Bull. Natn. Sci. Mus., Tokyo, Ser. A, **12** (3), pp. 123–127, September 22, 1986

Further Additions to the Group of *Trechiama oni* (Coleoptera, Trechinae)[1)]

By

Shun-Ichi UÉNO

Department of Zoology, National Science Museum, Tokyo

Abstract Two new anophthalmic species of the trechine genus *Trechiama* are described from abandoned mine adit and conduit in the northeastern part of the Island of Shikoku, Southwest Japan, under the names of *T. duplicatus* and *T. bandoi*. Both belong to the *satoui* complex of the group of *T. oni*.

In a previous paper of mine (UÉNO, 1985 c, p. l), I gave a preliminary notice that two new anophthalmic trechine beetles belonging to the group of *Trechiama oni* had been discovered in the northeastern part of the Island of Shikoku. One was found in an abandoned mine adit on the right bank of the Yoshino-gawa River, and the other was taken in an abandoned conduit under a paddy field on the left side of the same river. They were tentatively placed in the *satoui* and *instabilis* complexes, respectively.

Since then, additional specimens of the two species have been obtained by unfailing efforts exerted by Messrs. YOSHIDA and BANDÔ. A careful study of these ample materials has revealed that both of them have mixed characters of the two supposed species-complexes. In the present paper, therefore, I am going to unite them into a single complex, to be called the *satoui* complex in a new sense, and to describe the new species under the names of *T. duplicatus* and *T. bandoi*. The abbreviations used herein are the same as those explained in my previous papers (*e.g.*, UÉNO, 1985 b, p. 164).

Before going further, I wish to express my deep gratitude to Messrs. Masataka YOSHIDA and Haruo BANDÔ, whose enthusiastic investigations enabled me to complete the present report.

Trechiama (s. str.) ***duplicatus*** S. UÉNO, sp. nov.

[Japanese name: Aoishi-mekura-chibigomimushi]

(Figs. 1–3)

Length: 4.85–5.65 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *T. fujiwaraorum* S. UÉNO (1981, p. 15, figs. 4–6; 1985 a, p. 74, pl.

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

14, fig. 11; 1985 b, pp. 166, 169; etc.) and almost identical with the latter in external morphology, but distinguished from it by several important features of male genitalia.

Similar in coloration to *T. fujiwaraorum*, likewise light reddish brown with paler appendages. Head somewhat smaller on an average than that of *T. fujiwaraorum* though identical with the latter in configuration. Prothorax and elytra as in *T. fujiwaraorum* though the hind angles of the former are a little sharper; PW/HW 1.41–1.48 (M 1.44), PW/PL 1.05–1.13 (M 1.09), PW/PA 1.47–1.56 (M 1.50), PW/PB 1.41–1.50 (M 1.45), PB/PA 1.00–1.10 (M 1.04), EW/PW 1.64–1.69 (M 1.66), EL/EW 1.53–1.64 (M 1.58). Legs as in *T. fujiwaraorum*.

Male genitalia similar in many respects to those of *T. fujiwaraorum*, but different from the latter in the shape of aedeagus, which is more depressed, especially in apical two-fifths, and more straight before middle, and in the presence of a twofold copulatory piece. Aedeagus small and lightly sclerotized, about one-fourth as long as elytra, depressed, almost straight in proximal three-fifths but gently arcuate behind, with much flattened apical lobe; basal part large and elongate, hardly curved ventrad, with large basal orifice, whose sides are rather deeply emarginate; sagittal aileron small and hyaline; viewed dorsally, apical lobe broad, gradually narrowed towards subtriangular apical part; viewed laterally, apical lobe narrow, gradually narrowed apicad, slightly curved ventrad, and slightly reflexed at the blunt extremity; ventral margin widely emarginate behind middle in profile. Inner sac armed with a twofold copulatory piece just behind middle and a symmetrical patch of sclerotized teeth and scales just inside apical orifice; copulatory piece slender and thin, lying at the right side of inner sac, symmetrical in dorsal view, and folded with the two free ends directed proximally, the ventral portion being elongated triangular and much longer than the dorsal which is lanceolate; teeth-patch subquadrate as a whole in dorsal view and transversely bisinuate with longitudinally concave median part. Styles fairly elongate, left style much larger than the right, each bearing four setae at apex.

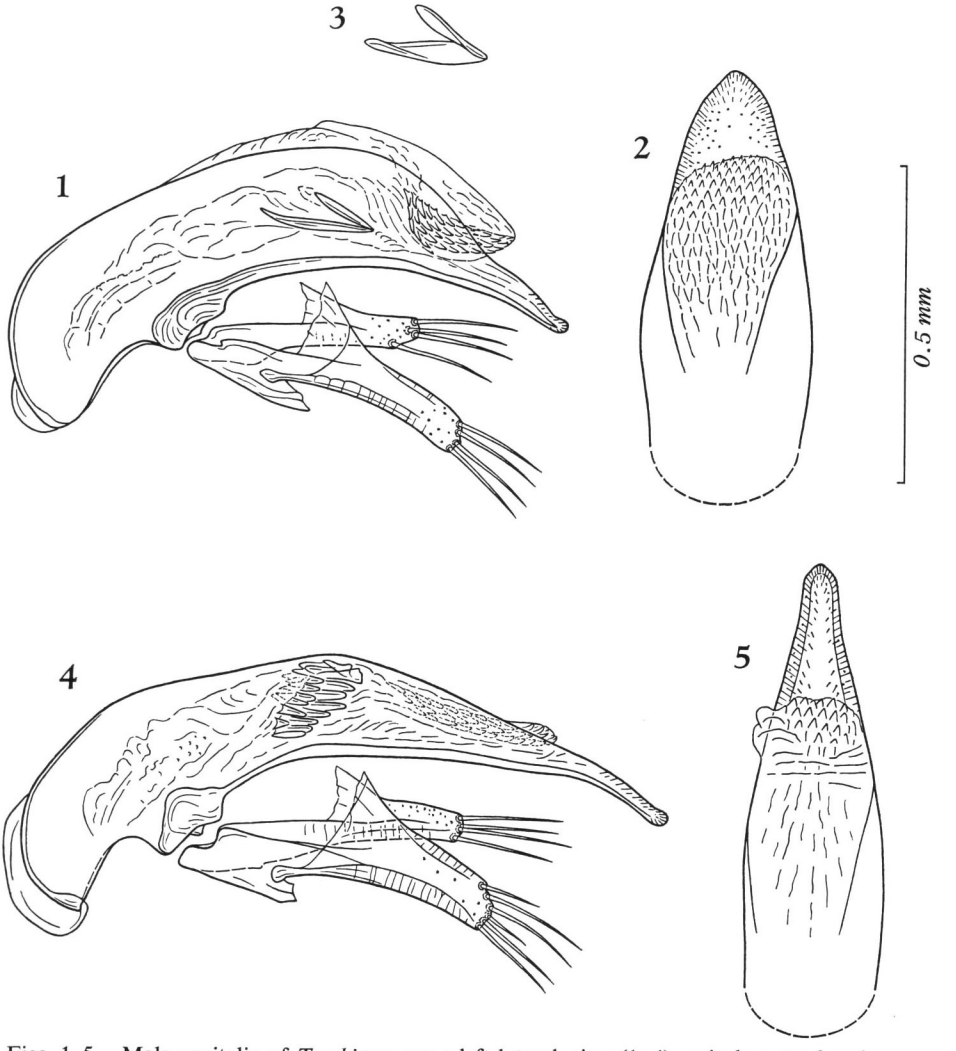
Type series. Holotype: ♂, 8–III–1986, M. YOSHIDA leg. (found in a baited trap set by M. YOSHIDA on 1–XII–1985). Allotype: ♀, 1–XII–1985, M. YOSHIDA leg. Paratypes: 1 ♀, 1–XII–1985, M. YOSHIDA leg.; 3 ♂♂, 3 ♀♀, 8–III–1986, M. YOSHIDA leg. (of these, 2 ♂♂ and 3 ♀♀ were found in baited traps set by M. YOSHIDA on 1–XII–1985); 2 ♂♂, 19–IV–1986, M. YOSHIDA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Abandoned mine adit called Aoishi-kô, at Ohri of Ikeda-chô in Tokushima Prefecture, northeastern Shikoku, Southwest Japan.

Notes. This new species could be regarded as a geographical race of *T. fujiwaraorum*, were it not for the presence of a copulatory piece. The presence or absence of this sclerite (and of the setiferous dorsal pore on the third elytral stria) was used in discriminating the *instabilis* complex from the *satoui* complex in my revision of the anophthalmic trechines belonging to the group of *Trechiama oni* (UÉNO, 1985 b, pp. 168–169). However, it now becomes apparent that any taxonomic value above the species level cannot be attached to this feature, since *T. duplicatus* is an indubitable

close relative of *T. fujiwaraorum* and yet possesses a differentiated copulatory piece.

Aoishi-kô is an abandoned adit of a copper mine dug into a cliff of schist on the right bank of the Yoshino-gawa River. It is about 10.5 km distant to the east by north from Fujiwarasan-no-kanaudo, the easternmost known locality of *T. fujiwaraorum*. The adit is straightly dug for about 50 m, so that the entrance can be seen from the innermost. The trechine beetle dwells in the inner half of the adit, and though not easily caught by eyes probably for the lack of favourable habitats, it can be attracted by baited traps.



Figs. 1–5. Male genitalia of *Trechiama* spp.; left lateral view (1, 4), apical part of aedeagus, dorso-apical view (2, 5), and separated copulatory piece, left dorso-lateral view (3). —— 1–3. *T.* (s. str.) *duplicatus* S. UÉNO, sp. nov., from Aoishi-kô Adit. —— 4–5. *T.* (s. str.) *bandoi* S. UÉNO, sp. nov., from the Imoba Conduit.

Trechiama (s. str.) ***bandoi*** S. UÉNO, sp. nov.

[Japanese name: Bandô-mekura-chibigomimushi]

(Figs. 4–5)

Length: 5.00–6.00 mm (from apical margin of clypeus to apices of elytra).

Very similar in habitus to *T. satoui* S. UÉNO (1975, p. 204, figs. 1–3; 1985 a, p. 74, pl. 14, fig. 10; 1985 b, pp. 166, 169; etc.), but the elytra are narrower and more convex on an average and usually possess a setiferous dorsal pore near the base of the third stria. In aedeagal features, it is closer to *T. tenuis* S. UÉNO (1983 b, p. 353, figs. 1–2; 1985 b, pp. 166, 170; etc.).

Colour as in *T. satoui*. Head and prothorax practically the same as those in *T. satoui*; PW/HW 1.42–1.50 (M 1.46), PW/PL 1.04–1.12 (M 1.09), PW/PA 1.41–1.49 (M 1.46), PW/PB 1.38–1.49 (M 1.43), PB/PA 0.99–1.04 (M 1.02). Elytra narrower on an average than in *T. satoui*, widest slightly before the middle; EW/PW 1.60–1.74 (M 1.65), EL/EW 1.49–1.62 (M 1.56); surface more convex, especially at the sides, than in *T. satoui*, with steeper apical declivity; shoulders more apparent, with less oblique prehumeral borders; sides less arcuate and more narrowly reflexed at the median parts; striae more or less deeper, especially at the sides, than in *T. satoui*; stria 3 usually (in 88.2% of the known specimens) with a setiferous dorsal pore at about 1/7 from base, at least on one elytron; stria 5 normally with two setiferous dorsal pores at about 2/9 and 5/9 from base, respectively; other elytral features as in *T. satoui*. Ventral surface and legs as in *T. satoui*.

Male genitalia similar to those of *T. tenuis*, though the aedeagal apical lobe is obviously shorter and broader. Aedeagus about two-sevenths as long as elytra, elongate, moderately flattened, and in lateral view, tapered apically from the middle, with large basal part lightly curved ventrad; basal orifice deeply emarginate at the sides; sagittal aileron large; viewed dorsally, apical lobe symmetrical, fairly broad at the base and gradually narrowed towards the blunt tip; viewed laterally, apical lobe narrow, curved ventrad, and slightly reflexed at the blunt extremity; ventral margin almost straight from before middle in profile. Inner armature and styles as in *T. tenuis*, the latter sometimes bearing five or even six setae on one side.

Variation in elytral chaetotaxy. Of the total 17 specimens examined, 6 (3 ♂♂, 3 ♀♀), or 35.3%, are more or less aberrant in the number of setiferous dorsal pores on elytra. Four of them are more or less lacking in the pore on the third stria: two females on the right elytron, and one male and one feamle on both the elytra. Two other males have a third pore on the fifth stria: one on the left elytron and the other on the right elytron.

Type series. Holotype: ♂, allotype: ♀, 8–XII–1985, M. YOSHIDA leg. Paratypes: 1 ♂, 5–XII–1985, H. BANDÔ leg.; 5 ♂♂, 9 ♀♀, 19–I–1986, M. YOSHIDA leg. (found in baited traps set by M. YOSHIDA and H. BANDÔ on 8–XII–1985). All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.),

Tokyo.

Type locality. Abandoned conduit called Imoba-yôsui, at Umenokibara of Awachô in Tokushima Prefecture, northeastern Shikoku, Southwest Japan.

Notes. In spite of the usual existence of a setiferous dorsal pore on the third elytral stria, this new species seems more closely related to *T. satoui* and *T. tenuis* than to *T. instabilis* and *T. murakamii*, mainly because of the similarity in the conformation of male genitalia. The chaetotaxy of its elytra is variable to some extent, though not so variable as in *T. instabilis* (cf. UÉNO, 1981, pp. 12–14). The occurrence of a few individuals in which the setiferous dorsal pore on the third stria has disappeared altogether from both the elytra suggests a close affinity of *T. bandoi* with *T. satoui* and at the same time, the derivation of *T. satoui* from a *bandoi*-like ancestor.

The type locality of this new species, the Imoba Conduit, is a unique construction for a habitat of subterranean animals. It is composed of a straight ditch about 50 m in length dug through a paddy field. The sides of the ditch are covered with stone walls, and the roof is formed by a series of flat stones thickly covered with soil. On rainy days, water comes out from spaces between the stones of the innermost wall, flows through the conduit, and emerges from the lower (western) end into the paddy field. It is, therefore, hardly favourable for terrestrial cavernicoles when the floor is immersed. In drier seasons, however, various troglobionts, including polydesmid millipeds, leptonetid spiders and carabid beetles, emerge into the conduit, especially into its inner part. *Trechiama bandoi* occurs everywhere in the conduit, sometimes found from under stones lying on muddy floor but usually caught by baited traps.

References

UÉNO, S.-I., 1975. Two new *Trechiama* (Coleoptera, Trechinae) from eastern Shikoku, Japan. *Bull. natn. Sci. Mus., Tokyo*, (A), **1**: 203–212.

——— 1981. New anophthalmic *Trechiama* (Coleoptera, Trechinae) from northern Shikoku, Japan. *J. speleol. Soc. Japan*, **6**: 11–18.

——— 1983 a. The anophthalmic trechine beetles from Takamatsu, Southwest Japan. *Bull. natn. Sci. Mus., Tokyo*, (A), **9**: 69–77.

——— 1983 b. The faunal affinity of the Island of Awaji-shima as viewed from trechine beetles. *Annot. zool. japon.*, **56**: 351–357.

——— 1984. Two new species and a new record of the group of *Trechiama oni* (Coleoptera, Trechinae). *J. speleol. Soc. Japan*, **9**: 5–13.

——— 1985 a. Carabidae (Nebriinae, Elaphrinae, Loricerinae, Scaritinae, Broscinae, Trechinae). *In* UÉNO, S.-I., Y. KUROSAWA & M. SATÔ (eds.), *The Coleoptera of Japan in Color*, **2**: 54–88. Hoikusha, Osaka. (In Japanese.)

——— 1985 b. The group of *Trechiama oni* (Coleoptera, Trechinae) —— its distribution and differentiation ——. *Mem. natn. Sci. Mus., Tokyo*, (18): 163–198.

——— 1985 c. Additions to the group of *Trechiama oni* (Coleoptera, Trechinae). *J. speleol. Soc. Japan*, **10**: 1–7.