

A New Threatened Species of the Genus *Trechiana* (Coleoptera,
Trechinae) from Northeastern Honshu, Japan, with
Notes on an Endangered Species

Shun-Ichi UÉNO

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

and

Yoshiaki NISHIKAWA

Biological Laboratory, Otomon Gakuin University,
2–1–15 Nishiai, Ibaraki-shi, Osaka, 567–8502 Japan

Abstract A new anophthalmic species of the trechine genus *Trechiana* is described from the Surikami-gawa drainage area of northeastern Honshu, Japan, under the name of *T. paucisaeta*. It is upper hypogean, inhabiting a scree opposite to the type locality of *T. oopterus* S. UÉNO, an endangered species recorded on the Red Data Book of the Japanese Government. A new locality of the latter species is recorded, and its probable distributional range is estimated.

Trechiana oopterus S. UÉNO (1995, p. 154, figs. 7–9, 16) is a medium-sized anophthalmic trechine beetle endemic to the upper part of the Surikami-gawa drainage area at the northwestern corner of Fukushima Prefecture in northeastern Honshu, Japan. It is recorded on the Red Data Book of the Japanese Government as an endangered species, since its type habitat, which had been the only known locality of the species before 2000, was threatened by the construction of the Surikami-gawa Reservoir. To find out other habitats of the trechine beetle above the prospective ponding surface of the reservoir, the staff of the Civil Engineering and Eco-technology Consultants Co., Ltd. and several members of the Fukushima Insect-lover's Association made a careful survey of the area concerned near the end of October 2000, in which the second author took part as one of the discoverers of the endangered species. Unfortunately, the first author was unable to participate in it as he was in China then, but he was invited to the second survey carried out in May this year, just before the final proofreading of this paper, and carefully examined the environment again.

The first attempt proved a success, and a second habitat of the beetle was located at the other side of the low ridge about 1.6 km northwest of the type locality and above

the ponding surface. What was unexpected was the discovery of a different species of anophthalmic trechine beetle from a scree lying on the opposite side of the main course of the Surikami-gawa River, 1.7 km northwest of the second locality of *T. oopterus*. This newly found species is very similar to *T. oopterus* in general appearance and hardly recognizable in the field, but externally differs from the latter in the chaetotaxy of the pronotum and elytra. Specific difference between the two species is decisive in the configuration of the male genitalia, which indicates that they belong to different lineages of the *echigonis* subgroup and that the second species is related to *T. masatakai* S. UENO of the Zaô Mountains. The scree in which this species dwells is higher from the prospective ponding surface than the type habitat of *T. oopterus*, but its survival can be threatened by drought caused by deforestation in the close surroundings of the reservoir, particularly due to road construction. We are therefore going to describe it in the present paper under the name of *Trechiamma paucisaeta* in order to record it as a threatened species.

The abbreviations used herein are the same as those explained in previous papers by the first author.

We are deeply indebted to the following persons whose careful investigations led to the discovery of this interesting trechine beetle: Mr. Hiroshi FUKAZAWA, Mr. Takeshi NODA and Ms. Shino MORISHIGE of the Civil Engineering and Eco-technology Consultants Co., Ltd., and Messrs. Jun'ichiro KOBAYASHI, Shozo MIZUNOYA and Tadao SAITO of the Fukushima Insect-lover's Association.

Trechiamma (s. str.) *paucisaeta* S. UENO et Y. NISHIKAWA, sp. nov.

(Figs. 1–3)

Length: 4.60–5.40 mm (from apical margin of clypeus to apices of elytra).

Closely similar to *T. masatakai* S. UENO (1983, p. 12, figs. 6–7; 1985 a, p. 75, pl. 14, fig. 16) in general appearance, but readily recognized on the absence of postangular pair of marginal setae on pronotum and preapical seta on each elytron. Besides, the pronotum is relatively long, and the elytra have more effaced shoulders, deeper striae and more widely distant dorsal pores. Decisively different from *T. masatakai* also in the configuration of aedeagal apical lobe, which is much longer and slenderer than in the latter species.

Colour as in *T. masatakai*, though the fore body is usually a little lighter. Head as in *T. masatakai*, though the antennae are somewhat shorter, usually reaching the middle of elytra in both ♂ and ♀, but only reaching basal four-ninths of elytra in certain females. Pronotum a little longer than in *T. masatakai*, widest at a level between two-thirds and five-sevenths from base, and a little more gradually narrowed posteriad than anteriorly; PW/HW 1.40–1.52 (M 1.46), PW/PL 1.05–1.11 (M 1.08), PW/PA 1.46–1.56 (M 1.53), PW/PB 1.38–1.51 (M 1.43); sides a little less strongly arcuate in front, a little less deeply sinuate at about basal fifth, and usually less divergent towards hind angles behind ante-basal situation; apex always slightly narrower than base. PB/PA

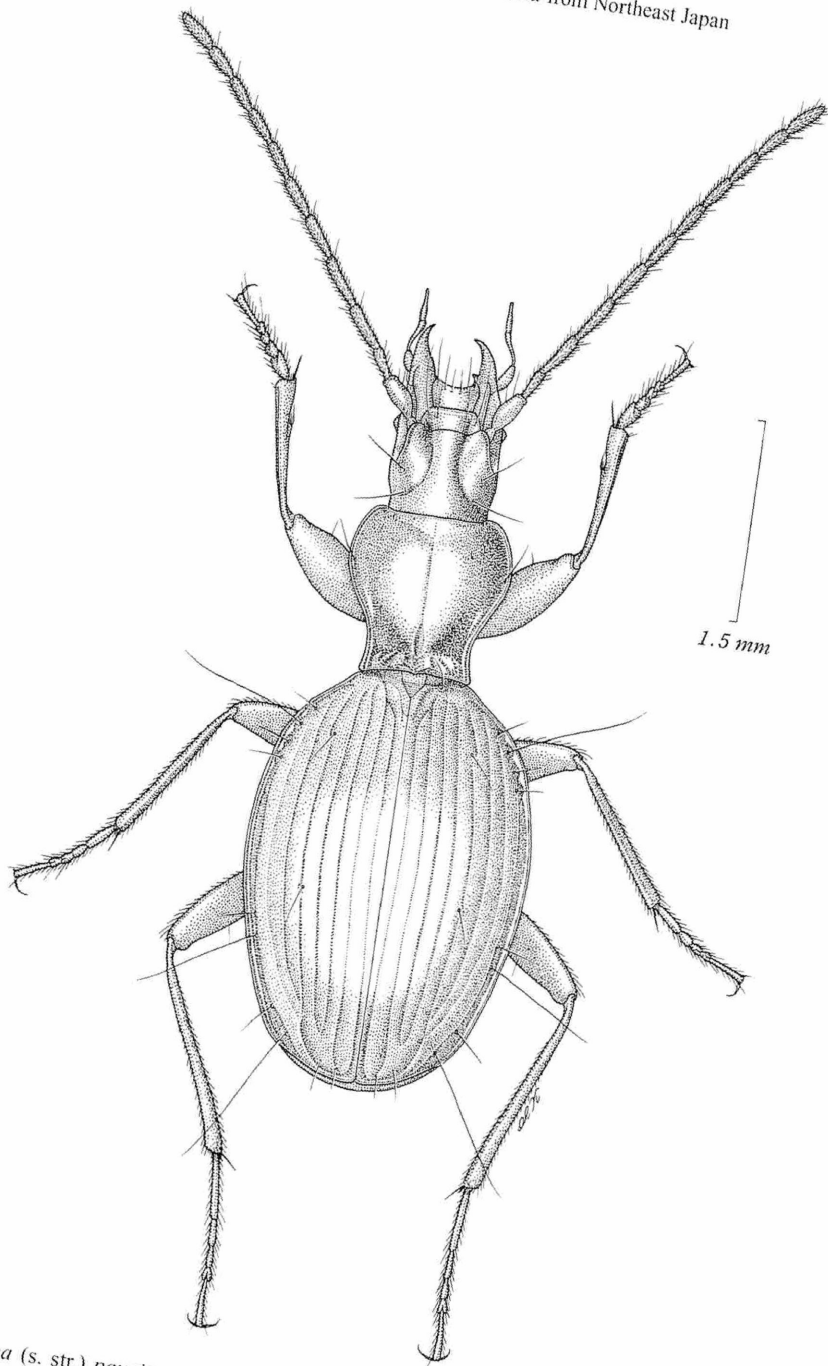
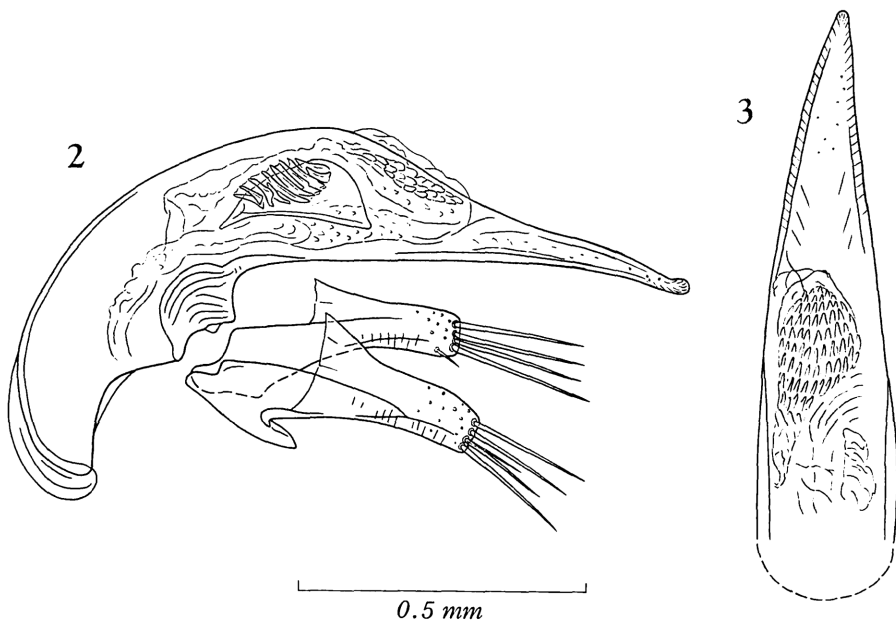


Fig. 1. *Trechiana* (s. str.) *paucisaeta* S. UENO et Y. NISHIKAWA, sp. nov., ♂, from Nagô of Moniwa in Iizaka-machi.

1.03–1.11 (M 1.07) [PA/PB 0.90–0.97 (M 0.94)]; front angles rounded and slightly produced forwards; hind angles sharp, postero-laterally protrudent, and devoid of postangular setae, though one of the male paratypes bears a postangular seta at the right side.

Elytra oval, more regularly convex than in *T. masatakai* though more or less depressed in basal areas, usually widest at about basal four-ninths, at least slightly before the middle, and a little more gradually narrowed towards apices than towards bases; EW/PW 1.71–1.77 (M 1.73), EL/EW 1.37–1.45 (M 1.42); shoulders more completely effaced than in *T. masatakai*, with more oblique prehumeral borders; sides rather widely reflexed, gently arcuate in front, less so behind middle, and almost conjointly rounded at apices, each with a very slight preapical emargination; striae entire, deeper than in *T. masatakai*, faintly crenulate; scutellar striole distinct, apical striole deep, joining stria 5 without appreciable sinuation; no setiferous dorsal pore on stria 3; stria 5 with two setiferous dorsal pores at 1/8–1/6 (usually at about 1/7) and 1/2–2/3 (usually at about 5/9) from base, respectively, the two pores being more widely spaced than in *T. masatakai*; preapical pore always absent. Legs somewhat stouter than in *T. masatakai*.

Male genital organ seemingly large and moderately sclerotized, though very long apical lobe is included in its length, similar in many respects to that of *T. masatakai*, but the apical lobe is much longer and much slenderer in dorsal view, the sagittal



Figs. 2–3. Male genitalia of *Trechiana* (s. str.) *paucisaeta* S. UENO et Y. NISHIKAWA, sp. nov., from Nagô of Moniwa in Iizaka-machi; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

aileron is large though narrow, the left proximal teeth-patch inside the inner sac is of different conformation, and the styles are much broader at the apical parts. Aedeagus about three-eighths as long as elytra, lightly depressed, not arcuate at middle though the basal part is elongate and strongly curved ventrad, with the dorsal margin semicircularly rounded before middle in profile; basal orifice large, with the sides deeply emarginate; sagittal aileron large but narrow, protruding ventrad; viewed dorsally, apical part very long, gradually tapered into narrow apical lobe, which is very slightly inclined to the left and indistinctly tuberculate at the extremity; viewed laterally, apical lobe narrow, gradually tapered apicad, very slightly curved ventrad in apical half, and slightly turned up at the tuberculate extremity; ventral margin nearly straight in profile except for the subapical portion. Inner sac armed with a thin copulatory piece about two-ninths as long as aedeagus and two patches of sclerotized teeth; copulatory piece similar to that of *T. masatakai* but the apex is simply pointed, not ventrally produced; left proximal teeth-patch formed by a somewhat irregular row of large lamellar teeth and obviously smaller than in *T. masatakai* as a whole; right apical teeth-patch horizontal and compact, thin in lateral view but widely rounded as a whole in dorsal view. Styles large, broad at the apical parts, left style being larger than the right, each usually bearing four apical setae, which are sometimes supplemented by a small or minute extra seta.

Type series. Holotype: ♂, allotype: ♀, 30-X-2000, Y. NISHIKAWA leg. Paratypes: 5♂♂, 2♀♀, 30-X-2000, Y. NISHIKAWA, J. KOBAYASHI & T. NODA leg.; 2♂♂, 1♀, 13-V-2001, S. UÉNO, J. KOBAYASHI & S. MORISHIGE leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Nagô, 330 m in altitude, of Moniwa in Iizaka-machi, Fukushima-shi, Fukushima Prefecture, northeastern Honshu, Northeast Japan.

Notes. This new species is doubtless closely related to *T. masatakai* of the Zaô Mountains, as is clearly demonstrated by the similarity of the male genitalia, which are identical in basic conformation between the two. However, it is decisively different from the Zaô species in the absence of the pronotal postangular and the elytral preapical setae as well as in the much longer and slenderer apical lobe of the aedeagus. Loss of both the setae specified above is seldom found in the members of the genus *Trechiana*, except in those of the *lavicola* subgroup (cf. UÉNO, 1960, 1972, 1989), and even loss of the preapical setae alone is exceptional, though it is one of the diagnostic features of the *tamaensis* subgroup (cf. UÉNO, 1981; UÉNO & SONE, 1994). As compared with the preapical setae on the elytra, the postangular setae on the pronotum are more frequently lost, and constantly so in the *oni* and *fujitai* complexes of the *oni* group (cf. UÉNO, 1985 b). Thus, *T. paucisaeta* can be recognized solely on the loss of the taxonomically important tactile setae on the pronotum and elytra, though reversion of the postangular or the preapical setae may rarely occur on one side as was pointed out in several species of the *tamaensis* and the *lavicola* subgroups. From *T. oopterus*, the present species can be readily discriminated by the loss of the two important setae and the differently shaped male genitalia, above all by the peculiarly modified aedeagal

apical lobe (cf. UENO, 1995, figs. 10–22 on p. 159).

The type habitat of this interesting species is located in a side gully on the left side of the main course of the Surikami-gawa River, about 1.3 km west by north of Nagô and only 500 m removed from the Miyagi border. A narrow stream flows down the gully shaded by deciduous broadleaved trees, exposing steep green tuff slopes on either bank at bends. Most of them are bare and consolidated, but there is a fairly large one on the left side whose foot is thickly covered with soil mingled with fist-sized tuffaceous gravel (cf. Fig. 4). It is this scree that is inhabited by the new trechine beetle. All the specimens known were dug out from the depth of 30–70 cm at the central part of the scree, where the upper hypogean zone was very humid being fed by a seepage. We have made extensive searches for anophthalmic trechines in this and nearby gullies, but have so far been unable to locate any other habitats of *T. paucisaeta*.

Trechiana (s. str.) *oopterus* S. UENO, 1995

Trechiana (s. str.) *oopterus* S. UENO, 1995, Mem. natn. Sci. Mus., Tokyo, (28), p. 154, figs. 7–9, 16; type locality: Togamimukai of Moniwa in Iizaka-machi.

Additional specimens examined. 3♂♂, 1♀, Nakatsu-gawa Valley, 330 m alt., Moniwa, Iizaka-machi, Fukushima-shi, 30–X–2000, Y. NISHIKAWA, T. SAITO, J. KOBAYASHI & S. MIZUNOYA leg.; 1♂, same locality, 14–V–2001, J. KOBAYASHI leg. (all NSMT).

Notes. As was noticed in the introduction of this paper, a second habitat of *T. oopterus* was discovered in last autumn at the northern side of the same ridge as the type habitat lies. It was a scree about 7 m wide lying in a side gully of the Nakatsu-gawa, a tributary of the Surikami-gawa River. What is peculiar is that the scree is formed about 8 m above the water of the stream flowing through the gully, and doubtless for this reason, it is subject to seasonal changes of the climate. When we revisited the place in this spring, the surface of the scree was completely dried up, forming a hard crust baked by the sun. However, the upper hypogean zone below was to such an extent protected by the crust as to keep its deepest part sufficiently humid for harbouring the anophthalmic trechine. All the five specimens of *T. oopterus* recorded above were found in this scree at a depth of 50–120 cm.

The two known habitats of *T. oopterus* are located near the zone where the lapilli tuff formation of Neocene origin meets the granite body of Cretaceous origin. Judging from geological and topographical evidences, occurrence of this trechine beetle seems to be confined to a small lapilli tuff area at the northeastern end of the Nanatsumori Ridge, which is surrounded by the Surikami-gawa River, two of its tributaries, the Karasu-gawa and the Nakatsu-gawa, and the large granite body. It is possible that in

Figs. 4–5. Habitat of *Trechiana* (s. str.) *paucisaeta* S. UENO et Y. NISHIKAWA, sp. nov., at Nagô of Moniwa. — 4. Scree deposited at the foot of a steep slope of green tuff. — 5. Close-up of the central portion of the above picture, showing the beginning of excavation. Photo S.-I. UENO.



former times, the distributional range of the beetle may have extended southeastwards beyond the Karasu-gawa Valley, since the same lapilli tuff formation extends in that direction. However, the hilly area on the right side of the Karasu-gawa has been completely destroyed by the quarrying of stone blocks for constructing the large dam.

It is to be regretted that the type habitat of *T. oopterus* will be submerged in the reservoir within a few years, but the trechine species can survive somewhere in the small lapilli tuff area specified above, even though it is not easy to locate its precise habitats due to paucity of favourable taluses or colluvia.

要 約

上野俊一・西川喜朗：東北地方で見つかったナガチビゴミムシ属の1新危急種。——福島県の北西端、福島市飯坂町茂庭名号の摺上川ダム建設予定地の近傍で発見された、ナガチビゴミムシ属の1盲目種を新種と認め、モニワメクラチビゴミムシ *Trechiana* (s. str.) *paucisaeta* S. UENO et Y. NISHIKAWA という新名を与えて記載した。この新種は、摺上川の対岸で発見され、絶滅危惧種として環境省版のレッド・データ・ブックに登録されている、スリカミメクラチビゴミムシ *T. oopterus* S. UENO に体形が酷似しているが、雄交尾器の形状からみて、系統がやや異なるザオウメクラチビゴミムシ *T. masatakai* S. UENO に近縁のものと考えられる。それほど広くない川を挟んで別種のチビゴミムシが生息していること自体が希有の例だが、そのいずれもが絶滅の危惧される状態にあるのはさらに驚くべきことである。ただし、モニワメクラチビゴミムシのすんでいる地下浅層は、スリカミメクラチビゴミムシの基準産地に比べると湛水予定面からの比高が大きいので、斜面の上部をおおう樹林が保全され、地下環境の湿度が飽和状態に保たれれば、種の存続の保証される可能性が高い。

References

- UENO, S.-I., 1960. A new blind trechid found in a lava cave of Japan. *Mem. Coll. Sci. Univ. Kyoto*, (B), **27**: 49–58.
- 1972. A new anophthalmic *Trechiana* (Coleoptera, Trechinae) found in an old mine of the Izu Peninsula, Central Japan. *Annotnes. zool. japon., Tokyo*, **45**: 111–117.
- 1981. *Trechiana tamaensis* (Coleoptera, Trechinae) and its close relatives. *Mem. natn. Sci. Mus., Tokyo*, (14): 117–132.
- 1983. New anophthalmic *Trechiana* (Coleoptera, Trechinae) from the upper hypogean zone of Northeast Japan. *J. speleol. Soc. Japan*, **8**: 7–17.
- 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.
- 1989. A new anophthalmic *Trechiana* (Coleoptera, Trechinae) from near the tip of the Izu Peninsula, Central Japan. *J. speleol. Soc. Japan*, **14**: 23–27.
- 1995. The anophthalmic *Trechiana* (Coleoptera, Trechinae) from the Nunobiki Hills and their surrounding areas. *Mem. natn. Sci. Mus., Tokyo*, (28): 147–163.
- & S. SONE, 1994. New anophthalmic trechines of the *Trechiana tamaensis* complex (Coleoptera, Trechinae). *Elytra, Tokyo*, **22**: 207–213.