Elytra, *Tokyo*, **30** (1): 91–99, June 30, 2002

A New Subspecies of *Pterostichus todai* MORITA et KANIE (Coleoptera, Carabidae) from Mt. Kisokoma-ga-take, Central Japan

Akemichi SUGIMURA

282–19, Kitanakano, Shinkawa-chô, Nishikasugai-gun, Aichi, 452–0914 Japan

Abstract A new subspecies of the pterostichine carabid beetle, *Pterostichus todai* MORITA et KANIE, 1997 is described from Mt. Kisokoma-ga-take, Central Japan, under the name of *Pterostichus todai toyoshimai* SUGIMURA, subsp. nov. It is distinguishable from the nominotypical subspecies by the peculiarity of the fore body and aedeagal configuration.

Up to the present, two populations of macrocephalic pterostichines have been known from the Kiso Mountains, Central Japan. One is *Pterostichus todai* MORITA et KANIE, 1997 from the Misaka-tôge, a pass near Mt. Éna-san which is the southernmost high peak on this mountain range, just lying on the borders between the southeastern part of Gifu Prefecture and the southwestern part of Nagano Prefecture. So far as I know, this species inhabits restrictedly near the top of the Misaka-tôge, ca. 1,500–1,600 m in altitude. It is characterized by having a comparatively large-sized body, nearly square pronotum, and the aedeagus elongate and strongly bent at about basal 1/3, with a small and weakly sclerotized plate-like convexity at the preapex of apical orifice. The other is distributed on Mt. Kisokoma-ga-take, the highest peak at the northern part of the same mountains, lying only about 40 km distant to the north-northwest from Mt. Éna-san. Only one specimen from the latter population, a female identified with *Pterostichus macrogenys* and illustrated by SAKAGUTI (1981), has previously been known to us. It has a voluminous fore body, the head with well developed and strongly hooked mandibles, and the base of the pronotum more strongly contracted, appearing to be somewhat different in external appearance from *Pterostichus todai*. I suspected if geographical differentiation has really taken place in such a narrow area, even though macrocephalic pterostichines are apterous and underground inhabitants in general. To solve my question, it was indispensable to examine a large number of specimens from these areas. I therefore made a short collecting trip to Mt. Kisokoma-ga-take early in the autumn of 2000 with my colleagues, Messrs. Ryôji TOYOSHIMA and Shôji KATÔ who kindly proposed to co-operate my research. We set about 500 cups of baited pit-in-traps at a dried craggy bottom of a narrow valley on the southwestern slope of Mt. Kisokoma-ga-take, the area called Kiso-dani, ca. 1,400 m in altitude. As the result, TOYOSHIMA obtained one female of the macrocephalic pterostichine in question. Since

then, we often visited this collecting site and were able to obtain several specimens. Further, we took rather a long series of *Pterostichus todai* from its type locality in the mid-autumn of 2001 and were able to make an adequate comparison. After a careful study, I came to the conclusion that this beetle is very peculiar in the adeagal configuration, and belongs to an independent population of *Pterostichus todai* at the subspecies level. Since it is new to science, I will name it *Pterostichus todai toyoshimai* in dedication to Mr. Ryôji TOYOSHIMA, who rediscovered this interesting carabid beetle on Mt. Kisokoma-ga-take. Adding to the original description of the nominotypical subspecies by MORITA and KANIE (1997), I will summarize its significant and definitive characteristics and prepare measurement tables for comparison.

The abbreviations used in the tables of this paper are as follows: 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; EW – greatest width of elytra; EL – greatest length of elytra; M – arithmetical mean; SD – standard deviation.

The holotype to be designated in this paper will be preserved in the collection of the National Science Museum (Nat. Hist.), Tokyo.

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 critical reading of the manuscript of this paper. My hearty thanks are due to Messrs. Ryôji TOYOSHIMA of Nagoya and Shôji KATÔ of Tsushima, Aichi Prefecture for their kind co-operation and useful advice.

Pterostichus todai todai MORITA et KANIE, 1997

[Japanese name: Éna-ôzu-naga-gomimushi]

(Figs. 1, 3)

Pterostichus todai MORITA et KANIE, 1997, Elytra, Tokyo, **25**, pp. 164–166, figs. 1–7.

Length (measured from apical clypeal margin to elytral apices): 14.1–15.6 mm in male, 14.4–17.2 mm in female. Humeral width: 4.1–4.7 mm in male, 4.1–4.9 mm in female. Other significant measurements are shown in Table 1. Body rather flat and comparatively large in size among the macrocephalic pterostichine species from Japan. Colour dark brown; head darker except for maxillary palpi, labrum, antennae and legs, which are lighter.

Head very large and voluminous, usually a little narrower than pronotum, widest near the middle; frontal furrows distinct and almost parallel; eyes small and entirely flat; antennae subfiliform and, if straightly stretching, reaching about basal 1/2.3–1/2.2 of elytra, ratio of each segment (I–XI) as follows: about 1 : 0.49 : 0.77 : 0.79 : 0.81 : 0.79 : 0.74 : 0.68 : 0.64 : 0.59 : 0.71 in 23♂♂; 1 : 0.48 : 0.77 : 0.78 : 0.78 : 0.77 : 0.71 : 0.66 : 0.61 : 0.57 : 0.67 in 12♀♀; temporae strongly and roundly swollen laterad, sides rather broadly and almost evenly arcuate, the curvature stronger in female; lateral grooves

Table 1. Measurements of *Pterostichus todai todai* MORITA et KANIE, 1997 from the Misaka-tôge.

23♂♂	Length (mm)	PW/HW	PW/PL	PW/PA	PW/PB	PA/PB	EW/PW	EL/EW
M	14.90	1.11	1.45	1.14	1.21	1.06	1.20	1.64
SD	0.488	0.025	0.035	0.024	0.027	0.030	0.025	0.036
12♀♀	Length (mm)	PW/HW	PW/PL	PW/PA	PW/PB	PA/PB	EW/PW	EL/EW
M	15.62	1.06	1.48	1.11	1.21	1.09	1.17	1.67
SD	0.898	0.027	0.028	0.025	0.032	0.043	0.022	0.035

short and almost straight with posterior ends reaching posterior supraorbital setae or a little outside them; additional grooves shallow though distinct, extending from a little outside and near the ends of eyes, reaching and joining posterior ends of lateral grooves; mandibles very long, left one longer than the right, somewhat sinuate near base and strongly hooked inwards near the middle to apex, right one weakly hooked; genae smooth on ventral side, without fine wrinkles.

Pronotum rather flat, nearly square, widest at about apical 1/5 in male or at about apical 1/7 in female (measured along the median line), lightly and sinuately narrowed basad; sides very feebly convergent apicad from the widest part, slightly arcuately convergent basad and almost paralleled near base; apical angles strongly projecting and acute with extremely narrowly rounded tips, basal ones rectangular or slightly sharp; disc shallowly longitudinally impressed at the middle, with fine transverse wrinkles on both sides of the impression, and sometimes also with a pair of shallow, small and subcircular foveae near the middle, latero-basal portions a little inside basal angles coarsely punctate and rather distinctly foveolate.

Elytra rather flat, elongate-subquadrate with moderately rounded apices, and almost parallel-sided though very slightly arcuate outwards; shoulders rather angulate; sutural angles angulate or denticulate; scutellar striole variable in condition, joining stria 1 or sometimes entirely separated from it.

Legs slender; protibiae slightly bowed in both sexes; underside of protarsi without adhesive hairs in female.

Terminal sternite of abdomen subcircularly depressed before and between a pair of setae in male, transversely depressed near apex in female; apical margin in male very slightly sinuate or almost smooth at the middle.

Aedeagus elongate and strongly bent at about basal 1/3; ventral side almost smooth, neither distinctly thickened nor carinately convex near the middle; apical lobe strongly produced, weakly reflexed in lateral view, slightly inclined to the right in dorsal view and inclined dextrally in frontal view; apical orifice with a small and weakly sclerotized plate-like convexity at preapex; right paramere with an acute apex; left paramere wide.

Specimens examined. 1♂, Misaka-tôge (ca. 1,500 m in alt.), Achi-mura, Nagano

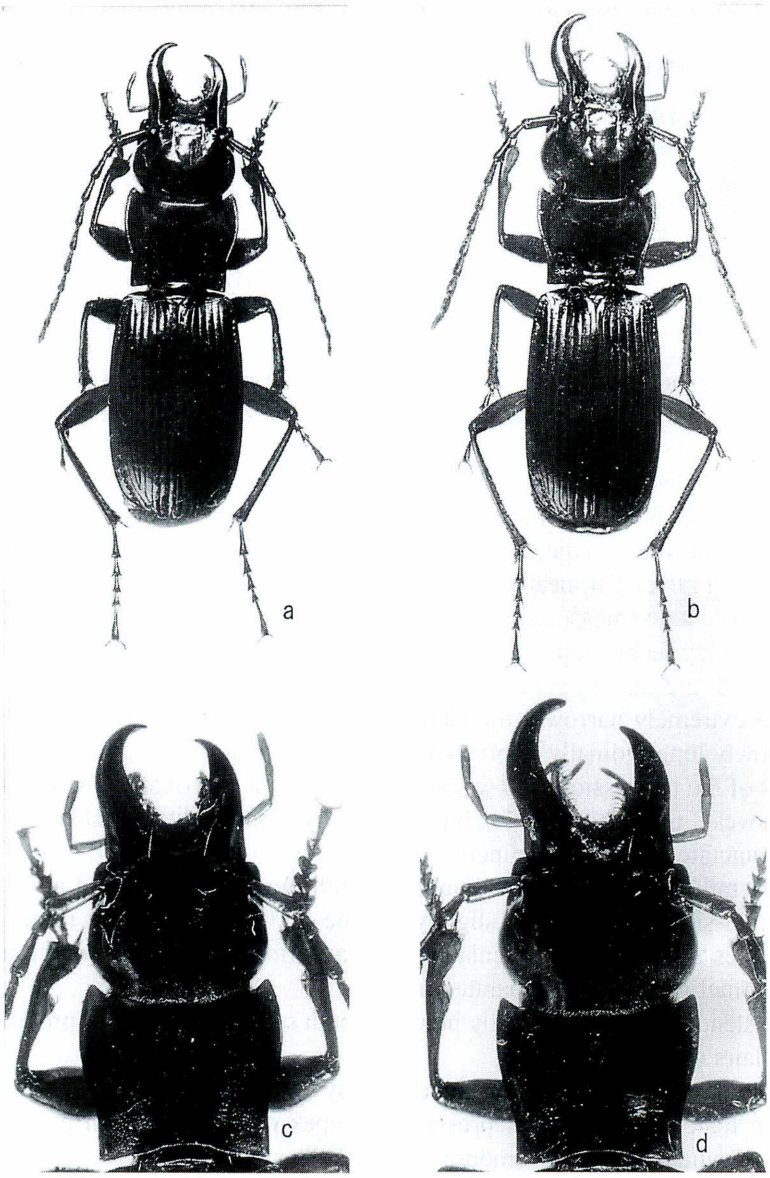


Fig. 1. *Pterostichus todai todai* MORITA et KANIE, 1997 from the Misaka-tôge; a–b, habitus; c–d, forebody; a, c: male; b, d: female.

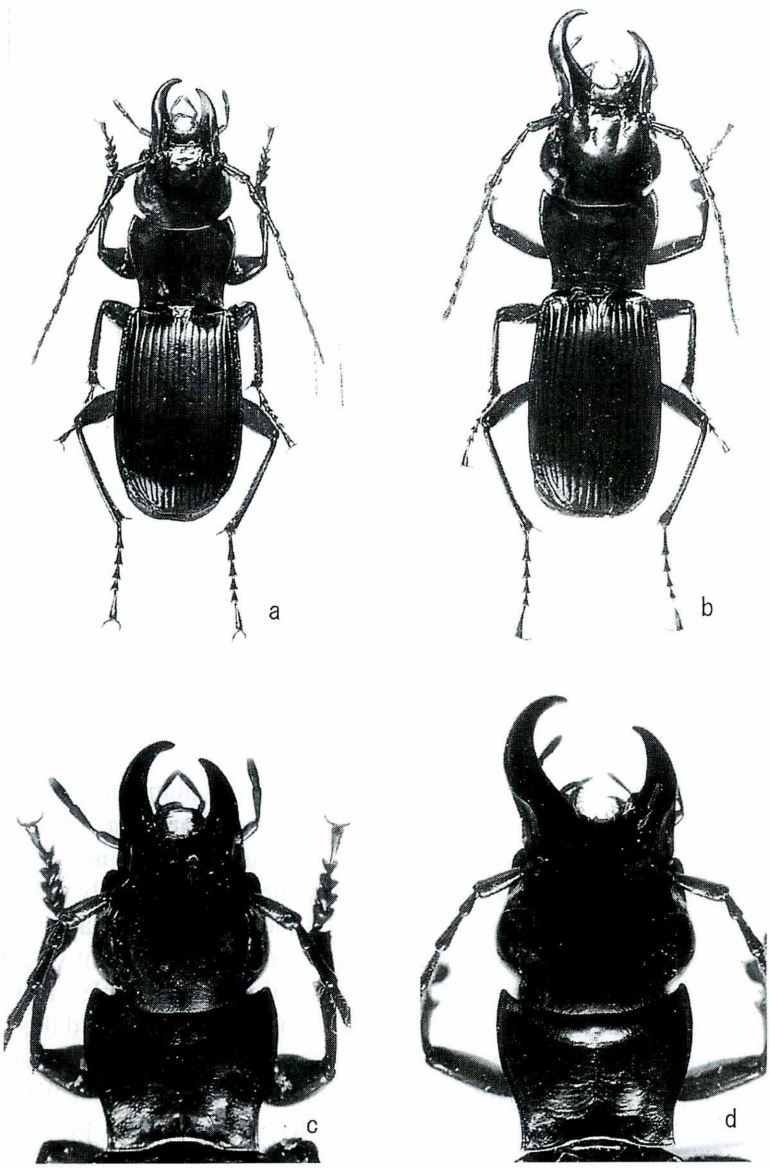


Fig. 2. *Pterostichus todai toyoshimai* SUGIMURA, subsp. nov., from Mt. Kisokoma-ga-take; a–b, habitus; c–d, fore body; a, c: male (holotype); b, d: female (paratype).

Pref., 2~3–IX–2000, Akemichi SUGIMURA leg.; 1♂, Misaka-tôge (ca. 1,500 m in alt.), Nakatsugawa-shi, Gifu Pref., 16~23–IX–2001, Shôji KATÔ leg.; 19♂♂, 9♀♀, same locality, 30–IX~11–X–2001, Ryôji TOYOSHIMA & Akemichi SUGIMURA leg.; 2♂♂, 3♀♀, same locality, 11~21–X–2001, Ryôji TOYOSHIMA & Akemichi SUGIMURA leg.

Pterostichus todai toyoshimai SUGIMURA, subsp. nov.

[Japanese name: Kisokoma-ôzu-naga-gomimushi]

(Figs. 2, 4)

Pterostichus macrogenys: SAKAGUTI, 1981, Ins. World, Osaka, **5**: pp. 71, 72, fig. 6 [part.]. [Nec BATES, 1883.]

Length (measured from apical clypeal margin to elytral apices): 14.6–15.2 mm in male, 15.4–16.4 mm in female. Humeral width: 4.0–4.7 mm in male, 4.1–4.9 mm in female. Other significant measurements are shown in Table 2. Body rather flat. Colour dark brown; head darker except for maxillary palpi, labrum, antennae and legs, which are lighter.

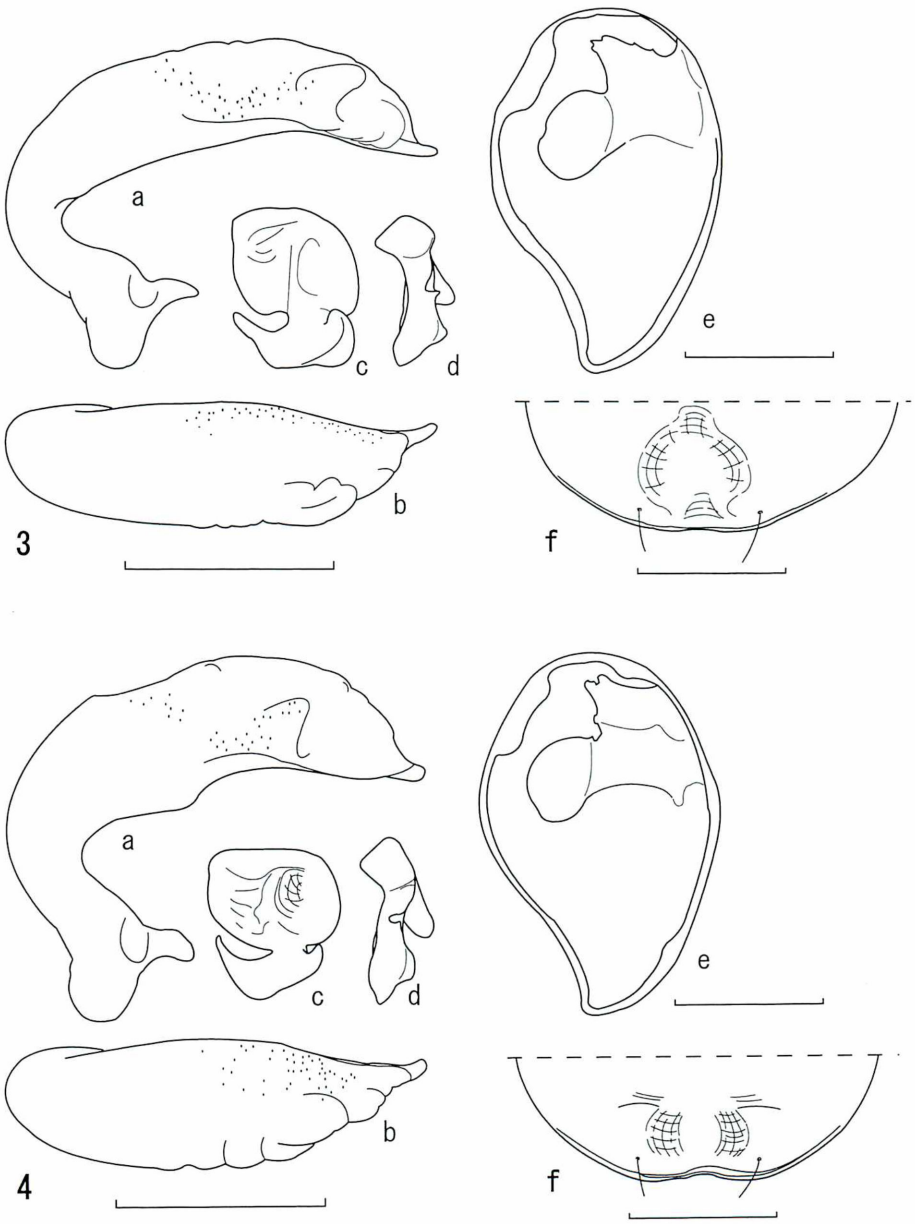
Head very large and voluminous, a little narrower or sometimes a little wider than pronotum; frontal furrows distinct and almost parallel; antennae, if straightly stretching, reaching about basal 1/3–1/2.3 of elytra, ratio of each segment (I–XI) as follows: about 1 : 0.49 : 0.78 : 0.81 : 0.80 : 0.74 : 0.73 : 0.65 : 0.61 : 0.58 : 0.61 in 2♂♂; 1 : 0.52 : 0.81 : 0.81 : 0.76 : 0.69 : 0.68 : 0.63 : 0.61 : 0.52 : 0.68 in 2♀♀; temporae strongly and roundly swollen laterad, sides almost evenly arcuate and widest a little behind the middle, the arcuations in female narrower and stronger than in the nominotypical subspecies; left mandibles relatively longer than that of the nominotypical subspecies; ventral surface bearing fine, short and transverse wrinkles near gular sutures.

Pronotum rather flat, nearly square, widest at about apical 1/6 in male or at about apical 1/10 in female (measured along the median line), more strongly narrowed basad than in the nominotypical subspecies; apex a little wider than base; sides feebly roundly convergent apicad from the widest part, sinuately convergent basad and subparalleled near base; apical angles strongly projecting; basal angles rectangular or slightly sharp; disc shallowly and longitudinally impressed at the middle, sometimes bearing a pair of small circular foveae a little inside lateral margins at about apical 1/3 in addition to a pair of small median foveae, transverse wrinkles near the impression stronger than those of the nominotypical subspecies, latero-basal portions coarsely punctate and foveolate as in the nominotypical subspecies.

Elytra of the same shape as in the nominotypical subspecies; scutellar striole variable in condition.

Terminal sternite of abdomen in male subcircularly depressed before and between a pair of marginal setae; in the holotype, a pair of fine short transverse lines and a few transverse wrinkles also present just before and beside the depression; apical margin in male slightly sinuate or almost smooth at the middle.

Aedeagus moderately bent at about basal 1/3, robuster than that of the nomino-



Figs. 3–4. Male genitalia of the two subspecies of *Pterostichus todai* MORITA et KANIE, 1997; a–e, male genital organ: a, aedeagus, left lateral view; b, aedeagus, dorsal view; c, left paramere; d, right paramere; e, genital segment; f, male terminal sternite. Scale: 2 mm. —— 3. *P. todai todai*, from the Misaka-tôge. —— 4. *Pterostichus todai toyoshimai* SUGIMURA, subsp. nov., from Mt. Kisokoma-ga-take.

Table 2. Measurements of *Pterostichus todai toyoshimai* SUGIMURA, subsp. nov., from Mt. Kisokoma-ga-take.

	Length (mm)	PW/HW	PW/PL	PW/PA	PW/PB	PA/PB	EW/PW	EL/EW
Holotype ♂	14.6	1.09	1.48	1.14	1.28	1.12	1.18	1.60
1♂	15.2	1.09	1.45	1.15	1.31	1.13	1.18	1.64
1♀	16.4	0.97	1.55	1.10	1.26	1.15	1.10	1.66
1♀	15.4	1.04	1.56	1.09	1.24	1.14	1.13	1.64

typical subspecies; middle portion particularly robust, strongly and carinately convex on the ventral side; apical lobe more or less produced and weakly reflexed in lateral view; apical orifice with a small and weakly sclerotized plate-like convexity as in the nominotypical subspecies; apex of right paramere not so acute.

Type series. Holotype: ♂, Ashijima (ca. 1,400 m in alt.), Agematsu-machi, Kiso-gun, Nagano Pref., 23~24–VI–2001, Ryôji TOYOSHIMA & Akemichi SUGIMURA leg. Paratypes: 1♀, same locality as the holotype, 2~3–IX–2000, Ryôji TOYOSHIMA leg.; 1♀, same locality as the holotype, 16~23–IX–2001, Shôji KATÔ & Akemichi SUGIMURA leg.; 1♂, same locality as the holotype, 11–X–2001, Ryôji TOYOSHIMA leg.; 1♂, Ôhara (ca. 1,200 m in alt.), Kisofukushima-machi, Kiso-gun, Nagano Pref., 1–X–2000, Kyôko TAKEDA leg.

Notes. Because of having a medium-sized body, distinct and almost parallel frontal furrows on the temporae widest near the middle, the elytra almost parallel-sided and angulate or denticulate at sutural angles, and the aedeagus strongly bent at about basal third with a weakly sclerotized plate-like convexity at the preapex, this new taxon doubtlessly belongs to *Pterostichus todai* at the species level. However, at the level of subspecies, it can be distinguished from the nominotypical subspecies by having the sides of pronotum more strongly arcuate outwards and rather strongly convergent basad, the aedeagus robuster with a carinate ridge on the ventral side and moderately bent at basal third, and the right paramere not so acute apically.

要　約

杉村明道：中部日本の木曽駒ケ岳から発見されたエナオオズナガゴミムシの1新亜種．——木曽山地におけるオオズナガゴミムシの仲間は，南部に位置する恵那山近傍の神坂峠に分布するエナオオズナガゴミムシ *Pterostichus todai todai* MORITA et KANIE, 1997 と，坂口 (1981) がニッコウオオズナガゴミムシ *Pterostichus macrogenys* として北部に位置する木曽駒ケ岳産の1♀ 個体を図示したものが知られていた．坂口が図示した個体は，非常によく発達した大顎と中央部がとくに強く張り出した側頭部を有していることなどから，ニッコウオオズナガゴミムシ *Pterostichus macrogenys* とは明らかに異なる種であり，著者はその分類上の地位について従来から注目していた．2000年の秋以降，著者は豊嶋亮司氏と加藤昭児氏の協力を得て，これらの地域で調査を行った結果，両地域でともに複数の個体を採集することができた．その後の比較研究の

結果、木曽駒ケ岳産の個体群は，翅鞘先端部の形状，雄交尾器右側片の形状および雄交尾器の中央片開口部付近に硬質化した小隆突起を持つことなどによりエナオオズナガゴミムシ *Pterostichus todai* に属するが，他方では重要な固有形質を保有しており，この種の新亜種と認められるので，キソコマオオズナガゴミムシ *Pterostichus todai toyoshimai* SUGIMURA, subsp. nov. と命名して記載した．

本新亜種は，前胸背板の側縁がより強く波曲し，基部がより強く狭まること，雄交尾器の中央片はより太く，基部1/3で緩やかに屈曲し，中央部付近では下面が顕著に張り出すことにより基亜種と区別できる．本新亜種の産地は，基亜種の基準産地である神坂峠から直線でわずか40 km程度しか離れておらず，このような狭い地域で亜種分化が見られることは，本種が地下生息性の強い甲虫であることを考慮しても非常に興味深い．

なお，本亜種名は木曽駒ケ岳からこの興味深いオオズナガゴミムシを再発見された豊嶋亮司氏に因んで命名した．

References

MORITA, S., & N. KANIE, 1997. A new macrocephalic pterostichine (Coleoptera, Carabidae) from Central Japan. *Elytra, Tokyo*, **25**: 163–167.

SAKAGUTI, K., 1981. The macrocephalic pterostichine carabids with asymmetric mandibles. *Insects of the World*, **5** [Eurasia]: 70–73. Hoikusha, Osaka. (In Japanese, with English book title.)

Elytra, Tokyo, **30** (1): 99–100, June 30, 2002

Rediscovery of *Brachypronomaea esakii* (Coleoptera, Staphylinidae, Aleocharinae) and its New Record from the Island of Okinawa-hontô, the Ryukyus

Munetoshi MARUYAMA

Systematic Entomology, Graduate School of Agriculture, Hokkaido University, Sapporo, 060–8589 Japan

The intertidal beetle, *Brachypronomaea esakii* SAWADA, 1956, of the tribe Pronomaeini was described on the basis of three specimens collected from a coral reef of Ishigaki-jima, Nanseishotô, Japan. Surprisingly, ESAKI (1956), the collector of the type series, reported that the beetles were discovered from about five kilometers off the coast of Ishigaki-jima and the reef was submerged under the seawater except for about two hours at each low tide. This species was