

## Two New Anophthalmic *Trechiana* (Coleoptera, Trechinae) from the Hakubi Hills in Western Honshu, Japan

Shun-Ichi UÉNO

Department of Zoology, National Science Museum (Nat. Hist.),  
3–23–1 Hyakunin-chô, Shinjuku, Tokyo, 169–0073 Japan

**Abstract** Two new anophthalmic species of the trechine genus *Trechiana* are described from the Hakubi Hills, which lie mostly at the northern part of Okayama Prefecture in western Honshu, West Japan. Both belong to the group of *T. oni*, and one of the two, named *T. humicola*, is related to *T. oni* itself though clearly different from it in several peculiarities of the male genitalia. On the other hand, the other species, named *T. yamajii*, is isolated within the species-group, particularly in the possession of the postangular pair of marginal setae on the pronotum and the bilobed apical part of the aedeagus, and is considered to form a species-complex of its own at the side of the *fujitai* complex.

Since a revision was published of the anophthalmic trechine beetles belonging to the group of *Trechiana oni* (UÉNO, 1985 b), nearly a dozen species of the same species-group have been discovered in Okayama and Hyôgo Prefectures in western Honshu, West Japan. Two of them were already described under the names *T. angustus* and *T. obliquus* (UÉNO, 1985 c), but the others remain undescribed mainly because of paucity of available materials. In recent years, however, additional specimens have been obtained bit by bit, and enable us to introduce them into science.

In the present paper, I am going to describe two of them in view of their taxonomic importance. Both the species are restricted to the Hakubi Hills near the borders of Okayama and Tottori Prefectures, where no eyeless trechines have previously been recorded. One of the two belongs to the *oni* lineage within the *oni* group, while the other is an isolated species in view of the peculiarity of chaetotaxy and aedeagal conformation. They will be named *T. humicola* and *T. yamajii*, respectively. The abbreviations employed herein are the same as those explained in previous papers of mine.

Before going into further details, I wish to express my hearty thanks to Messrs. Osamu YAMAJI and Masato MORI for their kindness in submitting invaluable specimens to me for taxonomic study. Deep appreciation is also expressed to Dr. Yoshiaki NISHIKAWA for his unfailing help in field works.

*Trechiana* (s. str.) *yamajii* S. UENO, sp. nov.

(Figs. 1–3)

Length: 4.80–5.40 mm (from apical margin of clypeus to apices of elytra).

Relatively small species within the *oni* group and probably related to the members of the *fujitai* complex, but different from them in the presence of postangular setae on pronotum and bilobed apical part of aedeagus. Not unlike *T. moritai* S. UENO (1985 b, pp. 168, 170, figs. 1–2) in general appearance, but a little smaller on an average and darker in coloration, with larger fore body and differently shaped elytra, the latter of which are more depressed, more prominent at shoulders, more distinctly striate, and bear more posteriorly located anterior dorsal pore.

Colour reddish brown, shiny, faintly iridescent on elytra; palpi, apical halves of antennae, venter of hind body including epipleura, and legs yellowish brown.

Head subquadrate, wider than long, and depressed above, with deep frontal furrows not angulate at middle and widely divergent in front and behind; frons and supra-orbital areas feebly convex, the latter bearing two pair of supraorbital pores lying on lines parallel to each other; microsculpture sharply impressed, mostly consisting of very transverse meshes; eyes absent, their trace being perceptible as small oblique patches; genae gently convex and completely glabrous; neck very wide, only a little narrower than the widest part, with the anterior constriction distinct though shallow; labrum emarginate at apex; mandibles fairly slender, moderately arcuate inwards at the apices; mental tooth broad, truncated and slightly emarginate at the tip; palpi fairly slender though not so long; antennae filiform and slender, usually reaching apical four-ninths of elytra, segment 2 the shortest, five-ninths as long as segment 3, 4 or 5, segment 6 slightly shorter than 5, 7–10 gradually decreasing in length towards the terminal, which is about as long as 6, obviously longer but narrower than scape, segments 6–7 each fully 3.5 times as long as wide.

Pronotum transverse cordate, evidently wider than head, widest at about two-thirds from base, and more strongly narrowed towards base than towards apex; PW/HW 1.41–1.47 (M 1.44), PW/PL 1.15–1.20 (M 1.17), PW/PA 1.40–1.46 (M 1.43), PW/PB 1.44–1.48 (M 1.46); sides narrowly bordered throughout, strongly rounded in front, deeply sinuate at about basal fifth, and then divergent again towards hind angles, which are sharp and postero-laterally produced, with two pair of marginal setae, the posterior one of which is inserted just before hind angle; apex slightly emarginate, with front angles obtuse and only slightly produced; base about as wide as apex, PB/PA 0.95–1.01 (M 0.99), nearly straight at middle but slightly oblique posteriad on each side just inside hind angle; dorsum moderately convex, steeply declivous at the antero-lateral parts, with vague transverse striations; microsculpture composed of fine transverse lines partially forming very transverse meshes; median line distinct, deepened in basal area; apical transverse impression shallow, basal one deep and continuous, with a distinct foveole on each side of median line, and laterally merging into deep basal foveae; postangular carina short but obvious; basal area narrow and smooth.

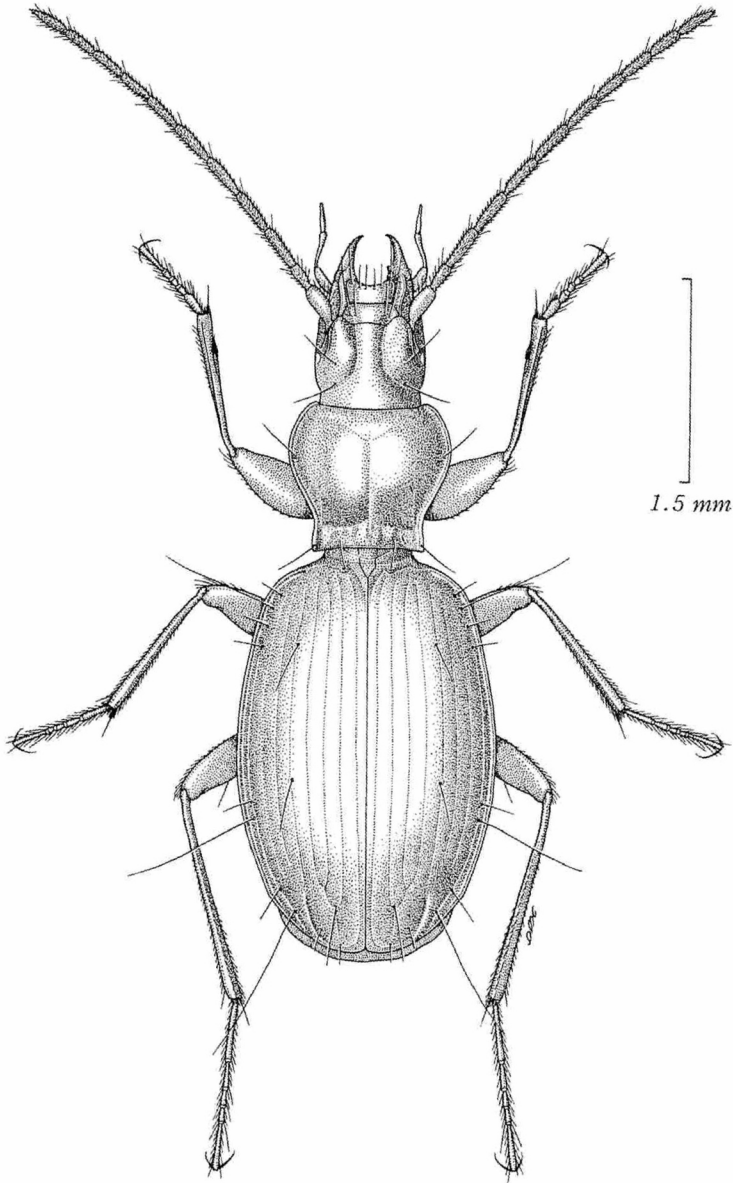


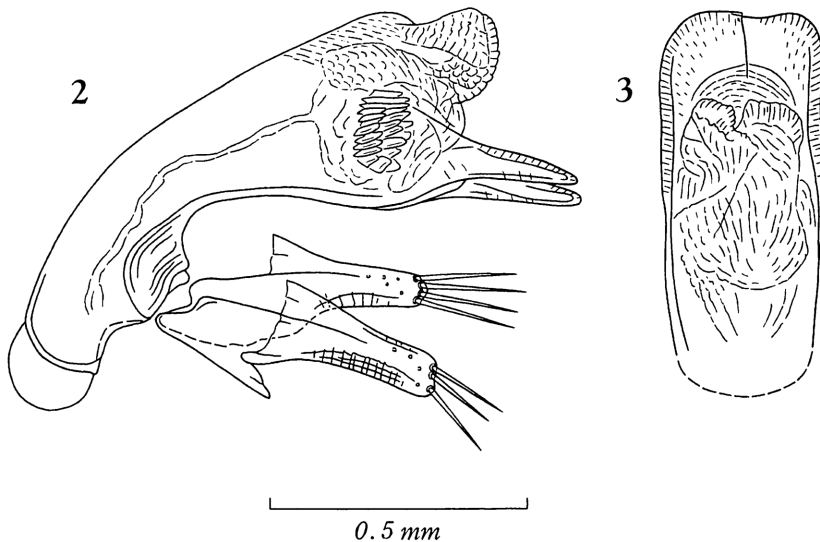
Fig. 1. *Trechiana* (s. str.) *yamajii* S. UENO, sp. nov., ♀, from the Nakatsukô-gawa Valley in Kamisaibara-son.

Elytra oval, evidently wider than pronotum, widest at about four-ninths from bases, and almost equally narrowed towards bases and apices; EW/PW 1.59–1.67 (M 1.63), EL/PL 2.80–2.88 (M 2.83), EL/EW 1.47–1.48 (M 1.47); shoulders distinct though rounded, with prehumeral borders either straight or very slightly arcuate and not very oblique; sides moderately reflexed throughout, nearly straight behind shoulders, then feebly arcuate to the level of the 7th pore of the marginal umbilicate series, and then widely and almost conjointly rounded at apices, which form a very small re-entrant angle at suture, each with a very slight preapical emargination; dorsum widely depressed, with steeply declivous lateral and apical parts; microsculpture formed by fine transverse lines, though not so sharply impressed; striae entire, feebly crenulate, equally impressed on the disc and at the side, stria 8 deepened behind the middle set of marginal umbilicate pores; scutellar striole fairly long; apical striole deep and moderately curved, joining stria 5; intervals flat, apical carina distinct though obtuse; no setiferous dorsal pore on stria 3; stria 5 with two setiferous dorsal pores at about 2/9 and 5/9 from base, respectively, the anterior one located at about the level of the 4th pore of the marginal umbilicate series; preapical pore located at the apical anastomosis of striae 2 and 3 at about or a little behind the level of the terminus of apical striole, and more distant from apex than from suture; marginal umbilicate pores regular.

Ventral surface smooth; anal sternite bisetose in ♂, quadrisetose in ♀. Legs fairly slender; protibiae straight and moderately dilated towards apices, each with a longitudinal groove on the external face; tarsi thin, segment 1 a little longer than segments 2 and 3 combined in mesotarsus, about as long as segments 2–4 combined in metatarsus; in ♂, protarsal segments 1 and 2 widely dilated and stoutly produced inwards at apices.

Male genital organ fairly large and heavily sclerotized. Aedeagus one-third as long as elytra, rather narrow and elongate at the basal part but bulged behind middle, and bilobed at the apical part, with a distinct median longitudinal carina on the ventral side, which reaches the dividing point of apical lobes at the apical end; dorsum widely membraneous, with the inner sac bulged out from apical orifice; basal part moderately curved ventrad, with small basal orifice whose sides are moderately emarginate; sagittal aileron large though hyaline; viewed dorsally, apical part very broad, nearly parallel-sided, widely subtruncated or slightly emarginate at the apex, and rounded at the lateral corners, more widely at the right side than at the left; apical lobes flattened and narrowly overlapping along the median line, the left lobe above the right; viewed laterally, apical lobes narrow, nearly straight and blunt at the apices; venter distinctly convex behind middle in profile. Inner sac scaly at the apical part and armed with a group of heavily sclerotized teeth at the left side near apical orifice; no differentiated copulatory piece. Styles fairly broad, left style being broader and longer than the right and bearing three apical setae in the allotype, while the right style bears four apical setae.

*Type series.* Holotype: ♀, Nakatsukô-gawa Valley, 15–VII–1997, S. UENO leg. Allotype: ♂ (with damaged hind body), same locality, 18–V–1997, O. YAMAJI leg. Paratype: 1 ♀, Takahachi-yama, 26–V–1996, O. YAMAJI leg. All preserved in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.



Figs. 2-3. Male genitalia of *Trechiana* (s. str.) *yamajii* S. UENO, sp. nov., from the Nakatsukô-gawa Valley in Kamisaibara-son; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

*Localities of the type specimens.* Nakatsukô-gawa Valley, Sabu-dani, 900 m in altitude, in Kamisaibara-son of Okayama Prefecture (type locality!), and Takahachiyama, 710 m in altitude on the southeastern slope, in Saji-mura of Tottori Prefecture, both in western Honshu, West Japan.

*Notes.* It is most unfortunate that the single known male of this isolated species is not in a good condition of preservation. The anterior half of the venter of its hind body is badly crushed, and the three legs, both the middle and the left hind, are lost. This is why the topotypical female in a perfect condition was selected as the holotype of the new species. It is a miracle that the characteristic male genitalia remain intact in that mutilated specimen; otherwise we might still wait for a second male.

Anyway, the male genitalia thus saved clearly show that *T. yamajii* is different from any of the previously recognized lineages of the group of *T. oni*. It is most similar to the members of the *fujitai* complex in external morphology and endophallic conformation, but is definitely different from them in the presence of the postangular pair of marginal setae on the pronotum and the peculiar conformation of the aedeagal apical lobe, which is longitudinally divided into two lobes narrowly overlapping along the median line. No other *Trechiana* species hitherto known exhibit such a peculiar modification of aedeagal apical lobe. However, the peculiarly formed male genitalia of *T. yamajii* are as a whole similar to those of *T. crassilobatus* of the *fujitai* complex if the apical lobe were not divided, which seems to suggest that the new species may be an offshoot of that species-complex whose members exhibit various modifications of aedeagal apical lobe (cf. UENO, 1985 b). For the time being, I prefer to recognize a par-

ticular lineage for *T. yamajii* at the side of the *fujitai* complex, leaving the final conclusion for future investigations.

Until now, *T. yamajii* has been known from two localities on the watershed ridge of the eastern part of the Chûgoku Hills on the borders of Okayama and Tottori Prefectures, which is often called the Hakubi Hills. The type locality lies at the southwestern foot of Mikuni-yama (1,252 m in height), while the second locality is on the southeastern slope of Takahachi-yama (1,203 m in height), about 5.6 km east by north of the type locality. The two heads are connected by the watershed ridge more than 1,000 m high. At the type locality, the two known specimens were dug out from the same scree about 10 m wide that had been formed on the left side of the Sabu-dani branch just above the stream water. Four specimens of a trechine species belonging to the *oni* complex were also found in coexistence with the present species. Very unfortunately, this scree was largely scraped away by flood water sometime in 1998, so that it may not be easy to take additional specimens from the same site at the present moment.

On Takahachi-yama, a single female specimen of *T. yamajii* was found out by YAMAJI from beneath a large stone lying at the shaded side of a forestry road. NISHIKAWA and I visited the place on 14 July 1997 and made a careful survey along the forestry road. However, we failed in locating favourable habitats of upper hypogean trechines and were unable to take any additional specimens of the present species.

*Trechiana* (s. str.) *humicola* S. UENO, sp. nov.

(Figs. 4–7)

Length: 5.15–5.90 mm (from apical margin of clypeus to apices of elytra).

Belonging to the *oni* complex of the *oni* group and related to *T. oni* S. UENO (1955, p. 30, figs. 1–2, 1985 b, pp. 168, 181, figs. 12–14), but distinguished at first sight from that species by the lighter coloration, relatively short prothorax with rather wide base and less protrudent hind angles, and less convex elytra with more distinct shoulders. Also different from *T. oni* in the configuration of the aedeagal apical lobe, endophallic armature and styles.

Colour light reddish brown, shiny, with lighter elytra which are faintly iridescent; palpi, apical halves of antennae, venter of hind body including epipleura, and legs light yellowish brown.

Head as in *T. oni* but usually smaller than in the latter, with genae slightly more convex and neck constriction more distinctly marked at the sides; antennae reaching apical four-ninths of elytra. Pronotum cordate, a little shorter on an average than in *T. oni* and usually less contracted at the base, widest at about three-fifths from base; PW/HW 1.41–1.50 (M 1.47), PW/PL 1.05–1.13 (M 1.09), PW/PA 1.48–1.56 (M 1.52), PW/PB 1.36–1.49 (M 1.43); sides narrowly bordered throughout, rather strongly rounded in front, deeply sinuate at about basal seventh, and more or less widely divergent again towards hind angles, which are sharp and produced more laterad than posteriad though less so than in *T. oni*; apex usually narrower than base, rarely about as wide

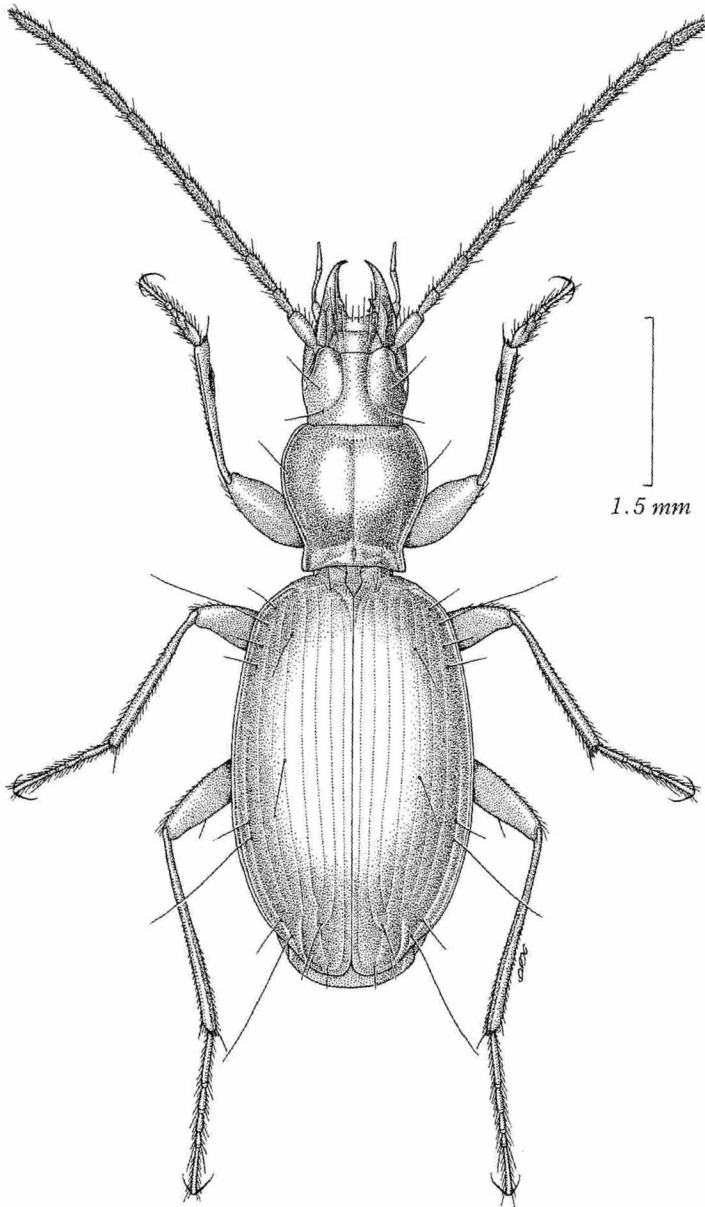
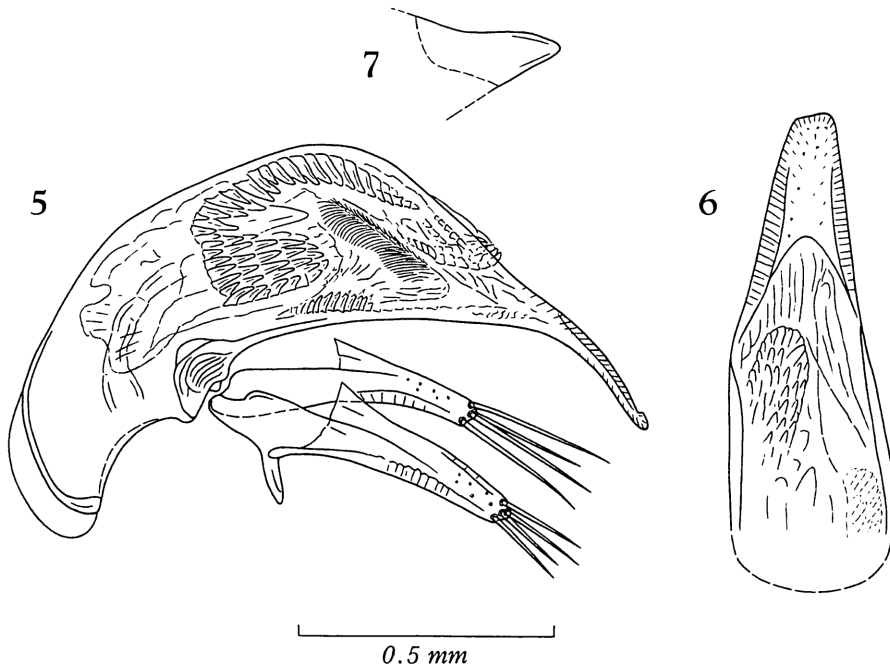


Fig. 4. *Trechiana* (s. str.) *humicola* S. UENO, sp. nov., ♂, from Yamanori-sen in Chûka-son.



Figs. 5–7. *Trechiama* (s. str.) *humicola* S. UENO, sp. nov., from Yamanori-sen in Chûka-son; left lateral view (5), apical part of aedeagus, dorso-apical view (6), and separated copulatory piece, left lateral view (7).

as the latter, PB/PA 1.01–1.12 (M 1.07), with front angles obtuse and hardly advanced; base less oblique posteriad inside hind angles than in *T. oni*; sculptures on dorsum as in *T. oni*. Elytra oval or subovate, a little smaller on an average than in *T. oni*, widest slightly before the middle; EW/PW 1.57–1.67 (M 1.62), EL/PL 2.72–2.98 (M 2.83), EL/EW 1.57–1.66 (M 1.61); shoulders distinct though rounded, with prehumeral borders very slightly arcuate and less oblique than in *T. oni*; sides moderately reflexed throughout, feebly arcuate, rather narrowly rounded at apices and forming a small re-entrant angle at suture, each with a slight preapical emargination; dorsum less convex and more narrowly depressed on the disc than in *T. oni*, with steeply declivous lateral and apical parts; striation and chaetotaxy as in *T. oni*, setiferous dorsal pores on stria 5 located at 1/7–1/5 and 1/2–4/7 from base, respectively.

Legs stouter than in *T. oni*; tarsal segment 1 longer than segments 2 and 3 combined but shorter than segments 2–4 combined in both meso- and metatarsi; in ♂, two proximal segments of each protarsus widely dilated and stoutly produced inwards at apices.

Male genital organ heavily sclerotized, similar in basic structure to that of *T. oni* (cf. UENO, 1955, p. 31, fig. 2, 1985 b, pp. 182–183, figs. 12–14) but different in many details, above all in the long, ventrally arcuate apical lobe of aedeagus, simply triangu-



lar copulatory piece and much slenderer styles. Aedeagus about two-sevenths as long as elytra, somewhat compressed, hardly arcuate at middle though the dorsal margin is semicircularly rounded in profile, and widely membranous on dorsum, with large basal part and long flattened apical lobe arcuate ventrad; basal part rather strongly curved ventrad, with large basal orifice whose sides are widely emarginate; sagittal aileron large but narrow and hyaline; viewed dorsally, apical lobe slightly inclined to the left, gradually narrowed towards the apex, which is somewhat obliquely truncated; viewed laterally, apical lobe very thin, gently arcuate ventrad, and gradually tapered towards the tip which is dorsally tuberculate; ventral margin only very slightly emarginate at middle in profile. Inner sac armed with teeth-patches and a copulatory piece as in *T. oni* but their configuration is considerably different; left proximal teeth-patch smaller than in *T. oni*, with longer dorsal arm consisting of larger teeth; left apical teeth-patch composed of much larger teeth at the ventral position; left apical patch of rather poorly sclerotized spinules more elongate and conspicuous; right dorsal teeth-patch compact, with two dorsal rows of small sclerotized scales; copulatory piece simply triangular with the apex curved inwards, heavily sclerotized only at the apical part and gradually becoming membranous at the base. Styles obviously slenderer than in the other members of the same species-complex, with more straight apical parts; left style much longer than the right and provided with protrudent ventral apophysis, each bearing four apical setae, which are much longer on right style than on the left.

*Type series.* Holotype: ♂, allotype: ♀, 30-V-1999, M. MORI leg. Paratypes: 1 ♀, 15-VI-1991, O. YAMAJI leg.; 1 ♀, 21-VI-1992, O. YAMAJI leg.; 1 ♂, 30-V-1999, M. MORI leg.; 2 ♂♂, 7-VIII-1999, M. MORI leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Yamanori-sen, 900 m in altitude on the western slope, in Chûka-son of Okayama Prefecture, western Honshu, West Japan.

*Notes.* It seems probable that the present species is closer to *T. oni* S. UÉNO than to *T. angustus* S. UÉNO (1985 c, p. 2, figs. 1-4), though its type locality is geographically nearer to that of the latter than to that of the former. Its body form is less slender than in *T. angustus* though the prothorax is relatively short as in the latter, and the general appearance of the aedeagus is more closely similar to that of *T. oni* than to that of *T. angustus*, with the exception of the configuration of the apical lobe. Anyway, it is markedly different from either of the two in the slender styles and particularly from *T. angustus*, in the configuration of the copulatory piece.

Yamanori-sen (1,048 m in height), the type locality of the present species, lies on a southward branch ridge of the watershed mountains, which marks the borders of Okutsu-chô and Chûka-son. It is about 15.5 km distant to the northwest beyond the Yoshii-gawa Valley from Yamato in Kagamino-chô, the type locality of *T. angustus*, and is about 20 km distant to the northeast beyond the Asahi-gawa Valley from Oni-no-ana Cave, the type locality of *T. oni*. At the western side of the mountain, the head-water of the Yamanori-gawa, one of the upper courses of the Asahi-gawa River, forms a rather wide, gently slanting depression in a beech forest, into which several narrow

gullies fall down. Because of such gentleness of slopes, no colluvia favourable for harbouring anophthalmic trechines are deposited anywhere in that area, and the flat banks of narrow streams are largely covered with undergrowths. *Trechiana humicola* usually dwells under piles of dead leaves, a habitat that is quite unusual for eyeless depigmented trechines. It is possible that the beetle survives on the surface owing to the highly humid environment in and around the depression in spite of its seeming unsuitableness.

### 要 約

上野俊一：伯備山地で見つかったナガチビゴミムシ属の2盲目種。—— 伯備山地のおもに岡山県側で発見されたナガチビゴミムシ属の2新種を記載し、ヤマチメクラチビゴミムシ *Trechiana yamajii* およびヤマノリメクラチビゴミムシ *T. humicola* と命名した。前者は、鳥取県との県境上に位置する三国山および高鉢山にすみ、比較的、幅の広い前胸背板に後角毛をそなえていることと、雄交尾器中央片の先端葉が縦に2分している点で、近隣地域に分布する同属種のうちでも特異な存在である。しかし、おそらくオニメクラチビゴミムシ種群のフジタメクラチビゴミムシ系から派生して、独自の一群を形成したものだろうと考えられる。ヤマノリメクラチビゴミムシのほうは、特徴的な雄交尾器の構造からみて、疑いもなくオニメクラチビゴミムシ系の種であるが、体形や雄交尾器中央片先端葉の形状、交尾片の単純さ、細長い側片などの点で、既知種とは明らかに異なる。奥津町と中和村との境に位置する山乗山で発見されたが、地下浅層ではなく腐葉下に生息することでも、盲目種としては特異である。

### References

- UENO, S.-I., 1955. Studies on the Japanese Trechinae (IV) (Coleoptera, Harpalidae). *Mem. Coll. Sci. Univ. Kyoto*, (B), **22**: 29–34.
- 1985 a. Carabidae (Nebriinae, Elaphrinae, Loricarinae, Scaritinae, Broscinae, Trechinae). In UENO, S.-I., Y. KUROSAWA & M. SATO (eds.), *The Coleoptera of Japan in Color*, **2**: 54–88 [incl. pls. 11–16]. Hoikusha, Osaka. (In Japanese, with English book title.)
- 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.