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A New Genus and Species of Anophthalmic Trechine Beetle
from a Mine Adit of Southwest Japan¹⁾

With 4 Text-figures

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ABSTRACT A remarkable new trechine beetle is described from an abandoned prospecting adit of a copper mine lying near the southwestern corner of the Island of Shikoku, Southwest Japan. It is related to *Rakantrechus*, but is radically different from that genus in the chaetotaxy of elytra. A new name, *Chaetotrechiana procerus*, is proposed for the new species.

It is well known among biospeologists that the differentiation of Japanese cave animals attains to its maximum in the Island of Shikoku. This is above all pronounced in trechine beetles, of which more than sixty species belonging to nine different genera have hitherto been found in that island alone (cf. UÉNO, 1975, p. 209, 1976, p. 277, 1980, p. 262, etc.). More new species of these beetles will doubtless be discovered in future, considering that there are still some areas in which no anophthalmic trechines have been met with until now. It is, however, most unexpected that a new species radically different at generic level from any of the previously known trechines should exist near the southwestern corner of the island.

The discovery of this remarkable new species was made in an abandoned prospecting adit of the copper mine called Ishimaru-kôzan. The adit lies near the northern foot of the Kaigamori Hills on the right side of the Nakasuji-gawa River, that is, at the southern side of Nakasuji Depression that separates the southwestern portion of Shikoku from the main part of the island. It is isolated from the known distributional ranges of any other genera of anophthalmic trechines by a distance of more than 30 km in a bee-line.

In the present paper, I am going to describe this interesting species under the new name *Chaetotrechiana procerus*. The abbreviations used herein are the same as those explained in other papers of mine.

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Genus *Chaetotrechiana* S. UÉNO, nov.

Type-species: *Chaetotrechiana procerus* S. UÉNO, sp. nov.

Related to *Rakantrechus* S. UÉNO (1951, p. 88, 1957, p. 184; JEANNEL, 1962, pp. 202, 205), in particular to the subgenus *Paratrechiana* S. UÉNO (1959, p. 37, 1970, p. 101), but decisively different from that genus in the supernumerary dorsal pores of elytra and the isolation of the fourth pore of the marginal umbilicate series. Besides, the single known species of this new genus is different from any of *Rakantrechus* in the exceptionally elongate body only pubescent on genae and pronotum, and the short thick male genitalia with peculiarly shaped copulatory piece.

Body elongate and convex, with long appendages; depigmented; surface glabrous except for genae and pronotum which are sparsely pubescent; inner wings absent.

Head elongate and nearly parallel-sided, with entire frontal furrows not angulate at middle; two supraorbital pores present on lines convergent posteriorly; eyes absent, though their trace is perceptible; genae pubescent. Labrum transverse, with the apical margin shallowly emarginate and slightly bisinuate. Mandibles slender, lightly arcuate, with sharp tips; right mandible sharply tridentate, while the left is bidentate. Labium not fused, with a distinct labial suture between mentum and submentum, the former bearing a porrect tooth in apical emargination, which is usually bifid (sometimes truncated at the tip), the latter sexsetose; ligula semicircularly produced, octosetose as usual; paraglossae thin, extending much beyond ligula. Maxillae long, with lacinia sharply hooked at apex. Palpi slender; penultimate segments gradually dilated towards apices, about as long as apical segment and asetose in maxillary palpus, evidently longer than apical segment and quadrisetose in labial palpus; apical segments gradually thinning towards the extremities in apical halves. Antennae long and slender, filiform; segment 2 the shortest and 3 the longest, 5–10 gradually diminishing in length towards apex, terminal segment about as long as segment 7 and much longer than scape.

Pronotum cordate, evidently wider than head, about as wide as or slightly wider than long, with the sides distinctly sinuate behind; disc covered with fairly long, suberect pubescence; sides entirely bordered and sharply reflexed, each with two marginal setae, of which the anterior one is at the widest part and the posterior is evidently distant from hind angle, the side border being curved outwards at the level of posterior marginal (=postangular) seta; hind angles small though sharp; median line distinct, widening and deepening in basal area; apical transverse impression very shallow, though more or less wrinkled longitudinally; basal transverse impression deep and continuous, with a longitudinal foveole on each side of median line and laterally merging into basal foveae, which are rather small but deep, smooth at the bottoms, and extend anteriorly along side borders; postangular carinae distinct though obtuse.

Elytra elongated ovate and convex, with distinct shoulders though the pre-

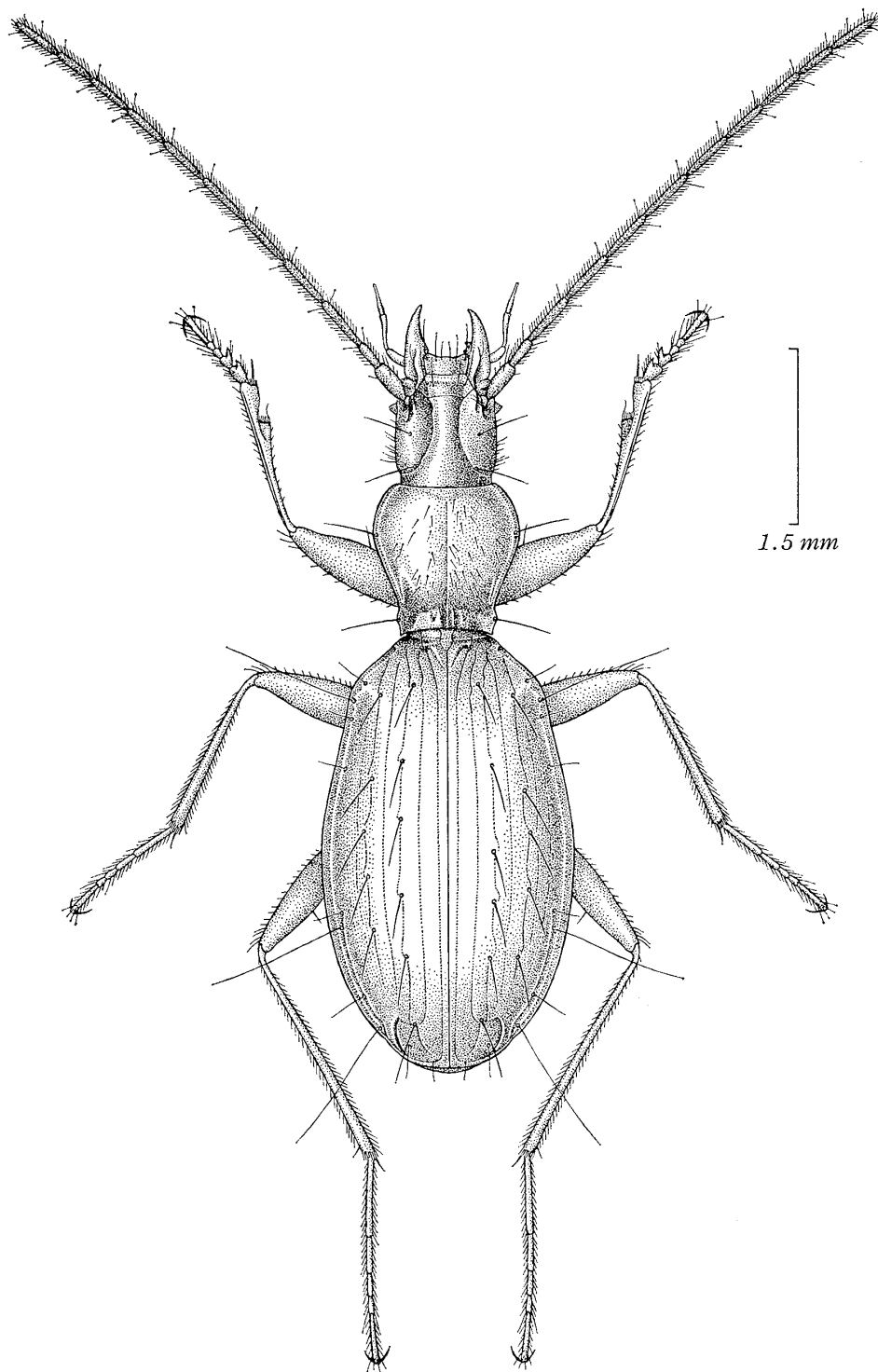


Fig. 1. *Chaetotrechiana procerus* S. UÉNO, gen. et sp. nov., ♂, from Ishimaru Mine in Sukumo-shi.

humeral borders are oblique; transverse furrow on basal peduncle not clearly defined; side borders complete anteriorly to the base of stria 5; striae almost entire though becoming shallower at the sides, indistinctly crenulate, stria 5 more or less deepening near base, 8 deeply impressed behind the middle set of marginal umbilicate pores; scutellar striole distinct though not long; apical striole short though deeply impressed, gently curved, usually free at the anterior end and directed to stria 5, but sometimes curved inwards and directed to stria 3; apical carina distinct though obtuse; stria 3 with four or five (rarely six) setiferous dorsal pores, stria 5 also with four or five (rarely six, exceptionally three) setiferous dorsal pores; pre-apical pore situated at the apical anastomosis of striae 2 and 3 near the level of the terminus of apical striole, and much more distant from apex than from suture; apical pores normal; marginal umbilicate pores not aggregated, the first three pores of the humeral set being closely and almost equidistantly ranged and adjoining marginal gutter, while the fourth pore is widely isolated from the others, the middle and apical sets widely distant from each other.

Ventral surface glabrous and smooth; prosternal process salient; sternites 3–5 each usually with only a pair of ordinary setae but rarely with an extra seta on one side; anal sternite provided with a pair of setae in ♂, with two pair of setae in ♀. Legs long and slender; pro- and mesocoxae moderately projecting; protibiae straight, gently dilated towards apices, longitudinally grooved on the external face, and glabrous on the anterior face even at the apical part; tarsi thin, segment 1 about as long as segments 2–4 taken together in both meso- and metatarsi, segment 4 with a long ventral apophysis in pro- and mesotarsi; in ♂, two proximal segments of each protarsus widely dilated, stoutly produced inwards at apices, and furnished beneath with sexual adhesive appendages.

Male genitalia rather small though broad. Aedeagus short and thick, arcuate, with large basal part and short apical lobe; basal part hardly bent, with very large basal orifice and devoid of sagittal aileron; apical lobe flat and nearly symmetrical; inner sac scaly though the scales are not sclerotized, being armed with a very large anisotropic copulatory piece at the right side and a large patch of heavily sclerotized teeth at the left side, the latter of which is seemingly divided into two portions, right dorsal and left ventral; styles small, left style being longer than the right, each usually bearing four apical setae.

Range. Known so far only from the southwestern portion of the Island of Shikoku, Southwest Japan.

Notes. Though doubtless related to *Rakantrechus*, this new genus is identical with *Ishikawatrechus* (HABU, 1950, p. 49; UÉNO, 1957, p. 191; JEANNEL, 1962, p. 202, erroneously spelled as "*Ishidawatrechus*") in the arrangement of the humeral four of the marginal umbilicate pores of elytra. This may be regarded as an indication that *Chaetotrechiana* has a history different from *Rakantrechus*. In any case, *Chaetotrechiana* is an archaic genus, having been preserved in isolation at the southwestern corner of the Island of Shikoku.

Chaetotrechiana procerus S. UÉNO, sp. nov.

[Japanese name: Kabané-mekura-chibigomimushi]

(Figs. 1–4)

Length: 5.30–5.85 mm (from apical margin of clypeus to apices of elytra).

A fairly large anophthalmic trechine of elongate body form, with long slender appendages. Colour reddish brown to dark reddish brown, shiny, faintly iridescent on elytra; palpi and apical half of antennae usually a little lighter than the other parts.

Head small, subquadrate, and a little longer than wide; surface depressed, though both the frons and supraorbital areas are gently convex; frontal furrows only feebly curved in front, rather weakly so even behind middle; microsculpture distinct, consisting of transverse meshes and lines; genae usually flat at middle, slightly convex even in front and behind; neck very wide, with the anterior constriction shallow though distinct; antennae long and slender, usually reaching apical fourth of elytra (sometimes a little shorter than that), with small scape subequal in length to segment 10, segment 2 about five-ninths as long as segment 3, which is as long as or very slightly longer than segment 4, apical segments cylindrical, 7–9 each almost 4.5 times as long as wide.

Pronotum cordate, not transverse though much wider than head, widest at about two-thirds from base, and more rapidly contracted towards apex than towards base; PW/HW 1.43–1.48 (M 1.46), PW/PL 1.00–1.06 (M 1.03), PW/PA 1.50–1.64 (M 1.58), PW/PB 1.51–1.63 (M 1.56); surface moderately convex, with irregularly transverse striations, and sparsely covered with suberect pubescence; microsculpture composed of fine transverse lines though partially obliterated; sides rather strongly arcuate in front, convergent behind middle in straight lines, distinctly sinuate usually at about one-sixth from base, briefly arcuate outwards at the level of postangular seta, and then usually subparallel or slightly convergent towards hind angles, which are sharp and usually produced posteriad (rarely postero-laterad); apex about as wide as base, PA/PB 0.93–1.03 (M 0.99), usually somewhat emarginate, with front angles obtuse and hardly produced; base widely emarginate, usually somewhat sinuate on each side; basal area more or less uneven, longitudinally notched along the basal margin.

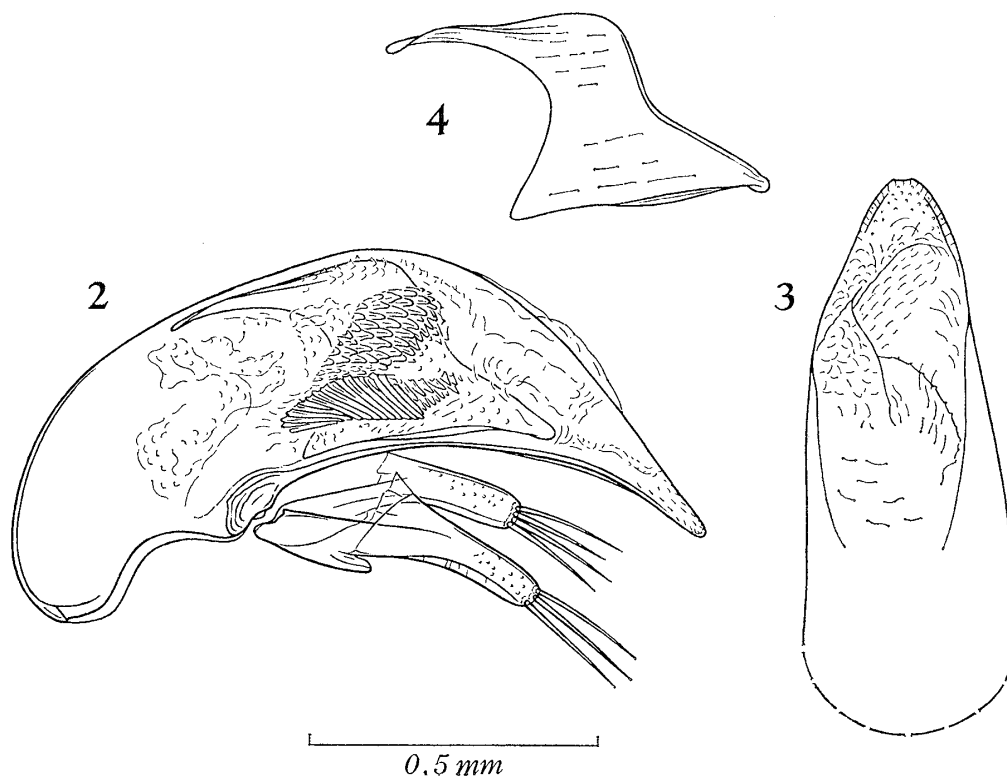
Elytra much larger than fore-body, elongated ovate, widest at about middle, and with ampler apical half; EW/PW 1.62–1.72 (M 1.68), EL/EW 1.67–1.75 (M 1.71); surface well convex, though distinctly depressed in the basal area, the external edge of the depression being delimited by the basal portion of interval 6; microsculpture largely obsolete, though consisting of fine transverse lines; shoulders distinct, rounded, with prehumeral borders very oblique and nearly straight; sides moderately reflexed at middle but the reflexed borders become much narrower around shoulders, slightly but distinctly emarginate behind shoulders, gently arcuate at middle, and then moderately rounded to apices through slight preapical emarginate.

nation; apices almost conjointly rounded; striae discernible throughout, though the outer ones are much shallower than the inner and sometimes nearly obsolete; intervals slightly convex on the disc but flat at the side; stria 3 usually with five (sometimes four, rarely six) setiferous dorsal pores between basal one-ninth and apical one-sixth; stria 5 also usually with five (sometimes four, rarely six, exceptionally three) setiferous dorsal pores between basal one-eighth and apical one-fourth; the variation in the number of setiferous dorsal pores is as shown in Table 1.

Table 1
Variation in the number of setiferous dorsal pores on elytra
in *Chaetotrechiana procerus* S. UÉNO, sp. nov.

| Sex | Left elytron | | Right elytron | |
|-----|--------------|---------|---------------|---------|
| | Stria 5 | Stria 3 | Stria 3 | Stria 5 |
| ♂ | 5 | 5 | 5 | 5 |
| ♂ | 5 | 5 | 5 | 5 |
| ♂ | 5 | 5 | 5 | 4 |
| ♂ | 4 | 5 | 5 | 4 |
| ♂ | 5 | 5 | 4 | 6 |
| ♂ | 5 | 5 | 4 | 5 |
| ♂ | 5 | 4 | 6 | 4 |
| ♂ | 5 | 5 | 4 | 4 |
| ♂ | 4 | 4 | 5 | 5 |
| ♂ | 5 | 4 | 4 | 6 |
| ♀ | 4 | 4 | 4 | 3 |

Male genital organ small though moderately sclerotized. Aedeagus short and thick, about one-third as long as elytra, rather abruptly narrowed towards apex from behind middle in lateral view, gradually narrowed towards the base of apical lobe and then more rapidly so towards the tip in dorsal view; basal part large and semiglobular, with very large basal orifice, the sides of which are distinctly emarginate; apical lobe short, gradually narrowed towards the blunt extremity in lateral view, subtruncated or slightly emarginate at the extremity in dorsal view; ventral margin widely emarginate in profile. Copulatory piece very large, widely curved along the right wall of aedeagus and extending from the ventral to the dorsal faces of inner sac, with produced ventral angles and prolonged dorso-proximal lobe; ventro-apical lobe somewhat twisted and curved ventrad at the tip. Teeth-patch large as a whole, folded at the basal part and seemingly divided into two portions, which are connected by rows of poorly sclerotized teeth; ventral portion longitudinally elongate and nearly vertical; dorsal portion also elongate, though running obliquely and extending from above the ventral portion of the teeth-patch to near the right dorsal part of inner sac. Styles small and short, each usually provided with four setae at apex, though one of the apical setae is sometimes missing.



Figs. 2-4. Male genitalia of *Chaetotrechiana procerus* S. UÉNO, gen. et sp. nov., from Ishimaru Mine in Sukumo-shi; left lateral view (2), apical part of aedeagus, dorso-apical view (3), and separated copulatory piece, left lateral view (4).

Type-series. Holotype: ♂, allotype: ♀, paratypes: 7 ♂♂, 2 ♀♀, 27-VIII-1981, S. UÉNO, T. MOHRI & M. HIRAKE leg. All deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Type-locality. Abandoned adit of Ishimaru Mine, at Nakanokawaguchi of Kurokawa in Hirata-chô, Sukumo-shi, Kôchi Prefecture, southwestern Shikoku, Southwest Japan.

Notes. As was already noted in the introduction of this paper, the present trechine was found in an abandoned prospecting adit of a copper mine, which was dug into a small hill, only 1.5 km in diameter and 127 m high, at the northern edge of the Kaigamori Hills. The adit lies in a shale formation at the eastern foot of the hill only 20 m above sea-level.

Without a good guide, it is rather difficult to locate the entrance to this adit, as it is almost closed by collapse and covered with shrubbery. However, this seems to have made the entrance section favourable for hypogean animals; a mass of muddy rock debris mingled with organic material was emplaced on the steep slope just inside the entrance and fed by a seepage from the outside. Most cavernicoles we were able to collect in the mine adit, including nine out of the eleven known specimens of *Chaetotrechiana*, were found in this heap of rock debris within several

metres from the entrance. Their habitat looked like an upper hypogean one, since they were mostly found at a depth of 50 cm or more, where muddy stones of various size lay under a thick layer of rather dry soil. Two specimens of the trechine were found from under a heap of rock debris in a ditch about 10 m removed from the entrance. Whenever the beetles were exposed, they ran so quickly that it was rather difficult to take them.

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