

Notes on the Pterostichine Subgenus *Eosteropus* (Coleoptera, Carabidae) from Japan

Part 4. Eight New Species of the *creper* Complex from Central Japan

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Abstract Eight new carabid species belonging to the subgenus *Eosteropus* are described from Central Japan. They are *Pterostichus (E.) hirasawai* sp. nov., *P. (E.) abensis* sp. nov., *P. (E.) ohkawai* sp. nov., *P. (E.) yoshizawai* sp. nov., *P. (E.) hidanus* sp. nov., *P. (E.) shimizui* sp. nov., *P. (E.) rengensis* sp. nov., and *P. (E.) hiramatsui* sp. nov.

Introduction

The pterostichine beetles belonging to the complex of *Pterostichus (Eosteropus) creper* are very closely similar to one another in general appearance as well as in genitalic features (MORITA, 2007, p. 409). However, they can be classified with confidence on the basis of a combination of the shape of the hind angles of the pronotum, that of the anal projection and that of the right paramere of the male genital organ. These differences may suffice for the recognition of a specific level. Further, the coloration of the legs and the structure of the aedeagal surface are helpful for identification. In this paper, I will describe eight new species, which seem to be allopatric, with the exception of the case of the Kubiki Mountains, on the borders of Nagano and Niigata Prefectures, so that if any specimens are collected from a known locality, they can be determined with confidence. The descriptions are summaries of characteristics which are useful for species recognition. Three known species, *P. (E.) creper*, *P. (E.) sudai* and *P. (E.) karasawai* will be taken up separately in the next part of this study.

Abbreviations

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; WL – greatest length of hind wing; TL – length of hind tarsus; M – arithmetic mean; NSMT – National Museum of Nature and Science, Tokyo; NIAS – National Institute of Agro-environmental Sciences, Tsukuba. The PB value was

taken as the width between the roots of postangular setae. Besides, this root is regarded as an apex of hind angle of pronotum.

Complex of *Pterostichus (Eosteropus) creper*

L: 12.00–16.14 mm.

Colour. Black, shiny on dorsal side; legs blackish brown to brown; antennal segments dark brown to blackish brown, becoming lighter towards apices.

Head. The following cephalic characteristics vary individually within a species.

Head moderately convex, finely and sparsely punctate; eyes moderately convex or rarely weakly so; frontal furrows shallow to deep, usually a little divergent posteriad, rarely almost parallel to each other, and reaching the level of the anterior supraorbital pores; in 1 ♂ from Nakabusa Spa, Nagano Prefecture, an additional pore present between left supraorbital pores; genae short, oblique or weakly convex.

Pronotum. The shape of the sides and hind angles are important external characters for identification of a species. The apical gutters exhibit slight variation in depth within a species. The other characters are themselves variable.

Pronotum moderately convex; apex almost straight to moderately emarginate; sides usually moderately arcuate in front, moderately or weakly so, or straightly convergent towards hind angles, rarely very weakly sinuate just before hind angles; hind angles widely rounded or obtuse, or sharp in *P. (E.) creper*; basal fovea very shallow or flat, and densely punctate and wrinkled; median line finely impressed, neither reaching apex nor base, and with fine longitudinal wrinkles at the basal part; anterior and posterior transverse impressions vague or obliterated; apical gutters rather shallow to deep, situated along the inside of apical angles and free at the inner end.

Elytra. Each part of the elytra does not seem to show a sufficiently important character at a species level.

Elytra oblong-ovate, moderately convex, and widest at about middle or a little behind the middle; shoulders widely rounded; sides weakly arcuate from shoulders to the widest part and moderately so behind; apices separately rounded; preapical emargination shallow; striae deeply impressed and almost smooth or very weakly crenulate; scutellar striole adjoining stria 1; one basal pore present on each side; intervals moderately convex; three dorsal pores situated on interval III, the first pore adjoining stria 3, the second and third adjoining stria 2; one to three additional pores sometimes present on interval III, rarely intervals I or V; basal part of interval VIII usually with deep transverse wrinkles; epipleuron becoming narrower towards apex and truncate at apex in *P. (E.) creper* and *P. (E.) sudai*, or rounded in other species in lateral view.

Hind wings. Hind wings reduced.

Anal sternite. The shape of anal projection is the most important external character for identification of a species.

In ♂, anal sternite with an anal projection or carina; anal projection triangular to elongate, and with transverse and oblique wrinkles at the sides; in ♀, anal sternite weakly

depressed and irregularly wrinkled along margin.

Microsculpture. Microsculpture of the elytra shows a slight difference in configuration at a species level.

Microsculpture of head consisting of isodiametric meshes; pronotum very finely and densely impressed with transverse meshes; microsculpture of elytra consisting of wide to transverse meshes, sometimes coarsely impressed.

Legs. Legs moderate; basal three segments of metatarsus externally sulcate; claw segment of metatarsus with several setae on ventro-lateral sides.

Aedeagus. The shape of the aedeagus is an important character for identification of a species. The presence or absence of the aedeagal fovea on the ventral side may suffice for the recognition of a species-group. Though the ventral side of several species described below possesses a strongly depressed area, I do not regard it as a fovea for the time being because of the absence of the edge of the fovea.

The form of the infolded inner sac affords excellent specific characters. However, this applies to carabid beetles in general, at present. Recognition within the *creper* complex can be made by the combination mentioned in the introduction of this paper.

Aedeagus robust and moderately bent at basal third; apical half of ventral side variable in structure, smooth, polished, or rugose, almost flat to strongly depressed, wrinkled or strongly impressed with microsculpture; apical part of left wall produced outwards; apical part of right wall usually heavily sclerotized and sometimes forming a ridge or carina. Inner sac mainly armed with rolled membranous part (MORITA, 2007, p. 413).

Paramere. Shape of the right paramere is also an important character for identification of a species. There are different outlines in the right paramere between the dorsal and apico-dorsal views, so that careful examination is needed. For instance, the illustrations in Figs. 1–2 can be defined as a dorsal view (Figs. 1–a, 2–a) and apico-dorsal view (Figs. 1–c, 2–c), respectively.

Right paramere C-shaped or U-shaped; basal part always wide and usually poorly sclerotized; apical part compressed, flat or twisted inwards at apex, or concave at dorsal side; in lateral view, apex simply rounded, or curved inwards or forming a tooth. Left paramere square.

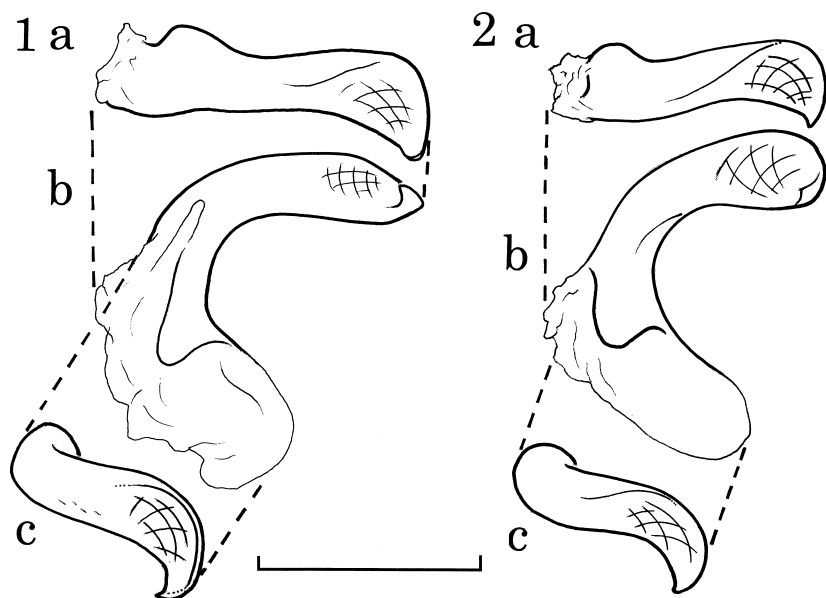
Pterostichus (Eosteropus) hirasawai MORITA, sp. nov.

[Japanese name: Hirasawa-kuronaga-gomimushi]

(Figs. 1, 3)

Diagnosis. Legs blackish brown. Sides of pronotum weakly arcuate posteriad; hind angles of pronotum rounded. Elytra strongly dilated towards the widest part in ♀. Anal projection usually elongate as in the top left of Fig. 3. Right paramere of male genitalia rather large and elongate; apical part of right paramere becoming narrower towards apex and strongly curved inwards and forming a tooth in lateral view.

Description. L: 14.14–15.20 mm. Body large; legs blackish brown. Head with deep



Figs. 1-2. Right paramere of *Pterostichus (Eosteropus)* spp. — 1, *P. (E.) hirasawai* MORITA, sp. nov., from Utajuku; 2, *P. (E.) karasawai* TANAKA from Mt. Nyūgasa-yama, Nagano Prefecture. — a, Dorsal view; b, left lateral view; c, apico-dorsal view. (Scale: 2 mm.)

frontal furrows; eyes moderately convex; PW/HW 1.39–1.44 (M 1.42) in ♂, 1.40–1.43 (M 1.42) in ♀; mentum tooth bifid and rounded at the tips; sides of gula usually with irregular wrinkles and fine punctures, rarely several transverse wrinkles; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI ≃ 1 : 0.51 : 0.90 : 0.87 : 0.85 : 0.84 : 0.80.

Pronotum with moderately emarginate apex; PW/PL 1.26–1.29 (M 1.28) in ♂, 1.28–1.37 (M 1.33) in ♀; PW/PA 1.39–1.44 (M 1.41) in ♂, 1.36–1.39 (M 1.37) in ♀; PW/PB 1.44–1.48 (M 1.47) in ♂, 1.46–1.49 (M 1.47) in ♀; PA/PB 1.00–1.06 (M 1.04) in ♂, 1.04–1.09 (M 1.08) in ♀; sides moderately arcuate in front and weakly so posteriad; hind angles rounded; apical gutters long, shallow and situated along the margin; reflexed sides narrow throughout or becoming wider posteriad; anterior transverse impression vague; posterior transverse impression obliterated.

Elytral sides moderately arcuate from shoulders to the widest part (= at about middle) and moderately so posteriad in ♂; in ♀, sides weakly arcuate from shoulders to the widest part (= a little behind middle) and moderately so posteriad; EL/PW 1.22–1.26 (M 1.24) in ♂, 1.26–1.35 (M 1.31) in ♀; EL/EW 1.56–1.63 (M 1.59) in ♂, 1.44–1.50 (M 1.45) in ♀; preapical emargination shallow; basal part of interval VIII usually with transverse wrinkles though rarely lacking; the first pore situated at basal 1/7–1/4, the second at about the middle, and the third at 7/10–4/5, respectively; an additional

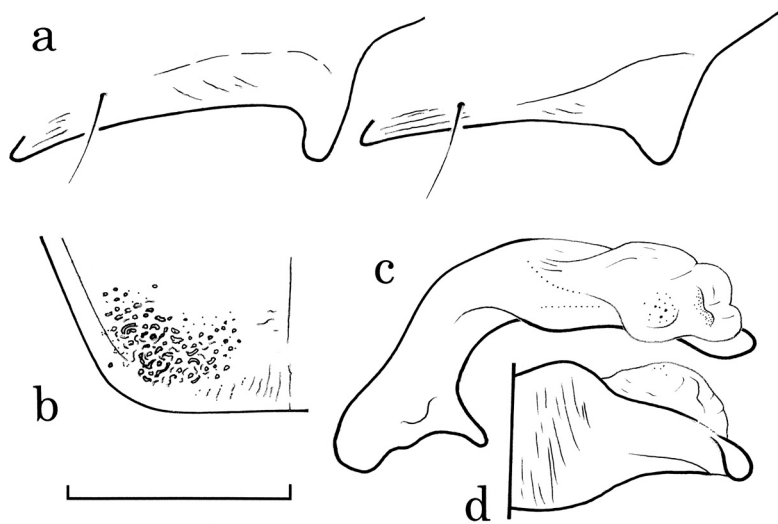


Fig. 3. *Pterostichus (Eosteropus) hirasawai* MORITA, sp. nov., from Utajuku. — a, Anal sternite in right lateral view, showing individual variation; b, left hind angle of pronotum; c, aedeagus in left lateral view; d, apical part of aedeagus in ventral view. (Scale: 2 mm for a; 1 mm for b, c, d.)

pore rarely present and situated at basal 1/3; marginal series composed of 17–19 pores.

Anal projection usually elongate, rarely basal part wide (= triangular) in lateral view. TL/HW 1.39–1.43 (M 1.41) in ♂, 1.25–1.34 (M 1.30) in ♀.

Aedeagus elongate; apical part of ventral surface weakly depressed, and transversely and sparsely wrinkled; apical third of left wall produced outwards; apical third of right wall heavily sclerotized and smooth. Inner sac armed mainly with rolled membranous part which is moderately sclerotized and is covered with minute spinules.

Right paramere U-shaped, rather large and elongate; apical part of right paramere usually narrow, rarely rather wide, and then strongly curved inwards and forming a tooth in lateral view.

Type series. Holotype: ♂, Utajuku, 5~8-VI-2000, H. HIRASAWA leg. (NSMT). Paratypes: 3 ♂♂, 1 ♀, Utajuku, 5~8-VI-2000, H. HIRASAWA leg.; 2 ♀♀, same locality, 26-V-2001, H. HIRASAWA leg.; 1 ♂, 2 ♀♀, same locality, 27-V-2001, H. HIRASAWA leg.; 3 ♂♂, 5 ♀♀, Karei, 20-VI-1998, H. HIRASAWA leg.

Localities. Utajuku and Karei, Hase-mura, Nagano Prefecture.

Notes. This new species seems closely allied to *P. (E.) karasawai* (TANAKA, 1958, p. 218). It is, however, distinguished from the latter mainly by the shape of the anal projection and of the apical part of the right paramere. To facilitate comparison, illustrations of the right paramere from the left lateral, dorsal and apico-dorsal views are prepared (Figs. 1–2).

The shape of the anal projection of this species exhibits slight variation in curvature

or size, but it is usually as in the top left of Fig. 3. The top right of Fig. 3 is an extreme variation. The standard ratios of body parts shown in the descriptive part are those of 4 ♂♂ and 4 ♀♀ from Utajuku.

Pterostichus (Eosteropus) abensis MORITA, sp. nov.

[Japanese name: Suruga-kuronaga-gomimushi]

(Fig. 4)

Diagnosis. Legs dark brown to blackish brown. Sides of pronotum strongly convergent posteriad, usually weakly sinuate before hind angles; hind angles of pronotum angulate or obtuse. Anal projection triangular in lateral view. Right paramere U-shaped; apical part of right paramere becoming narrower towards apex and strongly curved inwards and forming a tooth in lateral view.

Description. L: 12.00–14.43 mm. Legs dark brown to blackish brown. Head with convex eyes; genae short and convex in dorsal view; frontal furrows rather deep, liner, almost parallel to each other or weakly divergent posteriad and sometimes with short wrinkles at the posterior ends; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.50 : 0.89 : 0.89 : 0.91 : 0.91 : 0.87.

Sides of pronotum moderately arcuate in front, strongly convergent towards hind angles or weakly sinuate just before hind angles which are angulate or obtuse; PW/HW 1.37–1.42 (M 1.39) in ♂, 1.38–1.46 (M 1.41) in ♀; PW/PL 1.24–1.30 (M 1.28) in ♂, 1.30–1.39 (M 1.35) in ♀; PW/PA 1.38–1.52 (M 1.46) in ♂, 1.42–1.50 (M 1.45) in ♀; PW/PB 1.47–1.59 (M 1.54) in ♂, 1.48–1.66 (M 1.59) in ♀; PA/PB 0.97–1.11 (M 1.06) in ♂, 1.03–1.14 (M 1.09) in ♀; apex weakly to moderately emarginate; anterior transverse impression finely impressed or vague; posterior transverse impression obliterated.

Elytra rather narrow at basal part; EW/PW 1.20–1.33 (M 1.28) in ♂, 1.28–1.31 (M 1.29) in ♀; EL/EW 1.51–1.60 (M 1.58) in ♂, 1.45–1.56 (M 1.50) in ♀; shoulders obliquely and widely arcuate; sides almost straight from shoulders to the widest part, and moderately arcuate at apical parts, with shallow and narrow preapical emargination on each side; striae smooth or very weakly crenulate; basal part of interval VIII usually with several transverse wrinkles; marginal series composed of 17–18 pores; the first pore situated at basal 1/7–1/4 of elytra, the second one situated at about middle, and the third one situated at 3/4–4/5, respectively; additional pores rarely present, adjoining stria 2 or close to the stria and situated at basal 2/5, 3/5 and 7/10, respectively.

Anal projection triangular, low and with rounded apex in lateral view. TL/HW 1.46–1.58 (M 1.50) in ♂, 1.35–1.44 (M 1.39) in 2 ♀♀.

Aedeagus elongate, with slender basal part; viewed ventrally, apical third of ventral surface almost smooth, but the area between apical third and the mid-level of aedeagus is densely and finely wrinkled; apical third of ventral edge of right wall weakly advanced ventrad and strongly sclerotized. Right paramere U-shaped, rather large and elongate; apical part becoming narrower towards apex and strongly curved inwards and forming

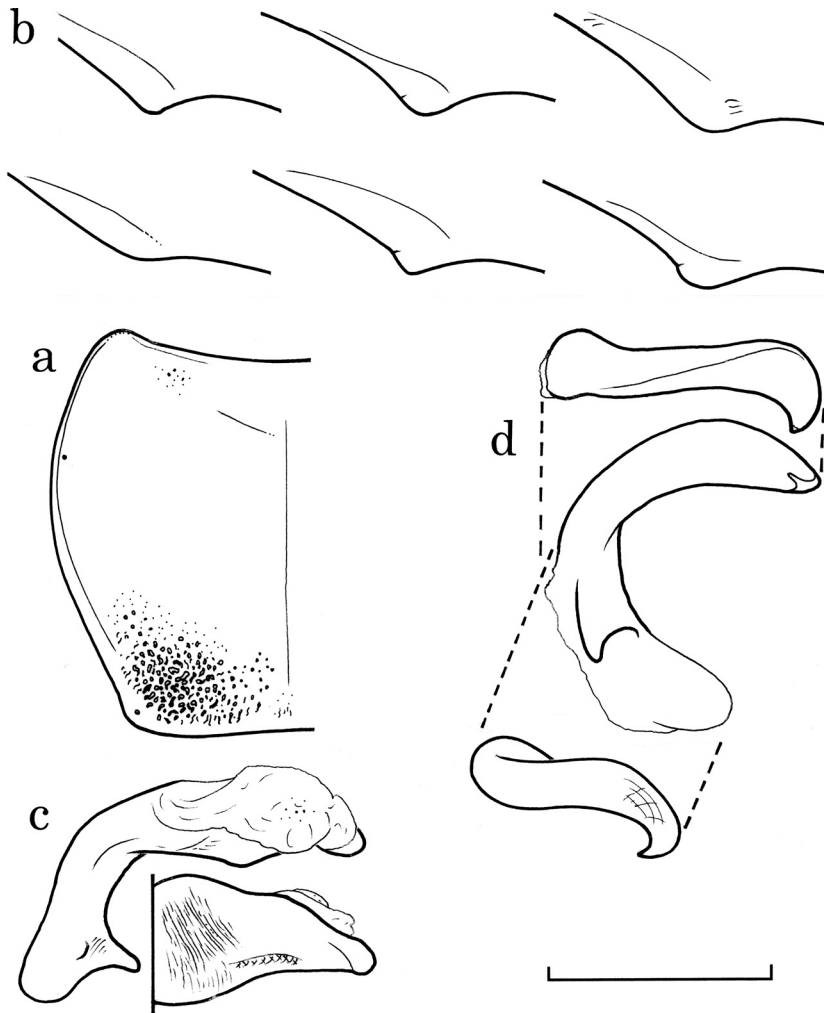


Fig. 4. *Pterostichus (Eosteropus) abensis* MORITA, sp. nov., from the Abe Pass. — a, Left side of pronotum; b, anal sternite in right lateral view, showing individual variation; c, aedeagus in left lateral view and apical part of aedeagus in ventral view; d, right paramere in dorsal view, left lateral view and apico-dorsal view. (Scale: 2 mm for b, d: 1 mm for a, c.)

a tooth in lateral view.

Type series. Holotype: ♂, Abe Pass, 17-XI-1996, S. MORITA leg. (NSMT). Paratypes: 15 ♂♂, 7 ♀♀, Abe Pass, 17-XI-1996, S. MORITA leg.; 1 ♂, Mt. Yanbushi-dake, 3-VIII-1974, K. HIRAI leg.; 2 ♂♂, 29~30-V-1999, same locality, H. OHKAWA leg.; 1 ♂ (teneral), same locality, 25-VIII-2002, K. ONDA leg.

Localities. Abe Pass and Mt. Yanbushi-dake, Shizuoka Prefecture.

Notes. This new species seems closely allied to *P. (E.) karasawai*. It is, however, distinguished from the latter mainly by the following points: 1) sides of pronotum more strongly convergent towards hind angles, 2) elytral shoulders more oblique, 3) elytral microsculpture consisting of very fine and wide or transverse meshes, 4) anal projection triangular, and 5) apical part of right paramere becoming narrower towards apex.

Standard ratios of body parts shown in the descriptive part are those of 5 ♂♂ and 5 ♀♀ from Abe Pass.

Pterostichus (Eosteropus) ohkawai MORITA, sp. nov.

[Japanese name: Akaishi-kuronaga-gomimushi]

(Fig. 5)

Diagnosis. Tibiae and tarsi brown. Hind angles of pronotum rounded; anal projection elongate and curved in lateral view; right aedeagal wall with carina; right paramere C-shaped.

Description. L: 13.43–15.00 mm. Tibiae and tarsi brown. Head with rather strongly convex eyes; genae short and convex in dorsal view; frontal furrows usually rather deep, short, linear and divergent posteriad with wrinkles and punctures, rarely parallel to each other or smooth; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.50 : 0.90 : 0.92 : 0.90 : 0.90 : 0.90.

Pronotum rather large and wide; sides strongly and widely arcuate in front, moderately so towards hind angles; PW/HW 1.36–1.44 (M 1.41) in ♂, 1.38–1.45 (M 1.42) in ♀; PW/PL 1.27–1.33 (M 1.30) in ♂, 1.25–1.33 (M 1.29) in ♀; PW/PA 1.36–1.48 (M 1.45) in ♂, 1.35–1.47 (M 1.39) in ♀; PW/PB 1.40–1.49 (M 1.44) in ♂, 1.41–1.53 (M 1.49) in ♀; PA/PB 0.94–1.03 (M 0.99) in ♂, 1.01–1.11 (M 1.07) in ♀.

Elytra with rather narrow basal part; EW/PW 1.21–1.29 (M 1.25) in ♂, 1.26–1.38 (M 1.31) in ♀; EL/EW 1.47–1.57 (M 1.51) in ♂, 1.44–1.49 (M 1.47) in ♀; shoulders widely arcuate; sides almost straight from shoulders to the widest part, and moderately arcuate behind, with shallow and narrow preapical emargination on each side; striae smooth; basal part of interval VIII usually with several shallow and transverse wrinkles; marginal series composed of 16–18 pores; epipleuron becoming narrower towards apex and with rounded ventral corner; the first pore situated at basal 1/7–1/4 of elytra, the second one situated between 2/5 and a little behind the middle, and the third one situated at basal 7/10–4/5, respectively; additional pores rarely present, situated on interval III and adjoining stria 2. WL/EL 0.36 in 1 ♂.

Anal projection elongate, curved posteriad and usually as in the top left of Fig. 5–b. TL/HW 1.35–1.48 (M 1.42) in ♂, 1.29–1.34 (M 1.31) in ♀.

Aedeagus robust, with large basal part; apical part of ventral surface almost smooth or polished, and moderately to strongly depressed; apical third of ventral surface sparsely and obliquely wrinkled, partially irregularly wrinkled and impressed with microsculpture of isodiametric meshes; apical third of ventral edge of right wall strongly sclerotized.

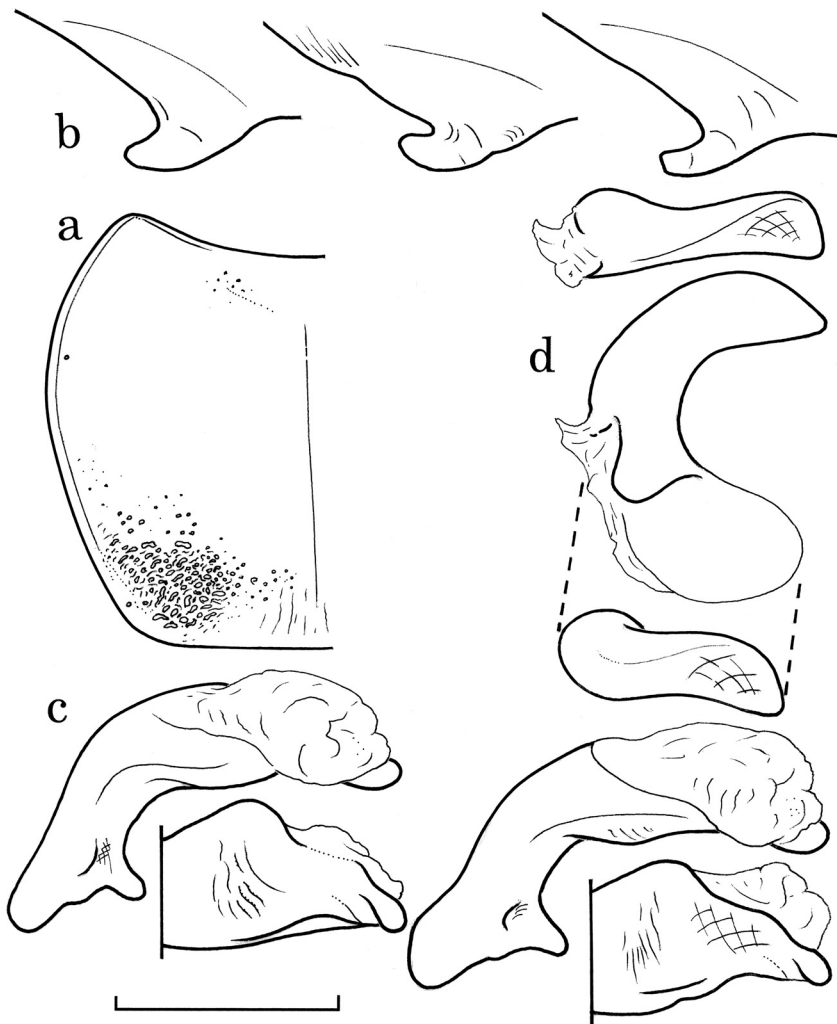


Fig. 5. *Pterostichus (Eosteropus) ohkawai* MORITA, sp. nov., from Shiokawa. — a, Left side of pronotum; b, anal sternite in right lateral view, showing individual variation; c, aedeagus in left lateral view and apical part of aedeagus in ventral view, showing individual variation; d, right paramere in dorsal view, left lateral view and apico-dorsal view. (Scale: 2 mm for b, d: 1 mm for a, c.)

Right paramere C-shaped, robust and with simply rounded apex.

Type series. Holotype: ♂, Shiokawa, 15~17-VII-1977, S. MORITA leg. (NSMT). Paratypes: 3 ♂♂, 7 ♀♀, Shiokawa, 15~17-VII-1977, S. MORITA leg.; 1 ♀, same locality, 9-VIII-1993, H. HIRASAWA leg.; 1 ♂, same locality, 1-X-1995, H. YOSHI-

TOMI leg.; 3 ♂♂, same locality, 14–XI–1998, M. SUGIMURA leg.; 2 ♂♂, Mt. Torikura-yama, 1–X–1994, N. YOSHIKAWA leg.; 1 ♂, same locality, 16–X–1994, N. YOSHIKAWA leg.; 7 ♂♂, 1 ♀, same locality, 12–XI–2000, Y. HAMAOKA leg.; 9 ♂♂, 7 ♀♀, Sasayama, Mt. Kurokawa-yama, 19~29–VIII–2007, H. OHKAWA leg.; 2 ♂♂, Mt. Toyoguchi-yama, 17–VI–2002, O. FURUTA leg.; 7 ♂♂, 1 ♀, Shirabiso Pass, 5~19–IX–2007, H. OHKAWA leg.

Localities. Shiokawa, Shirabiso Pass, Mt. Torikura-yama, and Mt. Toyoguchi-yama, Ooshika-mura, Nagano Prefecture.

Notes. This new species seems closely allied to *P. (E.) karasawai*. It is, however, distinguished from the latter mainly by the shape of anal projection and right paramere.

The standard ratios of body parts shown in the descriptive part are those of 5 ♂♂ and 5 ♀♀ from Shiokawa. The standard ratios of body parts in the following specimens were measured and slight variation was found:— in total 4 ♂♂ from Mt. Torikura-yama; body larger; pronotum wider; genae less convex; aedeagal right wall strongly produced and forming a weak carina; L: 14.71–16.14 mm; PW/HW 1.38–1.45 (M 1.42); PW/PL 1.29–1.38 (M 1.33); PW/PA 1.42–1.45 (M 1.44); PW/PB 1.38–1.53 (M 1.46); PA/PB 0.96–1.03 (M 1.01); EW/PW 1.18–1.27 (M 1.23); EL/EW 1.53–1.57 (M 1.56); TL/HW 1.35–1.42 (M 1.38); WL/EL 0.36, 0.37; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.51 : 0.88 : 0.89 : 0.87 : 0.87 : 0.80.

Pterostichus (Eosteropus) yoshizawai MORITA, sp. nov.

[Japanese name: Ena-kuronaga-gomimushi]

(Fig. 6)

Diagnosis. Tibiae and tarsi brown. Hind angles of pronotum rounded; anal projection elongate and weakly curved in lateral view; ventral side of right aedeagal wall with carina; right paramere U-shaped, almost straight in dorsal view and with concavity.

Description. L: 13.28–15.00 mm. Femora blackish brown; tibiae and tarsi brown; eyes weakly convex; genae weakly convex; PW/HW 1.35–1.41 (M 1.37) in ♂, 1.37–1.42 (M 1.39) in ♀; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.48 : 0.86 : 0.89 : 0.89 : 0.89 : 0.86.

Pronotum rather wide; sides strongly arcuate in front, and widely and moderately arcuate towards hind angles; apex usually weakly emarginate, rarely straight or moderately emarginate; apical gutters very short and shallow; PW/PL 1.20–1.39 (M 1.29) in ♂, 1.32–1.40 (M 1.35) in ♀; PW/PA 1.43–1.50 (M 1.46) in ♂, 1.42–1.49 (M 1.45) in ♀; PW/PB 1.48–1.60 (M 1.53) in ♂, 1.54–1.64 (M 1.61) in ♀; PA/PB 1.03–1.08 (M 1.05) in ♂, 1.09–1.14 (M 1.11) in ♀.

Elytra with narrow basal part; shoulders obliquely arcuate; sides weakly divergent or arcuate towards the widest part and moderately arcuate behind, and with rather deep preapical emargination on each side; the first pore situated at basal 1/5–3/10, the second at 2/5 to a little before the middle, and the third at 7/10–4/5, respectively; interval III rarely with an additional pore on one side; epipleuron becoming narrower towards apex

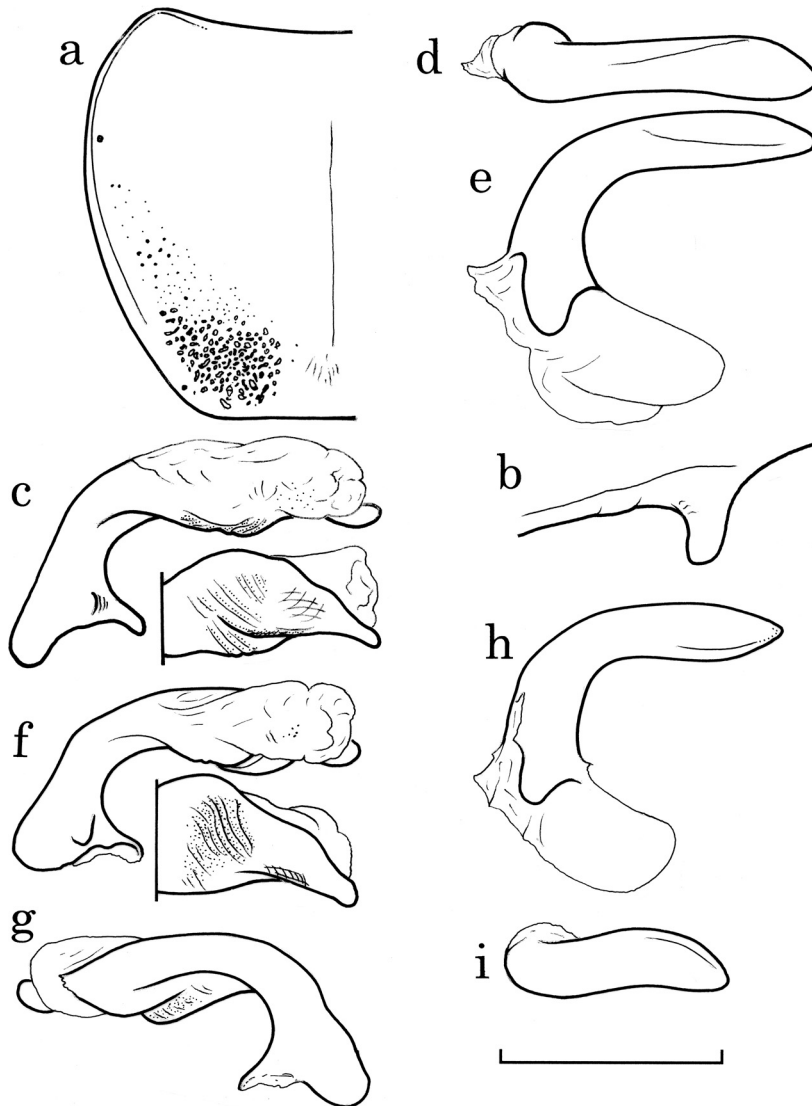


Fig. 6. *Pterostichus (Eosteropus) yoshizawai* MORITA, sp. nov. — a-e, Specimen from Misaka Pass; f-i, specimen from Mt. Surikogi-yama. — a, Left side of pronotum; b, anal sternite in right lateral view; c, aedeagus in left lateral view and apical part of aedeagus in ventral view; d, right paramere in dorsal view; e, same in left lateral view; f, aedeagus in left lateral view and apical part of aedeagus in ventral view; g, same in right lateral view; h, right paramere in left lateral view; i, same in apico-dorsal view. (Scale: 2 mm for b, d, e, h, i; 1 mm for a, c, f, g.)

and with very narrowly rounded apex; marginal series composed of 17–18 pores; EW/PW 1.24–1.33 (M 1.28) in ♂, 1.30–1.35 (M 1.32) in ♀; EL/EW 1.49–1.59 (M 1.53) in ♂, 1.44–1.51 (M 1.46) in ♀.

Anal projection elongate and weakly curved in lateral view. TL/HW 1.43–1.50 (M 1.46) in ♂, 1.34–1.40 (M 1.37) in ♀.

Aedeagus small and slender; apical third of left wall weakly produced in ventral view; right wall strongly sclerotized and forming a carina at apical 1/5–1/4 of aedeagus; ventral surface strongly and coarsely wrinkled.

Right paramere U-shaped and elongate; viewed dorsally, apical half almost straight, and becoming narrower towards apex; apical third of dorsal side concave.

Type series. Holotype: ♂, Misaka Pass, 6–IX–1997, K. SAKAGAMI leg. (NSMT). Paratypes: 1 ♂, 2 ♀♀, Misaka Pass, 26–VI–1994, S. MORITA leg.; 2 ♂♂, 1 ♀, same locality, 19~26–VIII–1996, N. TODA leg.; 4 ♂♂, 5 ♀♀, same locality, 6–IX–1997, K. SAKAGAMI leg.; 5 ♂♂, 1 ♀, same locality, 14~22–IX–2002, K. AKITA & T. KIMURA leg.; 5 ♂♂, 1 ♀, Mt. Surikogi-yama, 15–V–1993, T. YOSHIMURA leg.; 1 ♂, same locality, 8–IX–1994, N. YOSHIZAWA leg.; 1 ♀, Ôdaira Pass, 10–IX–1989, N. YOSHIZAWA leg.; 2 ♂♂, same locality, 6–V–1990, Y. OKUSHIMA leg.; 1 ♂, same locality, 28–V–1994, N. YOSHIZAWA leg.

Localities. Misaka Pass on the borders between Nagano and Gifu Prefectures; Ôdaira Pass and Mt. Surikogi-yama, Iida-shi, Nagano Prefecture.

Notes. This species is peculiar in the coloration of legs and the aedeagal structure. Standard ratios of body parts shown in the descriptive part are those of 5 ♂♂ and 4 ♀♀ from the Misaka Pass.

Pterostichus (Eosteropus) hidanus MORITA, sp. nov.

[Japanese name: Hida-kuronaga-gomimushi]

(Fig. 7)

Diagnosis. Legs blackish brown. Hind angles of pronotum rounded; apical gutters of pronotum long and shallow; reflexd lateral sides of pronotum very narrow throughout; elytral sides dilated to the widest part in ♀; anal projection triangular in lateral view; right paramere C-shaped, slightly reflexed at apex in left lateral view.

Description. L: 14.00–14.71 mm. Legs blackish brown. Head relatively narrow; frontal furrows usually shallow; PW/HW 1.41–1.47 (M 1.43) in ♂, 1.41, 1.43 (M 1.42) in ♀; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI ≐ 1 : 0.52 : 0.91 : 0.93 : 0.93 : 0.93 : 0.87.

Pronotum with long and shallow apical gutters on each side; sides moderately arcuate in front and usually weakly so towards hind angles, sometimes moderately arcuate throughout; hind angles rounded; reflexed lateral sides very narrow throughout; PW/PL 1.26–1.34 (M 1.31) in ♂, 1.27, 1.29 (M 1.28) in ♀; PW/PA 1.41–1.48 (M 1.45) in ♂, 1.41, 1.43 (M 1.42) in ♀; PW/PB 1.45–1.48 (M 1.49) in ♂, 1.45, 1.53 (M 1.49) in ♀; PA/PB 0.98–1.08 (M 1.02) in ♂, 1.02, 1.09 (M 1.06) in ♀.

Elytra oblong-ovate in ♂; in ♀, sides dilated to the widest part, and then moderately arcuate towards apices; preapical emargination wide and shallow; EW/PW 1.23–1.29 (M 1.25) in ♂, 1.36, 1.39 (M 1.38) in ♀; EL/EW 1.40–1.60 (M 1.50) in ♂, 1.36, 1.39 (M 1.38) in ♀; the first pore situated at basal 1/6–1/5, the second at 2/5–3/5, and the third at 7/10–9/10 respectively; epipleuron beoming narrower towards apex, with very narrowly rounded apex; marginal series composed of 18–19 pores; WL/EL 0.36 in 1 ♂.

Anal sternite triangular, with rounded apex in lateral view. TL/HW 1.35–1.40 (M 1.39) in ♂, 1.26 in 1 ♀.

Aedeagus robust with thick basal part; apical half of ventral surface polished, widely and weakly depressed, and sparsely and finely wrinkled; ventral edges of right and left walls weakly produced. Right paramere C-shaped, slightly reflexed at apex in left lateral view; viewed dorsally, apical part wide.

Type series. Holotype: ♂, Mt. Nabekanmuri-yama, alt. 1,500 m, 10-IX-2005, H. WATANABE leg. (NSMT). Paratypes: 5 ♂♂, 2 ♀♀, Mt. Nabekanmuri-yama, alt. 1,500

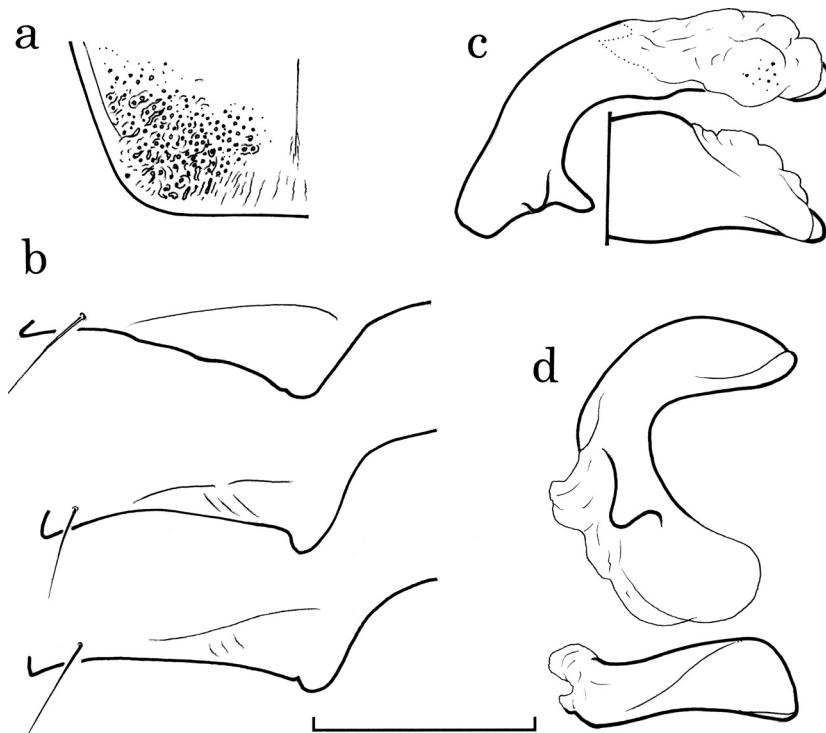


Fig. 7. *Pterostichus (Eosteropus) hidanus* MORITA, sp. nov., from Mt. Nabekanmuri-yama. — a, Left hind angle of pronotum; b, anal sternite in right lateral view, showing individual variation; c, aedeagus in left lateral view and apical part of aedeagus in ventral view; d, right paramere in left lateral view and dorsal view. (Scale: 2 mm for b, d; 1 mm for a, c.)

m, 10-IX-2005, H. WATANABE leg.; 1 ♀, Nakabusa Spa, 8-VIII-1984, M. NISHIKAWA leg.; 2 ♂♂, same locality, 14-V-1994, H. HIRASAWA leg.; 1 ♂, same locality, 23-VI-1994, H. HIRASAWA leg.; 1 ♂, same locality, 18-V-2001, H. HIRASAWA leg.

Localities. Mt. Nabekamuri-yama, alt. 1,500 m, Horigane-mura: Nakabusa Spa, Nagano Prefecture.

Notes. Elytral chaetotaxy of this species from Mt. Nabekamuri-yama is unstable: in 1 ♂ and 1 ♀, an additional pore present on one side; in 2 ♂♂, additional pore present on each side, situated at basal 3/10 or 2/5; in 1 ♂, an additional pore on the interval I and situated at basal 1/3. Standard ratios of body parts shown in the descriptive part are those of 5 ♂♂ and 2 ♀♀ from Mt. Nabekamuri-yama.

The standard ratios of body parts in the following specimens were measured and the slight differences were found:— in total 3 ♂♂ and 1 ♀ from Nakabusa Spa: PW/HW 1.37–1.41 (M 1.39), 1.36; PW/PL 1.18–1.29 (M 1.24), 1.28; PW/PA 1.38–1.43 (M 1.41), 1.43; PW/PB 1.46–1.60 (M 1.54), 1.38; PA/PB 1.04–1.12 (M 1.09), 0.97; EW/PW 1.26–1.31 (M 1.28), 1.37; EL/EW 1.55–1.57 (M 1.56), 1.43; TL/HW 1.38–1.44 (M 1.40), 1.24; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.51 : 0.87 : 0.87 : 0.87 : 0.88 : 0.78; ventral side of aedeagus rather sparsely wrinkled and more strongly depressed.

Pterostichus (Eosteropus) shimizui MORITA, sp. nov.

[Japanese name: Ontake-kuronaga-gomimushi]

(Fig. 8)

Diagnosis. Legs blackish brown to black; hind angles of pronotum widely rounded; anal projection triangular in lateral view; aedeagus elongate in lateral view; ventral edge of left wall produced; right paramere U-shaped and elongate.

Description. L: 12.64–14.00 mm. Legs blackish brown to black. Head usually with deep frontal furrows; PW/HW 1.35–1.42 (M 1.39) in ♂, 1.36–1.48 (M 1.42) in ♀; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.51 : 0.85 : 0.87 : 0.87 : 0.89 : 0.81.

Pronotum with shallow and long apical gutters; apex moderately emarginate; sides widely and moderately arcuate in front and widely arcuate or sometimes rather moderately so towards hind angles; hind angles widely rounded; reflexed lateral sides narrow throughout; PW/PL 1.22–1.33 (M 1.27) in ♂, 1.29–1.38 (M 1.34) in ♀; PW/PA 1.37–1.50 (M 1.43) in ♂, 1.39–1.47 (M 1.43) in ♀; PW/PB 1.46–1.53 (M 1.50) in ♂, 1.43–1.60 (M 1.53) in ♀; PA/PB 1.00–1.07 (M 1.05) in ♂, 0.99–1.12 (M 1.07) in ♀.

Elytra oblong-ovate in ♂; in ♀, sides dilated to the widest part, and moderately arcuate towards apices; preapical emargination wide and shallow; EW/PW 1.28–1.33 (M 1.31) in ♂, 1.27–1.38 (M 1.32) in ♀; EL/EW 1.45–1.56 (M 1.51) in ♂, 1.40–1.50 (M 1.45) in ♀; the first pore situated at basal 1/7–1/5, the second at 3/7–3/5, and the third at 7/10–4/5, respectively; additional pores situated at 1/10, 1/3, 2/5 respectively

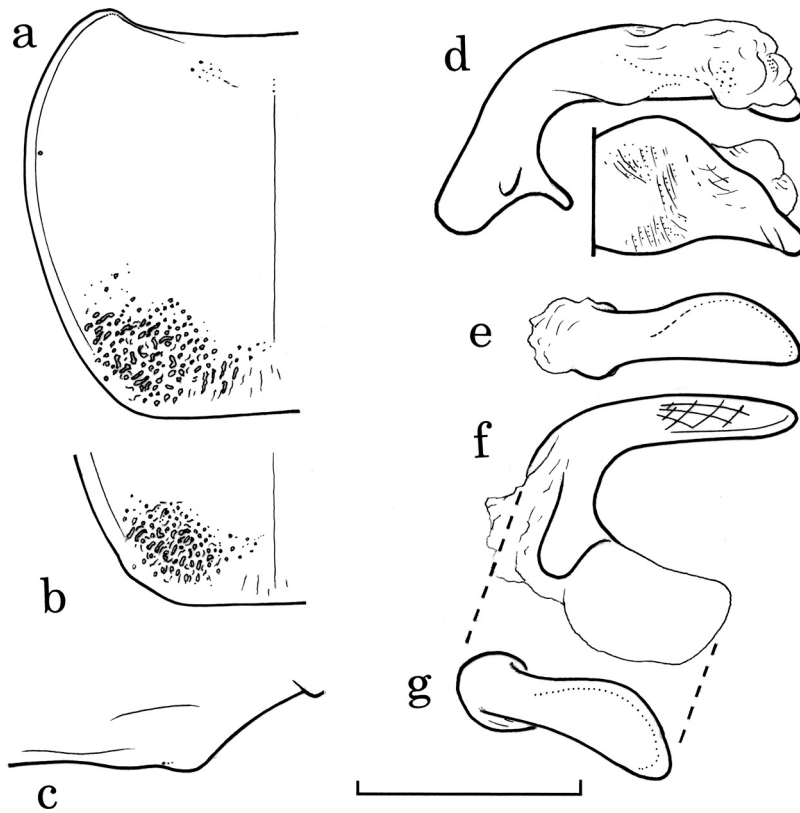


Fig. 8. *Pterostichus (Eosteropus) shimizui* MORITA, sp. nov., from Mt. Ontake-san. — a, Left side of pronotum; b, left hind angle of pronotum, showing individual variation; c, anal sternite in right lateral view; d, aedeagus in left lateral view and apical part of aedeagus in ventral view; e, right paramere in dorsal view; f, same in left lateral view; g, same in apico-dorsal view. (Scale: 2 mm for c, e, f, g; 1 mm for a, b, d.)

and usually adjoining stria 2, rarely on intervals III or V; epipleuron becoming narrower towards apex and with very narrowly rounded apex; marginal series composed of 15–17 pores; basal part of interval VIII usually weakly wrinkled, rarely smooth; microsculpture consisting of close and transverse meshes. WL/EL 0.35 in 1 ♂.

Anal sternite triangular and low in lateral view. TL/HW 1.37–1.50 (M 1.43) in ♂, 1.16–1.35 (M 1.30) in ♀.

Aedeagus robust with thick basal part; ventral surface of apical part rather deeply depressed and polished at apical 1/3, sparsely and rather deeply wrinkled at apical 2/3 and impressed with microsculpture of wide or isodiametric meshes; ventral edge of left wall strongly produced. Right paramere U-shaped and elongate; apical part flat in lateral view and wide in dorsal view.

Type series. Holotype: ♂, near Tanohara, Mt. Ontake-san, 15-VIII-2001, S. SHIMIZU leg. (NSMT). Paratypes: 8 ♂♂, 19 ♀♀, Mt. Ontake-san, 15-VIII-2001, S. SHIMIZU leg.; 3 ♀♀, Tanohara, 17-VIII-1984, S. MORITA leg.; 4 ♀♀, Mt. Ontake-san, 24-VIII-2003, H. OHKAWA leg.; 2 ♂♂, Mt. Ontake-san, 1-VI-2004, H. OHKAWA leg.; 1 ♂, 2 ♀♀, Mt. Hakkai-san, 22-VIII-1988, K. ITO leg.

Type locality. Mt. Ontake-san, on the borders between Nagano and Gifu Prefectures.

Notes. Standard ratios of body parts shown in the descriptive part are those of 4 ♂♂ and 5 ♀♀.

Pterostichus (Eosteropus) rengensis MORITA, sp. nov.

[Japanese name: Renge-kuronaga-gomimushi]

(Fig. 9)

Diagnosis. Legs black; sides of pronotum straightly convergent or very weakly arcuate from basal 3/8 to hind angles; hind angles obtuse; anal projection triangular and with produced apical part in lateral view; apical half of aedeagus weakly depressed and polished in ventral view; right paramere C-shaped.

Description. L: 13.85–14.29 mm. Legs black. Head with weakly convex eyes; PW/HW 1.37–1.47 (M 1.40); relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.51 : 0.91 : 0.89 : 0.90 : 0.89 : 0.90.

Pronotum with rather long and straight apical gutters on each side; apex moderately emarginate; sides moderately arcuate in front and straightly convergent or very weakly arcuate from basal 3/8 to hind angles; hind angles obtuse; PW/PL 1.23–1.34 (M 1.29); PW/PA 1.37–1.45 (M 1.41); PW/PB 1.45–1.56 (M 1.50); PA/PB 1.03–1.09 (M 1.06).

Elytral sides weakly arcuate from shoulders to the widest part, moderately so behind and with narrow preapical emargination; the first pore situated at about basal 1/5, the second between 2/5 and a little behind the middle, the third at 7/10–4/5, respectively; interval III rarely with one or two additional pores; epipleuron becoming narrower towards apex, with very narrow apex and rounded ventral corner; microsculpture consisting of fine transverse meshes; EW/PW 1.24–1.35 (M 1.29); EL/EW 1.43–1.58 (M 1.54).

Anal projection triangular and with produced apical part in lateral view. TL/HW 1.34–1.39 (M 1.37).

Aedeagus robust with thick basal part; apical half of ventral surface weakly and widely depressed and polished. Right paramere U-shaped, with almost straight or slightly reflexed apex in lateral view; in dorsal view, apical part narrow and rather flat, not concave.

Type series. Holotype: ♂, Renge Spa~Mt. Shirouma-dake, [24-0008456], 17-VIII-1967, K. BABA leg. (NIAS). Paratypes: 1 ♂, Renge Spa~Mt. Shirouma-dake, [24-0008452], 17-VIII-1967, K. BABA leg. (NIAS); 1 ♂, Renge Spa~Mt. Shirouma-

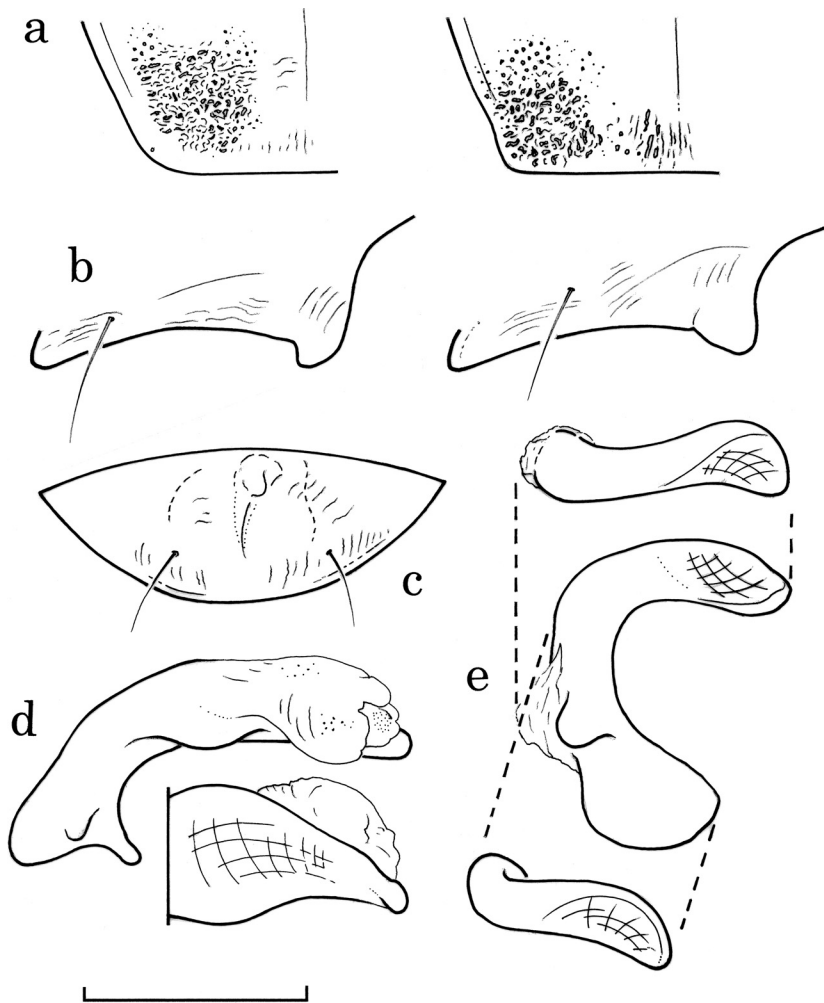


Fig. 9. *Pterostichus (Eosteropus) rengensis* MORITA, sp. nov., from Renge Spa. — a, Left hind angle of pronotum, showing individual variation; b, anal sternite in right lateral view, showing individual variation; c, same in ventral view; d, aedeagus in left lateral view and apical part of aedeagus in ventral view; e, right paramere in dorsal view, left lateral view and apico-dorsal view. (Scale: 2 mm for b, c; 1 mm for a, c, d.)

dake, [24-0008453], 22-VIII-1968, K. BABA leg. (NIAS); 1 ♀, Renge Spa, 21~22-VIII-1988, Y. UCHIYAMA leg.; 1 ♂, Renge Spa, 12-VII-2008, S. MORITA leg.

Type locality. Renge Spa~Mt. Shirouma-dake, Itoigawa-shi, Niigata Prefecture.

Notes. This new species seems closely allied to *P. (E.) creper*. It is, however, distinguished from the latter mainly by the following points: 1) hind angles of pronotum

obtuse, 2) apex of epipleuron narrowly rounded, 3) aedeagal ventral surface smooth and 4) apical part of the right paramere narrow in lateral view.

Standard ratios of body parts shown in the descriptive part are those of 4 ♂♂.

Pterostichus (Eosteropus) hiramatsui MORITA, sp. nov.

[Japanese name: Hakusan-kuronaga-gomimushi]

(Fig. 10)

Diagnosis. Legs black to blackish brown; sides of pronotum straightly convergent or very weakly arcuate from basal 1/3 to hind angles; hind angles obtuse; anal projection triangular, with rounded apex in lateral view; apical 1/4 of aedeagus strongly depressed. Right paramere U-shaped, with apical part straight or very slightly curved dorsad.

Description. L: 13.57–14.57 mm. Legs black to blackish brown. Head usually very sparsely and finely punctate; PW/HW 1.35–1.41 (M 1.39) in ♂, 1.39, 1.41 (M 1.40) in ♀; relative lengths of antennal segments as follows:— I : II : III : IV : V : VI : XI = 1 : 0.52 : 0.93 : 0.94 : 0.92 : 0.91 : 0.86.

Pronotum with deep and straight apical gutters which are inwardly distant; sides moderately arcuate in front, strongly convergent towards hind angles or weakly sinuate just before hind angles; PW/PL 1.31–1.34 (M 1.33) in ♂, 1.32, 1.39 (M 1.36) in ♀; hind angles obtuse; PW/PA 1.40–1.46 (M 1.44) in ♂, 1.41, 1.46 (M 1.44) in ♀; PW/PB 1.50–1.55 (M 1.52) in ♂, 1.46, 1.50 (M 1.48) in ♀; PA/PB 1.04–1.07 (M 1.06) in ♂, 1.00, 1.06 (M 1.03) in ♀.

Elytral sides rather widely arcuate from shoulders to the widest part and moderately so behind; the first pore situated at basal 1/5–1/4, the second at about middle, the third at 3/4–4/5, respectively; in 1 ♀, four additional pores present, two pores adjoining stria 3 and situated at 1/7 and 1/3 from base on the left elytron, the remaining two pores adjoining striae 2 and 3, and situated at 1/3 and 7/10 on the right, respectively; marginal series composed of 17–19 pores; EW/PW 1.27–1.33 (M 1.29) in ♂, 1.35, 1.36 (M 1.36) in ♀; EL/EW 1.48–1.55 (M 1.52) in ♂, 1.44, 1.44 (M 1.44) in ♀; epipleuron becoming narrower towards apex, with very narrow apex and rounded ventral corner; microsculpture consisting of fine transverse meshes; WL/EL 0.36 in 1 ♂.

Anal projection triangular, low in lateral view, and stable in the shape; apex always rounded. TL/HW 1.39 in 1 ♂, 1.26, 1.27 (M 1.27) in 2 ♀♀.

Aedeagus robust with thick basal part; apical third of ventral side strongly depressed and polished, but middle of ventral side is finely wrinkled; left wall strongly produced; right wall strongly sclerotized and produced. Right paramere U-shaped; apical part almost straight or weakly curved dorsad, and rather flat, not concave.

Type series. Holotype: ♂, Mt. Kuchisanpou-dake, Kawachi-mura, 2–VI–2002, S. HIRAMATSU leg. (NSMT). Paratypes: 2 ♂♂, Mt. Kuchisanpou-dake, Kawachi-mura, 2–VI–2002, S. HIRAMATSU leg.; 1 ♂, same locality, 13–X–2002, S. HIRAMATSU leg.; 2 ♂♂, 1 ♀, Mt. Chûgû-san, Yoshinodani-mura, 25–VI–2005, S. HIRAMATSU leg.; 1 ♀, Nakahanba, Shiramine-mura, 3–IX–1999, S. HIRAMATSU leg.; 1 ♂, Mt. Haku-san, 17–

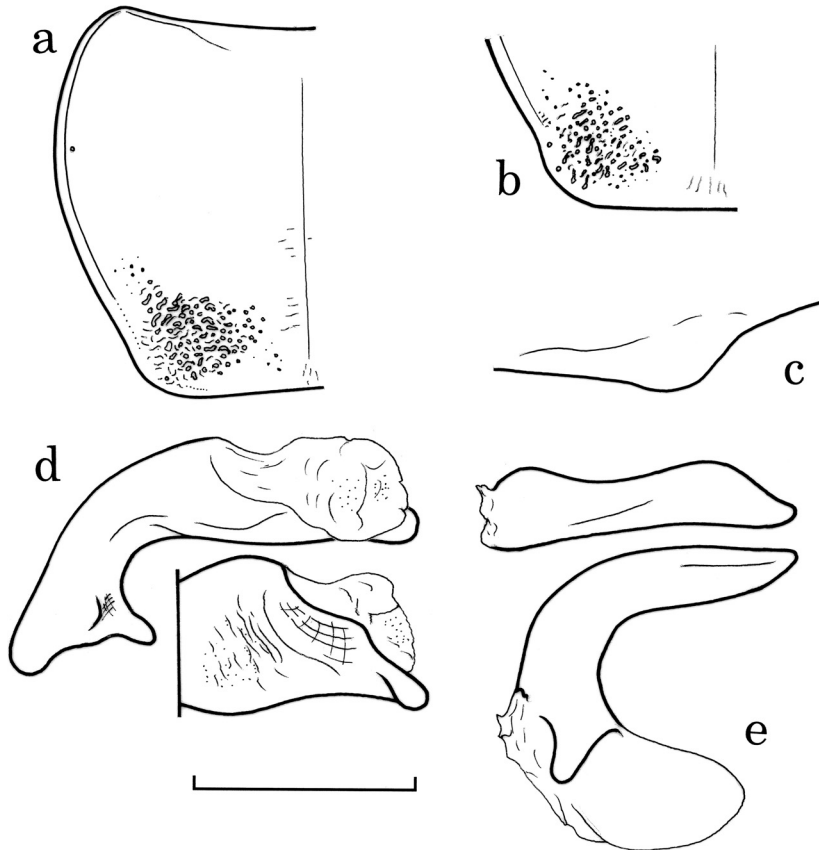


Fig. 10. *Pterostichus (Eosteropus) hiramatsui* MORITA, sp. nov., from Mt. Kuchisanpou-dake. — a, Left side of pronotum; b, left hind angle of pronotum; c, anal sternite in right lateral view; d, aedeagus in left lateral view and apical part of aedeagus in ventral view; e, right paramere in dorsal view and left lateral view. (Scale: 2 mm for c, e; 1 mm for a, b, d.)

VIII-1991; 1 ♂, 1 ♀, Mt. Nagakura-yama, 1,630 m alt., Ozo, 27-VI-2009, S. HIRAMATSU leg.

Localities. Mt. Kuchisanpou-dake, Kawachi-mura; Mt. Chûgû-san, Yoshinodani-mura; Nakahanba, Shiramine-mura; Mt. Nagakura-yama, Hakusan-shi; Ishikawa Prefecture.

Notes. The shape of anal projection is stable. Standard ratios of body parts shown in the descriptive part are those of 4 ♂♂ and 2 ♀♀ from Mt. Kuchisanpou-dake, Mt. Chûgû-san and Nakahanba.

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The standard ratios of body parts were checked by Miss Naoko JÔGASAKI. I thank her for her corrections.

要 約

森田誠司：日本産クロナガゴミムシ（コウチュウ目オサムシ科）の研究。4. 中部地方産の8新種。——中部地方から採集された標本をもとに8新種を記載し命名した。それらは、*Pterostichus (Eosteropus) hirasawai*, *P. (E.) abensis*, *P. (E.) ohkawai*, *P. (E.) yoshizawai*, *P. (E.) hidanus*, *P. (E.) shimizui*, *P. (E.) regensis*, *P. (E.) hiramatsui*である。これらの種はたがいによく似ているが、おもに前胸背板の側縁と後角の形、雄の腹端節の突起、雄交尾器の右側片の形状の組み合わせで、識別される。

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