

A Remarkable New *Trechiana* (Coleoptera, Trechinae) from the Upper Hypogean Zone of West Japan¹⁾

By

Shun-Ichi UÉNO

Department of Zoology, National Science Museum, Tokyo

Abstract A new anophthalmic trechine beetle belonging to the group of *Trechiana oni* is described from the upper hypogean zone near the western end of Honshu, West Japan. It is widely isolated from the other members of the species-group both taxonomically and geographically, and forms a subgroup of its own. The new name given is *Trechiana* (s. str.) *occidentalis*.

Dealing with the new additions to the group of *Trechiana oni*, I gave a preliminary notice that an unmistakable new species probably belonging to the same species-group had been found in the upper hypogean zone near the western end of Honshu but that its true affinity was not certain for lack of males (cf. UÉNO, 1985 c, p. 1). It was discovered by Mr. Yoshiaki NISHIKAWA on a low hill about 176 km distant to the west-southwest from the western localities of *T. insolitus* S. UÉNO (1959, pp. 31, 32, figs. 1–2; 1985 a, p. 74, pl. 14, fig. 12; 1985 b, pp. 168, 189), which was considered then to delimit the western periphery of the distributional range of the species-group. The wide area west of that territory, at least the southern side of the watershed range, was known to harbour other groups of subterranean trechines, and besides, the locality of the new species was, though non-calcareous, adjacent to the Akiyoshi limestone area, in which many caves are inhabited by *T. pluto* S. UÉNO (1958, p. 40, figs. 1–8; 1985 a, p. 74, pl. 14, fig. 13), a large species not directly related to the group of *T. oni*. Thus, it was necessary to obtain males at all costs for clarifying the true affinity of the trechine beetle.

The spot at which the first specimen of the beetle in question was found is a very small gully at the left side of the Sôda-gawa, a tributary of the Abu-gawa River that empties into the Sea of Japan at the City of Hagi. It is so small as to appear hardly suitable for a habitat of an anophthalmic beetle of fairly large size, and had not yielded any additional material in spite of careful investigations until a second specimen, also a female, was recently taken. However, a better habitat was at last located by Mr. NISHIKAWA in October, 1986, in a gully about 4.8 km west-southwest of the first locality, and a fairly long series of specimens, both males and females, were obtained from a small deposit of rock debris mingled with soil and small pieces of decayed wood, which

1) This study is supported by the Grant-in-aid for Scientific Research No. 60304013 from the Ministry of Education, Science and Culture, Japan.

was emplaced in a small hollow between two small outcrops. This collection enabled me to ascertain that the new trechine was an aberrant member of the group of *T. oni* and that it could be separated from the others in a subgroup of its own.

In the present paper, this remarkable new species will be described under the name of *Trechiamma* (s. str.) *occidentalis*. The abbreviations used herein are the same as those explained in other papers of mine (e.g., UÉNO, 1985 b, p. 164).

Before going into further details, I wish to express my hearty thanks to Professor Yoshiaki NISHIKAWA of Ohtemon-Gakuin University for his unfailing help in making important discoveries during the course of our study on the upper hypogean fauna, and to Dr. Tadashi KURAMOTO and Messrs. Hisashi NAKAMURA and Akira NOTO for their kind aid in making field investigations.

Trechiamma (s. str.) *occidentalis* S. UÉNO, sp. nov.

[Japanese name: Nagato-mekura-chibigomimushi]

(Figs. 1–5)

Length: 5.70–6.65 mm (from apical margin of clypeus to apices of elytra).

Belonging to the group of *T. oni*; readily recognized on its large size, rather peculiar facies with narrow fore body and large oblong-oval elytra, presence of postangular setae on pronotum, short aedeagus with symmetrical apical orifice and very short apical lobe, sigmoidally curved left proximal patch of lamellar teeth, and peculiarly shaped copulatory piece.

Colour reddish brown, fairly dark, shiny, and iridescent on elytra; palpi pale; apical segments of antennae, ventral surface of hind body, and legs more or less lighter than body.

Head subquadrate, slightly wider than long, and depressed above, with gently convex frons and supraorbital areas; microsculpture distinct though fine, mostly consisting of very transverse meshes and lines, partially of polygonal reticulation; frontal furrows entire, deep throughout, rather weakly arcuate and not angulate in front, and widely divergent behind towards neck constriction, which is shallow though distinct; remnant of eyes distinct though completely flat, about a third as long as genae, which are feebly convex and completely glabrous; neck very wide; labrum transverse, with the apical margin shallowly emarginate; mandibles slender, gently arcuate at the apical parts; mentum tooth broad, porrect, and sharply bifid; palpi thin; antennae long and slender, almost reaching apical third of elytra in ♂, usually a little shorter than that in ♀, segment 2 slightly more than a half as long as segment 3 or 4, segments 5–10 gradually decreasing in length, each of apical ones about four times as long as wide, terminal segment about as long and wide as segment 7 or 8, and evidently longer but narrower than scape.

Pronotum cordate, much wider than head, a little wider than long, widest at about two-thirds from base, and more strongly contracted towards apex than towards base; PW/HW 1.39–1.47 (M 1.42), PW/PL 1.05–1.14 (M 1.08), PW/PA 1.47–1.56 (M 1.52),

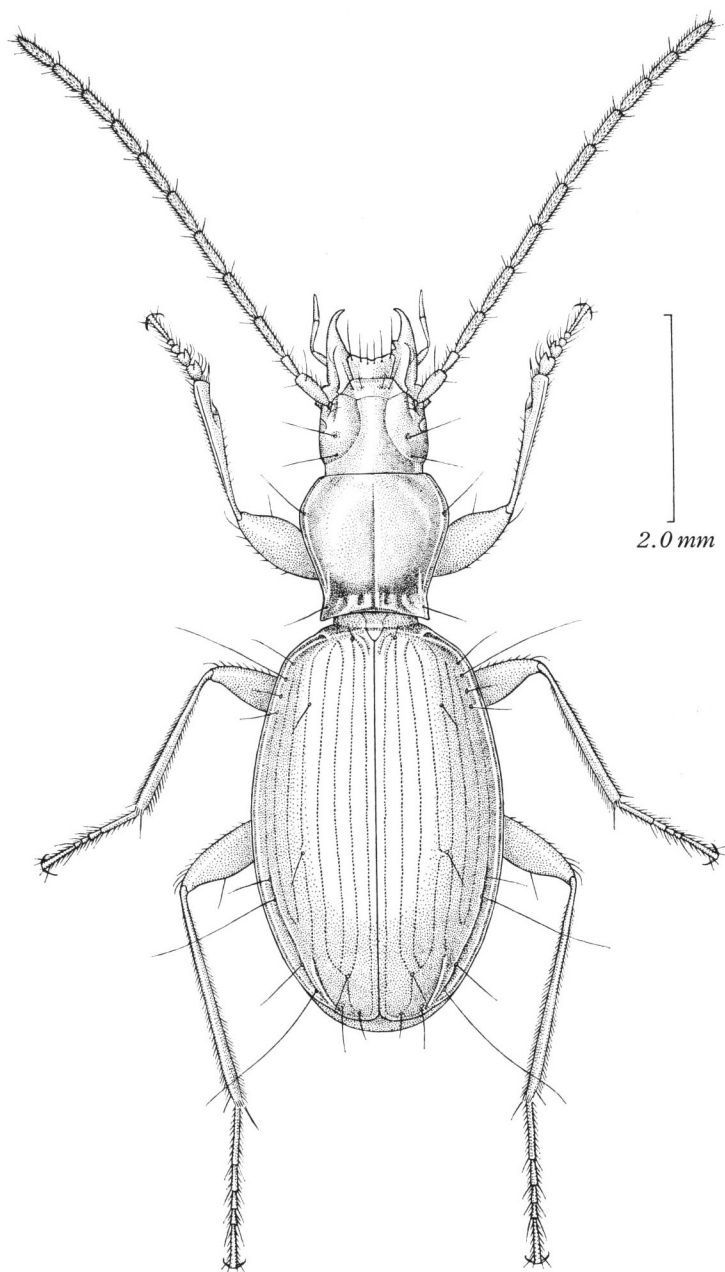


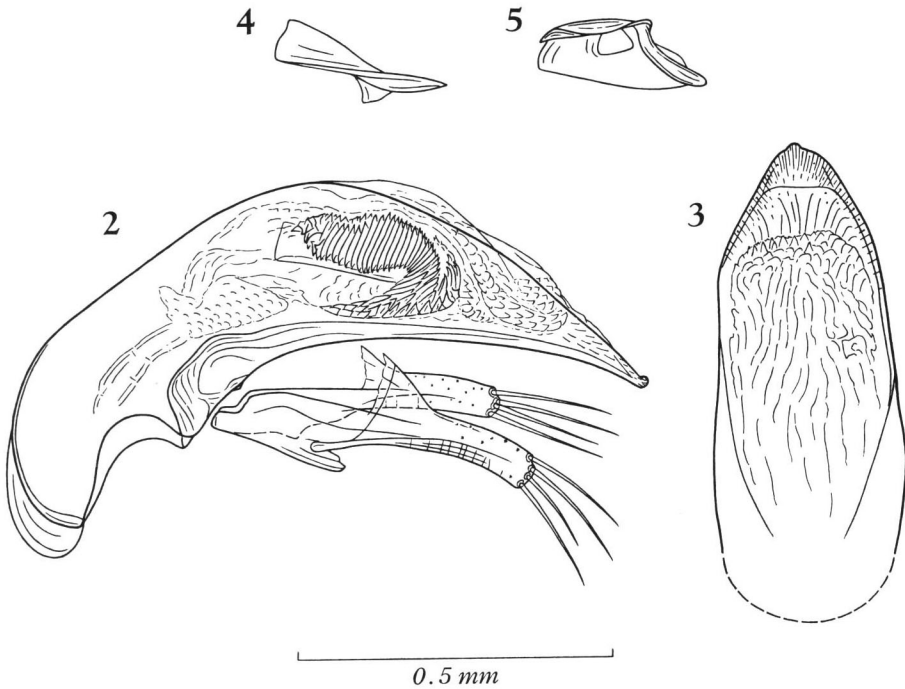
Fig. 1. *Trechiana* (s. str.) *occidentalis* S. UÉNO, sp. nov., ♂, from Motoyama of Otoshibata in Misumi-chô.

PW/PB 1.43–1.53 (M 1.48); surface moderately convex, with vague transverse striations; microsculpture formed by fine transverse lines partially forming very transverse meshes, though not sharply impressed; sides sharply reflexed throughout, rather strongly arcuate in front, nearly straight behind middle, distinctly sinuate at a level near basal sixth, and then more or less divergent towards hind angles, which are acute and usually produced postero-laterad; postangular pair of marginal setae present just before hind angles; apex either straight or slightly emarginate, with front angles always obtuse though sometimes a little produced forwards; base about as wide as apex, PB/PA 0.96–1.08 (M 1.03), either slightly arcuate, or straight at the median part and arcuate only near hind angles; median line sharply impressed, more or less deepening in basal area; apical transverse impression marked only by vague longitudinal wrinkles; basal transverse impression not sharply defined, with a longitudinal foveole on each side of median line, and laterally merging into basal foveae, which are not particularly large but deep and smooth at the bottom; postangular carinae distinct though usually obtuse; basal area narrow and smooth, though notched along the basal margin.

Elytra oblong-oval, much wider than prothorax, widest at about middle, and more gradually narrowed towards bases than towards apices; EW/PW 1.63–1.75 (M 1.70), EL/EW 1.53–1.58 (M 1.55); surface convex especially at the sides, though depressed in basal area, with steep apical declivity; microsculpture degenerated though consisting of fine transverse lines; shoulders very obtuse, with prehumeral borders oblique and almost straight; sides rather narrowly reflexed throughout, almost straight behind shoulders, then feebly arcuate to the level of the apicalmost pore of the marginal series, and almost conjointly rounded at apices though usually forming a small re-entrant angle at suture; preapical emargination very slight; striae entire, finely punctate, deeply impressed on the disc, becoming shallower towards the side though even stria 8 is complete, striae 1–5 more or less deepened near base, 8 deeply impressed behind the middle set of marginal umbilicate pores; scutellar striole short but deep; apical striole also short but deep, feebly arcuate in front and joining stria 5; intervals smooth, slightly convex near suture but flat at the side; apical carina conspicuous; stria 3 usually devoid of dorsal pores, but rarely with a setiferous dorsal pore at about 1/7 from base; preapical pore situated at the apical anastomosis of striae 2 and 3, and more distant from apex than from suture; stria 5 always with two setiferous dorsal pores at about 1/7 from base and about middle; marginal umbilicate pores aggregated and regular.

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

Male genital organ small though robust and rather heavily sclerotized. Aedeagus short, a little more than one-fourth as long as elytra, somewhat depressed, and gently arcuate from base to apex, with the dorsal margin strongly rounded at middle in profile; apical orifice symmetrical, with the side walls not reduced; basal part large, fairly



Figs. 2-5. Male genitalia of *Trechiana* (s. str.) *occidentalis* S. UÉNO, sp. nov., from Motoyama of Otoshibata in Misumi-chô; left lateral view (2), apical part of aedeagus, dorso-apical view (3), and separated copulatory piece, left lateral (4) and dorsal (5) views.

elongate, and not ventrally bent, with large basal orifice whose sides are deeply and widely emarginate; sagittal aileron fairly large though hyaline; apical lobe very short, broad, flattened, and slightly curved ventrad, rapidly narrowed towards the tip in dorsal view, more gradually so in lateral view, with a small but distinct tubercle on the dorsal side of the extremity; ventral margin either straight or slightly emarginate in profile. Inner sac armed with a copulatory piece and two patches of sclerotized teeth or scales; copulatory piece right lateral though horizontal, a little more than one-fourth as long as aedeagus, gently twisted, abruptly narrowed from behind middle towards blunt apex, which is inclined to the left, and with a window in the centre; left lateral teeth-patch large, sigmoidally curved, consisting of large lamellar teeth, which are heavily sclerotized and compactly set; apical teeth-patch horizontal, lying just inside apical orifice and consisting of rather poorly sclerotized teeth and scales. Styles fairly slender, left style obviously longer than the right, each bearing four apical setae.

Variation in elytral chaetotaxy. Of the 25 specimens of the type series, 4 (1 ♂, 3 ♀♀), or 16%, are aberrant in having a setiferous dorsal pore near the base of the third elytral stria. Two females have the pore on the right elytron only, but the other two (♂♀) have it on both the elytra at about the level of the proximal pore on the

fifth stria. The occurrence of a few individuals showing the symmetrical aberrancy is of particular interest from the taxonomic view-point, since it can be regarded as a reversion of elytral chaetotaxy. This pore exists in several Shikoku species belonging to the *satoui* complex, even though the percentage of its occurrence is variable according to species (100% in *T. murakamii* S. UÉNO, 88.2% in *T. bandoi* S. UÉNO, and 55.6% in *T. instabilis* S. UÉNO) (cf. UÉNO, 1981, p. 13; 1984, p. 8; 1985 b, pp. 165–166, 168, 190; 1986, p. 126), but it has never been found in any species of the other complexes with the exception of *T. insolitus*, in which the dorsal pores on the fifth stria have disappeared altogether (cf. UÉNO, 1959, pp. 31, 34; 1985 b, p. 168).

Type series. Holotype: ♂, Motoyama, 13-X-1986, Y. NISHIKAWA leg. Allotype: ♀, same locality and date as the holotype, S. UÉNO leg. Paratypes: 8 ♂♂, 14 ♀♀, same locality and date, S. UÉNO & Y. NISHIKAWA leg.; 1 ♀, Hachikubo, 13-X-1986, Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Localities of the type series. Motoyama of Otoshibata, 160 m in altitude, in Misumi-chô (type locality!), and Hachikubo of Yamanaka, 210 m in altitude, in Mitô-chô; both on the northern side of Yamaguchi Prefecture, at the western end of Honshu, West Japan.

Further specimens examined. 1 ♀, Sôda, 90 m alt., Akiragi, Asahi-mura, Yamaguchi Pref., 24-XI-1985, Y. NISHIKAWA leg. (NSMT); 1 ♀, same locality, 13-X-1986, Y. NISHIKAWA leg. (NSMT).

Notes. As was already pointed out in the introduction of this paper and at the beginning of its description, this new species is very peculiar and does not fall in any subgroups and species-complexes previously known. It looks like certain species of the *kosugei* complex, but is decisively different from them in the configuration of the apical part of aedeagus as well as in the disposition of aedeagal inner armature. From the *fujitai* and *oni* complexes, it is readily distinguished by the presence of the post-angular pair of marginal setae on prothorax and by the configuration of aedeagal apical lobe and inner armature. It resembles the members of the *satoui* complex, especially in view of the occurrence of certain individuals in which a setiferous dorsal pore exists on the third elytral stria, but is greatly different from the latter in the configuration of male genitalia. It may have some remote relationship with *T. insolitus* irrespective of the marked discrepancy in elytral chaetotaxy, as its male genitalia show certain similarities to those of the latter species, but the genitalic difference between the two is still wide even if the striking difference in external morphology is set aside. A new subgroup of its own is herewith recognized for *T. occidentalis*, whose true affinity may be clarified when other species of the same subgroup are discovered in future, most probably at the northern side of the watershed range in the western part of the Chûgoku District.

The two female specimens taken at Sôda (6.10–6.35 mm in the length of body) are excluded from the type series, though they doubtless belong to *T. occidentalis*. They are identical with certain paratypes whose prothoraces are relatively narrow at

the bases. The standard ratios of body parts in the Sôda specimens are as follows: PW/HW 1.37–1.42, PW/PL 1.07–1.11, PW/PA 1.49–1.51, PW/PB 1.52–1.59, PB/PA 0.95–0.98, EW/PW 1.63–1.67, EL/EW 1.52–1.59.

This interesting new species seems to occur only in a small area south and south-west of the old city of Hagi. Its type locality, Motoyama, is at the northern side of the Ono-ga-tao near the head of the Misumi-gawa River, and the second locality, Hachikubo, is at a slightly higher spot on the same slope, about 1.3 km south-south-west of the type habitat. The third locality, Sôda, is about 4.8 km distant to the east-northeast from Motoyama and is about 6 km south of Hagi. Brief accounts of the Motoyama and Sôda habitats were already given in the introduction of this paper. The Hachikubo specimen was taken in a steep small gully; it was found from beneath a heap of rock debris mingled with soil at a depth of about 30 cm.

References

- UÉNO, S.-I., 1958. The cave beetles from Akiyoshi-dai Karst and its vicinities. I. A new species of the genus *Trechiana*. *Mem. Coll. Sci. Univ. Kyoto*, (B), **25**: 39–48.
- 1959. The cave trechids from the central part of the Chûgoku District, Japan. III. The group of *Trechiana oni* S. UÉNO. *Ibid.*, (B), **26**: 29–36.
- 1981. New anophthalmic *Trechiana* (Coleoptera, Trechinae) from northern Shikoku, Japan. *J. speleol. Soc. Japan*, **6**: 11–18.
- 1984. Two new species and a new record of the group of *Trechiana oni* (Coleoptera, Trechinae). *Ibid.*, **9**: 5–13.
- 1985 a. Carabidae (Nebriinae, Elaphrinae, Loricarinae, Scaritinae, Broscinae, Trechinae). In UÉNO, S.-I., Y. KUROSAWA & M. SATÔ (eds.), *The Coleoptera of Japan in Color*, **2**: 54–88. Osaka, Hoikusha. (In Japanese.)
- 1985 b. The group of *Trechiana oni* (Coleoptera, Trechinae) — its distribution and differentiation —. *Mem. natn. Sci. Mus., Tokyo*, (18): 163–198.
- 1985 c. Additions to the group of *Trechiana oni* (Coleoptera, Trechinae). *J. speleol. Soc. Japan*, **10**: 1–7.
- 1986. Further additions to the group of *Trechiana oni* (Coleoptera, Trechinae). *Bull. natn. Sci. Mus., Tokyo*, (A), **12**: 123–127.

