

The Cave Beetles from Akiyoshi-dai Karst and its Vicinities

II. *Uozumitrechus*, a New Group of the Genus *Rakantrechus*¹⁾

By

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In one of his previous papers²⁾, the writer noticed the occurrence of the representatives of the genus *Rakantrechus* in the western part of the Chûgoku district, suggesting that a new subgenus should be established for these Chûgoku species. The present paper—the second part of this series—is devoted to these *Rakantrechus*-species, which are distributed in the Akiyoshi limestone area and its vicinities.

These trechids are not only different in their appearance from the Shikoku species of the genus, but resemble certain cavernicolous species of the genus *Trechiamia*. They might therefore be arranged under the name of *Trechiamia*, if they alone would be compared with the latter genus. There is, however, a clear difference in evolutionary trends between the genera *Rakantrechus* and *Trechiamia*. It will be confirmed when the undescribed species from Kyushu will be taken into account. On the basis of these considerations, the writer prefers to put the Chûgoku species in a new subgenus *Uozumitrechus*, which is regarded as an extreme type of *Rakantrechus*.

The Chûgoku species are also different from the Shikoku ones in a lesser extent of their adaptation to cave life. The trechids belonging either to the subgenus *Rakantrechus* (s. str.) or to *Yamautidius*, both of which are endemic to the western part of the Shikoku mountain range, are highly specialized and are found only in the depths of limestone caves. Contrary to these, *Uozumitrechus*-species inhabit both the twilight and dark zones of limestone caves, and, in some cases, they are found at the entrance where there is exposed to the direct sunlight. Moreover, their larvae are found in the same habitat as the adults. Such a mode of life resembles those of *Trechiamia*-species and is distinct from those of the Shikoku species of *Rakantrechus*. These problems will be discussed when the Kyushu species of the genus will be dealt with.

1) Contribution No. 11 from the Speleological Society of Japan; Results of the Akiyoshi Expedition 1956 of the Speleological Society of Japan, No. 2.

2) S. UÉNO, 1957, Mem. Coll. Sci. Univ. Kyoto, (B), 24, p. 185, foot-note.

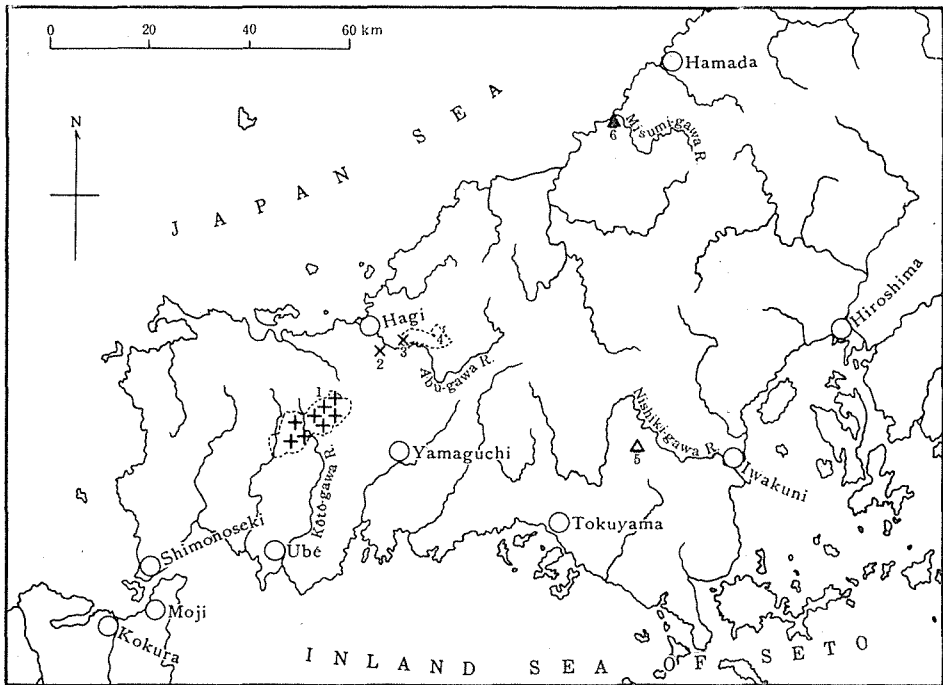


Fig. 1. Sketch map showing the distribution of *Uozumitrechus*.—1. Akiyoshi limestone area (*Rakantrechus (Uozumitrechus) etoi* sp. nov., f. typ.).—2. Kyôdoko-dô Cave (*R. (U.) etoi robustus* subsp. nov.).—3. Sazaré-dô Cave and Kwannon-kutsu Cave (*R. (U.) etoi robustus* subsp. nov.).—4. Zômeki limestone area.—5. Iwayakwannon-no-iwaya Cave (*R. (U.) etoi subterraneus* subsp. nov.).—6. Estuary of the Misumi-gawa River (*R. (U.) mukaibarai* sp. nov.).

Uozumitrechus S. UÉNO, subgen. nov.

Type-species: Rakantrechus etoi S. UÉNO, sp. nov.

Body larger than the species belonging to the other two described subgenera; glabrous and depigmented. Head with entire frontal furrows which are not angulate at middle; genae more or less pubescent; mentum free, not fused with submentum; mentum tooth simple, not bifid nor emarginate at the tip. Pronotal base more or less emarginate on each side just inside hind angle. Elytra with distinct scutellar striole; chaetotaxy similar to those in the other two subgenera, except that the fourth pore of the humeral group of marginal umbilicate series is more or less distant from the other three. Ventral surface glabrous; sternites without hairs along the respective hind margin. Protibiae externally grooved and glabrous even at the apical part; in ♂ protarsal segments 1 and 2 strongly dilated and inwardly produced at apices.

Aedeagus rather elongate and arcuate, with long apical beak and small sagittal aileron; lateral sides of basal orifice more or less emarginate. Inner sac without developed copulatory piece, but covered with numerous scales on the sac membrane; these scales are divided into two patches, of which the apical one is placed near apical orifice and the basal one is at middle; in dorsal aspect, the basal patch is symmetric and V-shaped, with the joining part at a ventro-apical position. Each style always provided with four apical setae.

The present new subgenus resembles the subgenus *Rakantrechus* (s. str.) in some respects, but may be discriminated from the latter chiefly by the structure of mentum tooth and the absence of copulatory piece. It comprises two new species, one of which may be subdivided into three subspecies. Although the distribution range of the subgenus covers Yamaguchi Prefecture and the western part of Shimané Prefecture, those of the respective species and subspecies are locally restricted. They are as described in the following paragraphs.

***Rakantrechus* (*Uozumitrechus*) *etoi* S. UÉNO, sp. nov.**

Uozumitrechus etoi S. UÉNO, 1953 (in litt.), Shin Konchū, Tokyo, 6 (11), p. 44.

Length: 4.2–5.2 mm (from front margin of clypeus to anal end).

Colour reddish brown or yellowish brown, translucent and shiny; palpi and tarsi pale; apical segments of antennae, apical sternites and legs yellowish brown; elytra more or less paler than the fore-body.

Head subquadrate, with supraorbital areas and front moderately convex; frontal furrows deep, not strongly curved and rather distant from one another; genae a little convex and sparsely pubescent; eyes absent, though the trace of them discernible by a patch which is found just behind the insertion of each antenna; microsculpture composed mostly of wide meshes and partly of isodiametric reticulation; mandibles slender; mentum tooth simple and triangular, or slightly truncated at the tip according to individuals, but neither bifid nor emarginate; antennae slender, extending a little beyond the middle of elytra, with segment 4 nearly as long as segment 3 or segment 5.

Pronotum cordate and convex, contracted posteriorly, about 1.45 times wider than head, about 1.1 times wider than long (the ratios variable to some extent according to individuals), widest at about three-fourths to five-sevenths from base; lateral sides narrowly bordered throughout, strongly rounded in front (sometimes obtusely subangulate at the widest part), shortly but deeply sinuate before hind angles; apex slightly but widely emarginate, distinctly wider than base, which is about seven-eighths as wide as the former (the ratio variable to some extent according to individuals); front angles somewhat advanced and rounded; hind angles acute, well projecting outwards and a little backwards; base slightly reduced at middle and distinctly emarginate on each side just inside hind angle; median line clear, not reaching apex but widening basally; apical transverse impression nearly

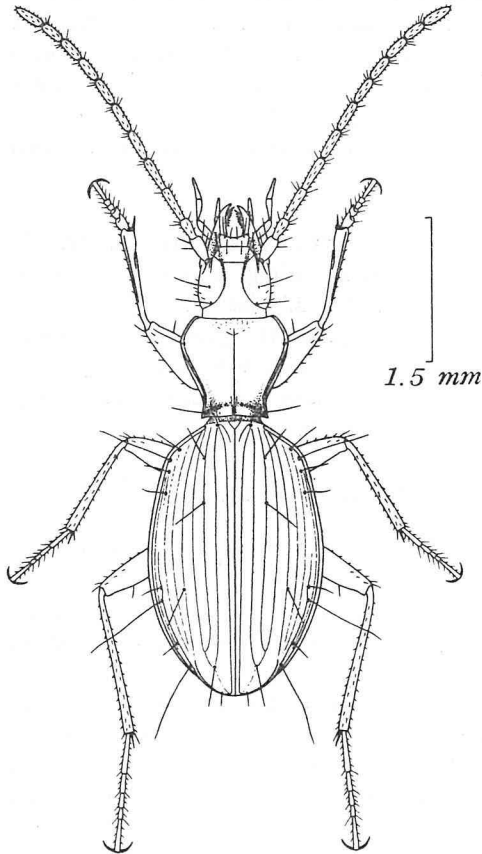


Fig. 2. *Rakantrechus* (*Uozumitrechus*) *etoi* subgen. et sp. nov., f. typ., ♂, of Taishō-dō Cave.

obsolete; basal transverse impression deep and more or less uneven, extending anteriorly parallel with the side border; postangular carina slight and visible only in some large individuals; surface with vague transverse striations, both apical and basal areas with vague longitudinal wrinkles; microsculpture formed partly by wide meshes and partly by fine transverse lines. Ventro-lateral sides of prothorax somewhat expanding outwards and slightly visible from above.

Elytra oval and convex, 1.6–1.7 times wider than pronotum, about 1.6 times longer than wide (exceptional individuals occur), widest at about middle; shoulders rounded or nearly effaced, with prehumeral borders very oblique and nearly straight; lateral sides regularly but not strongly rounded, with a slight emargination on each side before apex, which is usually subangulate; striae crenulate and superficial, becoming fainter at the sides but traceable throughout, stria 5 deeply impressed near base; intervals flat; apical carina prominent; stria 3 with two dorsal pores placed at one-ninth to one-seventh and two-sevenths to one-third from base respectively; stria 5 with a single

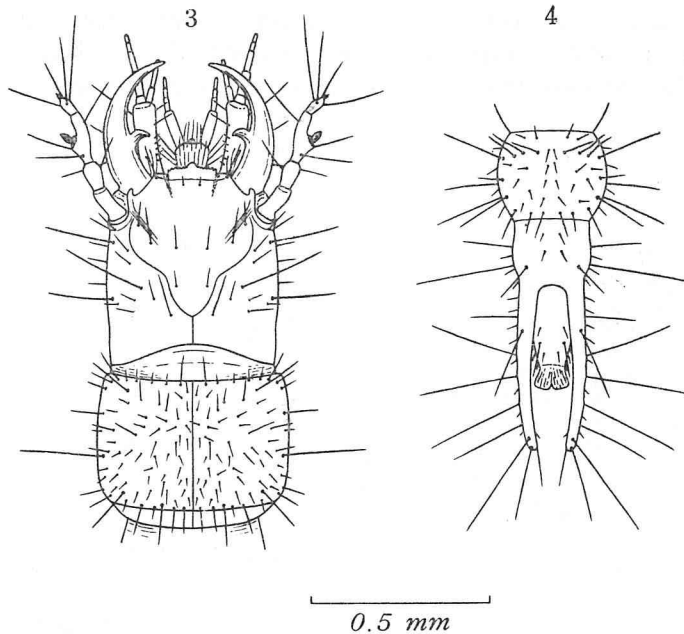
dorsal pore situated at four-sevenths to two-thirds from base; microsculpture formed by fine transverse lines and wide meshes.

Ventral surface glabrous; anal sternite with one seta in ♂, two in ♀ on each side³⁾. Legs slender; in ♂ segments 1 and 2 of each protarsus strongly dilated and inwardly produced at apices.

Male genital organ moderately chitinized. Aedeagus fairly large in basal half, attenuated towards apex behind middle and not strongly arcuate, with the dorsal side well rounded in profile; apex prolonged into a long beak which bends dorsally

3) In one male of the type-specimens, this secondary sexual character is abnormal, two setae being present on the left side of anal sternite.

and terminates in a blunt tip; basal orifice fairly large, with lateral sides deeply emarginate; sagittal aileron small and narrow; ventral side more or less (but not deeply) concave at middle.



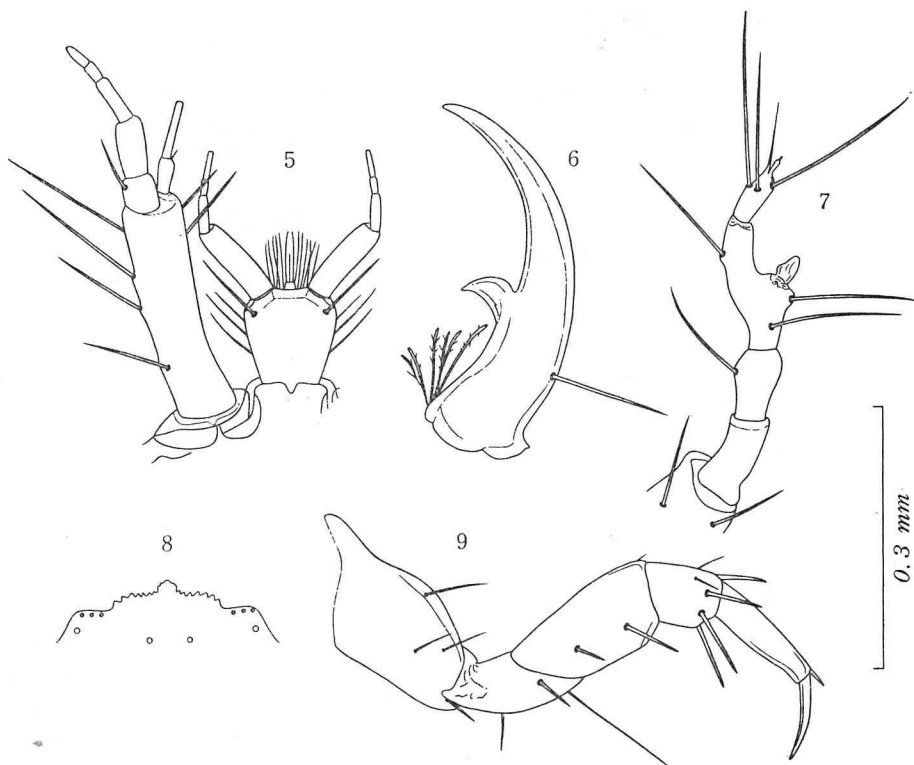
Figs. 3-4. *Rakantrechus* (*Uozumitrechus*) *etoi* subgen. et sp. nov., f. typ., mature larva, of Taishō-dō Cave.—3. Head and prothorax, dorsal view.—4. Anal parts, showing cerci and anal tube; dorsal view.

Description of Mature Larva: Length: 4.1-5.0 mm (from apex of clypeal lobe to the tip of anal tube).

Body elongate and weak, with head and pronotum moderately chitinized. Colour white and translucent; head and cephalic appendages light reddish brown, pronotum yellowish brown, claws pale yellowish brown.

Head subquadrate, with lateral sides nearly parallel and without neck constriction; integument evidently reticulated; a longitudinal carina present on each lateral face; ocelli entirely absent. Clypeal lobe trilobed and moderately produced; median lobe porrect from lateral lobes and finely denticulate; lateral lobes provided with 5-7 larger denticles on respective apical margin. Mandibles long, slender and well arcuate, with retinacles hooked and pointed at the tip. Maxillae with fairly long stipes, which is about 4 times longer than wide; galea slender, with apical segment nearly twice as long as basal segment; maxillary palpus of five segments, two proximal segments more than twice as wide as distal ones; segment 3 long and

slender, only a little shorter than segment 2 and longer than segments 4 and 5 together. Labium subtrapezoid, nearly as long as wide and contracted basally; labial palpus of four segments; basal segment about 3 times longer than wide, nearly as long as segments 2-4 together and nearly 3 times wider than segment 3; segments 2-4 slender, segment 4 longer than segment 3 but shorter than segment 2. Antennae slender, of four segments; segment 2 about 1.5 times longer than wide; segment 3 elongate, more than twice as long as wide; apical segment small.



Figs. 5-9. *Rakantrechus (Uozumitrechus) etci* subgen. et sp. nov., f. typ., mature larva, of Taishō-dō Cave.—5. Right maxilla and labium, ventral view.—6. Right mandible, dorsal view.—7. Right antenna, dorsal view.—8. Clypeal lobe, dorsal view.—9. Right front leg, posterior face.

Prothorax transverse, a little wider than head and evidently shorter than meso- and metathoraces together, with lateral sides nearly parallel; scuta pubescent. Legs relatively long. Abdominal segments, anal tube and cerci pubescent. Anal tube more than twice as long as basal width and gradually narrowing towards anal orifice. Cerci remarkably slender and long, much longer than anal tube and 13-14 times longer than median width.

Type-specimens: Described on 113 specimens (111 adults and 2 larvae), which were obtained in 9 different caves and 1 pothole. They are as listed below.

Holotype: ♂, allotype: ♀ (Taishō-dō Cave, 14-VIII-1952, collected by S. UÉNO). Paratypes: 19♂♂, 5♀♀ (Taishō-dō Cave, 14~15-VIII-1952, by S. UÉNO and M. UOZUMI); 6♂♂, 8♀♀ (Taishō-dō Cave, 18-X-1955, by S. UÉNO); 11♂♂, 11♀♀ (Taishō-dō Cave, 13-VII-1956, by S. UÉNO); 2♂♂, 4♀♀ (Taishō-dō Cave, 23-XI-1956, by S. UÉNO and K. MORIKAWA); 9♂♂, 13♀♀ (Hakugyo-dō Cave, 15-VIII-1952, by T. KUBOTA); 1♂ (Kagekiyo-dō Cave, 23-XI-1956, by S. ANNO); 2♂♂, 1♀ (Misumada-no-ana Cave, 18-X-1955, by S. UÉNO); 4♂♂, 2♀♀ (Suzumé-ana Cave, 13-VII-1956, by S. UÉNO); 1♂ (Naki-ana Cave, 13-VII-1956, by S. UÉNO); 1♀ (Tsubaki-ana Pothole, 24-XI-1956, by K. OCHI); 1♂, 2♀♀ (Terayama-no-ana Cave, 17-VIII-1952, by S. UÉNO); 3♀♀ (Yurino-no-ana Cave, 18-VIII-1952, by S. UÉNO); 2♂♂ (Yurino-no-ana Cave, 4-XI-1954, by J. ISHIKAWA); 1♂ (Uba-ga-ana Cave, 15-VII-1956, by S. UÉNO); 1 mature larva (Taishō-dō Cave, 13-VII-1956, by S. UÉNO); 1 mature larva (Taishō-dō Cave, 23-XI-1956, by S. UÉNO).

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

Type-localities: A limestone cave called "Taishō-dō", at Sayama, Akagō, Mitō-chō; a limestone cave called "Hakugyo-dō", at Ikari, Akagō, Mitō-chō; two limestone caves called "Kagekiyo-dō" and "Misumada-no-ana", at Shishidē-dai, Akagō, Mitō-chō; two limestone caves called "Suzumé-ana" and "Naki-ana" and a pothole called "Tsubaki-ana", at Akiyoshi-dai Karst; two limestone caves called "Terayama-no-ana" and "Yurino-no-ana", Beppu, Shūhō-chō; a limestone cave called "Uba-ga-ana", at Iwanaga-dai Karst; all these caves and pothole are found in the Akiyoshi limestone area in Yamaguchi Prefecture, western Honshu.

The present new species appears to be hypotroglobiont or highly troglophilous one. In some caves (e.g., Kagekiyo-dō Cave and Terayama-no-ana Cave), it is found only in their depths, while in some others (e.g., Suzumé-ana Cave, Naki-ana Cave and Uba-ga-ana Cave), it dwells in the twilight zone or even at the entrance entirely exposed to the sun. In Taishō-dō Cave, the beetle is found both at the entrance and at the innermost. Adding to these different conditions of light, the habitats of the trechid are also variable concerning humidity and the nutriments. In the caves Taishō-dō and Hakugyo-dō, both of which are ponors, it is abundant in the heaps of wet vegetable debris which are swept in from the outside. The larvae are found in the same biotope in Taishō-dō Cave. In Misumada-no-ana Cave and Kagekiyo-dō Cave⁴⁾, the insect inhabits under stones on the silty bank of an underground stream. In the caves Suzumé-ana, Naki-ana and Uba-ga-ana, the trechid is found under fragments of rocks on the floors near their entrances, where there are relatively dry. These differences in the habitats may easily be known, if the plans of these caves will be given accompanied with short descriptions. The

4) These two caves develop along the upper and the lower parts of a single water course. A surface stream in a doline is swallowed into the former and emerges from the latter.

localities of this species are, however, too many to summarize here, the writer refrains at present from making any description of those caves.

The distribution range of the typical form of this new species is equivalent to that of *Trechiana pluto*. However, these two species usually do not coexist in a single limestone cave, with the exception of Taishō-dō Cave and Suzumé-ana Cave, where the two species do not only occur but live in a same habitat. It is difficult to explain how such an isolation has been resulted, but the cause may be biological, owing probably to the competition between the two species, of which *Rakantrechus etoi* seems to be a dominant one.

***Rakantrechus (Uozumitrechus) etoi robustus* S. UÉNO, subsp. nov.**

Distinguished from the typical form chiefly by the structure of the humeral parts of elytra.

Comparatively large in size; length: 4.5–5.7 mm (from front margin of clypeus to anal end). Colour darker; head and prothorax dark reddish brown; the hind body, antennae (becoming paler towards apices) and legs reddish brown, darker than those of the typical form; palpi and tarsi pale reddish brown.

Genae usually a little more prominent, with neck constriction (on the lateral sides) more or less deeper; antennae longer, reaching or nearly reaching apical one-third of elytra. Pronotum less contracted posteriorly, with lateral sides more regularly and widely rounded in front; 1.4–1.45 times wider than head, 1.05–1.1 times wider than long, widest at about three-fourths to five-sevenths from base, which is somewhat wider than that in the typical form, i.e. about nine-tenths as wide as apex; front angles a little more prominent.

Elytra ampler than those of the typical form and rather ovate, with lateral sides less divergent behind shoulders and less rounded; shoulders well marked, though rounded, prehumeral borders distinctly less oblique than those in the typical form; striae more or less shallower, with the crenulation relatively indistinct; the ratios of width of elytra to width of pronotum and length to width of elytra as well as the position of setiferous dorsal pores are similar to those in the typical form⁵⁾.

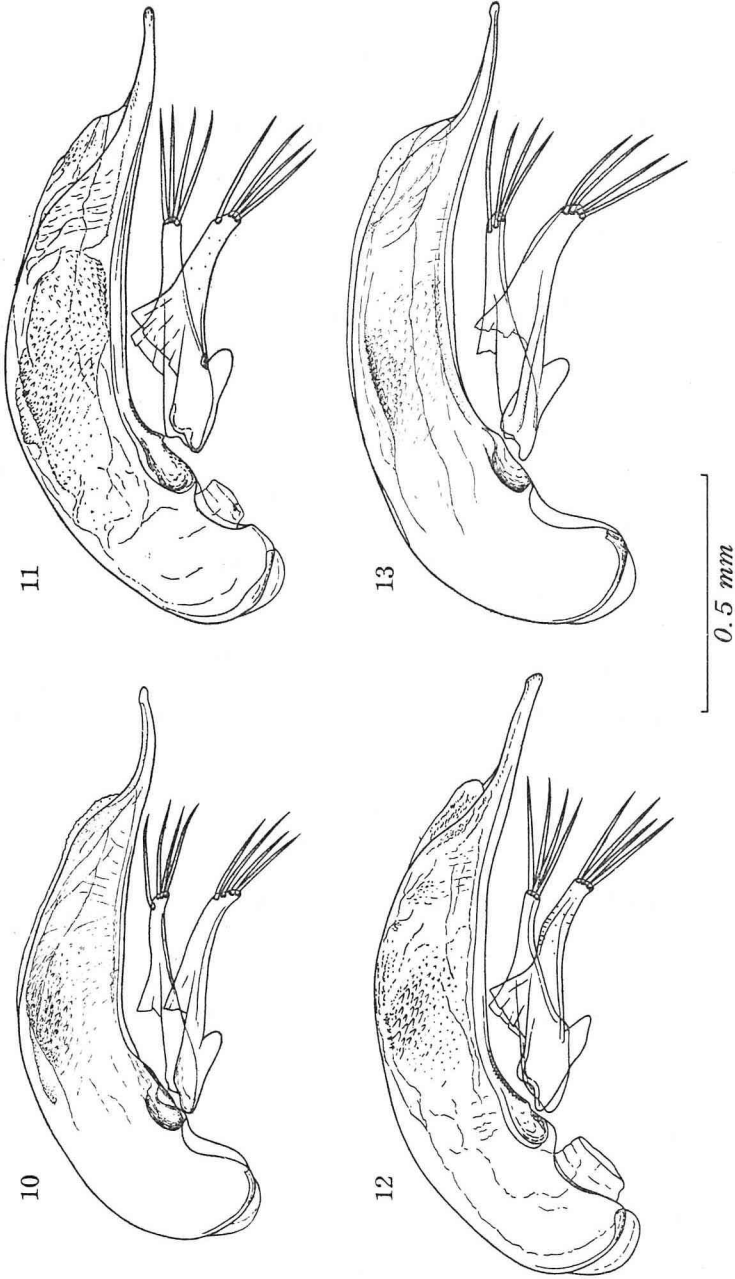
Male genital organ similar to that of the typical form, excepting the shape of aedeagus which is somewhat wider in profile. Other differences shown in the text-figures may be considered as individual variation.

Type-specimens: Described on 17 specimens, which are found in 3 different limestone caves situated in the Abu-gawa drainage area. They are as listed below.

Holotype: ♂, allotype: ♀ (Sazaré-dō Cave, 14-VII-1956, collected by S. UÉNO). Paratypes: 5♂♂, 2♀♀ (Sazaré-dō Cave, 14-VII-1956, by S. UÉNO); 1♀ (Kwannon-kutsu Cave, 14-VII-1956, by S. UÉNO); 5♂♂, 2♀♀ (Kyōdoko-dō Cave, 14-VII-1956, by S. UÉNO).

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

5) Only an exception is the basal one of the dorsal pores on stria 3, which is usually placed a little more backwards.



Figs. 10-13. Male genital organ, left lateral view.—10. *Rakantrechus (Uozumitrechus) etoi* sp. nov., f. typ., of Taishō-dō Cave.
 —11. *Rakantrechus (Uozumitrechus) etoi robustus* subsp. nov., of Sazari-dō Cave.—12. *Rakantrechus (Uozumitrechus) etoi subterraneus* subsp. nov., of Iwayakwannon-no-iwaya Cave.—13. *Rakantrechus (Uozumitrechus) mukaibarai* sp. nov., of the estuary of the Misumi-gawa River.

Type-localities: Two limestone caves called "Sazaré-dô" and "Kwannon-kutsu", at Sazaré, in Fukukawa, Fukuéi-mura, and a limestone cave called "Kyôdoko-dô", at Kyôdoko, Kawakami-mura; all in Yamaguchi Prefecture, western Honshu.

The two limestone caves Sazaré-dô and Kwannon-kutsu are situated at the western end of the Zômeki limestone area on the left side of the Sazaré-gawa, which flows into the Abu-gawa River at the right side. The caves develop in a same large block of limestone, opening the entrance in a bamboo-grove at the bases of two different outcrops. They are unlike both in extension and in features, though the distance between them is not large. Sazaré-dô Cave, which is several times larger than Kwannon-kutsu Cave, is open at a lower position. Two pitches connect three parts of different levels of the cave, so that the innermost is much lower than the level of the entrance. On the contrary, Kwannon-kutsu Cave, situated at a higher place, has its opening at the lower end, from where the tunnel slopes upwards gently for some way and then steeply to its end which is formed by an impassable crack. Both the caves are not eutrophic and their faunae are not rich. The trechid was, however, rather frequent among pebbles or under stones at the wet parts in Sazaré-dô Cave, coexisting with two species of catopids.

Kyôdoko-dô Cave, the other one of the type-localities, is a small grotto existing in a small block of limestone and is not known to most of the natives of the neighbouring village. Its position is about 6 km south-west of Sazaré-dô Cave, a same distance south-east of Hagi City and on the left side of the Abu-gawa River. A small mouth of the cave is open at the foot of a cliff only a few metres above water of the river. Judging from the vegetable debris which is accumulated at the entrance, the water of the river seems to flow into the cave at inundations. Consequently, the cave fauna is not rich in this grotto. Near the innermost, however, there are some places where there appear not to be flooded on any occasion. The trechid was found at such places under pebbles or in fissures of half-dried mud.

Rakantrechus (Uozumitrechus) etoi subterraneus S. UÉNO, subsp. nov.

Uozumitrechus subterraneus S. UÉNO, 1953 (in litt.), Shin Konchû, Tokyo, 6 (11), p. 44.

Distinguished from the typical form and subsp. *robustus* chiefly by the ratio of pronotal base to apex and the structure of the apical beak of aedeagus.

Length: 5.2-5.3 mm (from front margin of clypeus to anal end).

Colour similar to that of the light individuals of subsp. *robustus*. Head similar to that of the typical form, with the exception of antennae which are a little longer and reach apical one-third of elytra. Pronotum much less contracted posteriorly than that of the typical form and of subsp. *robustus*; lateral sides more regularly and more widely rounded in front than those of the typical form, more strongly rounded in front than those of subsp. *robustus*; about 1.45 times wider than head, 1.05-1.1 times wider than long, widest at about three-fourths from base, which is obviously wider than that in the typical form or in subsp. *robustus*, i.e. a little

wider than apex, while, in the latter two forms, pronotal base is always narrower than apex; front angles somewhat advanced. Elytra oval, nearly 1.7 times (in the holotype) or fully 1.6 times (in the allotype) wider than pronotum, about 1.55 times longer than wide, widest at about middle; humeral parts quite similar to those in the typical form; striae deeper than those in the typical form, with the crenulation well marked; two dorsal pores on stria 3 placed at about one-eighth and two-sevenths from base respectively, one dorsal pore on stria 5 placed at about two-thirds from base.

Aedeagus longer than that of the typical form, rather suddenly attenuated towards apex in profile, with the apical beak a little longer and not bending dorsally; sagittal aileron larger.

Type-specimens: Holotype: ♂, allotype: ♀ (20-VIII-1952, collected by S. UÉNO and deposited in his collection).

Type-locality: A limestone cave called "Iwayakwannon-no-iwaya", at Iwaya, Kuwané, Mikawa-mura, Yamaguchi Prefecture, western Honshu.

It has already been noted that there are two principal limestone areas in Yamaguchi Prefecture. In the Nishiki-gawa drainage area, however, there exist several small blocks of limestone, which are inserted in Palaeozoic formations. Iwayakwannon-no-iwaya Cave is found in one of such limestone blocks, situated at about 18 km west of Iwakuni and about 60 km east of Akiyoshi-dai Karst. It is formed by two small branches with two different openings. The lower branch is so shallow that the daylight penetrates throughout it from its large entrance. The upper branch is also not so deep but develops in a form of narrow winding corridor. Accordingly, the interior of this branch is perfectly dark and wet. Cave animals are not rich even in this upper branch, but the trechid was found at its innermost part in association with *Stomis prognathus japonicus* STRANEO and *Synuchus arcuaticollis* (MOTSCHULSKY)⁶⁾.

Rakantrechus (Uozumitrechus) mukaibarai S. UÉNO, sp. nov.

Closely allied to the type-species of the genus and well accord with the description of the latter excepting the features noted below.

Length: 5.6 mm (from front margin of clypeus to anal end).

Colour similar to that of *R. etoi robustus* and darker than that of *R. etoi etoi*.

Head with wider neck and shallower neck constriction than that of *R. etoi*; genae only slightly convex; both supraorbital areas and front evidently flatter than those in *R. etoi*; mandibles somewhat slenderer; antennae longer, reaching apical one-third of elytra.

Pronotum subcordate, convex and much less contracted behind even than that of *R. etoi subterraneus*, with the widest part at a more posterior position; nearly

6) These two species of carabids are troglomenous.

1.5 times wider than head, slightly wider than long, widest at two-thirds from base; lateral sides widely and moderately rounded in front, shortly sinuate just before hind angles; base fully 1.05 times wider than apex; front angles rounded; each hind angle projecting both outwards and backwards as a denticle; basal transverse impression closer to base than that in *R. etoi* and merging on each side into smaller basal fovea; microsculpture formed by fine transverse lines though rather indistinct.

Elytra larger than those of the type-species, oval and convex, about 1.75 times wider than pronotum, fully 1.55 times longer than wide, widest at about middle; shoulders widely rounded, with prehumeral borders less oblique than those in *R. etoi*; lateral sides moderately rounded at middle; two dorsal pores on stria 3 placed at about one-eighth and one-third from base respectively, one dorsal pore on stria 5 placed at about three-fifths from base; microsculpture composed of fine transverse lines but not clearly impressed.

Legs somewhat slenderer than those of *R. etoi*.

Aedeagus moderately arcuate, longer and more regularly tubular than that of the type-species; apical beak weakly bending upwards; ventral side regularly but not deeply concave at middle.

Female unknown.

Type-specimen: Holotype: ♂ (29-IX-1954, collected by T. MUKAIBARA and deposited in UENO's collection).

Type-locality: The estuary of the Misumi-gawa River, Miho, Misumi-chō, Shimané Prefecture, on the coast of the Japan Sea in western Honshu.

The present new species, known only on a single individual, is so closely allied to the variable species *R. etoi*, that the writer has hesitated for long to decide whether it is an independent species or an extreme one of the subspecies of *R. etoi*. The suspicion was partly due to the small number of available specimens of *R. etoi*, which were inadequate to determine the full range of individual variation. At present, however, the writer has obtained a fairly good series of specimens of *R. etoi* from various localities in western Honshu. The Misumi-gawa specimen is clearly isolated from this series of specimens of *R. etoi* by its peculiar form of prothorax and the large elytra. The writer is now of the opinion that the Misumi-gawa specimen is an independent species closely related to *R. etoi*, though it has not been reobtained.

It was accidental that the holotype of *R. mukaibarai* was taken by Mr. Teruo MUKAIBARA. It was found among vegetable debris which was accumulated at the estuary of the Misumi-gawa River by inundations. The specimen was then submitted to the present writer for identification through the courtesy of Mr. Kōsaku MASIDA. Judging from its external features, the new species appears to be either endogean or hypogean. It is of course interesting to know the natural habitats of the trechid, but the extreme rarity of the species has made it impossible to obtain

any of the additional specimens. So far as the writer has known, no limestone cave has been found in the Misumi-gawa drainage area, though there are some small blocks of limestone at the upper courses of the river.

Postscript

After the manuscripts were completed concerning the commencing parts of the present series of papers, the present writer joined the "Expédition spéléologique franco-japonais" as a biologist. This expedition was carried out under the leadership of Prof. Masuzo UÉNO, the president of the Spelaeological Society of Japan, and Prof. Kenji NAKAMURA, a counsellor of the Society, with Dr. Henri COIFFAIT of the Faculté des Sciences of Toulouse as a visiting scientist. Several potholes were investigated at Akiyoshi-dai Karst during the expedition for the first time, and were found to be inhabited by many cave animals. Though the full accounts of the results obtained will be published in future, the writer prefers to note here that two new localities of cave trechids were found in the area under consideration.

1) A pothole called "Ryûgo-no-Coiffait-ana", at Akiyoshi-dai Karst; investigated by H. COIFFAIT, S. UÉNO and K. OCHI on August 4, 1957.

Specimens examined: *Trechiana* (s. str.) *pluto* S. UÉNO, 1♂, 1♀, collected by S. UÉNO; *Rakantrechus* (*Uozumitrechus*) *etoi* S. UÉNO, 3♂♂, 5♀♀, by S. UÉNO.

This pothole is the third one of the localities, where the two species coexist in the same habitat. They were found in a heap of vegetable debris which was accumulated at the bottom of 60 m shaft.

2) A pothole called "Fûsen-ana", at Akiyoshi-dai Karst; investigated by H. COIFFAIT, S. UÉNO, K. MORIKAWA and R. YOSII on August 8, 1957.

Specimens examined: *Trechiana* (s. str.) *pluto* S. UÉNO, 2♂♂, taken by S. UÉNO.