

A New Species-Group of the Genus *Rakantrechus*  
(Coleoptera, Harpalidae)<sup>1)</sup>

By

**Shun-Ichi UÉNO**

Zoological Institute, College of Science, University of Kyoto

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At the east of Aso Volcano, the Kyushu mountain range divides into several branch massifs and sinks towards the Bungo Channel. Limestone formations are mainly distributed to one of these branch massifs, which, called the Haidaté massif, continues from the Sobo mountains in the southwest to Tsukumi in the northeast. Although it attains only to the heights of 600–700 m, the watershed of this massif seems to constitute a barrier to the dispersal of troglobiontic trechids. Those which spread along the eastern side resemble the members of *Uozumitrechus* in appearance, and may be regarded as to form a distinct species-group within the subgenus *Paratrechiama*. Most peculiar to this species-group is a feature of having the glabrous genae, which are so far unknown in the genus *Rakantrechus*. This group of trechids, which will be called the group of *R. nomurai*, forms the subject of the present article.

The writer wishes herewith to express his hearty thanks to Prof. Kenji NAKAMURA for his encouragement; to Prof. Riozo YOSII, Dr. Kazuyoshi KUROSA and the late Mr. Sigeru NOMURA for their kind aid rendered at the field survey; and to Messrs. Jūjirō ISHIKAWA and Toshifumi KUBOTA for their kindness in supplying the writer with the specimens.

***Rakantrechus* (*Paratrechiama*) *nomurai* S. UÉNO, sp. nov.**

Length: 4.4–5.1 mm (from front margin of clypeus to anal end).

Colour reddish brown to dark reddish brown, very shiny, somewhat iridescent and translucent when alive; palpi pale; apical segments of antennae, epipleura, apical sternites and legs pale reddish brown.

Head oblong, wide at the neck and nearly parallel-sided in front, with supraorbital areas and front gently convex; frontal furrows deep, entire, not strongly curved nor angulate at middle, and fairly distant from each other; microsculpture distinct, composed mostly of wide meshes; eyes wanting; genae slightly convex and perfectly glabrous; neck constriction shallow; mandibles

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1) Contribution No. 37 from the Spelaeological Society of Japan.

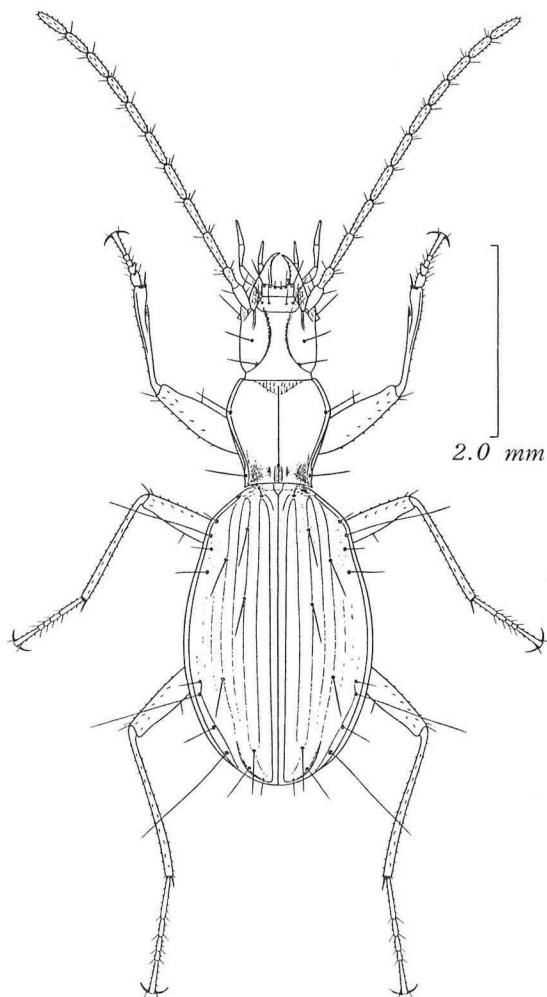


Fig. 1. *Rakantrechus (Paratrechiana) nomurai* sp. nov.,  
f. typ., ♂, of Karyû-dô Cave.

slender and slightly hooked at apices; mentum tooth rather narrow, emarginate or bifid at the tip, or at least truncated at the extremity; palpi slender, with apical segments subulate; antennae long and slender, usually a little longer in ♂ than in ♀, reaching apical two-fifths of elytra in ♀ and usually extending a little beyond that level in ♂, with segment 2 about four-sevenths as long as segment 3 or segment 4.

Pronotum cordate and convex, 1.31–1.39 times wider than head (mean 1.35), a little wider than long (range 1.01–1.08, mean 1.03), widest at about seven-tenths from base; the ratio of the greatest width to the width of apex 1.35–1.46

(mean 1.41), that to the width of base 1.45-1.60 (mean 1.51); lateral sides narrowly bordered and reflexed, moderately rounded in front or somewhat subangulate at the widest part and evidently sinuate at one-sixth to two-ninths from base (usually at about one-fifth from base), with marginal gutters fairly wide at the widest part but becoming very narrow before basal sinuation; postangular seta widely distant from hind angle; apex slightly but widely emarginate, 1.03-1.14 times wider than base (mean 1.08), which is widely emarginate; front angles only very slightly advanced and rounded; hind angles acute, sometimes forming a sharp denticle at the tip; median line rather shallow though distinct, not reaching apex but widening near base; apical transverse impression shallow and more or less uneven; basal transverse impression distinct, provided with a longitudinal fovea on each side of median line and merging on each side into deep basal fovea, which is fairly large and more or less extending anteriorly; postangular carina either obtuse or obliterated; surface smooth, with vague transverse striations, apical area longitudinally wrinkled; microsculpture formed by fine transverse lines. The expansion of the ventro-lateral sides of prothorax clearly visible from above.

Elytra oval and well convex, with the basal area evidently depressed, 1.73-1.81 times wider than pronotum (mean 1.77), 1.53-1.62 times longer than wide (mean 1.57), widest at about or a little behind middle; shoulders distinct though widely rounded, with prehumeral borders oblique and nearly straight; lateral sides nearly straight or slightly emarginate behind shoulders, moderately rounded at middle and slightly emarginate again before apices, which are rounded; striae superficial, indistinctly crenulate and almost obsolete both at the sides and at the apical part, stria 1 moderately impressed throughout, striae 1-5 deepening near base, stria 8 traceable only at the apical part; scutellar striole distinct; apical striole deep and moderately curved, suddenly interrupted at the end but directed to the termination of stria 5; intervals smooth and flat, excepting interval 1 which is moderately convex in basal half, intervals 5 and 6 more or less raised at the basal parts and forming an obtuse basal carina; apical carina prominent; stria 3 with two setiferous dorsal pores located at one-eighth to one-seventh (or closer to the base) and one-third to four-ninths from base respectively, stria 5 also with two dorsal pores at one-fifth to one-fourth and three-fifths to two-thirds from base respectively; preapical pore situated at the meeting point of striae 2 and 3 more or less behind the level of the termination of apical striole (rarely on that level); humeral group of umbilicate pores irregular and not aggregated, pores 1 and 2 adjoining marginal gutter, while the other two widely distant from the gutter, pore 3 closest to pore 2, and pore 4 isolated from the other three; microsculpture formed by fine transverse lines but rather indistinct.

Ventral surface glabrous and smooth; anal sternite with one seta in ♂, two in ♀ on each side. Legs long and slender, with thin tibiae and tarsi; each protibia with a deep groove on the external face and glabrous on the anterior

face; tarsal segment 4 with a long ventral apophysis in pro- and mesotarsi; in ♂, protarsal segments 1 and 2 dilated and well produced inwards at apices.

Male genital organ small but moderately chitinized. Aedeagus gently arcuate and relatively wide even near apex, which is widely rounded; basal part hardly bent towards the ventral side; lateral sides of basal orifice emarginate; sagittal aileron moderately developed; ventral side slightly but widely concave. Inner sac without developed copulatory piece but provided with four groups of large teeth, which range one above another on the left side inside the sac. Styles fairly wide, left style obviously longer than right style, each provided with four setae at apex.

*Type-specimens*: Holotype: ♂, allotype: ♀ (23-III-1955, collected by S. UÉNO). Paratypes: 1 ♂ (11-X-1953, by J. ISHIKAWA and T. KUBOTA); 1 ♂ (20-VIII-1954, by S. NOMURA); 2 ♂♂, 5 ♀♀ (23-III-1955, by S. UÉNO); 1 ♂, 3 ♀♀ (30-III-1956, by S. NOMURA).

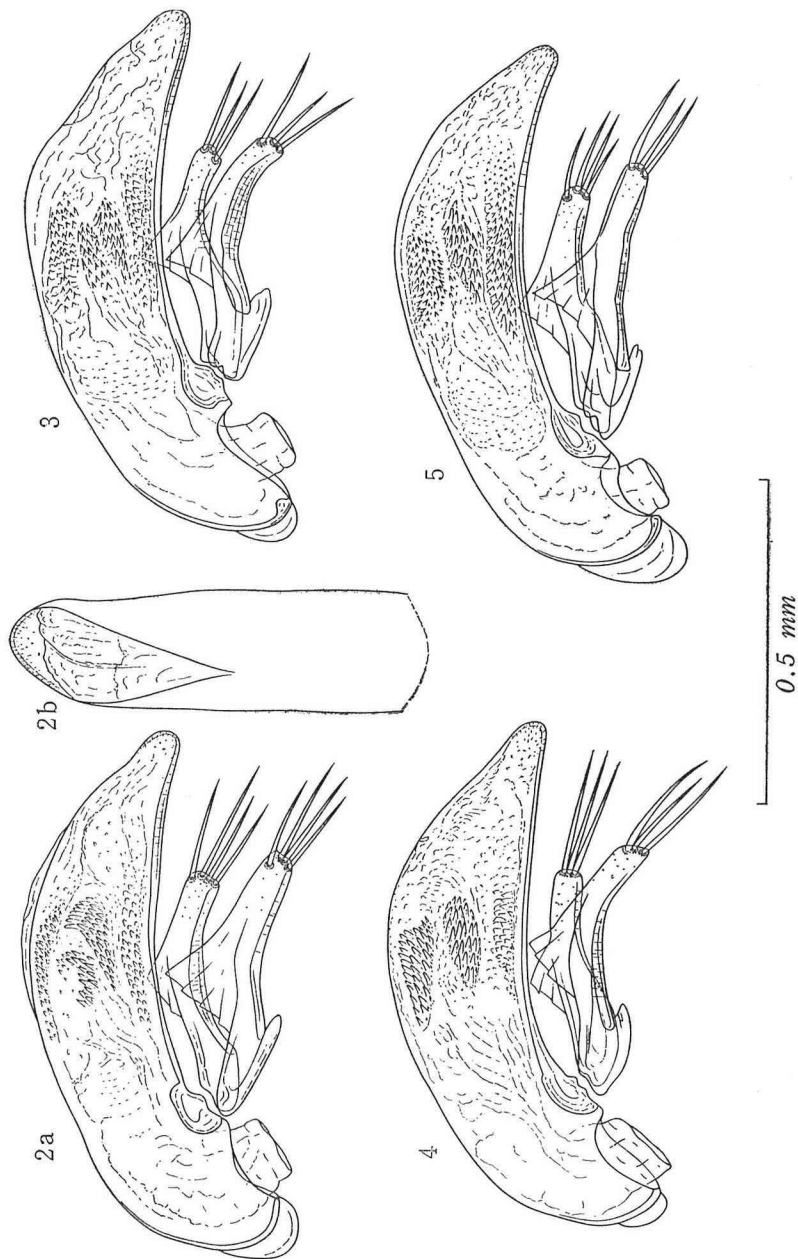
All the type-specimens are preserved in the writer's collection.

*Type-locality*: A limestone cave called "Karyū-dō", at Karyū, in Nishikami-ura of Saéki City, Ōita Prefecture, on the eastern coast of central Kyushu.

Karyū-dō Cave is a commercialized one, opening the small entrance on the southern slope of a calcareous mountain. It is not very large but has intricate passages. The floor is wet throughout, and there is a good deal of bats' guano and decayed wood in the depth. The present new trechid is found everywhere in the dark zone under stones or rotten boards.

Among the collection of cave trechids received from the late Mr. NOMURA, there was a specimen labelled "Ogoshi-dō Cave on Mt. Tenjinbaru, 20-VIII-1954". This specimen seems to fit in every respect to the typical form of *R. nomurai*. Only an exception may be the difference in the ratio of the width of elytra to the width of pronotum, which amounts to 1.85 in the specimen in question. This value, however, may well be regarded as an extreme of the range of individual variation. On the other hand, there are evidences that seem to deny the occurrence of *R. nomurai nomurai* in Ogoshi-dō Cave, where there inhabits *R. andoi*, belonging to a different species-group<sup>2)</sup>. This cave belongs to the Kita-gawa drainage and lies in a calcareous massif different from that in which Karyū-dō Cave lies. They are separated from each other by a distance of more than 40 km in a bee-line. Moreover, *R. nomurai* is differentiated into well defined subspecies in the area lying between the two caves (refer to the later pages). Since no additional specimen has hitherto been available to support the accuracy of the labelling, it seems to be probable that the specimen may have been confused by the collector with that of *R. andoi* and was sent to the writer with the indication mentioned above.

2) Cf. S. UÉNO, 1959, Mem. Coll. Sci. Univ. Kyoto, (B), 26, pp. 288, 290.



Figs. 2-5. Male genital organ; left lateral view (2a, 3, 4 and 5), and dorsal view of the apical part of aedeagus (2b).—  
 2. *Rakantrechus (Paratrechitama) nomurai* sp. nov., f. typ., of Karyû-dô Cave.—3. *R. (Paratrechitama) nomurai fodinarum*  
 subsp. nov., of Tsuruoka-kô Mine.—4. *R. (Paratrechitama) nomurai humerosus* subsp. nov., of Onâgara-dô Cave.—5. *R.*  
*(Paratrechitama) elegans* sp. nov., of Kozono-no-ana Cave.

**Rakantrechus (Paratrechiana) nomurai fodinarum** S. UÉNO, subsp. nov.

Discriminated from the nominate subspecies chiefly by the larger fore-body as well as by the difference in the shape of pronotum and in the structure of the humeral part of elytra.

Length: 4.4–5.1 mm (from front margin of clypeus to anal end).

Head and pronotum larger than those in the nominate subspecies. Head more transverse and more clearly depressed on the dorsal side, with genae a little more convex; antennae reaching apical one-third of elytra. Pronotum relatively transverse and more strongly contracted in front, 1.34–1.42 times wider than head (mean 1.38), 1.03–1.11 times wider than long (mean 1.07), widest at about five-sevenths from base; the ratio of the greatest width to the width of apex 1.43–1.52 (mean 1.46); lateral sides more strongly but evenly rounded in front, sinuate at about one-fifth from base; postangular seta as in the nominate subspecies; apex narrower than that in the nominate subspecies, usually a little wider than base but sometimes as wide as the latter, and rarely a little narrower than base (range 0.98–1.04, mean 1.02); postangular carina usually absent. Elytra shorter, a little less convex and less contracted basally than those in the nominate subspecies, 1.69–1.77 times wider than pronotum (mean 1.74), 1.46–1.54 times longer than wide (mean 1.50), widest at about or a little behind middle; shoulders more prominent, with prehumeral borders less oblique; basal carina more or less sharper.

Aedeagus similar in structure to that of the nominate subspecies, but has larger basal orifice. Each style provided with three apical setae only.

*Type-specimens*: Holotype: ♂ (23-III-1955, collected by S. UÉNO). Allotype: ♀ (18-III-1955, by S. NOMURA). Paratypes: 1 ♂ (7-X-1954, by S. NOMURA); 1 ♂ (13-XII-1954, by S. NOMURA); 1 ♀ (5-III-1955, by S. NOMURA); 1 ♂ (18-III-1955, by S. NOMURA); 7 ♂♂, 4 ♀♀ (18-IX-1955, by S. NOMURA); 3 ♂♂, 3 ♀♀ (29-X-1957, by S. NOMURA).

All the type-specimens are preserved in the writer's collection.

*Type-locality*: An abandoned mine called "Tsuruoka-kō", at Tsuruoka, Tsurumi of Saéki City, Ōita Prefecture, on the eastern coast of central Kyushu.

Tsuruoka-kō is an old mine, situated in the western suburbs of Saéki at about 7.5 km south of Karyū-dō Cave. The entrance is open at the western foot of a hill and several metres above a paddy-field. The gallery is nearly horizontal and has small pools and narrow streams in the depth. The fauna is strikingly rich in this old mine, various troglobionts having been found together with many troglophilous animals. Unfortunately, however, the depths of the gallery are exposed to a serious danger of roof-fallings, and the best habitat of the trechid is not accessible at present due to a roof collapse. It was formerly found under stones or decayed mine posts, but the recent specimens were mainly taken by traps.

***Rakantrechus* (*Paratrechiana*) *nomurai humerosus* S. UÉNO, subsp. nov.**

Discriminated from the nominate subspecies chiefly by the difference in the shape of pronotum and in the structure of the humeral parts of elytra, and from the preceding subspecies chiefly by the narrower fore-body and the different shape of pronotum.

Length: 5.2 mm (from front margin of clypeus to anal end).

Head similar to that of the nominate subspecies, with the exception of genae which are slightly more convex; antennae reaching apical two-fifths of elytra. Pronotum widest more in front than those in *R. nomurai nomurai* and *R. nomurai fodinarum*, 1.39 times wider than head, 1.02 times wider than long, widest at three-fourths from base; the ratio of the greatest width to the width of apex 1.45, that to the width of base 1.50; lateral sides rather strongly rounded in front and obtusely subangulate at the widest part, convergent posteriorly in straight lines and rather feebly sinuate at one-sixth from base; postangular seta as in the nominate subspecies; apex 1.03 times wider than base, which is bisinuate. Elytra similar in shape to those in *R. nomurai fodinarum* but larger than those in the latter, 1.80 times wider than pronotum, 1.55 times longer than wide, widest at a little behind middle; humeral parts as in *R. nomurai fodinarum*, with basal carina a little more prominent. Aedeagus similar to that in *R. nomurai fodinarum*. Female unknown.

*Type-specimen*: Holotype: ♂ (12-X-1953, collected by J. ISHIKAWA and T. KUBOTA; deposited in the writer's collection).

*Type-locality*: A limestone cave called "Onagara-dō", at Onagara, in Nakano of Honjō-mura, Ōita Prefecture, on the eastern coast of central Kyushu.

Onagara-dō Cave is situated on the left side of the Banshō-gawa River, at about 16 km southwest of Karyū-dō Cave and about 12 km west of Tsuruoka-kō Mine. It is a commercialized cave, developing along the course of an underground stream. The floor is largely covered with silt and gravel, but is poor in organic matters. Consequently, cave animals are not rich, and the present new trechid seems to be very rare. Only a single known specimen of the subspecies was found under a stone placed on the muddy floor in a side passage, which was not so remote from the entrance. Collaborated with the late Mr. NOMURA, the writer investigated the cave on March 24th, 1955, but was not successful in taking new material.

***Rakantrechus* (*Paratrechiana*) *elegans* S. UÉNO, sp. nov.**

Very closely allied to *R. nomurai* and particularly resembling the nominate subspecies of the latter, but distinguished at first sight from that species by the absence of pronotal postangular setae.

Length: 4.5-5.3 mm (from front margin of clypeus to anal end).

Head quite similar to that in *R. nomurai nomurai*; mentum tooth truncated or slightly emarginate at the tip; antennae reaching apical two-fifths of elytra. Pronotum somewhat longer than in *R. nomurai nomurai*, with lateral sides more widely and regularly rounded in front; 1.35–1.41 times wider than head (mean 1.38), usually as wide as long but sometimes a little wider than long or a little longer than wide (the ratio of the width to the length 0.98–1.03, mean 1.00), widest at about five-sevenths from base; the ratio of the greatest width to the width of apex 1.40–1.45 (mean 1.42), that to the width of base 1.45–1.53 (mean 1.48); lateral sides widely and evenly rounded in front, rather widely sinuate at one-eighth to one-fifth from base (usually at about two-elevenths from base); marginal gutters even, not narrowed before basal situation; postangular setae always absent; apex 1.02–1.07 times wider than base (mean 1.04).

Elytra relatively large but similar in shape to those in *R. nomurai nomurai*, with deeper basal depression; 1.75–1.90 times wider than pronotum (mean 1.82), 1.55–1.61 times longer than wide (mean 1.58), widest at about or a little behind middle; humeral parts as in *R. nomurai nomurai*; basal part of stria 5 deeper than that in the same subspecies; apical striole a little shorter and less curved than that in *R. nomurai nomurai*, but directed to the termination of stria 5; basal carina prominent as in *R. nomurai fodinarum*; stria 3 with two setiferous dorsal pores in the typical individuals, situated at one-eighth to one-seventh (usually at about one-seventh) and two-fifths to three-sevenths from base respectively, a third pore frequently present on one elytron and rarely on both the elytra; stria 5 always with two setiferous dorsal pores at about one-fourth and two-thirds from base respectively; preapical pore situated at the level of the termination of apical striole or a little before that level; humeral group of umbilicate pores ranged similarly to that in *R. nomurai*.

Aedeagus slenderer especially in basal half and more strongly arcuate than that of *R. nomurai*, rather suddenly attenuated towards apex; basal orifice smaller, with the lateral sides deeply emarginate; sagittal aileron larger; ventral side evenly concave. Each style with three apical setae; a fourth seta sometimes present on one style.

*Type-specimens*: Holotype: ♂, allotype: ♀, paratypes: 6 ♂♂, 3 ♀♀ (21–III–1955, collected by S. UÉNO and preserved in his collection).

*Type-locality*: A limestone cave called “Kozono-no-ana”, at Kozono in Tsukumi City, Oita Prefecture, on the eastern coast of central Kyushu.

Kozono-no-ana Cave lies near the border of a large quarry of limestone. Its position is about 400 m WSW of the village of Kozono, about 7 km NW of Karyû-dô Cave and about 2 km SSW of Tokura-no-ana Cave. The entrance, which is open at the root of a large outcrop of limestone, is very small and only passable by crawling. The cave itself is composed of a narrow winding passage, which slopes rapidly upwards to the innermost. Though small, this cave contains an interesting fauna, among which *R. elegans* may be the most important member. It was found under stones or on the small heaps of bats' excreta, and seemed to assemble on the borders of drip basins. It is to be noted with much regret that the cave will be destroyed in near future as a result of successive enlargement of cement manufactory.