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Two New Macrocephalic Pterostichine Carabids (Coleoptera, Carabidae) from Central Japan

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Abstract Two new macrocephalic pterostichine carabid beetles are described from Central Japan under the names of *Pterostichus momuranus* sp. nov. and *P. nakamiyorinus* sp. nov.

The purpose of this paper is to describe two new macrocephalic pterostichine carabids collected from Tochigi Prefecture, Central Japan.

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 mid-line; PA–width of pronotal apex; PB–width of pronotal base; EW–greatest width of elytra; EL–greatest length of elytra; TL–length of metatarsus; M–arithmetic mean; NSMT–National Museum of Nature and Science, Tsukuba; TPM–Tochigi Prefectural Museum.

Before going further, we wish to express our deep gratitude to Dr. Shun-Ichi Uéno of the National Museum of Nature and Science, Tsukuba, for critically reading the original manuscript of this paper.

Our thanks are also due to the late Mr. Kengo Onda for supplying us with important material.

Mr. Katsumi Akita gave the first author an opportunity to see the holotype of *Pterostichus isolatus* Sasakawa. Without his help, we could not have undertaken this study.

Pterostichus momuranus Morita, Ohkawa et Kurihara, sp. nov.

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

(Figs. 1, 3–10)

Diagnosis. Body large and wide; head very large; eyes very small and flat; genae weakly convex; pronotum almost smooth with strongly produced apical angles and wide reflexed lateral sides; anterior pair of marginal setae of pronotum usually situated a little behind the widest part; elytral sides not parallel to each other; in ♂, anal sternite (VI) moderately arcuate and not bordered at apex; sclerotized plate near aedeagal apical orifice lacking; right paramere of male genitalia with widely rounded apex.

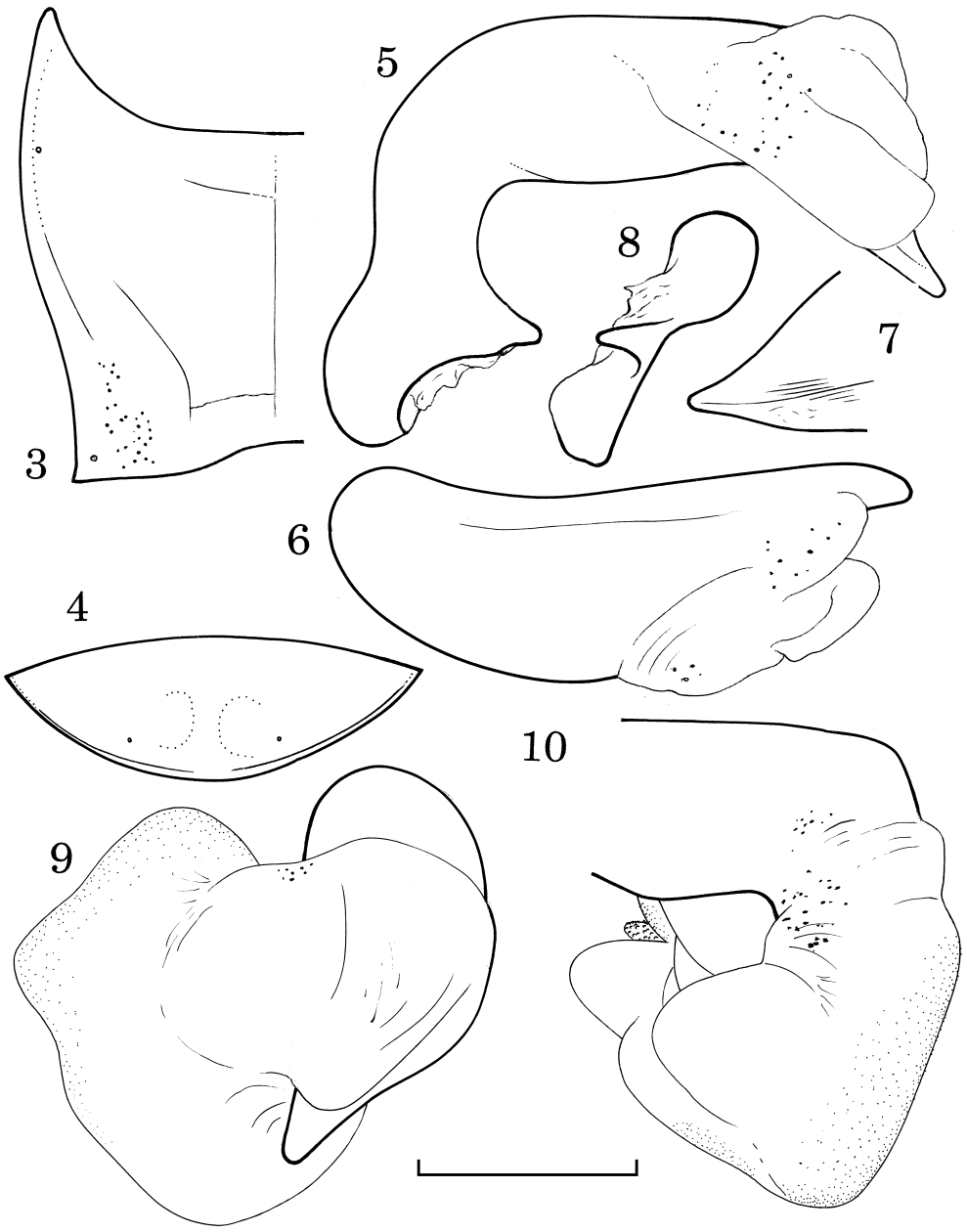
Description. L: 14.14–16.86 mm. Body large, wide and robust. Colour blackish brown; appendages dark brown.

Head very large and convex; eyes very small and flat; frontal furrows shallow and divergent pos-

Figs. 1–2. *Pterostichus* spp. —— 1, *Pterostichus momuranus* Morita, Ohkawa et Kurihara, sp. nov., from Momura; 2, *P. isolatus* Sasakawa from Tashiroyama-rindô.

teriad; lateral grooves deep, linear, straight in front, curved inwards and wide at the posterior halves, and then reaching the posterior supraorbital pore on each side; additional groove very shallow and situated outside lateral groove on each side; surface usually sparsely and very finely punctate; PW/HW 1.19–1.27 (M 1.26) in ♂, 1.09–1.18 (M 1.14) in ♀; genae very large, though weakly convex; microsculpture almost obliterated, partially consisting of isodiametric meshes; mentum tooth wide, stout and bifid at the tips; relative lengths of antennal segments as follows: — I : II : III : IV : V : VI : XI ≒ 1 : 0.48 : 0.92 : 0.88 : 0.80 : 0.81 : 0.75 in ♂, 1 : 0.49 : 0.89 : 0.85 : 0.77 : 0.76 : 0.74 in ♀.

Pronotum trapezoidal, weakly convex and widest between apical 3/20 and 1/5 (measured along the mid-line); apex widely and strongly emarginate; PW/PL 1.56–1.63 (M 1.60) in ♂, 1.40–1.51 (M 1.47) in ♀; sides widely and weakly arcuate in front, and then shallowly sinuate at basal 1/5 (measured along the mid-line) and weakly divergent towards hind angles; reflexed lateral sides wide; base moderately emarginate at median part, slightly oblique or transverse at the sides; PW/PA 1.10–1.17 (M 1.14) in ♂, 1.07–1.11 (M 1.09) in ♀, PW/PB 1.23–1.27 (M 1.25) in ♂, 1.26–1.30 (M 1.28) in ♀, PA/PB 1.08–1.14 (M 1.10) in ♂, 1.16–1.20 (M 1.18) in ♀; apical angles strongly produced and very narrowly rounded at the tips; hind angles sharp; anterior pair of marginal setae usually situated a little behind the widest part, rarely at that level, posterior ones a little before and inside hind angles; anterior transverse impression very shallow at the median part and vanished at the sides; posterior transverse impression very deep and oblique; median line clearly impressed between anterior and posterior



Figs. 3–10. *Pterostichus momuranus* Morita, Ohkawa et Kurihara, sp. nov., from Momura. —— 3, Pronotum; 4, anal sternite, in ♂; 5, aedeagus, left lateral view; 6, aedeagus, dorsal view; 7, apical part of aedeagus, obliquely right ventro-lateral view; 8, right paramere, left lateral view; 9, inflated inner sac, dorso-apical view; 10, same, left lateral view. (Scale: 2 mm for 3, 4; 1 mm for 5–10.)

impressions, and vaguely reaching apex and base; basal foveae shallow, linear at the bottom, and very finely and rather sparsely punctate; disc almost flat and smooth; microsculpture composed of fine and wide or transverse meshes; basal part between bottoms of basal foveae smooth.

Elytra elongate, rather flat and widest at middle or a little behind the middle; EW/PW 1.09–1.12 (M 1.10) in ♂, 1.13 (M 1.13) in 3 ♀♀, EL/EW 1.55–1.60 (M 1.58) in ♂, 1.51–1.60 (M 1.56) in ♀; shoulders obtuse and narrowly rounded at the corner on each side; sides very weakly arcuate, and then moderately so towards apices, and with very shallow preapical emargination on each side; apices narrowly separated from each other, and sutural angle obtuse; scutellar striole vestigial; striae rather shallow and smooth; basal pore situated at the base of stria 1; two dorsal pores situated on interval III and adjoining stria 2, rarely close to stria 2; anterior dorsal pore situated between basal 2/5 and the middle; posterior dorsal pore situated between basal 3/4–17/20; intervals almost flat and very finely and sparsely punctate; microsculpture composed of wide to transverse meshes; inner plica visible; epipleuron gradually narrowed towards apex; marginal series composed of 13–16 pores.

Genae usually smooth or sometimes rugose on ventral side; ventral surface of protholax almost smooth; mesosternum, mesepisternum, metepisternum, sides of metasternum and apical part of sternite I sparsely and finely punctate; in ♂, anal sternite (VI) usually moderately arcuate, rarely narrowly so towards apex, not bordered at apex, and shallowly concave at apical part, though median part very weakly and longitudinally convex.

Legs of moderate size; tarsi smooth on dorsal surface; TL/HW 1.04–1.18 (M 1.12) in ♂, 0.98–1.02 (M 1.00) in ♀.

Aedeagus stout, elongate and bent at basal 1/4; basal part thick; apical part weakly sinuate at apical 1/4 in lateral view; ventral side of apical lobe flat or very weakly concave and wrinkled; right side of apical lobe with longitudinal wrinkles and heavily sclerotized dorsal margin; viewed dorsally, apex simply rounded at the tip; sclerotized plate near apical orifice lacking.

Right paramere weakly bent at middle, and with widely rounded apex.

Everted inner sac with a large lobe in left side of aedeagus (=in left lateral view); in lateral view, dorsal side of inner sac weakly constricted; viewed right laterally, a medium-sized lobe present.

Type series. Holotype: ♂, Enna rindô, 30–X–1994, K. Onda leg. (NSMT). Paratypes: 1 ♂, Enna, Nasu, 10–VIII–1978, S. Takahashi leg. (TPM); 1 ♂, Yumiya, 7–IV–1990, Onda leg.; 1 ♀, Momura, 18～26–V–2002, K. Onda leg.; 1 ♂, 1 ♀, same locality, 8～23–VI–2002, H. Ohkawa leg.; 1 ♀, same locality, 19～27–X–2002, H. Ohkawa leg.; 1 ♂, same locality, 10～19–X–2002, K. Onda leg.; 1 ♂, same locality, 11～28–IX–2004, H. Ohkawa leg.; 1 ♀, same locality, 8–X～12–XI–2011, H. Ohkawa leg.; 1 ♂, 1 ♀, same locality, 17–IX～13–X–2012, H. Ohkawa leg.; 1 ♂, Mt. Momura-yama, 19–X–2003, H. Ohkawa leg.

Localities of the type series. Yumiya, Enna rindô, Momura and Mt. Momura-yama, Nasushiobara-shi, Tochigi Prefecture, Central Japan.

Notes. When the first specimens of this new species were found, they were considered as a local race of *Pterostichus ixion* described by Tschitschérine (1902, p. 494) from Nikko [sic.], since the range of this new species is only 42 km distant from Nikkô, the type locality of the latter. However, it is easily distinguished from *P. ixion* and the other members of the macrocephalic *Pterostichus* by

larger and wider body and less convex genae.

It seems that the inner sac shown in Fig. 10 is not wholly everted. If stronger air pressure with a syringe is used, the inner sac will be broken. Most part of the inner sac, however, was wholly everted and inflated, so that most of it was easily examined and illustrated by our own study.

Standard ratios of body parts shown in the descriptive part are those of four males and three females.

Etymology. The species name is taken from one of the localities, Momura.

Pterostichus nakamiyorinus MORITA, OHKAWA et KURIHARA, sp. nov.

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

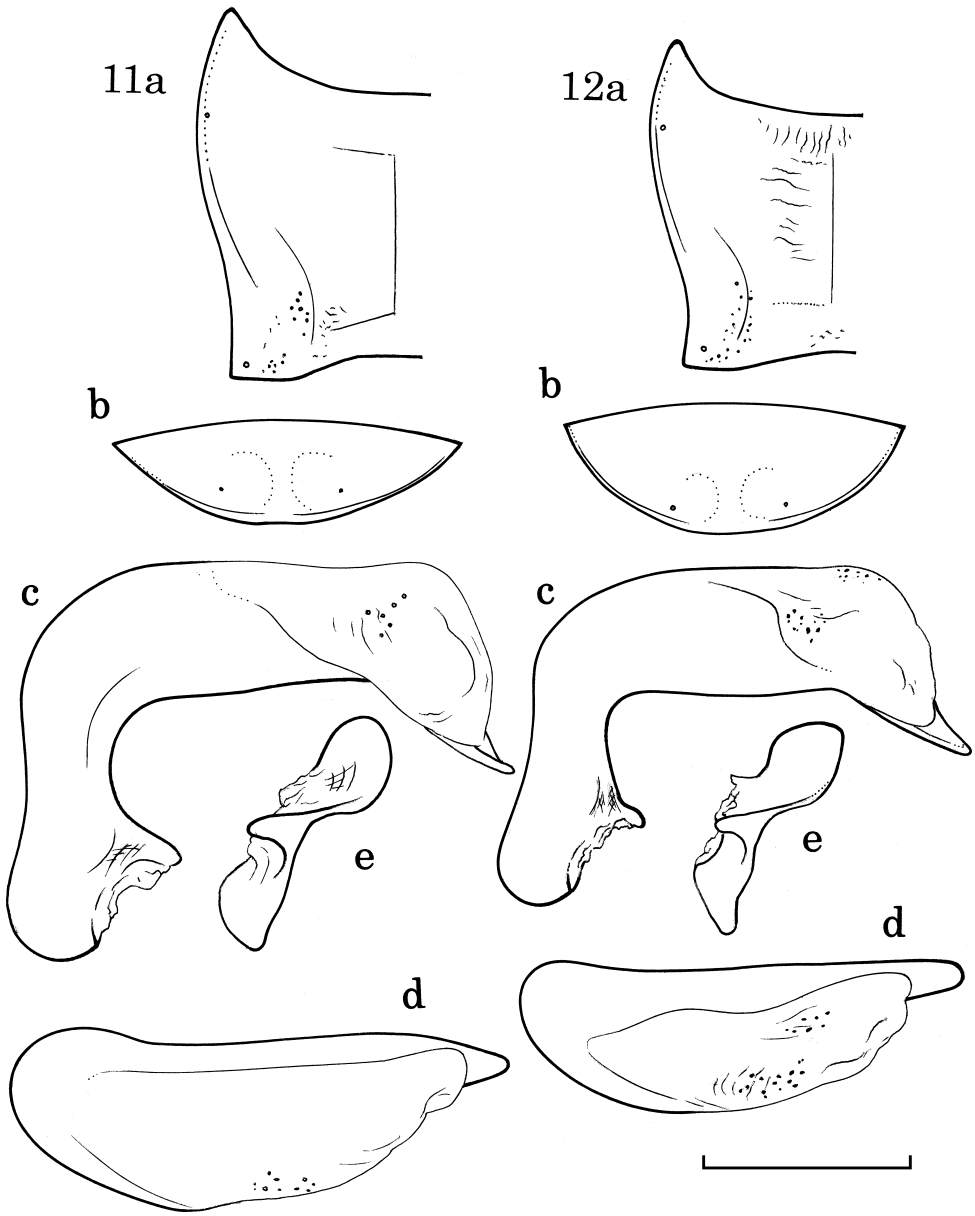
(Figs. 11, 13, 14)

Diagnosis. Medium-sized species; head very large; eyes very small and very weakly convex; lateral groove of head without additional groove; genae weakly convex; elytral sides not parallel to each other; in ♂, anal sternite (VI) moderately arcuate, not bordered at apex, with narrowly and weakly truncated apex; viewed dorsally, apical lobe of aedeagus gradually narrowed towards apex; sclerotized plate near aedeagal apical orifice lacking; right paramere of male genitalia with moderately rounded apex.

Description. L: 12.57–13.85 mm. Medium-sized species. Colour black; appendages dark brown.

Head very large and convex; eyes very small and very weakly convex; frontal furrows shallow and divergent posteriad; lateral grooves deep, linear, straight in front, curved inwards at the posterior halves, and then reaching the posterior supraorbital pore on each side, and without additional groove; surface sparsely and very finely punctate; PW/HW 1.23–1.24 (M 1.23) in ♂, 1.20, 1.18 (M 1.19) in ♀; genae very large, though weakly convex; microsculpture consisting of isodiametric meshes; mentum tooth rather narrow, shallowly bifid at the tips; relative lengths of antennal segments as follows: ― I : II : III : IV : V : VI : XI≒1 : 0.48 : 0.90 : 0.87 : 0.81 : 0.80 : 0.74 in ♂, 1 : 0.47 : 0.90 : 0.86 : 0.82 : 0.78 : 0.78 in ♀.

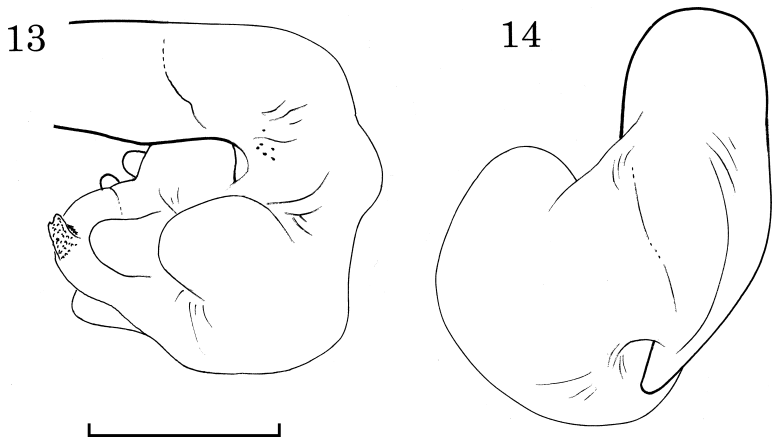
Pronotum trapezoidal, weakly convex and widest between basal 9/10 and a level a little behind the apical margin (measured along the mid-line); apex widely and strongly emarginate; PW/PL 1.53–1.61 (M 1.57) in ♂, 1.59, 1.63 (M 1.61) in ♀; sides almost straight or very weakly arcuate from apical angles to the widest part, very weakly arcuate behind, shallowly sinuate at about basal 1/4 (measured along the mid-line) and then weakly divergent towards hind angles; base moderately emarginate at median part, slightly oblique or transverse at the sides; PW/PA 1.13–1.15 (M 1.14) in ♂, 1.14, 1.11 (M 1.13) in ♀, PW/PB 1.24–1.25 (M 1.25) in ♂, 1.27, 1.30 (M 1.29) in ♀, PA/PB 1.09–1.10 (M 1.10) in ♂, 1.12, 1.18 (M 1.15) in ♀; apical angles strongly produced and very narrowly rounded at the tips; hind angles sharp; anterior pair of marginal setae inserted at the widest part, posterior ones a little before and inside hind angles; anterior transverse impression very shallow at the median part and vanished at the sides; posterior transverse impression deep and transverse or oblique; median line clearly impressed between anterior and posterior impressions; basal foveae shallow, linear at the bottom, and



Figs. 11–12. *Pterostichus* spp. —— 11, *Pterostichus nakamiyorinus* Morita, Ohkawa et Kurihara, sp. nov., from Naka-miyori; 12, *P. isolatus* Sasakawa from Tashiroyama-rindô. —— a, Pronotum; b, anal sternite, in ♂; c, aedeagus, left lateral view; d, same, dorsal view; e, right paramere, left lateral view. (Scale: 2 mm for a, b; 1 mm for c, d, e.)

finely and rather sparsely punctate; disc almost flat; microsculpture composed of fine and wide or transverse meshes; basal part between bottoms of basal foveae weakly wrinkled or almost smooth.

Elytra elongate, rather flat and widest at about middle or a little behind the middle; EW/PW



Figs. 13–14. *Pterostichus nakamiyorinus* Morita, Ohkawa et Kurihara, sp. nov. —— 13, Inflated inner sac, left lateral view; 14, same, dorso-apical view. (Scale: 1 mm.)

1.11–1.19 (M 1.15) in ♂, 1.15, 1.14 (M 1.15) in ♀, EL/EW 1.59–1.75 (M 1.66) in ♂, 1.67, 1.63 (M 1.65) in ♀; shoulders obtuse or narrowly rounded at the corner on each side; sides weakly arcuate, and then moderately so at the apical parts, with very shallow preapical emargination on each side; apices narrowly separated from each other, and apex obtuse, rarely obtusely rounded; scutellar striole very short, impunctate, and situated on interval I, rarely vanished; striae rather shallow and smooth; basal pore situated at the meeting point of striae 1 and 2; two dorsal pores situated on interval III and adjoining stria 2; anterior dorsal pore situated between a level before the middle and basal 3/5 in ♂, a little before the middle in ♀; posterior dorsal pore situated between basal 4/5–9/10 in ♂, at basal 4/5 in ♀; intervals flat and very finely and sparsely punctate; microsculpture composed of wide to transverse meshes; inner plica invisible; epipleuron gradually narrowed towards apex; marginal series composed of 13–16 pores.

Genae usually rugose or partially smooth on ventral side; ventral surface of protholax almost smooth; mesosternum, mesepisternum, metepisternum, sides of metasternum and apical part of sternite I sparsely and finely punctate; in ♂, anal sternite (VI) moderately arcuate, not bordered at apex, with narrowly and weakly truncated apex, and shallowly concave at apical part, though median part very weakly and longitudinally convex. TL/HW 1.12–1.16 (M 1.13) in ♂, 1.08, 1.09 (M 1.09) in ♀.

Aedeagus stout, elongate and bent at basal 1/4; basal part thick; viewed dorsally, apical lobe gradually narrowed towards apex; apical part weakly bent at apical 1/4; ventral side of apical lobe weakly concave and wrinkled; right side of apical lobe weakly and longitudinally wrinkled along ventral margin; viewed dorsally, apex simply rounded at the tip; sclerotized plate near apical orifice lacking.

Right paramere rather moderately curved at middle, and with moderately rounded apex.

Everted inner sac with two lobes at the left side of aedeagus (=in left lateral view); viewed right laterally, two small lobes and a medium-sized lobe present; apical part of inner sac with rolled membraneous part and a copulatory piece.

Type series. Holotype: ♂, 10–XI～8–XII–2012, H. Ohkawa leg. (NSMT). Paratypes: 1 ♀, 2–X–1999, H. Ohkawa leg.; 1 ♀, 2～10–X–1999, H. Ohkawa leg.; 1 ♂, 15～20–VIII–2000, H. Ohkawa leg.; 1 ♂, 16–X～13–XI–2011, H. Ohkawa leg.; 5 ♀♀, 13–XI–2011～4–V–2012, H. Ohkawa leg.; 1 ♂, 4～27–V–2012, H. Ohkawa leg.; 1 ♀, 27–V～18–VII–2012, H. Ohkawa leg.; 1 ♀, 18～26–VII–2012, H. Ohkawa leg.; 1 ♀, 13–X～10–XI–2012, H. Ohkawa leg.; 1 ♂, 2 ♀♀, 10–XI～8–XII–2012, H. Ohkawa leg.

Locality of the type series. Naka-miyori, Nikkô-shi, Tochigi Prefecture, Central Japan.

Notes. This new species is distinguished from *Pterostichus isolatus* Sasakawa (2005, p. 76) known from Tashiro-rindô in Fukushima Prefecture by the following points: 1) body larger, 2) disc of pronotum rather smooth, 3) sides of elytra weakly arcuate, 4) anal sternite longitudinally shorter, 5) viewed dorsally, apical lobe gradually narrowed towards apex, 6) apex of right paramere more rounded, and 7) different shape of inner sac (cf. Sasakawa, 2005, Fig. 13).

During a Visiting Mr. Akita's house where the carabid collection is housed, the first author had an opportunity to see the holotype (♂) of *P. isolatus* Sasakawa, including the everted inner sac. At that time, he did not have time enough to carefully study it. Fortunately, the second author collected three specimens of *P. isolatus*, which enabled us to make a direct comparative study.

Standard ratios of body parts shown in the descriptive part are those of 4 males and 2 females.

Specimens compared. *Pterostichus isolatus* Sasakawa: 1 ♂, (holotype), Tashiroyama-rindô Fukushima-ken Tateiwa-mura / 20–VIII–2001 / Ohkawa hideo leg. // Katsumi Akita / Collection / KAC 12489 // HOLOTYPE / *Pterostichus* (*Nialoe*) / *isolatus* / Sasakawa, 2005 / FZUT0006 // Biogeography, / 7:76, Fig.13 //; 1 ♂, 1 ♀, Tashiroyama-rindô (=Tashirosan-rindô), Nikkô-shi, Tochigi Prefecture, 18–IX～9–X–2011, H. Ohkawa leg.; 1 ♂, same locality, 9–X～5–XI–2011, H. Ohkawa leg. L: 11.35–12.00 mm. Body very small. Head relatively large with small and very weakly convex eyes; genae almost parallel to each other in dorsal view. Pronotum wrinkled on the disc; basal part with short and longitudinal wrinkles along the margin. Elytral sides almost parallel to each other; interval III usually with two dorsal pores, rarely with three pores on one side. In ♂, anal sternite large (Fig. 12-b) and moderately arcuate in profile.

Aedeagus elongate with elongate apical lobe.

Right paramere with narrowly rounded apex. According to the original description, inner sac small and spherical.

The standard rations of body parts of two males and one female are as follows: relative lengths of antennal segments as follows: ― I : II : III : IV : V : VI : XI ≒ 1 : 0.52 : 0.91 : 0.82 : 0.84 : 0.87 : 0.84 in ♂, 1 : 0.49 : 0.96 : 0.90 : 0.87 : 0.82 : 0.87 in ♀. PW/HW 1.23, 1.21 (M 1.22) in ♂, 1.15 in ♀; PW/PL 1.51, 1.55 (M 1.53) in ♂, 1.54 in ♀; PW/PA 1.11, 1.15 (M 1.13) in ♂, 1.09 in ♀; PW/PB 1.25, 1.27 (M 1.26) in ♂, 1.27 in ♀; PA/PB 1.13, 1.10 (M 1.12) in ♂, 1.16 in ♀; EW/PW 1.11, 1.10 (M 1.11) in ♂, 1.10 in ♀; EL/EW 1.66, 1.68 (M 1.67) in ♂, 1.71 in ♀; TL/HW 1.11, 1.06 (M 1.09) in ♂, 1.02 in ♀.

Etymology. The species name is taken from the locality, Nakamiyori.

要　　約

森田誠司・大川秀雄・栗原　隆：中部日本産オオズナガゴミムシ（コウチュウ目オサムシ科）の2新種．—— 栃木県で採集されたオオズナガゴミムシ類を新種と認め，モムラオオズナガゴミムシ *Pterostichus momuranus* sp. nov. およびナカミヨリオオズナガゴミムシ *P. nakamiyorinus* sp. nov. とれぞれ命名記載した．はじめの種は，すでに35年前に採集され栃木県立博物館に所蔵されていたもので，著者の大川・栗原により発見された．さらに最近採集された標本を加えて記載した．本種は，大型，幅広く，頭部も非常に巨大化しているが，日光から記載された *P. ixion* Tschitschérine とは，側頭部の形が明瞭に異なる．

2番目の種も比較的大きく，田代山林道から記載された *P. isolatus* Sasakawa に近縁であるが，より大型で，雄腹端節は，縦に短く，陰茎先端部，右側片の形などで識別される．また，内部構造も原記載の不明瞭な写真ではあるが，比較して異なる．

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