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A New Trechine Beetle of the *Epaphiopsis*
Complex from Korea¹⁾

With 3 Text-figures

Shun-Ichi UÉNO

Department of Zoology, National Science Museum (Nat. Hist.),
Shinjuku, Tokyo 160, Japan

ABSTRACT A new species of scotophilous trechine beetle belonging to a new genus of the *Epaphiopsis* complex is described from Mt. Odae-san that stands at the central part of the Korean Peninsula. It is characterized mainly by the pedunculate structure of pronotal base, very coarsely punctate and piliferous elytral striae, the complete absence of the internal series of setiferous dorsal pores on elytra, and the presence of a long copulatory piece embraced by a compact mat of sclerotized scales. A new name, *Ushijimaella pilosistriata* is given to this interesting species.

Dealing with the members of *Epaphiama*, one of the subgenera of the trechine genus *Epaphiopsis*, I made the remark that "certain *Epaphiopsis* . . . should also occur there [southeastern Manchuria and the Korean Peninsula]" and that "it is of deep interest to find what kind of *Epaphiopsis* is distributed in Korea, since it may prove of considerable importance for an analysis of the past dispersal of this group of trechine beetles" (Uéno, 1978, p. 144). Now, my expectation is fulfilled by the exertions of Mr. Koichiro Ushijima, though in a most unexpected way.

In the summer of 1979, Mr. Ushijima made a collecting trip to South Korea. Although his activities were subject to restrictions and confined in several particular areas, he was able to find out a good habitat of a microphthalmic trechine beetle at the southeastern foot of Mt. Odae-san, one of the forested mountains of the Taebaeg Range that stretches from northwest to southeast along the eastern side of the central part of the Korean Peninsula. He later submitted his collection to me for taxonomic study.

It needed only a glance at his specimens to reveal that the trechine was a long-awaited Korean representative of the *Epaphiopsis* complex. Much to my surprise, however, I found the beetle to belong neither to the subgenus *Epaphiama* theretofore

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known from the southern part of the Soviet Far East and southwestern Hokkaido, nor to the subgenera *Pseudepaphius* and *Epaphiopsis* (s. str.) spread in Southwest Japan. In short, it did not fall in any of the taxa previously described in the *Epaphiopsis* complex, and furthermore, it could be regarded as constituting a new genus equivalent to *Epaphiopsis* (s. lat.) and *Tienmutrechus*, seeing that some of the peculiarities exhibited by the species were so outstanding as to be considered subgeneric.

It is the purpose of the present article to introduce the interesting Korean species into science and to clarify its systematic status. The abbreviations used herein are the same as those explained elsewhere in my previous papers.

Genus *Ushijimaella* S. Uéno, nov.

Type-species: *Ushijimaella pilosistriata* S. Uéno, sp. nov.

Related to *Epaphiopsis* S. Uéno (1953, p. 32, 1962, p. 42), but the prothoracic base is distinctly pedunculate, the elytral striae (*not* intervals) bear longitudinal rows of fairly long hairs, the setiferous dorsal pores are absent altogether on the third elytral stria, and the inner sac of the male genitalia contains a long sagittate copulatory piece embraced by a compact mat of sclerotized scales.

Body well convex on dorsum, constricted between prothorax and hind body, more or less pubescent on both the dorsal and ventral surfaces except for head, and devoid of inner wings. Microsculpture degenerated throughout though still perceptible here and there. Colour brown.

Head small, transverse, with entire frontal furrows not angulate at middle; eyes flat though perfectly faceted; genae tumid and covered with fairly long hairs; two pair of supraorbital pores present on lines subparallel to each other. Labrum transverse, with the apex deeply emarginate. Mandibles fairly stout though sharply hooked at apices; right mandible sharply tridentate, while the left is bidentate. Mentum free, with the tooth in apical emargination broad, either simple or truncated at the tip; submentum sexsetose; ligula roundly produced, octosetose as usual. Palpi fairly stout, very sparsely covered with vestige of microscopic pubescence; penultimate segments widely dilated towards apices, quadrisetose in labial palpus and asetose in maxillary palpus; apical segments long subconical. Antennae subfiliform, fairly stout.

Pronotum cordate and convex, with pedunculate base; surface sparsely covered with fairly long, recurved hairs; sides bordered throughout and strongly arcuate, with denticulate hind angles and two pair of marginal setae, the posterior one of which is on the denticle; basal transverse impression continuous though irregular; basal foveae small but deep.

Elytra oval and convex; shoulders rounded off, with humeral borders arcuate and complete to the base of stria 4; sides widely reflexed at middle; striae deeply impressed on the disc, becoming shallower or nearly obsolete at the side, very coarsely punctate especially on the disc, each puncture bearing a fairly long, recurved

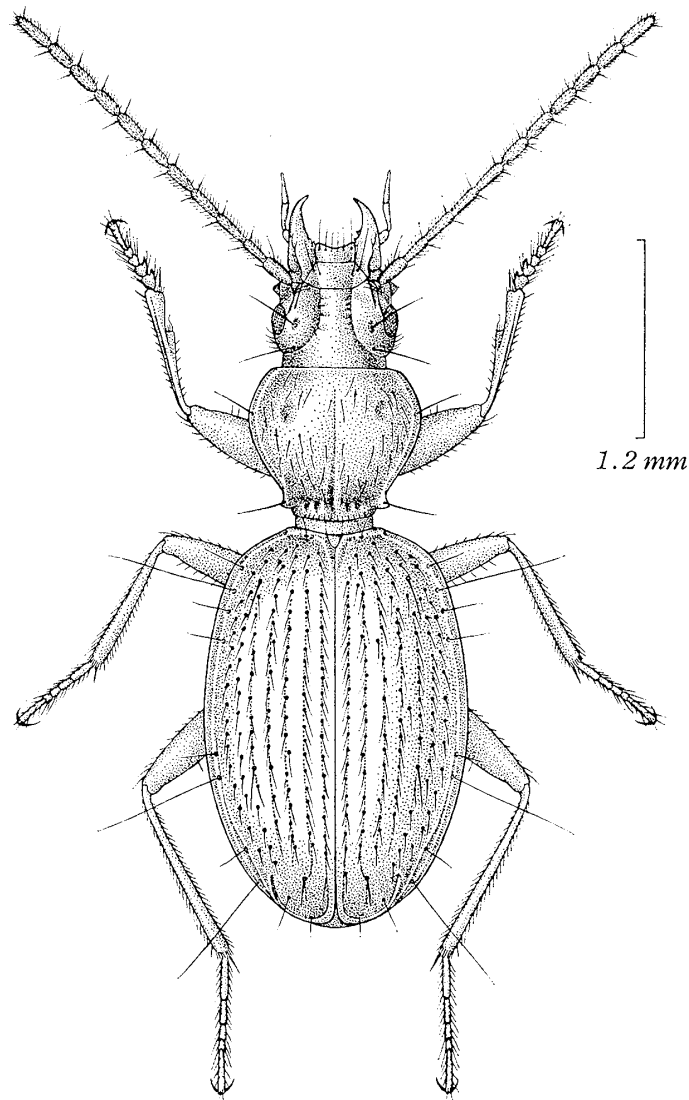


Fig. 1. *Ushijimaella pilosistriata* S. Uéno, gen et sp. nov., ♂, from Weoljeongsa at the foot of Mt. Odae-san.

hair; stria 8 impunctate throughout, becoming deeper behind the middle group of marginal umbilicate pores; scutellar striole fairly long and deep, impunctate; apical striole short but deeply impressed, usually free at the anterior end though directed to stria 5; two setiferous dorsal pores present on stria 5 but none on stria 3; preapical pore situated at the apical anastomosis of striae 2 and 3 at about or a little before the level of the terminus of apical striole and evidently more distant from apex than from suture; apical pores normal; marginal umbilicate pores regular and aggregated, the four pores of the humeral set being ranged equidistantly.

Ventral surface sparsely pubescent; sternites 3–5 each with a pair of ordinary setae; anal sternite with a pair of setae in ♂, two pair of them in ♀. Legs fairly

long though not so slender; protibiae straight, gently dilated towards apices, and glabrous on the anterior face even at the apical portion, each with a longitudinal groove on the external face, which is shallow and becomes obsolete towards apex; tarsi fairly slender, segments 1 and 2 in ♂ protarsus widely dilated, stoutly produced inwards at apices, and furnished beneath with sexual adhesive appendages.

Aedeagus small and moderately arcuate, with large bulbous basal part devoid of sagittal aileron; lateral sides of basal orifice not emarginate; apical lobe flat and reflexed; inner sac covered with a compact mat of sclerotized scales, which is spatulate as a whole with the convex face towards the right wall of aedeagus and embraces on the left side an elongate sagittate copulatory piece. Styles short and broad, left style only slightly longer than the right and devoid of ventral projection, each bearing four setae at apex.

Range. Known so far only from the central part of Korea.

Notes. Though considerably differing in facies, the present new genus no doubt belongs to the *Epaphiopsis* complex, in view of the fact that it is identical with the previously known genera of the genus-group in such fundamental features as the buccal structure, the arrangement of the marginal umbilicate pores on elytra and the conformation of protibiae. What makes *Ushijimaella* unique is the strange articulation of the prothorax with the mesothorax and the peculiar disposition of hairs on the elytral striae. The presence of a long sagittate copulatory piece is also characteristic of this genus, though certain *Epaphiopsis* bear sclerites in the inner sac of their male genitalia (cf. Uéno, 1960, pp. 55–56, fig. 8).

Of special interest and importance is the mode of hairs on the elytra. In many trechines whose elytra are pubescent, the fine short hairs are either scattered on the intervals or ranged in a single longitudinal row down the middle of each interval. In *Ushijimaella*, however, the hairs are unusually long and stout, arising from very coarse punctures longitudinally ranged in each elytral stria. The punctures are of the same size as the setiferous dorsal pores, so that the latter could not be recognized were it not for the decisive difference in length between the ordinary dorsal setae and the numerous hairs in the striae. This reminds us of the exceeding multiplication of setiferous dorsal pores in *Tienmutrechus dispersipunctis*. Though two pair of differentiated dorsal setae exist in *Ushijimaella*, the numerous hairs in the elytral striae may also be considered to represent a very primitive condition of tactile setae, from which the *Tienmutrechus* type, and then the *Epaphiopsis* type, have been derived. At present, it is difficult to verify this supposition, but the Korean trechine can be regarded at least as an archaic form within the genus-group.

As I already pointed out (Uéno, 1978, pp. 144–145), the trechine beetles of the *Epaphiopsis* complex seem to have originated in the Chinese Continent and radiated from there. They exhibit various degrees of differentiation, *Tienmutrechus* being the most primitive and *Epaphiama* the most advanced, and the evolutionary gradation is apparent according to genera and subgenera. *Ushijimaella* is exceptional in this respect; it possesses advanced characters alongside with archaic ones. The indubi-

table examples of the former are the absence of the internal series of setiferous dorsal pores and the fixation of the preapical pore on the apical anastomosis of the second and third elytral striae. The pedunculate prothoracic base may also be considered advanced, though I am not confident of this point. It can be surmised that *Ushijimaella* had colonized in Korea long before the dispersal of more advanced forms took place, underwent its own specialization in an isolated condition, and survives until to-day in a limited area of the peninsular country.

Ushijimaella pilosistriata S. Uéno, sp. nov.

(Figs. 1-3)

Length: 3.60-4.15 mm (from apical margin of clypeus to apices of elytra).

A medium-sized species of rather elongate body-form, with unusually constricted articulation between prothorax and mesothorax. Colour brown, more or less reddish, shiny, and faintly iridescent, especially on elytra; palpi, apical segments of antennae, ventral surface of hind body, and legs more or less lighter than the rest of body.

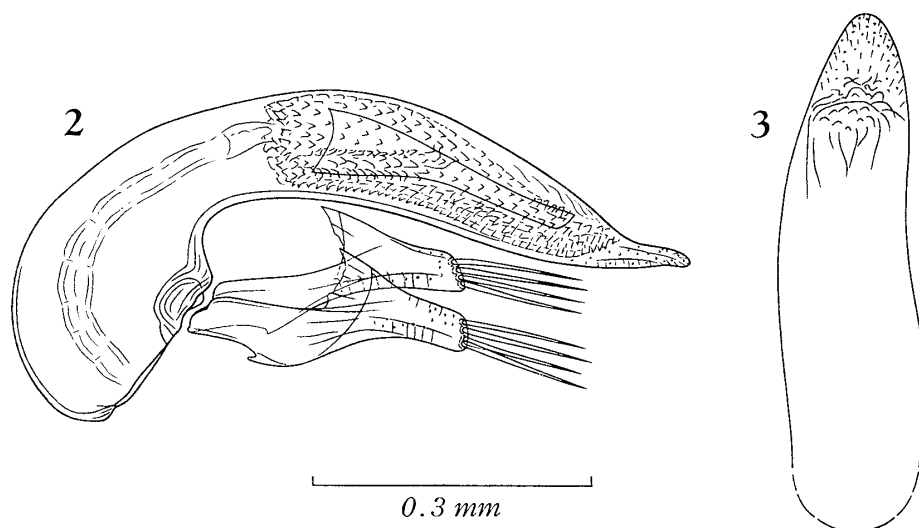
Head small, transverse, and depressed above, though both the frons and supra-orbital areas are gently convex; frontal furrows deeply impressed throughout, rather weakly divergent anteriorly but widely so posteriorly towards neck constriction; microsculpture mostly composed of wide polygonal meshes, which are clearly visible only on frons and the posterior part of vertex; eyes small and flat, though rather variable both in size and in convexity; genae convex, five-ninths to five-sixths as long as eyes according to the size of the latter, and strongly contracted behind to distinct neck constriction; neck wide; antennae fairly stout, reaching or nearly reaching basal one-third of elytra, with segment 2 about three-fourths as long as segment 3, which is slightly longer than segment 4, segments 8-10 each cylindrical and fully twice as long as wide, terminal segment the longest though evidently narrower than scape.

Pronotum cordate, much wider than head, wider than long, widest at about two-thirds from base, and strongly contracted behind; PW/HW 1.34-1.45 (M 1.38), PW/PL 1.12-1.20 (M 1.16), PW/PA 1.46-1.56 (M 1.50), PW/PB²⁾ 1.53-1.69 (M 1.61); sides strongly arcuate, more strongly so in front than behind, and briefly but deeply sinuate just before hind angles (or at a level between one-seventh and one-sixth from base); apex either straight or slightly arcuate, more or less wider than the distance between postangular denticles and much wider than pedunculate base, with front angles obtuse and rounded, PA/PB 1.02-1.14 (M 1.07); base arcuate, its sides sinking under hind angles which are denticulate, produced laterad and have arcuate posterior margins; surface convex, with a shallow but distinct foveole on each side at the level of anterior lateral seta; median line clearly impressed, widening and deepening near base; apical transverse impression not defined, though the apical area is more or

2) The PB value was taken on the distance between the postangular denticles, since it is difficult to measure the accurate width of the pedunculate base.

less uneven; basal transverse impression distinct, with deep foveoles, basal foveae small but deep; postangular carinae very obtuse; basal area narrow, longitudinally strigose; microsculpture formed by fine transverse lines though mostly evanescent.

Elytra oval, much wider than pronotum, widest at about middle and equally contracted in front and behind; EW/PW 1.46–1.60 (M 1.53), EL/EW 1.43–1.53 (M 1.48); surface convex though somewhat depressed on the disc; microsculpture practically absent, though vestige of fine transverse lines is partially perceptible; shoulders rounded, with prehumeral borders moderately oblique at the innermost portions; sides feebly arcuate at middle and almost conjointly rounded at apices, which form a small re-entrant angle; preapical emargination very slight; striation as described under the genus; intervals smooth, slightly convex near suture but flat at the side; apical carina distinct though short and obtuse; stria 5 with two setiferous dorsal pores at $1/9-1/7$ and $4/7-5/8$ from base respectively.



Figs. 2–3. Male genitalia of *Ushijimaella pilosistriata* S. Uéno, gen. et sp. nov., from Weol-jeongsa at the foot of Mt. Odae-san; left lateral view (2), and apical part of aedeagus, dorsal view (3).

Male genital organ small and lightly sclerotized. Aedeagus about three-tenths as long as elytra, moderately arcuate and gently twisted, with large basal part moderately curved ventrad; basal orifice rather small and with straight sides; viewed laterally, apical lobe reflexed, narrowly produced, and slightly curved ventrad at the blunt extremity; viewed dorsally, apical lobe wide, narrowly rounded at the tip; ventral margin lightly emarginate at middle but convex before apex. Copulatory piece long and slender, sagittate, with the tip angulate at the right dorsal corner.

Type-series. Holotype: ♂, allotype: ♀, 15–VIII–1979, K. Ushijima leg. Paratypes: 18 ♂♂, 22 ♀♀,³⁾ 15–16–VIII–1979, K. Ushijima leg. All deposited

3) Of these 40 specimens of the paratypes, 23 (6 ♂♂, 17 ♀♀) are more or less teneral.

in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Type-locality. Weoljeongsa, 650 m in altitude, at the southeastern foot of Mt. Odae-san, in Jinbu-myeon of Kangweon-do, at the eastern side of Central Korea.

Notes. According to Mr. Ushijima, the collector, all the known specimens of this new trechine were found at the entrance to a prospecting adit excavated near the road leading from Weoljeongsa to Sangweonsa. It lies on the right side of the upper stream of the Han-gang River, which rises on the eastern slope of Mt. Odae-san. The mountain is not so high, only attaining to a height of 1,563 m at the highest point, but being a sanctuary of famous temples, it is exceptionally well forested, mainly with coniferous trees. The spot where the adit opens is in a scrub of deciduous broadleaved trees.

The entrance to the adit was dim and very humid, as it lay under the shade of the thicket. A mass of earth mingled with rock debris had been thrown in to build a bank, which dammed up the underground water and formed a pool in the adit. It was this bank that harboured the trechine beetles, together with millipeds and salamanders. They were found from under stones or in fissures of clods of earth, and readily took refuge into the ground when exposed.

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