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A New Subgenus and Species of *Apotomopterus* (Coleoptera, Carabidae) from Taiwan[1)]

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Abstract A new subgenus belonging to the genus *Apotomopterus* HOPE is erected under the name of *Taiwanocarabus*, with the description of the new type species, *Apotomopterus* (*Taiwanocarabus*) *masuzoi*, from central Taiwan.

During the zoological expedition 1989 to the high mountains of Taiwan made by the National Science Museum, Tokyo, a series of specimens of a strange carabid beetle belonging to the subtribe Carabina were collected. At first sight, it reminds us of certain species of *Leptocarabus*, especially of *Adelocarabus* or of *Pentacarabus* occurring on the high mountains of central Honshu, Japan, because of its small forebody and slender elytra. Its multi-costate elytral sculpture somewhat resembles that of *Ceroglossus* of South America. However, the absence of ostium lobe and the presence of a sclerotized ligula of the male genitalia prove that it belongs to the group Spinulati, according to the taxonomical works by ISHIKAWA (1973, '78). In our view, the Spinulati now contains the two genera, *Apotomopterus* HOPE and *Siamocarabus* IMURA, and we regard the species in question as a member of the former, mainly on the basis of the direction of the ligular apex. On the other hand, it is considerably different from hitherto known *Apotomopterus* in many respects, and we are going to erect a new subgenus for placing this remarkable carabid beetle and to describe it as a new species in the following lines. Only one species belonging to the genus *Apotomopterus*, namely, *sauteri* (ROESCHKE, 1912) (p. 4), has hitherto been recorded from Taiwan, and the present new species is the second representative of the genus occurring in this tropical island.

The abbreviations used herein are as follows: HW – greatest width of head including eyes; PAW – approximate width of pronotal apex, measured between the most advanced points on both sides; PBW – approximate width of pronotal base, measured between the most protrudent points of hind angles; PL – length of pronotum,

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measured along the mid-line; EW – greatest width of elytra; EL – greatest length of elytra; M – arithmetic mean. The measurement was made by using 30 ♂♂ 30 ♀♀ specimens randomly picked up from the type series.

Before going into further details, we wish to express our deep gratitude to Dr. Shun-Ichi UÉNO of the National Science Museum (Nat. Hist.), Tokyo, under whose leadership the 1989 expedition to Taiwan was carried out, not only for giving us the privilege of studying invaluable specimens but for critically reading the manuscript of this paper. Hearty thanks are also due to Dr. Mamoru OWADA for his kind help in collecting the material used. The first author is greatly indebted to Miss Pamela GILBERT of the Entomology Library, British Museum (Natural History), London, for her kindness in providing with photocopies of the necessary literature.

Subgenus ***Taiwanocarabus*** IMURA et M. SATÔ, nov.

Type species: *Apotomopterus* (*Taiwanocarabus*) *masuzoi* subgen. et sp. nov.

Small-sized *Apotomopterus* carabid beetle somewhat similar in general appearance to certain *Leptocarabus*. Body elongate, with relatively small prothorax and slender elytra; colour black, with more or less lighter appendages; antennae and legs long and slender.

Head subquadrate, slightly convex above with protruding eyes; frontal furrows deep in front, becoming shallower posteriad; lateral grooves distinct; frons feebly convex, irregularly punctato-striate; dorsal surface of head behind eyes finely rugoso-striate; supraorbital margins complete; mandibles normal, with each retinaculum bidentate, the right one being smaller than the left; apical segments of palpi not so strongly dilated; penultimate segment of labial palpus bisetose; antennae filiform, long and slender, without hairless ventral depressions, segment 5 the longest and subequal to segment 6 or 7, each about 1.3 times as long as scape.

Pronotum small, subcordate, a little wider than long, widest before the middle; front angles slightly protrudent anteriad; lateral margins reflexed throughout and clearly bordered; marginal setae absent; hind angles protrudent posteriad, with the apices obliquely bent ventrad; central part of the disc convex; surface punctate, partly becoming uneven and scabrous; basal foveae distinct; median line narrow and finely impressed.

Elytra elongate and weakly convex, widest behind the middle; preapical emargination faintly recognised only in females; primary intervals weakly costate except for apical parts; secondaries weaker than primaries and more or less catenulate; tertiaries indicated by irregular rows of granules; intervals except for elevated parts scattered with microgranules.

Pro- and mesepisterna distinctly punctate; metepisterna and sides of sternites also punctate, partly becoming scabrous; sternal sulci completely and prominently carved; metacoxa bisetose; legs long and slender, basal four segments of male foretarsus dilated.

Table 1. Comparison between the subgenera *Apotomopterus* HOPE and *Taiwanocarabus* IMURA et M. SATÔ, nov.

	Apotomopterus (s. str.)	*Taiwanocarabus* nov.
Body proportion	usually less specialised, prothorax sometimes even disproportionately enlarged	long and slender, with relatively small prothorax
Penultimate segment of labial palpus	bi- or multisetose	bisetose
Marginal setae of pronotum	present at least by a pair	completely lost
Preapical emarginations of elytra	usually distinct in both sexes and more conspicuous in ♀	faintly recognised only in ♀
Primary intervals	often segmented or indicated by rows of tubercles	weakly costate and linearly continuous except for apical parts
Ligula	long and spine-like	short and thorn-shaped

Male genital organ medium-sized and elongate; aedeagus subcylindrical, not tuberculate nor carinate, with the apex triangularly pointed; ostium lobe invisible at the membraneous preostium; endophallus with a ligula situated at the left side near the base; the ligula moderately sclerotized, thorn- or beak-shaped and sharply pointed at the apex; praeputial pads and peripheral rims of gonopore developed, but neither basal lobe nor paraligula is recognised; female genitalia with vaginal apophysis poorly developed.

Notes. The present new subgenus may be distinguished from the nominotypical one (type species: *Carabus prodigus* ERICHSON) by the diagnostic characters shown in Table 1.

Apotomopterus* (*Taiwanocarabus*) *masuzoi IMURA et M. SATÔ, sp. nov.

(Figs. 1–5)

Length: 18.6–22.4 mm (from apical margin of labrum to apices of elytra). Width: 6.3–7.5 mm.

Body elongate, with relatively small prothorax and slender elytra with effaced shoulders; antennae and legs very long and slender. Colour black, with shiny head and subpolished pronotum; elytra rather mat, with faint velvety lustre except for the elevated parts and margins which are grossy; basal 4 segments of antennae and of meso- and metatarsi blackish, each with brownish basal part; apical 7 segments of antennae reddish brown; palpi, foretarsi, claws and sometimes elytral margins a little reddish; venter polished and blackish brown, hind body sometimes a little more reddish.

Head subquadrate, slightly convex above with protruding eyes; frontal furrows rather deeply carved in front, especially before the level of fronto-clypeal suture, then obliquely extending to the anterior supraorbital margins, becoming a little shallower

posteriad, with the surface sparsely punctate; lateral grooves narrow but distinct; frons feebly convex above, irregularly punctato-striate, usually with a pair of round depressions on each side at about the mid-eye level, each depression not so deep, about half the diameter of an eye; dorsal surface of head behind eyes irregularly and finely rugoso-striate; microsculpture visible, forming fine transverse meshes; supraorbital margins narrow but usually complete; mandibles rather stout, acutely hooked and sharply pointed at the apices; retinaculum of mandible bidentate, the right one being a little smaller than the left; apical segments of palpi not so strongly dilated in both sexes; penultimate segment of labial palpus bisetose; antennae filiform, long and slender, extending slightly beyond basal three-fifths of elytra in male and reaching the middle of elytra in female, pubescent from segment 5, without hairless ventral depressions; relative lengths of scape and segments 2–4, 8, 9 as follows:— 1: 0.85: 1.28: 0.90: 1.18: 1.05; segment 5 the longest, subequal in length to segment 6 or 7, 1.33 times as long as scape; penultimate and terminal segments subequal in length to segment 4 and scape, respectively, though the former two are much narrower than the latter two; median tooth of mentum triangularly pointed with the margin slightly but distinctly reflexed.

Pronotum relatively small, subcordate, only a little wider than long, widest at about apical two-fifths, rather gradually narrowed towards base than towards apex; PW/HW 1.20–1.32 (M 1.27), PW/PL 1.05–1.19 (M 1.13), PW/PAW 1.42–1.57 (M 1.50), PW/PBW 1.33–1.52 (M 1.43), PBW/PAW 1.00–1.14 (M 1.06); apical margin feebly emarginate; front angles either almost rectangular or a little obtuse, slightly protrudent anteriad with rounded tips; sides gently rounded in front, rather weakly sinuate behind, then almost parallel or slightly dilated before hind angles; lateral margins feebly reflexed throughout and clearly bordered, the borders becoming a little narrower towards front angles; marginal setae absent in all the type specimens examined; hind angles rather sharply protrudent posteriad, with the apices obliquely bent ventrad; basal margin evenly bisinuate; disc slightly convex above, with subtriangular apical impression widely divergent anteriad; lateral parts broadly depressed, most widely at about posterior third, with the surfaces punctate in anterior portions, becoming foveolate and scabrous behind the middle; basal impression subquadrate, subtriangularly or sometimes rather roundly protrudent anteriad at the middle, with the surface distinctly foveolate and scabrous; basal foveae large and deep, subtriangular, extending anteriorly along the side borders; these discal depressions give the centre of pronotum a papilionaceous relief, with the surface sparsely punctate and partly becoming uneven; median longitudinal line very narrow and finely impressed, partly becoming unclear.

Elytra elongate and weakly convex above, widest at about apical four-ninths, and much more gradually narrowed towards bases than towards apices; EW/PW 1.43–1.70 (M 1.60), EL/EW 1.89–2.06 (M 1.96); preapical emargination faintly recognised only in females; primary intervals indicated by narrow and weakly elevated costae, linearly continuous except for the apical parts, where they are gradually reduced to

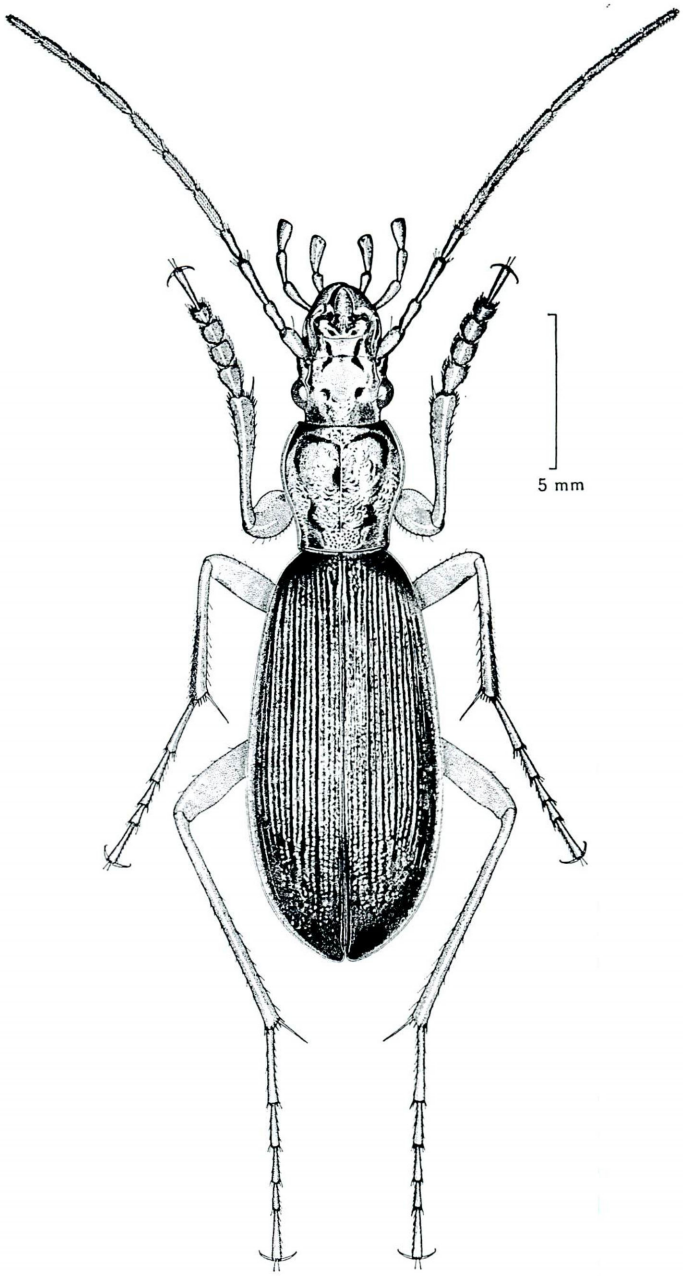
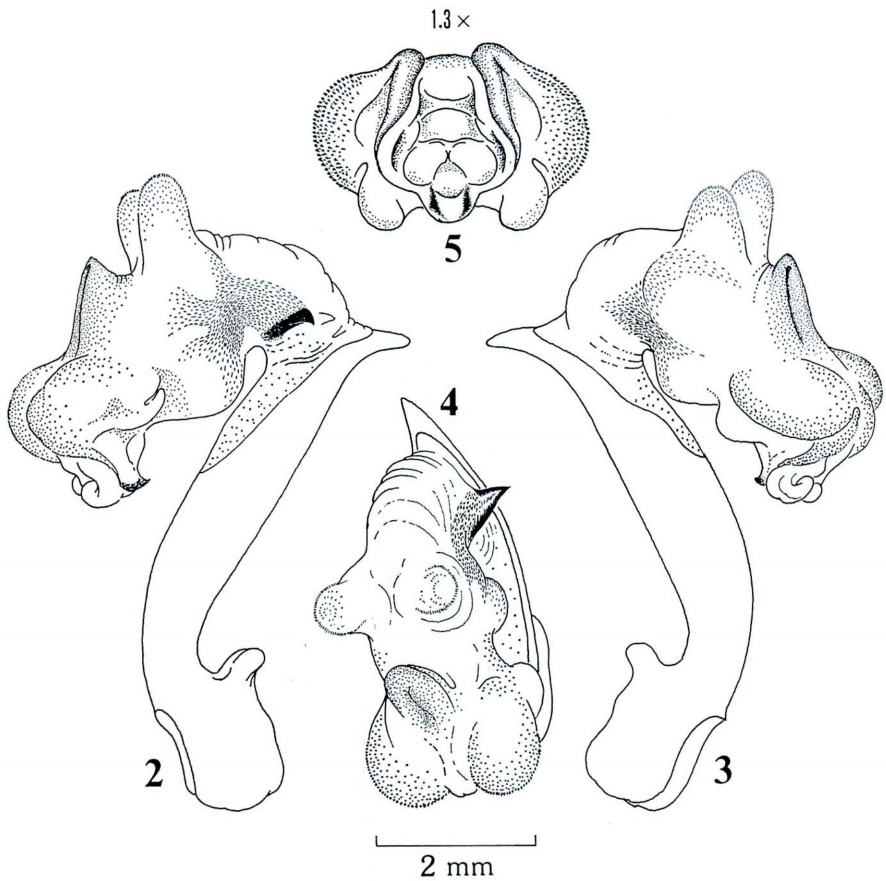


Fig. 1. *Apotomopterus* (*Taiwanocarabus*) *masuzoi* IMURA et M. SATÔ, subgen. et sp. nov., ♂, from Mt. An-ma Shan, central Taiwan.



Figs. 2–5. Male genitalia of *Apotomopterus* (*Taiwanocarabus*) *masuzoi* IMURA et M. SATÔ, subgen. et sp. nov., from central Taiwan; 2, aedeagus with endophallus in fully everted condition (left lateral view); 3, same (right lateral view); 4, same (dorsal view); 5, apical part of endophallus.

form irregular rows of granules; secondaries weaker than primaries and more or less catenulate, being reduced to form rows of granules apically as well as primaries; tertiaries a little lower than secondaries, indicated by rather irregularly set rows of granules; striae between intervals composed of rows of foveoles; intervals except for the elevated parts sparsely scattered with microgranules; umbilicate series indicated by irregular rows of granules extending nearly to elytral apices.

Pro- and mesepisterna rather sparsely but distinctly punctate, microsculpture visible, forming isodiametric meshes; metepisterna and sides of sternites more densely punctate, partly becoming asperous or rather scabrous; sternal sulci completely and prominently carved, but sometimes becoming unclear on segment 7, especially in the central part; metacoxa bisetose, anterior setae absent; legs long and slender, basal

four segments of male foretarsus dilated, with hair pads on the ventral surface.

Male genital organ medium-sized and elongate. Aedeagus a little shorter than half the elytral length, with the basal part rather abruptly curved ventrad, median portion subcylindrical, almost parallel-sided and widest at about the middle, apical lobe moderately elongate, gently curved ventrad, slightly compressed laterad and subtriangularly pointed; ostium lobe invisible at the membraneous preostium; endophallus with a ligula situated at the left side near the base; the ligula moderately sclerotized, very short and thorn- or beak-shaped, with the apex gently hooked ventrad and sharply pointed; praeputial pads and peripheral rims of gonopore well developed, but neither basal lobe nor paraligula is recognised; female genitalia less specialised; bursa copulatrix moderately extending dorso-anteriad, with the surface very weakly or barely rugulose; vaginal apophysis poorly developed, with vertical plate very low, both the outer and inner plates vestigial, scanty pigmentation remaining along the longitudinal median line.

Type series. Holotype: ♂, allotype: ♀, paratypes 45 ♂♂, 84 ♀♀, 14～17–VI–1989, S.-I. UÉNO, M. SATÔ & M. OWADA leg. The holo- and allotypes and a part of the paratypes are deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo. The rest of the paratypes are separately deposited in the collections of the Biological Laboratory, Nagoya Women's University, of the Department of Plant Pathology and Entomology, National Taiwan University, and of Y. IMURA.

Type locality. Mt. An-ma Shan, 2,230 m alt., Ta-hsüeh-shan Mts., T'ai-chung Hsien, central Taiwan.

Other specimen examined. 1 ♀ (24.5 mm), unknown data, in the KANO collection preserved in the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Notes. This remarkable new species was discovered in an evergreen mixed forest on the southern slope of Mt. An-ma Shan, which lies near the southwestern end of the Hsüeh-shan Mountain Range. All the known specimens were found in baited traps, and their natural habitats were not located in spite of enthusiastic investigations made by the members of the expedition. However, the beetles must have concealed themselves in immediate proximities to the trapping sites, since traps set at the same sites as the night before did not attract any additional specimens, which seemed to indicate that the new species was not a very active wanderer, at least at that time of the year.

In Tadao KANO's collection now preserved in the National Science Museum (Nat. Hist.), Tokyo, there is a female *Apotomopterus* without collecting data, which is apparently referable to *A. masuzoi* though somewhat larger than the type specimens. It must have come from somewhere on the Ta-hsüeh Mountains, since the late Dr. KANO was well known as the only scholar who had investigated the fauna of the Hsüeh-shan Mountain Range before the war-time.

This remarkable new species is dedicated to the late Dr. Masuzo UÉNO, a leading

biologist in Japan and the father of Dr. Shun-Ichi UÉNO, who unexpectedly passed away on June 17th, 1989, at the age of 89, while his son was leading the expedition party on the high mountains of Taiwan.

要　約

井村有希・佐藤正孝：台湾中央部で発見されたトゲオサムシ属の1新亜属新種．—— 1989年度，国立科学博物館によって行われた台湾高山帯の昆虫類調査において，同島中央部の大雪山系にある鞍馬山 (Mt. An-ma Shan) から1種の興味深いオサムシが採集された．本種は，♂交尾器の特徴によりトゲオサムシ属 *Apotomopterus* HOPE に属するものと判断されるが，一見，日本のコクロナガオサムシに似た細長い体形をもつばかりでなく，既知のトゲオサムシ類各種とは形態的にかなり異なっているので，新亜属 *Taiwanocarabus* を設け，その基準種を *A.* (*T.*) *masuzoi* IMURA et M. SATÔ として記載した．本新亜属は，1) 体はより細長く，2) 下唇肢次端節の剛毛はつねに2本で，3) 前胸背板側縁に剛毛を欠き，4) 上翅端のえぐれは♀にのみわずかに認められ，5) 上翅第1次間室は翅端部を除き連続する弱い隆条となり，6) 舌状片は短く，嘴状あるいは棘状である，などの諸形質により，トゲオサムシ亜属 *Apotomopterus* (s. str.) から区別される．本新種は，ザウテルトゲオサムシ *A.* (s. str.) *sauteri* ROESCHKE についで，台湾から記録される2種目のトゲオサムシ類となる．

この顕著なトゲオサムシは，鞍馬山南西面に保存されている常緑混交林に生息している．既知の全標本はトラップによって採集され，注意深い探索にもかかわらず，自然状態での生品は得られなかったが，一度トラップをかけた場所からは翌日以降に追加標本が採集されなかったことから判断すると，行動範囲のあまり大きい虫ではないように思われる．

国立科学博物館の鹿野コレクション中に，やや大型ではあるがあきらかに本種と同定できる標本1♀が保存されている．データがつけられていないために詳しい産地はわからないが，本種が台湾においてすでに採集されていたことは確かだろう．

新種名は，上記の台湾調査期間中に日本で急逝された，上野俊一博士のご尊父，故上野益三博士に献名されたものである．

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