

## Two New *Epaphiopsis* (Coleoptera, Trechinae) from Taiwan<sup>1)</sup>

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**Abstract** Two new species of the trechine genus *Epaphiopsis* are described from near the two ends of the high mountain ranges of the Island of Taiwan. Both belong to the *multipunctata* group of the subgenus *Formosiellus*; one of them, from the northernmost known locality and named *E. (F.) constricta*, is related to *E. elegans*, while the other, from the southernmost locality and named *E. (F.) notos*, to *E. yushana*. A new locality of *E. (F.) yushana* S. UÉNO is also recorded.

Since the Taiwanese species of *Epaphiopsis* then known were enumerated (UÉNO, 1989), new materials of this group of mesophilous trechine beetles have been rapidly accumulated from various parts of the island. We now know of the existence of *Epaphiopsis* at more than ten additional localities, some of which are remote from those previously recorded. Many of the specimens newly collected belong to the group of *E. formosana*, which does not show very intensive speciation, but the collection also contains distinctive new species belonging to the group of *E. multipunctata*.

In the present paper, I am going to describe two new species of the latter group in view of zoogeographical importance of introducing them into science, one from the northern periphery of the distributional range of the subgenus *Formosiellus* and the other from the southernmost known locality of the same group. For facilitating numerical comparison with the latter, a second specimen of *E. yushana* S. UÉNO will be recorded with its standard ratios. The abbreviations used are the same as those explained in my 1989 paper (p. 106).

In preparing this report, I am much indebted to the following members of the 1990 and 1991 expeditions to Taiwanese high mountains, to all of whom my hearty thanks are due: Professors Yau-I CHU, Jun-ichi AOKI and Yoshiaki NISHIKAWA, Messrs. Chiun-Cheng KO and Kun Fu SHIH, and Ms. Akiko SAITO.

*Epaphiopsis (Formosiellus) constricta* S. UÉNO, sp. nov.

(Figs. 1–3)

Length: 3.90–4.05 mm (from apical margin of clypeus to apices of elytra).

Belonging to the *multipunctata* group and probably related to *E. elegans* S. UÉNO

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(1989, pp. 110, 116, figs. 6–8) of Mt. Hsüeh Shan, but recognized at a glance on its peculiar facies remarkably constricted between prothorax and hind body.

Colour dark brown, very shiny and slightly iridescent on elytra, whose basal areas and lateral margins are reddish brown; palpi, apical halves of antennae, ventral surface, and legs reddish brown, more or less lighter than dorsum.

Head small and relatively long though still wider than long, depressed above; frontal furrows deep throughout, rather close to each other at middle, and moderately divergent in front and behind; frons and supraorbital areas moderately convex; microsculpture largely obliterated, though consisting of wide polygonal meshes; supraorbital pores lying on lines divergent posteriorly, the anterior one being foveolate; eyes small and flat; genae either slightly convex or nearly straight, not tumid, five-ninths to three-fifths as long as eyes, and completely glabrous; neck fairly wide, with the anterior constriction distinct at the sides; mentum tooth either truncated or slightly emarginate at the tip; palpi short, with subulate apical segments; antennae relatively slender, almost reaching apical third of elytra, segment 2 about four-fifths as long as segment 3, which is slightly longer than segment 4 or 5, segments 7–10 each subcylindrical and more than twice as long as wide, terminal segment a little longer but much narrower than scape, about four-fifths as wide as the latter, and about three times as long as wide.

Pronotum cordate, wider than head, a little wider than long, widest at about five-eighths from base, and strongly contracted towards base; PW/HW 1.35–1.37 (M 1.36), PW/PL 1.16–1.20 (M 1.18), PW/PA 1.50–1.52 (M 1.51), PW/PB 1.59–1.66 (M 1.63); dorsum strongly convex and sparsely covered with fairly long suberect hairs; microsculpture formed by fine transverse lines though mostly degenerated; sides narrowly bordered, the border becoming finer near each front angle, strongly arcuate from front angles to before hind angles though less strongly so in basal halves, and very briefly but deeply sinuate just before the latter; apex either straight or slightly arcuate, more or less wider than base, PB/PA 0.90–0.95 (M 0.93), with front angles very obtuse and almost rounded off; base either straight or feebly arcuate, briefly but distinctly emarginate just inside each hind angle, forming a very short basal peduncle; hind angles small, forming on each side a denticle produced laterally; median line distinct, reaching neither apex nor base; apical transverse impression not continuous but indicated by irregular rugosity; basal transverse impression deep and narrow, with a longitudinal foveole on each side of median line, and laterally continuing into basal foveae, which are small but deep, smooth at the bottom, and shallowly extending antero-laterad; no distinct postangular carinae; basal area narrow and smooth.

Elytra oval, much wider than prothorax, widest at about middle, and a little more gradually narrowed towards bases than towards apices; EW/PW 1.49–1.51 (M 1.50), EL/EW 1.45–1.50 (M 1.47); shoulders distinct though very obtuse, with prehumeral borders straight and oblique; sides rather narrowly reflexed throughout, feebly arcuate behind shoulders, more regularly so behind middle, and narrowly rounded at apices, which form a very small re-entrant angle at suture, each with a slight preapical

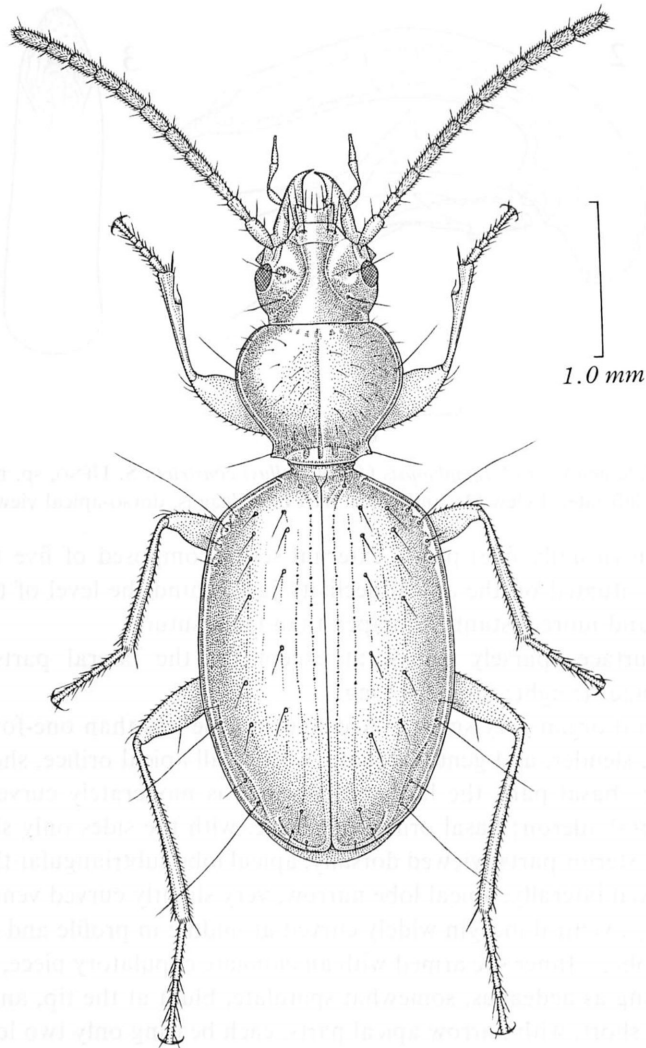
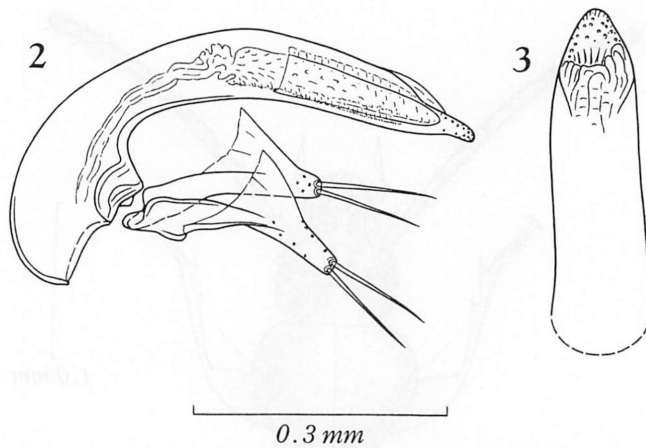


Fig. 1. *Epaphiopsis (Formosiellus) constricta* S. UÉNO, sp. nov., ♀, from Mt. Lo Shan.

emargination; dorsum rather strongly convex but the apical declivity is not particularly steep; microsculpture practically vanished; striae deeply impressed on the disc but obsolete at the side, 1 and usually 2 entire, more or less punctate in basal three-fifths, 3 also distinct on the disc but abbreviated near base, 4-5 slight and fragmentary, 6-7 evanescent, 8 deeply impressed behind the middle set of marginal umbilicate pores; scutellar striole short but deep; apical striole also short but deep, moderately curved, and free at the anterior end though seemingly directed to the site of stria 5; intervals 1 and 2 slightly convex, others completely flat; apical carina distinct; setiferous dorsal pores, especially of the external series, more or less foveolate, internal series composed



Figs. 2-3. Male genitalia of *Epaphiopsis (Formosiellus) constricta* S. UÉNO, sp. nov., from Mt. Lo Shan; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

of five to seven (usually five) pores, external series composed of five to eight pores; preapical pore situated on the apical declivity just behind the level of the terminus of apical striole, and more distant from apex than from suture.

Ventral surface sparsely pubescent except for the lateral parts. Legs fairly slender; protibiae straight; tarsi not long.

Male genital organ very small. Aedeagus a little less than one-fourth as long as elytra, tubular, slender, and gently arcuate, with small apical orifice, short apical lobe, and fairly large basal part, the last one of which is moderately curved ventrad and devoid of sagittal aileron; basal orifice not large, with the sides only shallowly emarginate at the posterior parts; viewed dorsally, apical lobe subtriangular though rounded at the tip; viewed laterally, apical lobe narrow, very slightly curved ventrad, and blunt at the extremity; ventral margin widely curved at middle in profile and slightly convex before apical lobe. Inner sac armed with an elongate copulatory piece, which is about one-third as long as aedeagus, somewhat spatulate, blunt at the tip, and covered with scales. Styles short, with narrow apical parts, each bearing only two long setae at the apex.

*Type series.* Holotype: ♀, allotype: ♂ (somewhat teneral), paratype: 1 ♀ (somewhat teneral), 29-V-1991, Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Mt. Lo Shan, 2,140 m in altitude, in Wu-feng Hsiang of Hsin-chu Hsien, northern Taiwan.

*Notes.* This is a very remarkable new species, whose peculiar facies remind us of those of *Ushijimaella pilosistriata* S. UÉNO (1980, p. 144, figs. 1-3) from the Korean Peninsula. It is, however, doubtless that the trechine beetle belongs to the *multi-punctata* group of the subgenus *Formosiellus*, more precisely to the same lineage as *E. elegans* and *E. multipunctata*, as is clearly indicated by the conformation of its male

genitalia. It may have long been isolated at the northwestern corner of the sub-generic range and have developed the unique appearance.

Mt. Lo Shan (also called Lu-ch'ang-ta Shan; 2,616 m in height) lies near the northwestern end of a branch ridge of the Hsüeh-shan Mountain Range, on the borders between Hsin-chu Hsien and Miao-li Hsien. It is therefore situated at the northern periphery of the distributional range of *Formosiellus*, and besides, isolated from all the other known localities of the members of the subgenus. Its habitat is also somewhat different from those of the others. Instead of living in a subalpine forest, it inhabits a broadleaved forest at a relatively low altitude. All the known specimens were taken in a shaded depression only several square metres in area. They were sifted out from moist dead leaves accumulated among roots of herbaceous undergrowth.

Of the three specimens known, only one female is fully mature and the other two are more or less teneral. For this reason, I selected the mature female as the holotype of this interesting new species.

*Epaphiopsis (Formosiellus) notos* S. UÉNO, sp. nov.

(Figs. 4-6)

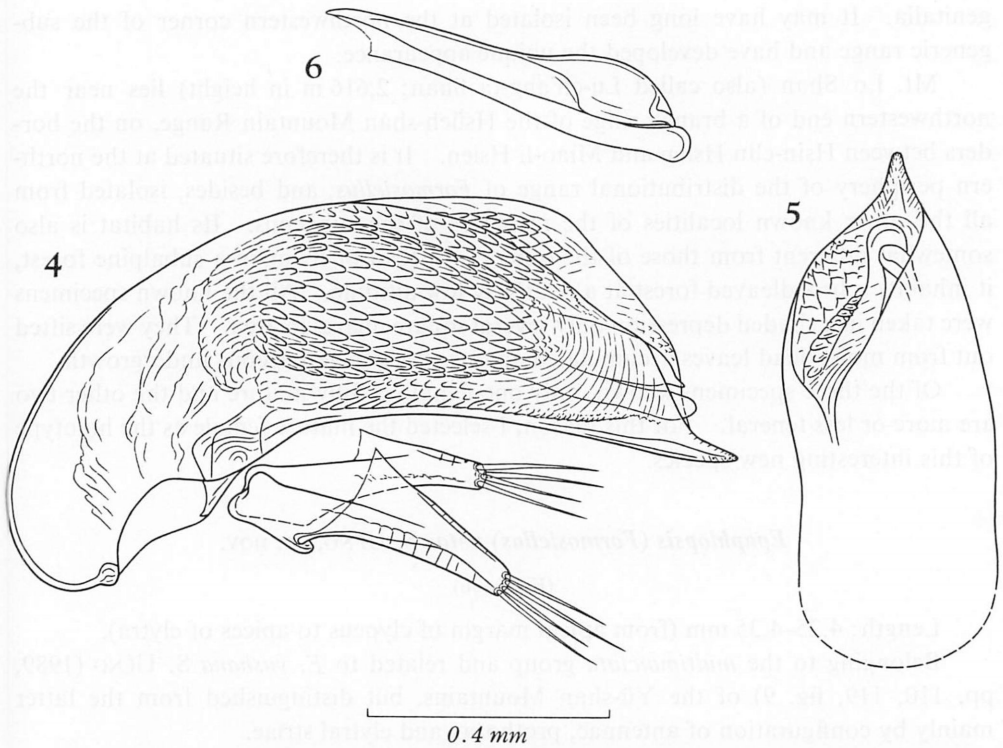
Length: 4.25-4.35 mm (from apical margin of clypeus to apices of elytra).

Belonging to the *multipunctata* group and related to *E. yushana* S. UÉNO (1989, pp. 110, 119, fig. 9) of the Yü-shan Mountains, but distinguished from the latter mainly by configuration of antennae, prothorax and elytral striae.

Colour as in *E. yushana*. Head almost identical with that of *E. yushana*, but the antennae are slenderer though not much longer, reaching basal three-tenths of elytra in ♂, basal two-sevenths of elytra in ♀; antennal segments 5-10 subcylindrical, not ellipsoidal, obviously narrower than in *E. yushana*, 4-6 each 2.2-2.3 times as long as wide, 8-10 each 2.1-2.2 times as long as wide, terminal segment evidently longer than (nearly 1.5 times as long as) segment 4 or 5, a little longer than scape though about two-thirds as wide as the latter.

Pronotum suborbicular rather than subcordate, hence similar to that of *E. divarboris* S. UÉNO (1989, pp. 110, 122, figs. 10-12), wider than head, wider than long, widest at about three-fifths from base, and almost equally narrowed in front and behind; PW/HW 1.38-1.43 (M 1.41), PW/PL 1.13-1.17 (M 1.16), PW/PA 1.51-1.55 (M 1.54), PW/PB 1.44-1.46 (M 1.45); sides widely arcuate from apex to just before base, the curvature being somewhat weaker behind middle; apex slightly arcuate, slightly narrower than base, PB/PA 1.03-1.07 (M 1.05), with front angles very obtuse and hardly produced; base almost straight or slightly arcuate at middle, briefly but distinctly emarginate on each side just inside hind angle, which forms a sharp denticle produced postero-laterally; disc as in *E. divarboris*, similarly sculptured.

Elytra as in *E. yushana* with the exception of several details; EW/PW 1.44-1.52 (M 1.48), EL/EW 1.52-1.60 (M 1.56); shoulders more widely rounded than in *E. yushana*, with prehumeral borders more oblique though slightly arcuate; sides more



Figs. 4-6. Male genitalia of *Epaphiopsis (Formosiellus) notos* S. UÉNO, sp. nov., from Mt. Pei-ta-wu Shan; left lateral view (4), apical part of aedeagus, dorso-apical view (5), and separated copulatory piece, left lateral view (6).

regularly, though feebly, arcuate from behind shoulders to behind middle, and conjointly rounded at apices; disc evidently less convex than in *E. yushana*, longitudinally depressed in basal three-fourths; striae obviously deeper than in *E. yushana*, 1-5 moderately impressed and more or less clearly punctate, 6-7 much shallower than the inner, often fragmentary and sometimes degenerated, but usually traceable at middle, 8 deeply impressed behind the middle set of marginal umbilicate pores; scutellar striole short but deep; apical striole deeply impressed though short, lightly curved, and joining or almost joining stria 5; intervals flat; apical carina distinct though obtuse; internal dorsal series composed of six to eight (usually seven or eight) setiferous pores, external series of five to seven (usually six) setiferous pores; preapical pore as in *E. yushana*.

Ventral surface and legs as in *E. divarboris*, the latter being slenderer than in *E. yushana*.

Male genital organ very large and heavily sclerotized. Aedeagus robust, nearly a half as long as elytra, and hardly arcuate at middle though the basal part is gently curved ventrad; apical orifice markedly asymmetrical, inclined to the right, though the right aedeagal wall is obviously higher than the left; apical lobe very short and

narrow, straight, slightly reflexed, and blunt at the tip; basal part not particularly large and devoid of sagittal aileron; basal orifice rather small, with the sides lightly emarginate; ventral margin very slightly emarginate at middle in profile. Inner sac wholly covered with heavily sclerotized teeth, which seemingly form intricate longitudinal patches due to the folds of sac membrane. Copulatory piece elongate, a little more than a half as long as aedeagus though its proximal three-fifths is concealed by teeth-mat and not observable by transparency, spatulate in proximal part and bilobed in apical part; right apical lobe longer than the left, nearly parallel-sided, and rounded at the apex; left apical lobe vertically dilated before the apex, which is horizontally curved inwards above the right lobe and narrowly rounded at the extremity. Styles relatively small, left style evidently longer than the right, each bearing four setae at the apex.

*Type series.* Holotype: ♂, allotype: ♀, paratype: 1 ♂, 18-X-1990, S. UÉNO leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Mt. Pei-ta-wu Shan, 2,550 m in altitude on the SW slope, in Tai-wu Hsiang of P'ing-tung Hsien, southern Taiwan.

*Notes.* This is an interesting species something intermediate between *E. yushana* and *E. divarboris*. It is closer to the former in many respects, but resembles the latter in the shape of its prothorax. True relationship of these species can be determined with confidence only when males of *E. yushana* are known.

Mt. Pei-ta-wu Shan (3,092 m in height) is the southernmost of the high mountains in Taiwan exceeding 3,000 m in altitude. Though belonging to the Chung-yang Mountain Range, it lies on a small isolated group of mountains separated from the main northern part by a col only 1,700 m in height. It is about 96 km distant to the south-southwest from Mt. Yü Shan, the type locality of *E. yushana*, and about 186 km distant in a similar direction from Pi-lu, the type locality of *E. divarboris*.

The three specimens of the type series of *E. notos* were found in a limited place at the head of the Kuai-ku on the southwestern slope of the mountain. This site was just below the conifer zone and was in a broadleaved forest with thick undergrowths of ferns. The trechine beetles were obtained by sifting moist dead leaves accumulated among the roots of ferns in the immediate vicinity of a gully.

### *Epaphiopsis (Formosiellus) yushana* S. UÉNO, 1989

*Epaphiopsis (Formosiellus) yushana* S. UÉNO, 1989, Bull. natn. Sci. Mus., Tokyo, (A), 15, pp. 110, 119, fig. 9; type locality: Mt. Yü Shan.

*Additional specimen examined.* 1 ♀, Pa-nai-i-k'o, 2,860 m alt., Yü-shan Mts., Hsin-i Hsiang, Nan-t'ou Hsien, central Taiwan, 25-X-1990, Y. NISHIKAWA leg. (NSMT).

*Notes.* The specimen recorded above from Pa-nai-i-k'o, which is located on the northeastern ridge of the Yü-shan Mountains about 14.4 km east-northeast of P'ai-

yun Shan-chuang where the holotype of *E. yushana* was collected, is larger (4.15 mm in body length) and has narrower prothoracic base, but is otherwise similar to the type specimen. Unfortunately, comparative study of male genitalia cannot be made between the two populations, but in my view, they are safely regarded as belonging to the same species. The standard ratios of the Pa-nai-i-k'o specimen are as follows: PW/HW 1.38, PW/PL 1.23, PW/PA 1.46, PW/PB 1.52, PB/PA 0.96, EW/PW 1.42, EL/EW 1.52. The internal dorsal series consists of eight setiferous pores on the left elytron and nine on the right; the external dorsal series of eight pores on the left and six on the right.

### 要 約

上野俊一：台湾産ケムネチビゴミムシ属の 2 新種。——ケムネチビゴミムシ属のうちで、台湾に固有の亜属 *Formosiellus* の分布域の北限（樂山）および南限（北大武山）から、それぞれ 1 新種を記載し、*Epaphiopsis (Formosiellus) constricta* および *E. (F.) notos* と命名した。ともに *multipunctata* 種群に属するが、たがいの類縁関係はそれほど近くない。なお、玉山を基準産地として記載された *E. (F.) yushana* を、同じ山系の巴奈伊克から記録した。

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