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Occurrence of a New Oculate *Trechiama* (Coleoptera, Trechinae) on the Abukuma Hills in Eastern Honshu, Japan[1)]

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Abstract A new oculate species of the trechine genus *Trechiama* is described from a sink near the highest point of the Abukuma Hills in eastern Honshu, Central Japan. It belongs to the *nivalis* complex of the group of *T. oreas*, and is considered to be a relict of a past dispersal of the species-group. The new name given is *Trechiama abcuma* sp. nov.

The old hills called the Abukumas, which stretch for about 200 km along the Pacific coast of eastern Honshu, are not rich in the trechine fauna, though various interesting beetles have been recorded from the range, in particular from its eastern side. Only one upper hypogean species, *Kurasawatrechus zenbai* S. UÉNO (1990, p. 176, figs. 1–2), has been added to our knowledge, since two cave-dwelling species were first recorded from the range nearly twenty years ago (cf. UÉNO, 1974).

Late in the summer of 1990, the annual meeting of the three major speleological groups of Japan was held at Takiné-machi at the central part of the Abukuma Hills. The main purpose of this meeting was to explore the Abukuma-dô cave system, which was formerly known as three different caves, Oni-ana, Ohtakiné-dô and Abukuma-dô, but was later found to be a complex of caves connected with one another by squeezes and narrow shafts.

On the first day of the exploration, a trechine beetle, unfortunately a female, was obtained by Tadaaki YANAGISAWA in a room at the uppermost part of the Ohtakiné-dô section. This was most unexpected, since the cave had repeatedly been examined by biospeologists and never yielded trechines before. Later examination proved it to be a member of the *nivalis* complex of the group of *Trechiama oreas*, which had theretofore been unknown from the Abukumas. It was, however, impossible to determine its true identity, because all the five species of the *nivalis* complex described up to that time are extremely similar to one another in external morphology and can be confidently classified only by diagnostic characters of male genitalia (cf. UÉNO, 1986, 1989).

The room in which the trechine specimen was collected is one of the most deserted parts of the whole cave system. On rainy days, however, it is fed by a narrow stream coming down from the bottom of a large sink thickly covered with trees. It was

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therefore surmised that the original habitat of the trechine beetle might be somewhere in that sink, and that the specimen in question had been carried down into the cave by a flood after a heavy rain. Thus, our searches were concentrated on that part of the karstic area. Needless to say, the cave itself was also repeatedly examined both by naked eyes and by trappings. Nevertheless, our efforts were repaid only after two years; a second specimen, male, was at last found out in July of this year from beneath a very large stone embedded at the side of the stream just outside the entrance to Ohtakiné-dô, or at the deepest point of the sink.

An examination of its genitalia has proved beyond all doubt that the trechine is an isolated new species of the *nivalis* complex. In view of the zoogeographical importance of the discovery, I am going to describe it in the present paper under the name of *Trechiama abcuma*. This specific name is a Latinized variant of Abukuma and seems most appropriate to the new species, since its type locality not only lies in the Abukuma-dô cave system but is situated at the centre of the Abukuma Hills. The abbreviations used herein are the same as those explained in previous papers of mine.

Before going further, I wish to express my deep indebtedness to Mr. & Mrs. Shinzaburo SONE, and Messrs. Hirohisa KIZAKI, Sumao KASAHARA and Tadaaki YANAGISAWA for giving me the opportunity to report on this important discovery. But for the indefatigable searches made by SONE and KIZAKI, the male of this rare species could never have been brought to light.

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

(Figs. 1–3)

Length: 5.20–5.25 mm (from apical margin of clypeus to apices of elytra).

Belonging to the *nivalis* complex of the group of *T. oreas* and externally similar to *T. kurosawai* S. UÉNO (1986, p. 140, figs. 8–10) of the Azuma Mountains, only differing from the latter in the broader base of pronotum and the more elongate elytra. It is, however, evidently different from *T. kurosawai*, and from all the other described forms of the same species-complex, in the configuration of male genitalia, as will be described later.

Colour as in *T. kurosawai*, dark reddish brown with more or less lighter appendages. Head identical with that of *T. kurosawai*; genae about three-fourths as long as eyes; antennae reaching basal two-fifths of elytra in ♂, basal three-eighths of elytra in ♀. Pronotum also similar to that of *T. kurosawai*, but a little more strongly contracted at apex and less strongly so at base, with more strongly arcuate sides, which are most widely distant at about four-sevenths and deeply sinuate at about one-eighth from base respectively. Elytra more elongate than in *T. kurosawai*, with more effaced shoulders, more pointed apices, and obviously deeper striae, but otherwise similar to the latter; stria 3 with three setiferous dorsal pores at about 1/8, 1/3 and 5/8 from base respectively, stria 5 with a single setiferous dorsal pore at about basal 1/8. Legs as in *T. kurosawai*. Standard ratios of body parts: PW/HW 1.42 in the holotype (H),

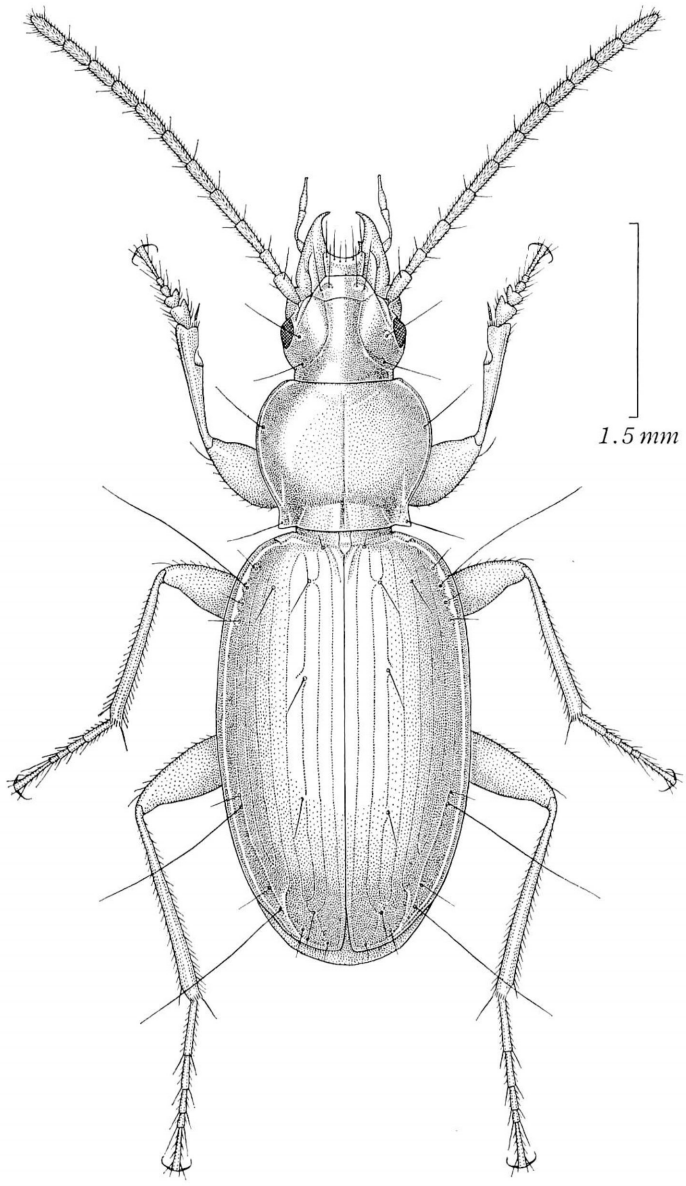
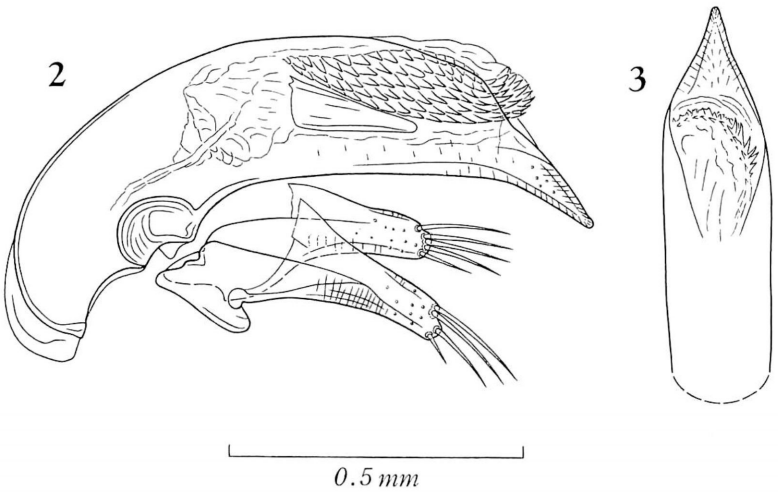


Fig. 1. *Trechiama* (s. str.) *abcuma* S. UÉNO, sp. nov., ♂, from the entrance to Ohtakiné-dô Cave at the bottom of Oni-ana Sink.

1.41 in the allotype (A), PW/PL 1.19 in H, 1.18 in A, PW/PA 1.62 in H, 1.54 in A, PW/PB 1.35 in H, 1.36 in A, PB/PA 1.20 in H, 1.14 in A, EW/PW 1.45 in H, 1.44 in A, EL/EW 1.62 in H, 1.61 in A.



Figs. 2–3. Male genitalia of *Trechiama* (s. str.) *abcuma* S. UÉNO, sp. nov., from the entrance to Ohtakiné-dô Cave at the bottom of Oni-ana Sink; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

Male genital organ closer to those of *T. akinobui* S. UÉNO (1986, p. 137, figs. 5–7) than to those of *T. kurosawai*, particularly in the conformation of inner armature, though the aedeagal tube itself is something intermediate between the two. Aedeagus small though moderately sclerotized, about three-tenths as long as elytra, short, compressed, hardly arcuate at middle though the dorsal margin is semicircularly rounded from base to apex in lateral view, and nearly parallel-sided in dorsal view, with fairly large basal part and narrowly produced apical lobe; basal part gently curved ventrad, shallowly emarginate at the sides of basal orifice, and with fairly large sagittal aileron; viewed dorsally, apical lobe broad at the base, rapidly narrowed apicad, and produced into a narrow distal part which is blunt at the extremity; viewed laterally, apical lobe narrow, moderately curved ventrad, and rather pointed at the extremity; ventral margin hardly emarginate at middle in profile. Inner sac armed with a relatively small copulatory piece and a large dorsal patch of heavily sclerotized teeth; copulatory piece elongated subtriangular, about two-ninths as long as aedeagus, somewhat spatulate, and blunt at the apex; teeth-patch about three-sevenths as long as aedeagus, much larger than copulatory piece, longitudinally extending above the latter to apical orifice, and irregularly spatulate as a whole. Styles broad, left style longer but not broader than the right; in the holotype, the left style bears four apical setae, the ventralmost one of which is much smaller than the others, while the right one bears five short setae at the apex.

Type series. Holotype: ♂, entrance to Ohtakiné-dô Cave, 26–VII–1992, S. & N. SONE and H. KIZAKI leg. Allotype: ♀, Ohtakiné-dô Cave, 25–VIII–1990, T. YANA-

GISAWA leg. Both deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Entrance part of the limestone cave called Ohtakiné-dô, at the bottom of Oni-ana Sink, 630 m in altitude, on Sendaihira of Tokiwa-machi in Fukushima Prefecture, eastern Honshu, Central Japan.

Notes. It is difficult to determine to which of the previously described species *T. abcuma* is most closely related. Its type locality is geographically nearest to that of *T. kurosawai*, about 57 km distant to the southeast from the latter. They are, however, widely separated from each other by the alluvium of the Abukuma-gawa River, and are also different in the nature of the mountains, the former lying on old non-volcanic hills and the latter on recent volcanoes.

The aedeagal structure of *T. abcuma* suggests that the species may be related more closely to *T. akinobui* than to *T. kurosawai*; if this is actually the case, we shall confront a very difficult problem to solve. *Trechiama akinobui* is localized on recent volcanoes in the vicinities of the Ozegahara Moor, which is not only distant for more than 130 km to the west-southwest from the Abukuma-dô Caves, but is beyond the Abukuma-gawa Alluvium, the Nasu Volcanoes and the Taishaku Mountains. No trechines of the group of *Trechiama oreas* have been found on these intervening mountains, and the derivation of *T. akinobui* has been sought in the north (cf. UÉNO, 1986, p. 139), not in the east. In any case, *T. abcuma* must be a relict of a past dispersal of the *nivalis* complex, which must have widely spread over the Abukumas at some time in the Pleistocene but survives now as a small isolated colony in a wet depression near the highest point of the hills.

The Abukuma-dô cave system lies under the karstic ridge called Sendaihira stretching on the borders between Takiné-machi and Tokiwa-machi. It is situated at the western side of Mt. Ohtakiné-yama, 1,192 m in height, which is the highest point of the Abukuma Hills. The large sink called Oni-ana lies at the eastern side of the ridge, 4.8 km west-southwest of the top of Mt. Ohtakiné-yama, and is thickly covered with a mixed temperate forest, the floor of which is always humid. A narrow stream emerges at the eastern side of the sink, flows down across it, and enters into the cave from the Ohtakiné-dô entrance. It is the colluvia deposited along this stream that seem to harbour *T. abcuma*. As was already described in the introduction of this paper, the holotype of the trechine beetle was found from beneath a large embedded stone at the bottom of the sink, while the allotype was found from under a stone in the uppermost room of the cave not far from the entrance. The surface portion of the stream is by no means long, and still more, favourable colluvia have been formed only along its lowest part. This seems to mean that the habitat of the trechine beetle is much restricted even within the forested sink, and it may be the reason why the trechine beetle is exceedingly rare.

要　約

上野俊一：阿武隈山地における有眼ナガチビゴミムシの発見．―― 阿武隈山地の最高点，大滝根山の西側に位置する鬼穴ドリーネの底から，ナガチビゴミムシ属の有眼の1新種を記載し，これにアブクマナガチビゴミムシ *Trechiama abcuma* S. UÉNO という新名を与えた．この種は，イワキナガチビゴミムシ種群のイイデナガチビゴミムシ系列に属するが，既知の5種からやや孤立し，過去の分布模様の片鱗を示す遺存的なものだろうと考えられる．

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新　刊　紹　介

The Biogeography of Ground Beetles of Mountains and Islands. Ed. by G. R. NOONAN, G. E. BALL & N. E. STORK. vii＋256 pp. 1992. Intercept, Andover.

1988年7月，カナダのヴァンクーバー市で開催された第18回国際昆虫学会議の会期中に，6～7の両日にわたって，ゴミムシ類の生物地理に関するシンポジウムが開かれた．その5年前に亡くなった P. J. DARLINGTON, JR. の功績を記念したもので，主題は「山地性および島嶼性ゴミムシ類の生物地理」，ただし，孤立した高山は一種の島だとも考えられるし，ハンミョウ類の生息する砂地も生態的な島だといえなくもないので，結局のところは，島嶼の生物地理学をテーマにしたものだった．

このシンポジウムに招かれた 11 題の報告に，シベリア南部の高山性ゴミムシ相に関する論文1篇を加えて1冊にまとめたのが本書である．9ヵ国の研究者が，さまざまな地域のゴミムシ類を対象にして，さまざまな角度から検討を加えているので，どの論文を取りあげてもそれなりにおもしろいが，オーストラリア北部の山地が豊富なゴミムシ相を維持し，多くの種を分化させたとする M. BAEHR の解析や，*Mecyclothorax* がタヒチの山地で，信じられないほど多様な種分化を起こしていることを明らかにした G. G. PERRAULT の報告などはとくに興味深い．

ゴミムシ類を題材にした書物は，ここ 10 年あまりのあいだになん冊も出版され，研究の現状と進展を知るのに大きく貢献してきたが，本書もまたゴミムシ類に関する話題をゆたかにすることだろう．

（上野俊一）