

A New Anophthalmic *Trechiana* (Coleoptera, Trechiniae) Found in a Rhyolitic Cave in Central Japan¹⁾

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Abstract A new anophthalmic trechine beetle is described from a rhyolitic cave in Central Japan under the name of *Trechiana* (s. str.) *mammalis*. It belongs to the group of *T. habei* and is related to its type species.

About 39 km inland from the Pacific coast of Central Japan, there is a well known natural monument called Chiiwa-kyô, a rhyolitic valley with caves and natural bridges. Popular interest centres in a large cave or rather a rock shelter opening on a cliff, which has been regarded by Buddhists as a sacred place. However, a cave of deeper interest to biologists lies on the left side of the bottom of the valley, under the sightseeing trail leading to the Buddhists' sanctuary.

This cave, called Kappa-dô, is very peculiar from the speleological point of view. It seems to have been formed by corrasion of the Chiiwa-gawa, whose small branch now flows through its lowest level. Though it is developed on three different levels, the passages of the lower two, which are connected by steeply sloping holes, have openings at the two ends respectively. They are subject to diurnal and seasonal changes of climate, and harbour no specialized animals of biospeological interest. The upper level of the cave consists of an inclined room with steeply slanting floor, accessible through a hole opening on a shelf of the mid-level passage. It forms a recess in the dark zone, maintaining a stable climate comparable to that in limestone caves.

At first sight, even this secluded room seems utterly deserted, but continuous trappings have proved that it actually harbours various kinds of troglobiontic animals, including three species of carabid beetles, *Jujiroa*, *Ja* and *Trechiana*. Unfortunately, all of them are extremely rare as can be readily surmised. The first specimen, a female, of the *Trechiana* was caught early in the spring of 1982, but we had to wait four years for a second specimen. This was a male, and proved beyond doubt that the species was theretofore unknown to science.

Thus, I have now at my hands a pair of the specimens of the new species. This is by no means satisfactory, but in view of the exceeding rareness of the beetle, I have decided to describe it in the present paper and to introduce its peculiar habitat to bio-

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speology. All the abbreviations used herein are the same as those in other papers of mine.

I wish to express my deep indebtedness first to Mr. Hiroshi IWASAKI, without whose enthusiastic investigations the new trechine beetle could never have been brought to light, and also to Professors Masataka SATÔ and Yoshiaki NISHIKAWA for their kind aid extended to me during the field survey.

Trechiana (s. str.) *mammalis* S. UÉNO, sp. nov.

[Japanese name: Chiiwa-mekura-chibigomimushi]

(Figs. 1–3)

Length: 5.85–5.95 mm (from apical margin of clypeus to apices of elytra).

Similar in facies to *T. habei* (S. UÉNO) (1954, p. 32, figs. 3, 4A) from Ja-ana Cave, but readily distinguished from that species by its larger size and differently shaped prothorax, which is longer and more strongly contracted at the base. Decisively different from *T. habei* also in the configuration of male genitalia, above all in the shape of aedeagal apical lobe, copulatory piece and teeth-patches.

Relatively large species with narrow fore body and ample elytra; depigmented and devoid of hind wings. Colour reddish brown, shiny; palpi, scape and apical segments of antennae, ventral surface of hind body, and legs more or less lighter than body, largely yellowish brown.

Head subquadrate, slightly wider than long, and depressed above, with deep entire frontal furrows which are hardly angulate at middle, widely divergent in front and behind, and gently arcuate towards shallow neck constriction; frons and supra-orbital areas gently convex, the latter bearing two pair of supraorbital setae on lines convergent posteriorly; microsculpture distinct, mostly consisting of wide meshes; remnant of eyes distinct though very narrow and completely flat; genae feebly convex and glabrous; neck very wide; labrum transverse, with the apical margin shallowly emarginate; mandibles slender, sharply hooked at apices; mentum tooth broad, deeply cleft at the apex; palpi fairly thin; antennae long, reaching apical third of elytra in ♂, apical two-fifths of elytra in ♀, segment 2 about a half as long as segment 3, which is about 1.2 times as long as segment 4, 5 or 6, segments 7–10 gradually decreasing in length, each about four times as long as wide, terminal segment about as long as segment 7, much longer but narrower than scape.

Pronotum cordate, evidently wider than head but only slightly wider than long, widest at about five-sevenths from base, and more rapidly narrowed towards apex than towards base; PW/HW 1.45 in the holotype ♂, 1.44 in the allotype ♀, PW/PL 1.05 in ♂, 1.07 in ♀, PW/PA 1.43 in ♂, 1.44 in ♀, PW/PB 1.41 in ♂, 1.45 in ♀; surface moderately convex, with vague transverse striations; microsculpture formed by fine transverse lines partially forming very transverse meshes, though not sharply impressed in many parts; sides rather widely reflexed for the most part though the borders become narrower near front angles, gently arcuate in front, almost straight at middle,

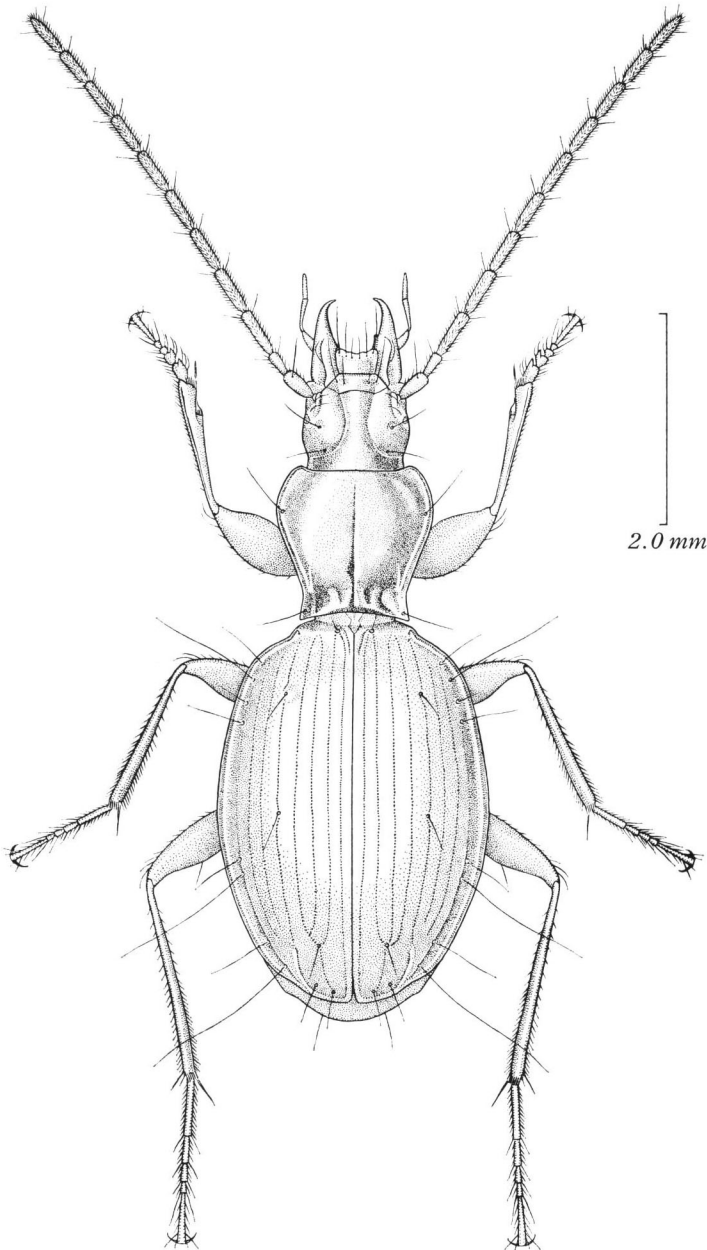


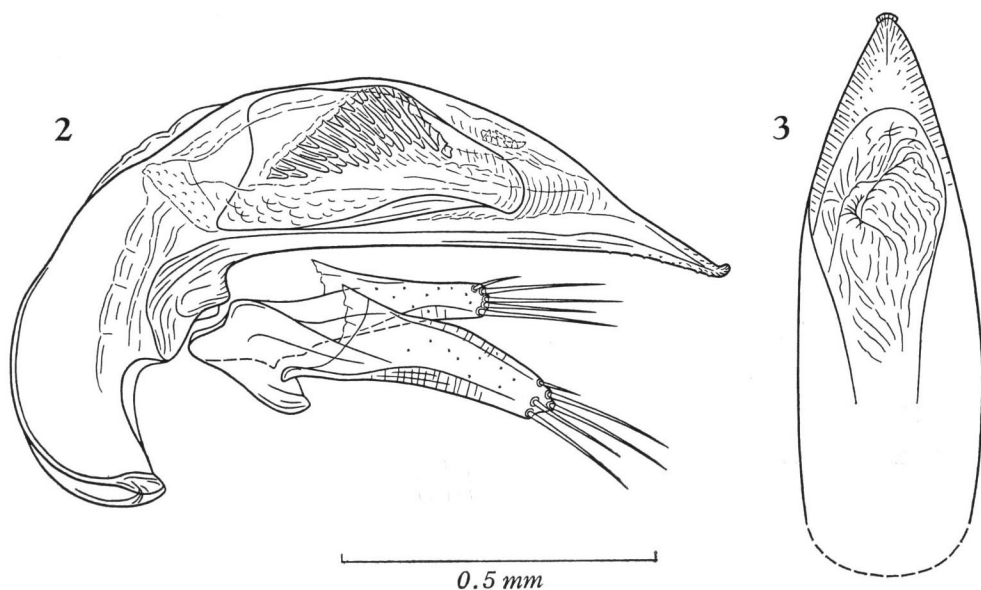
Fig. 1. *Trechiana* (s. str.) *mammalis* S. UÉNO, sp. nov., ♂, from Kappa-dô Cave at Chiiwa-kyô.

shallowly but distinctly sinuate at a level between basal sixth and fifth, and then slightly divergent towards hind angles, which are sharp and produced more posteriorly than laterally; two pair of marginal setae present, the posterior one being a little distant from hind angles; apex either straight at middle or slightly emarginate, about as wide as base, PB/PA 1.02 in ♂, 1.00 in ♀, with front angles more or less rounded though a little advanced; base widely arcuate; median line distinct, deeply impressed in basal area; apical transverse impression more or less obsolete; basal transverse impression not clearly defined, with a longitudinal foveole on each side of median line, and laterally merging into basal foveae, which are fairly deep, smooth at the bottom and extend anteriorly along side borders; postangular carinae distinct; basal area narrow, somewhat uneven.

Elytra oval, broad and ample, much wider than prothorax, widest a little before the middle, and equally narrowed towards bases and towards apices; EW/PW 1.75 in ♂, 1.70 in ♀, EL/EW 1.44 in ♂, 1.45 in ♀; surface convex, with steep lateral parts and apical declivity; microsculpture formed by fine transverse lines but largely obliterated; shoulders widely rounded, with prehumeral borders oblique and briefly sinuate at the base of interval 6; sides widely reflexed, moderately arcuate at middle and slightly emarginate before apices, which are rounded and form a small re-entrant angle at suture; striae entire though not particularly deep, indistinctly punctate, moderately impressed on the disc, striae 1–5 or 6 more or less deepened near base, 8 deeply impressed behind the middle set of marginal umbilicate pores; scutellar striole short though distinct; apical striole also short but deep, hardly curved in front, and joining or almost joining stria 5; intervals smooth, slightly convex only near suture; apical carina distinct though obtuse; stria 3 devoid of dorsal pores; preapical pore present, lying at the apical anastomosis of striae 2 and 3, at about the level of the terminus of apical striole, and much more distant from apex than from suture; stria 5 with two setiferous dorsal pores at about basal fifth and about middle; marginal umbilicate pores aggregated and regular.

Ventral surface smooth; anal sternite with a pair of sexual setae in ♂, with two pair of them in ♀. Legs fairly long; protibiae straight, gradually dilated towards apices, longitudinally grooved on the external face, and glabrous on the anterior face even at the apical portion; tarsi slender, two proximal segments of each protarsus widely dilated and stoutly produced inwards at apices in ♂.

Male genitalia smaller than in *T. habeii* though rather heavily sclerotized. Aedeagus about one-third as long as elytra, fairly elongate, widest at about middle and hardly arcuate, though the dorsal margin is semicircularly rounded in profile; basal part large and elongate, strongly bent ventrad, and deeply emarginate at the sides of basal orifice; sagittal aileron narrow though distinct; apical part regularly narrowed apicad from the sides of apical orifice, forming elongated subtriangular apical lobe, whose tip is distinctly tuberculate in dorsal view; viewed laterally, apical lobe narrow, very slightly curved ventrad, gradually tapered apicad, and distinctly turned up at the extremity; ventral margin almost straight at middle in profile. Inner sac armed with



Figs. 2-3. Male genitalia of *Trechiana* (s. str.) *mammalis* S. UÉNO, sp. nov., from Kappa-dô Cave at Chiwa-kyô; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

a very large copulatory piece and two patches of sclerotized teeth; copulatory piece about three-sevenths as long as aedeagus, somewhat spatulate, widely rolled from right dorsal to left ventral, and widely rounded at apex; proximal teeth-patch left lateral, much larger than the apical, composed of large, heavily sclerotized teeth, lying at the left dorsal side of copulatory piece, and sinuously dilated towards dorsal apex; apical teeth-patch very small and formed by small teeth, lying just above the dorsal edge of the right apical part of copulatory piece. Styles very unequal, left style being much longer and broader than the right, each bearing four apical setae; in the holotype, a small additional seta present near the dorso-apical corner of each style.

Type series. Holotype: ♂, 12-IV-1986, H. IWASAKI leg. (found in a baited trap set by H. IWASAKI on 23-IX-1985). Allotype: ♀, 22-III-1982, H. IWASAKI leg. (found in a baited trap set by H. IWASAKI on 28-XII-1981). Both deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Rhyolitic cave called Kappa-dô, at Chiwa-kyô of Kawai in Hôrai-chô, Aichi Prefecture, on the Pacific side of central Honshu, Central Japan.

Notes. As was already mentioned in the introduction of this paper, the type cave of this interesting new species lies in the rhyolitic valley called Chiwa-kyô, which is an upper stream of the Toyo-kawa River. It is about 30 km distant to the north-east by north in a bee-line from Ja-ana Cave, the type locality of *T. habeii*, to which *T. mammalis* is most closely related, and is about 230 m above sea-level. The two speci-

mens now known were caught by baited traps covered with rice straws and flat stones, which had been set in a small depression about a half way up the inclined floor of the upper level room.

The specific name of this new trechine beetle is derived from the locality name Chiiwa, meaning a rock of breasts in Japanese.

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