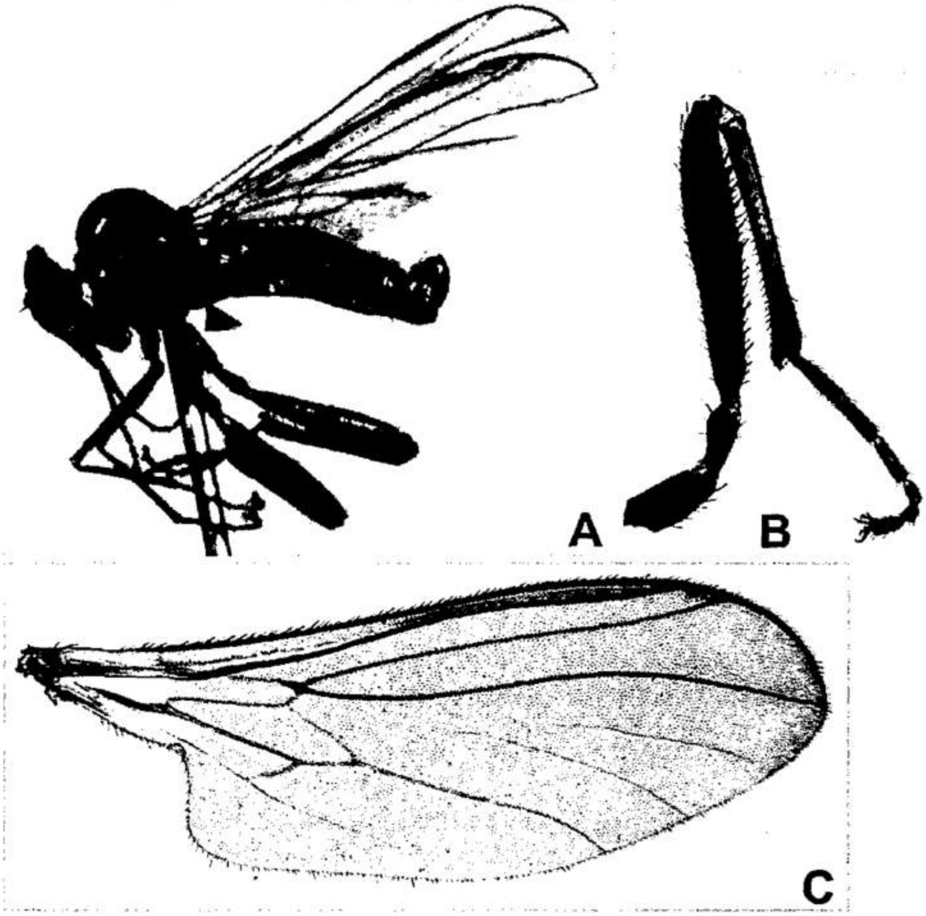

Fig. 2. *Hoplocyrtoma watanabei* sp. nov.; A, male; B, male left hind leg; C, male wing.

the epandrial process, which is moderately broad and distinctly produced into a short dorsodistal process; right paramere with serrate ventral margin; left paramere simple and small; phallobase with a dorsally projecting dorsoproximal sharp projection; apical portion of phallus large, tapered apically and strongly curved ventrally.

Lengths: Body 2.9–3.0 mm; wing 3.2–3.3 mm.

Female. Similar to male; abdomen tapering apically to a pair of slender cerci; pollinose areas of terga may be slightly narrower than in male.

Lengths: Body 3.3–3.8 mm; wing 3.6–3.9 mm.

Type series. Holotype ♂. Kitadake (2,700–3,000 m), Akaishi-sanmyaku, Yamanashi Pref., Honshu, 21–VII–1981, T. Gotô leg. Paratypes: 2♂♂, 2♀♀, same data as holotype; 1♀, Kitadake (1,500–2,000 m), Akaishi-sanmyaku, Yamanashi Pref., Honshu, 20–VII–1981, T. GOTÔ leg.; 1♀, Kitazawa P., Senjô-dake, Akaishi-sanmyaku, Yamanashi Pref., Honshu, 21–VII–1959, Y. MIYATAKE leg., 7♀♀, Senjôdake (alpine zone), Nagano Pref., Honshu, 20–VII–1959, Y. MIYATAKE leg.; 4♀♀, Ôdaigahara, Nara Pref., Honshu, 5–VI–1981, T. GOTÔ leg.; 1♂, Tsuchigoya, Mt. Ishizuchisan, Ehime Pref., Shikoku, 26–V–1988, T. SAIGUSA leg.; 1♂, Mt. Ishizuchisan, Ehime Pref., Shikoku, 29–V–1967, A. NAKANISHI leg.

Distribution. Honshu and Shikoku.

Remarks. This species is easily distinguished from the known species by its smaller size, clear wings, and dorsally directing male genitalia in addition to the extensively pollinose abdominal terga.

The specific name is dedicated to Dr. Yasuaki WATANABE, who was a supervisor of KATO, one of the authors, when he was a student of Tokyo University of Agriculture.

Hoplocyrtoma japonica sp. nov.

(Figs. 1 & 3)

Male. Head spherical, but a little producing anteroventrally; in profile, anterior margin of compound eye more strongly curved on ventral 1/3 than on dorsal 2/3; the level of antennal sockets at 0.54 of head height. Frons long and linear except for a short triangle above antennal sockets; face short, slightly wider than anterior ocellus, subshining; all occipital and postocular setae blackish. Compound eye continuous for a long distance on frons, with upper facets weakly enlarged, 1.22× as large as lower ones, and their diameter 0.37× width of anterior ocellus. Antenna 0.83× as long as head; 3rd antennal segment 2.3× as long as basal two segments together, thickened to subbasal portion, then keeping same thickness to 2/3, and strongly tapered to short slender apical portion, with almost straight dorsal margin and strongly arched ventral margin; style 0.6× as long as 3rd antennal segment, its basal segment 2× as long as thick, and 0.12× as long as apical segment.

Thorax. Mesonotum thinly brownish pollinose; pleura thinly greyish pollinose. Legs dirty yellow on fore- and midleg except brown cx1 and cx2, hindleg blackish brown, basal 2/3 of t3 and tar3 yellowish. Vestiture of legs black. Hind femur long, 1.8–1.9× as long as mesothorax, 6.5× as long as thick, weakly swollen on basal 1/2, then slightly curved dorsally and swollen on apical 1/2, thickest around 2/3, with dorsal margin slightly incurved around the middle, clothed with long suberect setae 0.4-0.5× as long as thickness of f3; t3 0.75× as long as f3, 0.13, 0.09, 0.1× as thick as long at subapical, middle and subbasal portions, respectively; metatarsus slender, 0.30–0.34× as long as f3, 0.15× as thick as long.

Wing 2.7–2.8× as long as wide, rather broad and distinctly tinged with brownish; costa almost straight to tip of R_1, then gently rounded to tip; alula almost straight, alular incision nearly 100°, axillary lobe strongly developed; stigma broad; cell R_1 distinctly narrowed from the middle towards subapical portion of stigma; R_{4+5} moderately bisinuate; stalk of M_1 and M_2 moderately long; 2nd basal cell moderately broad. Halter

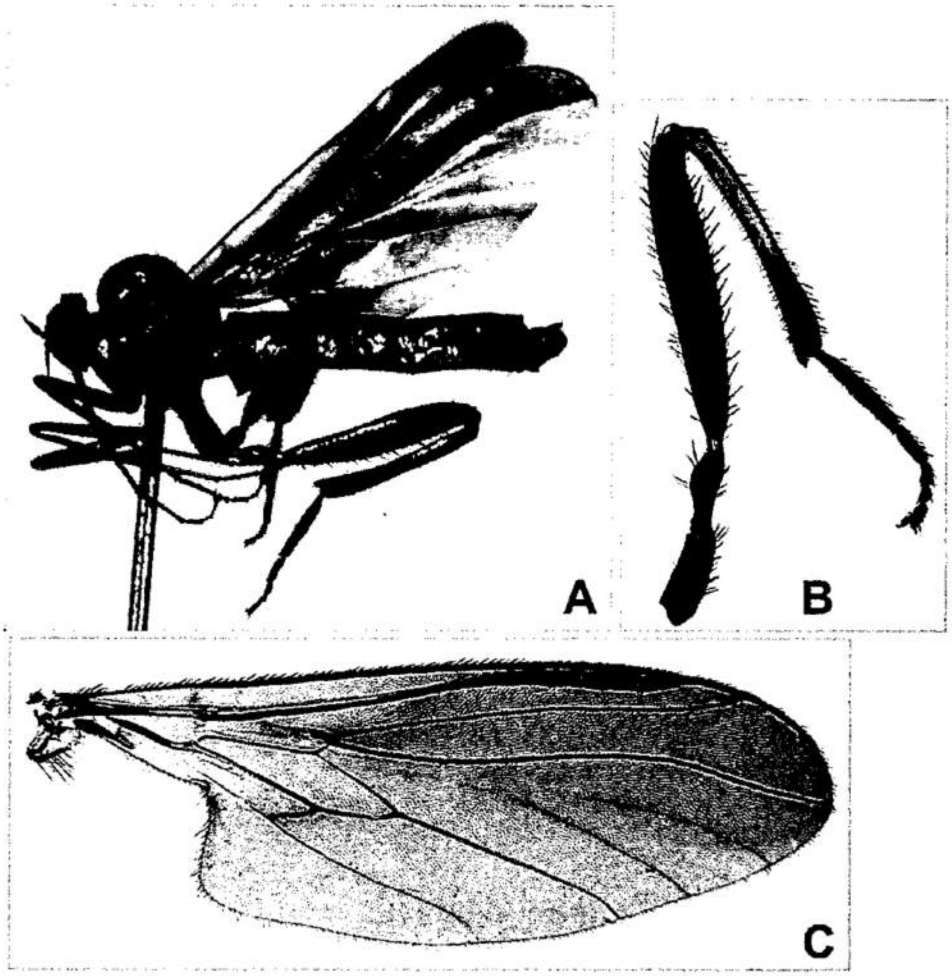

Fig. 3. *Hoplocyrtoma japonica* sp. nov.; A, male; B, male left hind leg; C, male wing.

yellowish white.

Abdomen long, blackish brown; extensively polished, with the following thinly greyish pollinose areas: each narrow dorsomedian triangular area extending from anterior margin to or near posterior margin on all terga, these areas becoming narrower on posterior terga. Tergal vestiture including strong bristles along posterior margins of 1st and 2nd terga yellow, some short setae on posterior terga darker.

Male genitalia:— Directing posteriorly. Epandrium gently constricted to base of the epandrial process, which is moderately broad and weakly pointed dorsodistally; parameres rounded, right one larger than left one; apical portion of phallus rather small, strongly tapered and moderately curved ventrally.

Lengths: Body 3.6–4.2 mm; wing 3.4–3.8 mm.

Female. Similar to the male. Abdomen tapering apically, with a pair of slender cerci. Abdominal terga almost polished except for anterodorsal portion in 2nd to 5th abdominal segments, almost entirely grayish pollinose on 6th to 8th segments.

Lengths: 4.0–5.5 mm; wing 3.5–4.0 mm.

Type series. Holotype ♂, Innakiyama, Wakamiya, Fukuoka Pref., Kyushu, 16–IV–1961, T. SAIGUSA leg. Paratypes: [Honshu] 7♂♂, 10♀♀, Jakuchikyô, Kuga-chô, Yamaguchi Pref., 30–IV–1987, T. SAIGUSA leg.; 28♂♂, 12♀♀, Kanmurikôgen, Hiroshima Pref. [Kyushu] 1♂, 3♀♀, same data as holotype; 1♂, same locality, 15–IV–1962, T. SAIGUSA leg.; 7♂♂, 5♀♀, same locality, 10–IV–1977, K. ÔHARA leg.; 3♂♂, 1♀, same data, T. GOTÔ leg.; 2♂♂, same locality, 11–IV–1977, T. GOTÔ leg.; 1♂, 1♀, same data, K. ÔHARA leg.; 5♂♂, 6♀♀, Kikuchisuigen, Kikuchi, Kumamoto Pref., 27–IV–1978, K. ÔHARA leg.

Distribution. Honshu (western Chûgoku District), Kyushu (northern and central areas).

Remarks. This new species resembles *Hoplocyrtoma femorata* (LOEW, 1864) from Eastern North America in the extensively polished abdominal terga, but is distinguished from it by the more widely polished abdominal terga, less strongly enlarged upper facets and extensively pale colored fore- and midlegs.

The specimens from high altitudes (1,500–3,000 m) in central mountain region of Honshu are much larger than the type series. Those from the Amô-tôge (1,400 m alt.), Gifu Pref., Honshu have dark brown fore- and midlegs. Those from Yahazuyama, Kôchi Pref., Shikoku are as large as those from central mountain region. These specimens seem to be conspecific with the type series, as the male genitalia are extremely similar to each other in the detailed structure of epandrial processes, parameres and apical shape of phallus.

Acknowledgements

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