

# Discovery of the genus *Epimarptis* Meyrick, 1914 (Gelechioidea: Coleophoridae s. l.) in Japan, with the description of a new species

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**Abstract.** *Epimarptis hiranoi* sp. n. is described on the basis of specimens collected at several localities in Honshū, Japan. The following characters are illustrated: the habitus, head appendages, wing locking system and venation, thoracic and abdominal skeletons, abdominal vestiture, and genitalia. *E. hiranoi* is the fourth member of the genus *Epimarptis* Meyrick, 1914 and the first representative discovered in regions other than South Asia. It can be distinguished from congeneric species in the colouration of the forewing. In the thoracic skeletons, the new species has several characters not found in other genera of Coleophoridae s. l..

**Key words.** *Epimarptis hiranoi* sp. n., Japan, head appendages, thoracic skeletons, genitalia, *Epimarptis*, Coleophoridae s. l..

## Introduction

Meyrick (1914) established the genus *Epimarptis* to describe the type species, *Epimarptis philocoma* Meyrick, 1914. Up until now the genus had been represented by three species (Meyrick 1914, 1917, 1931, 1936): *E. philocoma* was recorded from Bombay, India, *E. septicodes* Meyrick, 1917 from Maskeliya, the Democratic Socialist Republic of Sri Lanka, and *E. isoloxa* Meyrick, 1931 from Assam, India. Most of the generic characters of *Epimarptis* given in the original description are typical of the members of superfamily Gelechioidea where the genus is currently placed. Excluding the characters typical of gelechioids, the generic characters given in the original description are as follows: antennae in male near the base with a notch covered by an oblique tooth beneath it; pecten absent; in forewing venation M1 stalked with stem of R4+5, R5 reaching termen instead of costa; in hindwing venation Rs and M1 stalked, M2 absent. The presence or absence of a pecten sometimes varies within a genus. Smaller-sized gelechioids generally have the forewing M1 stalked with the stem of R4+5 and the hindwing with less than three M-veins. According to Meyrick (1931), *E. isoloxa* has the same wing venation as the type species. On the other hand, Meyrick (1917) stated that *E. septicodes* is different from the type species in having the forewing with CuA1 absent and M1 separated from the stem of R4+5. Consequently, among the generic characters in the original description, the effective diagnostic characters of *Epimarptis* are restricted to the male antennal notch covered by a tooth and the forewing with R5 reaching the termen.

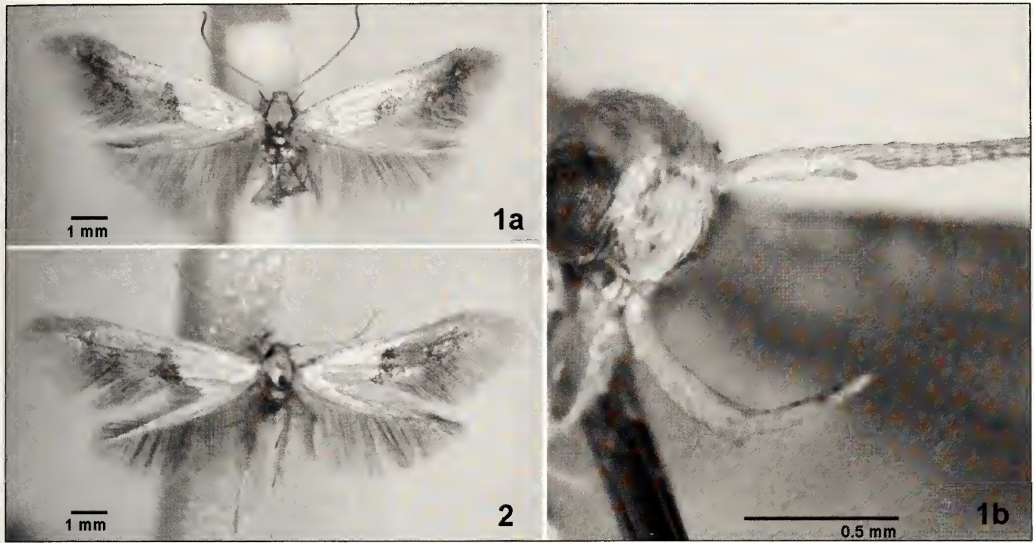
When establishing the genus *Epimarptis*, Meyrick (1914) proposed the family Epimarptidae for this genus alone, stating “Probably it is a development of the Oecophoridae.” Later, however, Meyrick (1917) transferred the genus to the Epermeniidae and maintained this idea in subsequent papers (Meyrick 1931, 1936).

Current limits of the superfamily Gelechioidea were generally accepted in the late 1960's, and since the late 1970's, rearrangements of the gelechioid family-group taxa have been attempted repeatedly. Minet (1986) was the first author to include *Epimarptis* in the superfamily. Later authors, when taking the genus into account, regarded it as forming solely the family Epimarptidae (Minet 1990; Sinev 1992) or the subfamily Epimarptinae of the family Batrachedridae (Hodges 1998). Kaila (2004) implemented a cladistic analysis of 143 gelechioid taxa using 193 morphological characters in order to estimate phylogenetic relationships within Gelechioidea. He stated that *Epimarptis* would fall in his expanded Coleophoridae comprising *Coelopoeta* Walsingham, 1907, *Stathmopoda* Herrich-Schäffer, 1853, and Batrachedrinae of Hodges (1998) in addition to Coleophoridae in the traditional sense, while abundant missing entries for *Epimarptis* prevented him from including the genus in his final analysis.

In spite of many recent studies on the taxonomic system within Gelechioidea, little morphological information is available for *Epimarptis* in the literature. The genitalia have never even been described and there are no available illustrations except for the figures of the moth and hindwing venation of the type species given by Hodges (1998). In the higher classification of the microlepidoptera, the head appendages and thoracic skeletons often offer some phylogenetic evidence, but these characters have not yet been examined in *Epimarptis*. *Epimarptis* is currently accepted as the type genus of a nominal family-group taxon, and current lack of information must be improved in order to obtain a more reliable hypothesis of its relationships within Gelechioidea.

On recent examination of some personal and institutional collections in Japan I found several Japanese specimens apparently referable to *Epimarptis*. These specimens have the male antennae with a notch near the base and the forewing with vein R5 reaching the termen. In addition, they agree with the original description of *E. philocoma* in many aspects of wing markings and also with a moth photo of the species in Hodges (1998). By courtesy of Mr K. Tuck and H. Taylor of The Natural History Museum, London (BMNH), I was able to compare my Japanese specimens with images of *Epimarptis* specimens in the BMNH, i.e. moth images of the type specimens of all described species and genitalia images of one male and two female non-type specimens of *E. philocoma*. Then I concluded that the Japanese specimens represented an *Epimarptis* species distinct from all described ones. Discovery of *Epimarptis* in Japan had not been expected because the genus has never been recorded even in Southeast Asia. The Southeast Asian fauna is generally much more similar to that of South Asia than to that of Japan.

In the present paper, I describe the Japanese *Epimarptis* species as the fourth member of the genus. For a better understanding of the genus and also of the Gelechioidea as a whole, I give illustrations not only of the habitus and genitalia, but also of some other characters that are usually neglected in species descriptions. A discussion is given on the morphology of the Japanese species mainly from the viewpoint of comparing it with that of some other genera placed in Coleophoridae by Kaila (2004).



**Figs. 1–2.** Moths of *Epimarptis hiranoi* sp. n. **1.** Holotype (a: Whole moth, with abdomen removed for dissection. b: Antennal notch). **2.** ♀ paratype from Inekoki.

### *Epimarptis hiranoi* sp. n.

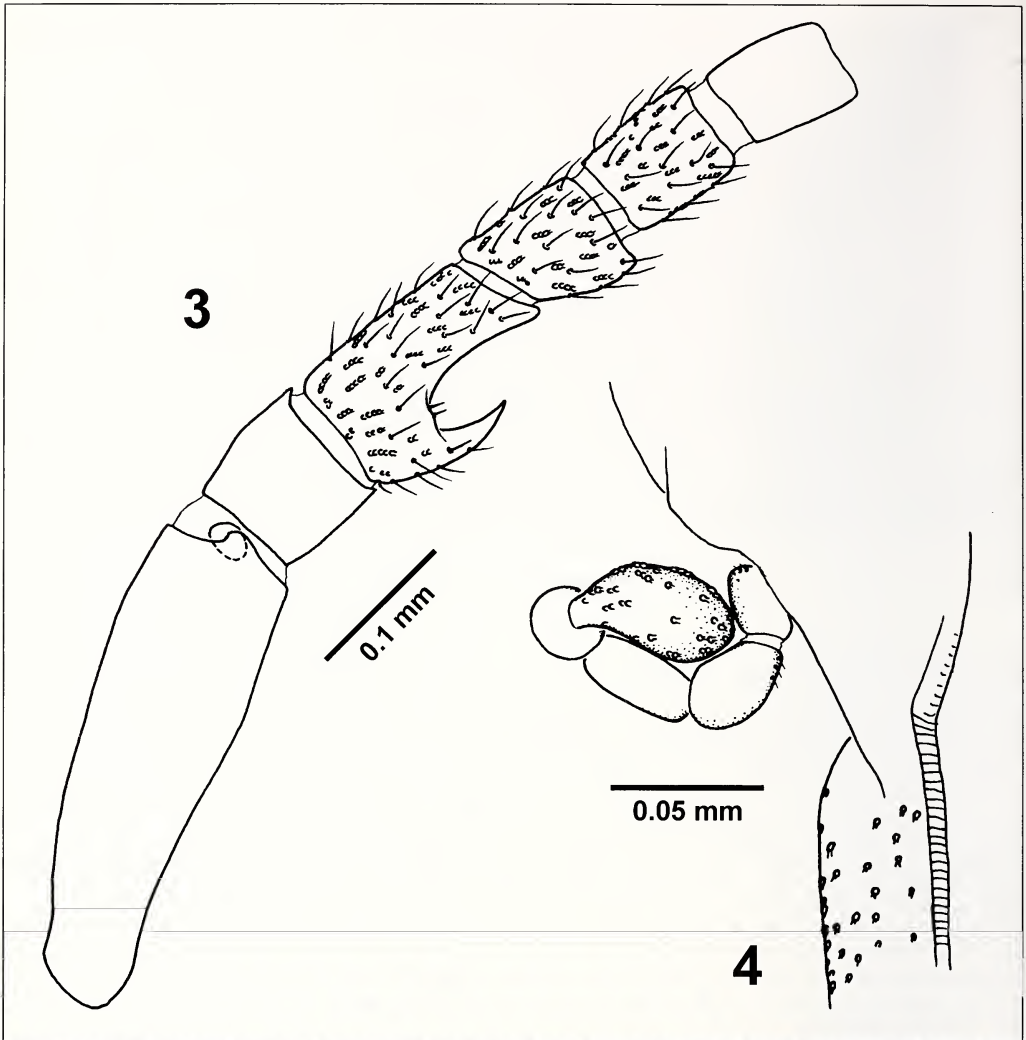
(Figs. 1–20)

**Material.** All specimens collected in Honshū, Japan. Holotype: ♂, 'Japan; Honsyū <underlined> | Kamasawa[-onsen] <35°30'N, 138°06'E> | Oosika Vill.[age] | Nagano Pref.[ecture] | 24.vi.2001 | K. Sugisima leg.', '♂ genitalia | slide no. 0910 | K. Sugisima, 2001', deposited in Entomological Laboratory, Osaka Prefecture University, Sakai-si, Ōsaka-hu, JAPAN (OPU). — Paratypes: 1♂, 'Fujihara-Dam <36°48'N, 139°03'E> | Minakami Machi | Gunma Pref. | 12.VI.1999 | U. Jinbo <leg.>'; 1♂, 'Ikezawa <36°24'N, 137°57'E> | Ikusaka mura | Nagano-ken | 29.VII.1995 | N. Hirano leg.'; 1♀, 'Ookuchizawa <36°17'N, 137°57'E>', Toyo- | shina T. Nagano | pref. 13 JUL 1979 | N. HIRANO leg.'; 1♂, 'Ohkuchizawa <36°17'N, 137°57'E>', To- | yoshina Nagano | pref. 10 VI 1983 | N. HIRANO leg.'; 1♂, 'Japan; Honsyū <underlined> | Ookuti-zawa <36°17'N, 137°57'E> | Toyosina Town | 19.vii.2003 | K. Sugisima leg.'; 1♀, 'Shimashima valley <36°11'N, 137°46'E> | Nagano pref. | 9 VII 1981 | N. HIRANO leg.'; 1♀, 'Shimashima valley <36°11'N, 137°46'E> | Nagano pref. | 26 VI 1982 | N. HIRANO leg.'; 1♂, 'Shimashima-dani <36°11'N, 137°46'E> | Azumi-mura | Nagano-ken | 19.VI.1987 | N. HIRANO [leg.]; 1♂1♀, 'Inekoki <36°09'N, 137°46'E> | Azumi-mura | Nagano-ken | 9.VII.1988 | N. HIRANO [leg.]; 1♂, ' [Kiso]Hukusima <Kawanisi> <36°50'N, 137°41'E> | Nagano-ken | Honsyū | Japonia', '8/VII | 1975 | T. KUMATA [leg.]; 1♀, 'JAPAN | HONSYU, NAGANO: | Kamasawa[-onsen] <35°30'N, 138°06'E> | (Osika-mura) | 30.VI.2001 | T. SAITO [leg.]; 1♂1♀ (1♀ whole insect mounted on slide 1737 of K. Sugisima), '13-JUL-1996 | JAPAN Aichi-pre. <underlined> | Asahi-highland <35°13'N, 137°24'E> | Asahi-cho | T. Mano leg.'; 2♂ (1♂ whole insect mounted on slide 0614 of K. Sugisima), '5-JUL-1997 | JAPAN Aichi-pre. <underlined> | Asahi-highland <35°13'N, 137°24'E> | Asahi-cho | T. Mano leg.'; 1♂, 'JAPAN: Mie-pre. <underlined> | Hijiki [34°42'N, 136°11'E] [alt.] 250 m | Ueno-city | 27-VI-1997 | T. Mano leg.'; 1♂, 'Yase | Kyoto[-city] | 26.vi.1952 | A. Mutuura [leg.]; 1♂, 'Japan; Honsyū <underlined> | Tyōzya-hara <34°41'N, 132°11'E> | Geihoku-tyō | 10.vii.2001 | Ohshima-Issei leg. (Paratypes deposited in OPU, SEHU (Systematic Entomology, Hokkaido University, Sapporo, Japan), and BMNH (The Natural History Museum, London)). – 2♂2♀, Ōkuchi-zawa, Toyoshina, Nagano Pref. (in personal collection of N. Hirano).

**Description.** Male (Fig. 1) and female (Fig. 2) with no differences in size and coloration. Forewing length 5.3–6.0 mm (holotype 5.7 mm).

Head yellowish with a row of dark brownish scales above dorsal margin of eye. Antenna 4/5 as long as forewing; basal notch and covering tooth of male due to modification of third segment (Figs. 1b, 3); coloration yellow-ochreous, scape paler,

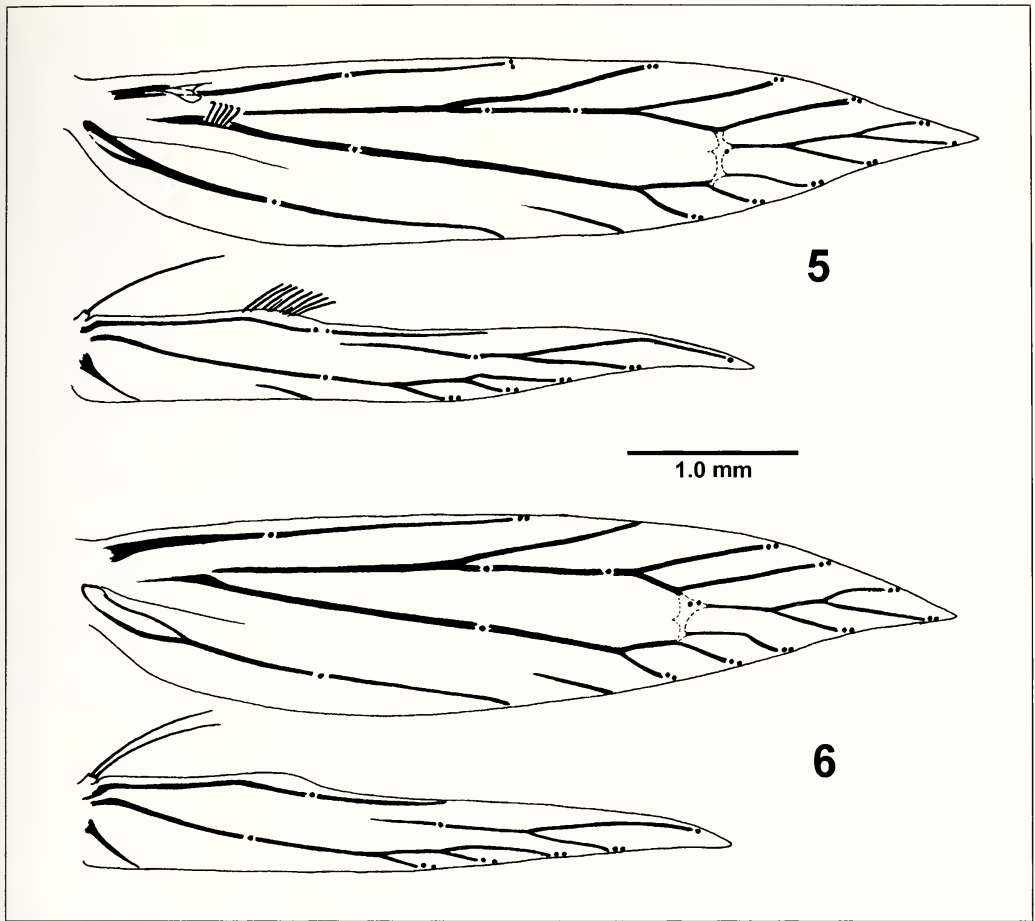




**Figs. 3–4.** Head appendages of *Epimarptis hiranoi* sp. n. (♂ paratype from Asahi highland, slide no. 0614 of K. Sugisima). 3. Basal segments of antenna. 4. Maxillary palpus.

flagellum annulated with dark brownish except on apical flagellomeres. Labial palpus yellowish, medially paler, densely mottled with dark brownish scales on third segment and often also at apex of second segment dorsally. Proboscis well developed, scale on basal 3/4; maxillary palpus (Fig. 4) composed of five segments, second and third segments cylindrical, fourth spherical, fifth bullet-shaped. Thorax yellowish, mottled with dark brownish scales on cephalic part of tegula. Legs pale ochreous, densely mottled with dark brownish scales on outer surface of fore tibiae, sparsely elsewhere; hind tibia dorsally ornamented with long soft hair-like scales. Abdomen pale ochreous dorsally, ivory ventrally.

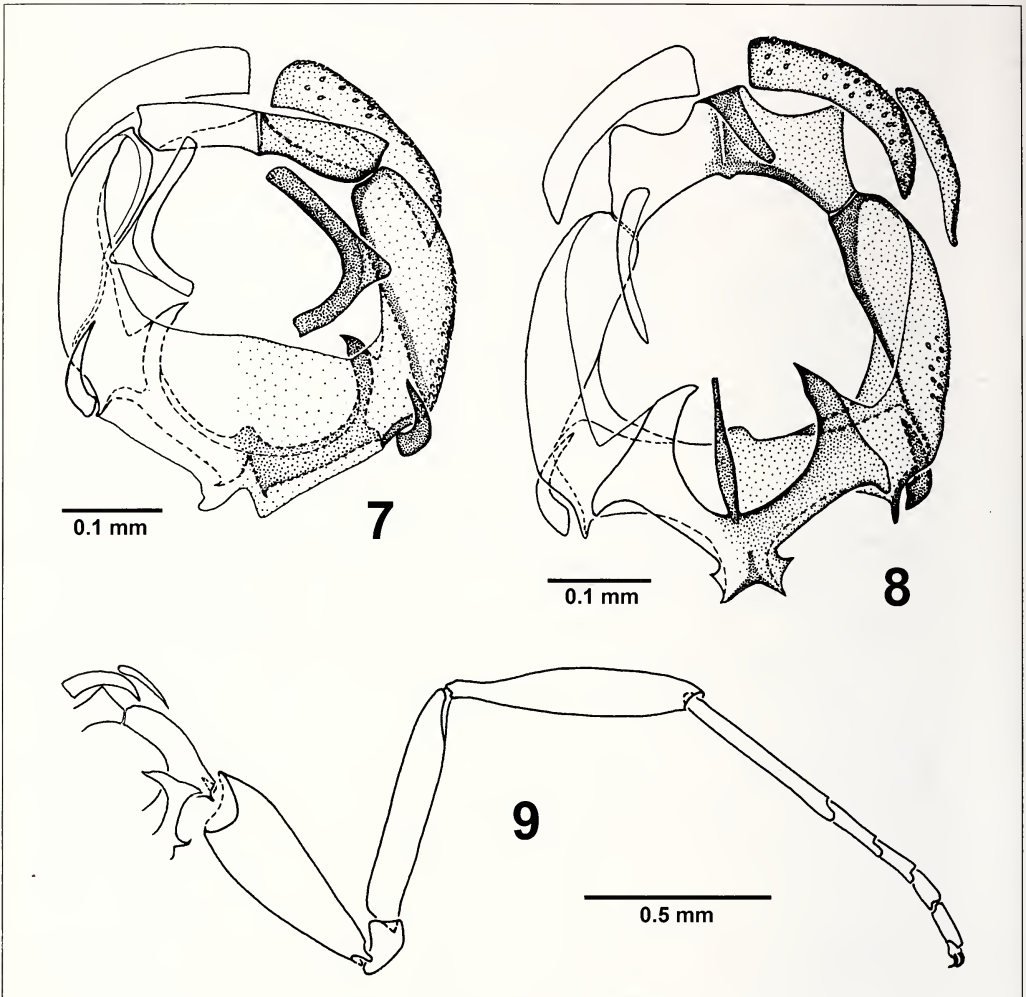
Forewing moderately lustrous, yellowish from base to 2/5, where a dark brownish triangular patch extends outwards obliquely from hind margin just beyond R-stem,



**Figs. 5–6.** Wing venation of *Epimarptis hiranoi* sp. n.; dots indicate positions of campaniform sensillae. 5. ♂ paratype from Inekoki, slide no. 0580 of K. Sugisima. 6. ♀ paratype from Shimashima-dani, wing-locking scales omitted, slide no. 0583 of K. Sugisima.

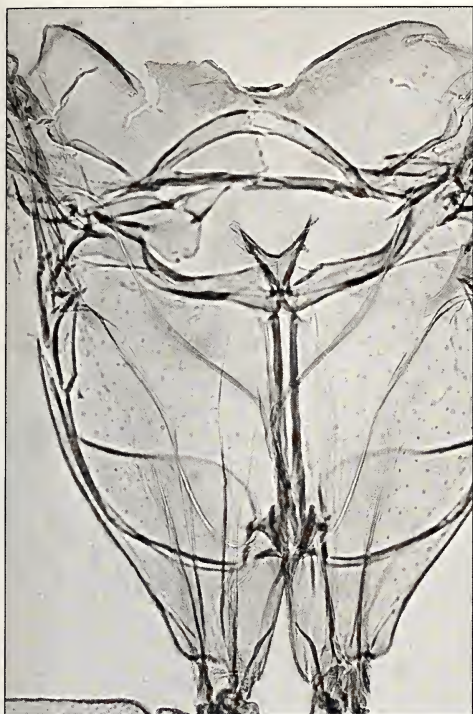
thence wing becoming orange-brownish to brownish near termen; another dark brownish triangular patch present around tornus, half as wide as first one; with another dark brownish patch of variable size and shape near apex of wing; each dark brownish patch almost unicolourous, with no gradation; costa thinly edged with dark brownish scales; cilia orange brownish, darker around tornus.

Wing structures (Figs. 5, 6). Forewing elongate lanceolate,  $1/4$ – $1/5$  as wide as long, widest around  $1/3$ , apically pointed; Sc reaching costal margin slightly beyond middle; cell almost closed around  $1/8$  because CuA-stem closely approaching R-stem, rudimentary between base of R3 and base of CuA1; R1 and R2 twice to three times as distant from each other as R2 and R3 are; M1 stalked with stem of R4+5; one of M2 or M3 absent (or M2 and M3 fused); CuP recognised as vein distally, as fold basally; anal vein bifurcate basally. Hindwing half as wide as forewing, linear-lanceolate, widest beyond  $1/3$ ; costal margin slightly projecting beyond  $1/3$ ; Sc+R1 nearly parallel to costa, ending at  $2/3$ ; Rs very weak in basal half, one branch arising caudally

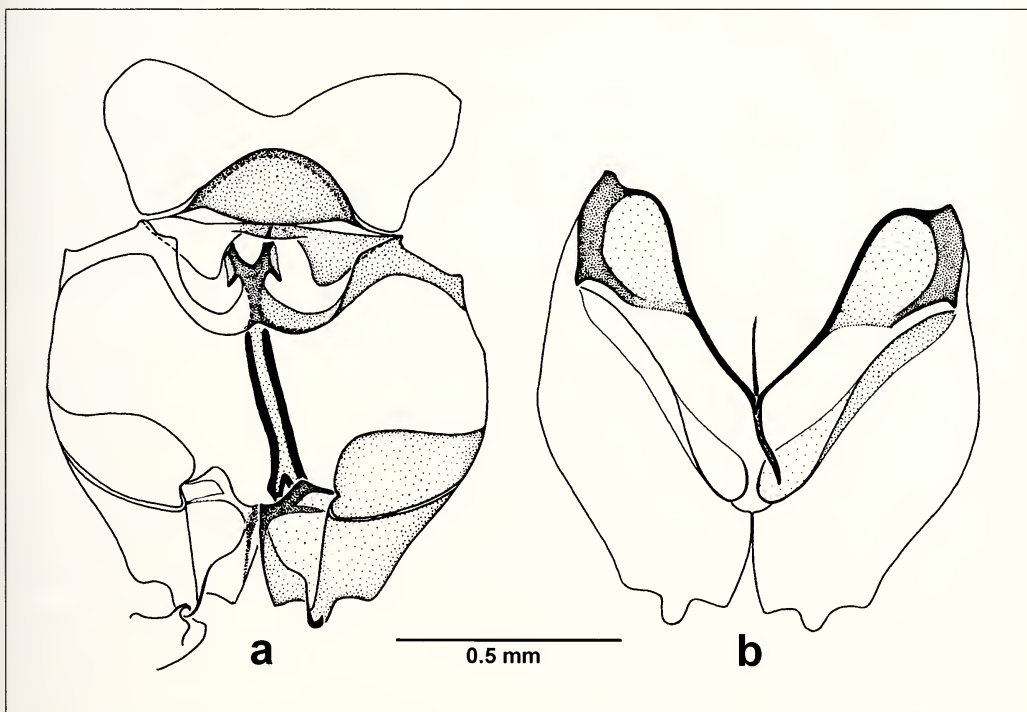


**Figs. 7–9.** Denuded prothorax of *Epimarptis hiranoi* sp. n. **7.** Cephalic view of prothorax (♀ paratype from Asahi highland, slide no. 1737 of K. Sugisima); parapattagia omitted. **8.** Caudal view of prothorax (♂ paratype from Asahi highland, slide no. 0614 of K. Sugisima). **9.** Foreleg (♂ paratype from Asahi highland, slide no. 0614 of K. Sugisima).

from Rs, three branches arising from CuA-stem. Subcostal element of retinaculum in male arising from stalk of Sc; caudal element composed of a row of stout hooked scales along CuA-stem; frenulum with two acanthae in female; supplementary wing-locking system as a group of elongate scales around hind margin of forewing and a group of long needle-like scales arising from projection of costal margin of hindwing. Thorax (Figs. 7–12). Preepisternum without a membranous window in its lateral projection (Fig. 7). Parapattagium as a distinct pad-like sclerite, with sockets (Fig. 8). Fore tibia without epiphysis (Fig. 9). Cephalic margin of metascutellum round and totally margined by its internal folding (Figs. 10, 11a). Caudal margin of metathorax with a medial ridge (Fig. 11a). Caudal suture of inner sclerite of metacoxa present (Figs. 10, 12a). Intercoxal lamella forming a simple keel (Fig. 11b). Margin of infra-

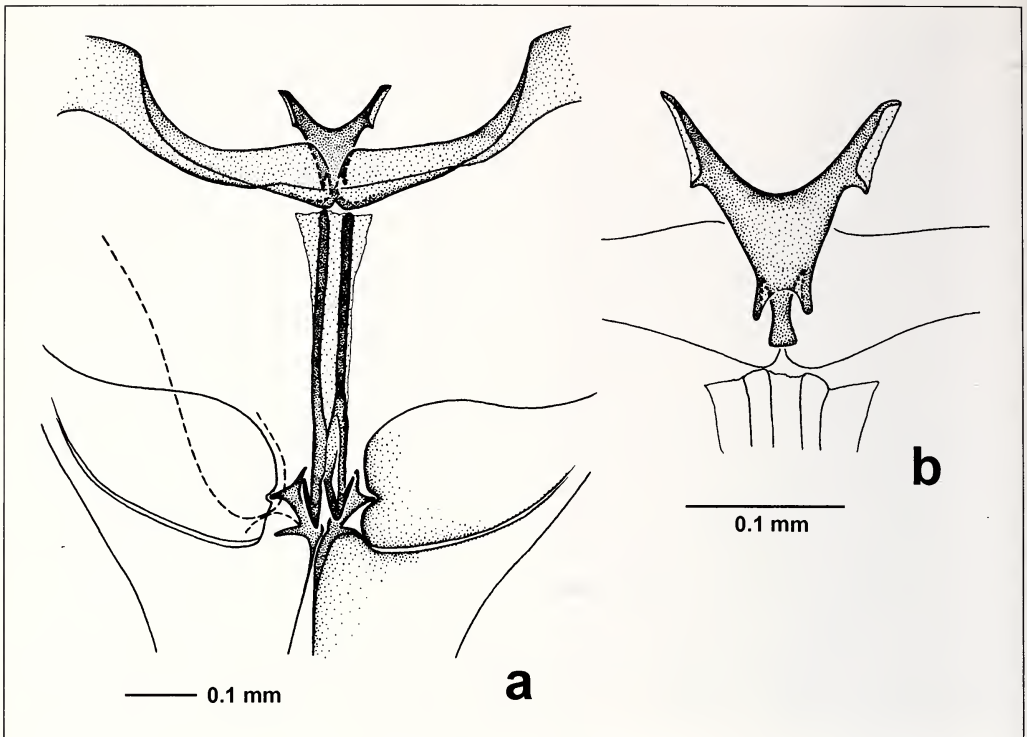


**Fig. 10.** Denuded metathorax of *Epimarptis hiranoi* sp. n. in dorsal view (♀ paratype from Asahi highland, slide no. 1737 of K. Sugisima).



**Fig. 11.** Metathoracic skeleton of *Epimarptis hiranoi* sp. n. in caudal view (♂ paratype from Asahi highland, slide no. 0614 of K. Sugisima). a: Structures of dorsal half. b: Structures of ventral half.



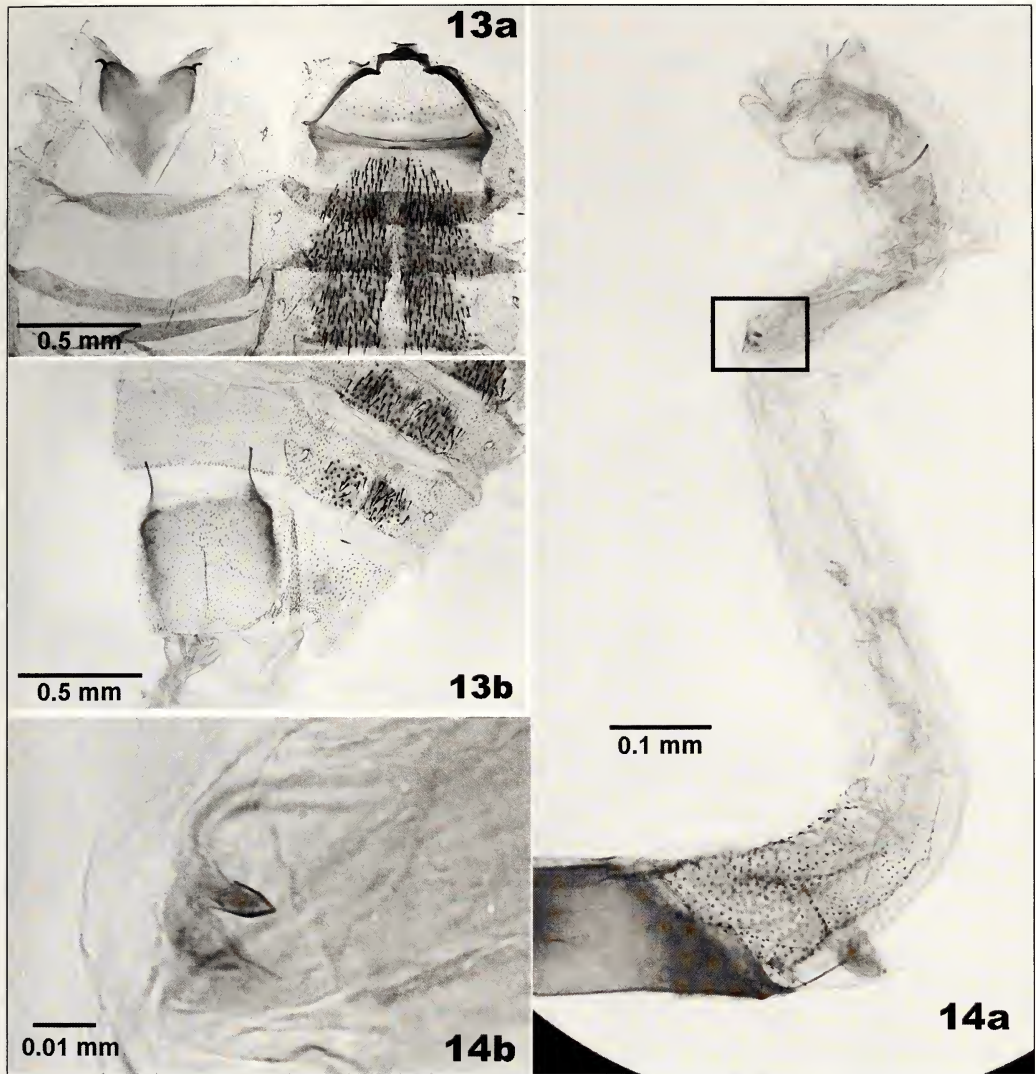


**Fig. 12.** Metathoracic furca in dorsal view (♀ paratype from Asahi highland, slide no. 1737 of K. Sugisima). a: Whole furcal structures and articulation with coxa. b: Furcal apophysis.

episternum strongly sclerotised, except for less sclerotised medial half of caudal part (Fig. 11b). Apophysis of metafurca (Fig. 12b) bluntly Y-shaped, cephalically bifurcate; each cephalic branch pointing toward cephalo-ventral and dorso-caudal corners; a pair of small projections directed dorso-caudally near caudal end of apophysis; secondary arm of furca and its lamina forming chiasma (Figs. 10, 11a, 12a); stem of furca composed of pair of longitudinal stout bars and less sclerotised lamina supported by these bars, with a relatively weak part around caudal 1/5 (Figs. 10, 12a).

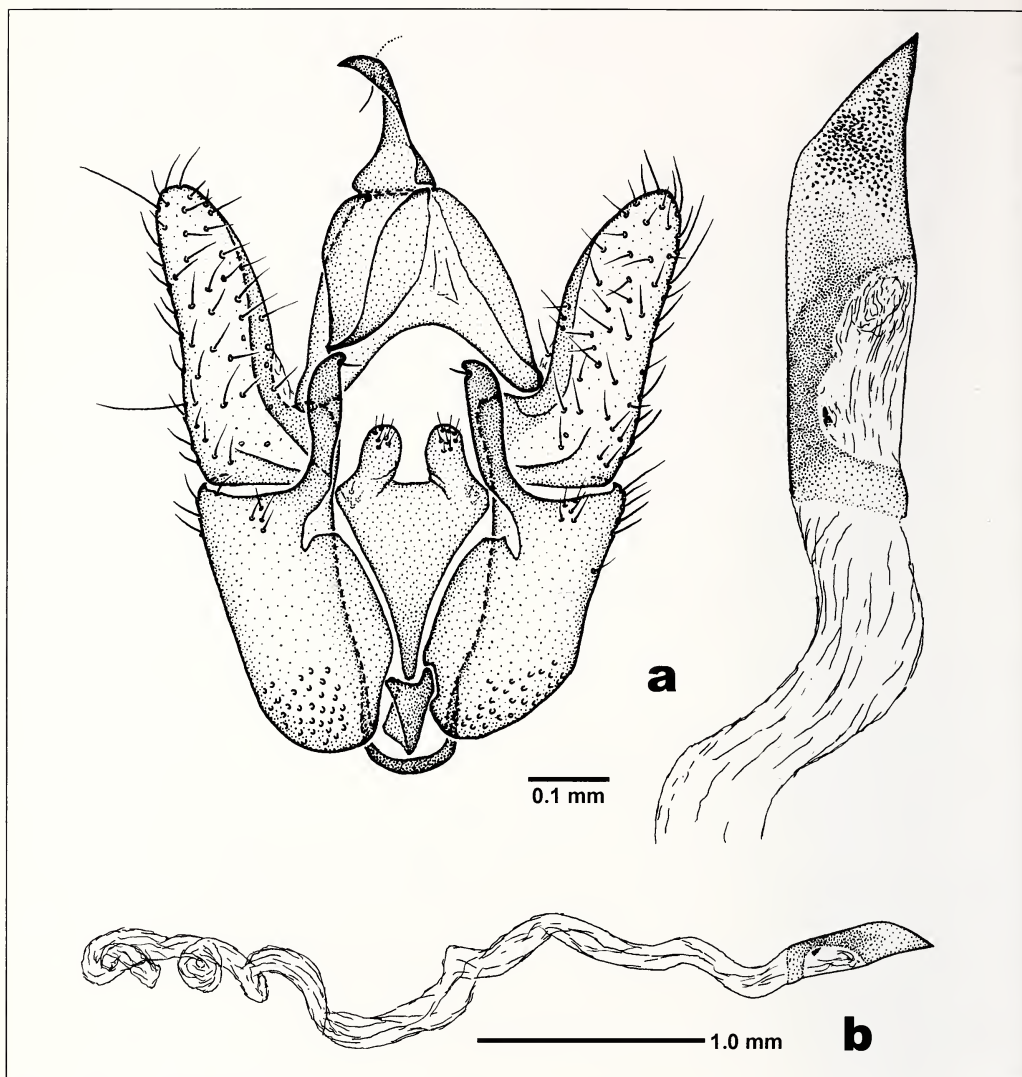
**Abdomen** (Fig. 13). Abdominal supporting system of same structure in both sexes: ventral element composed of heavily sclerotised sub-pentagonal area with pair of short apodemes arising from cephalic corners and indistinct venulae forming margins. Second to seventh tergites each ornamented with pair of patches of spine-like scales. ♂ genitalia (Figs. 14–17) and associated structures (Fig. 13b). Eighth sternite (Fig. 13b) sclerotised more strongly than third to seventh sternites, with pair of apophyses arising sublaterally on cephalic margin. Uncus down-curved, abruptly narrowed near base and slightly tapering towards acute apex, with pair of setae present before apex. Gnathos (Figs. 15, 16b) articulated with tegumen, evenly tapering towards apex, strongly sclerotised along caudal margin, moderately so elsewhere; apex with a short point extending towards head. Tegumen tapering towards uncus, strongly sclerotised along margins of round cephalo-lateral corners. Inner





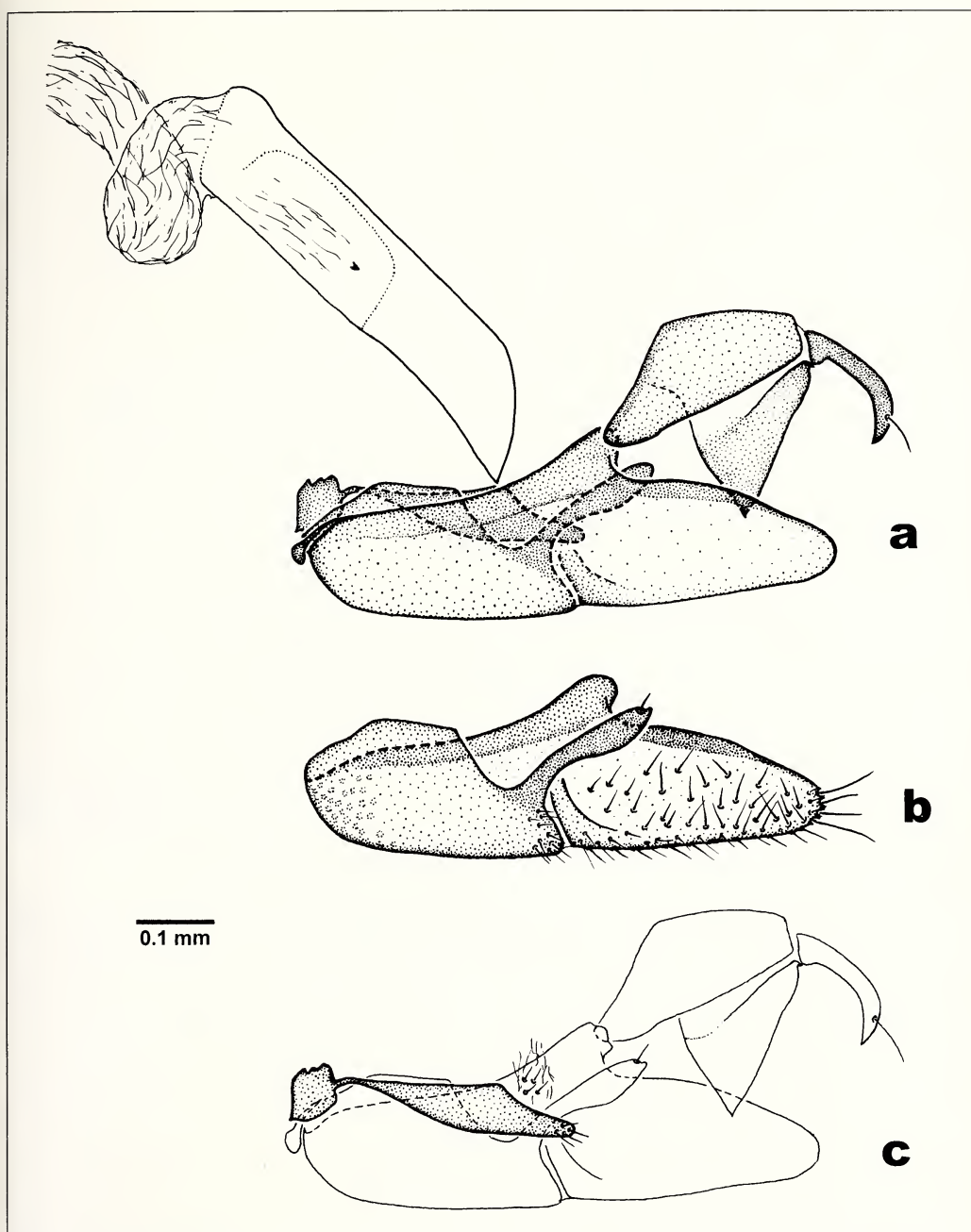
**Figs. 13–14.** Male abdomen and vesica of *Epimarptis hiranoi* sp. n. **13.** Abdominal segments of holotype (a: Cephalic four segments, showing structures of abdominal base and arrangement of ‘spines’ on tergites. b: Caudal two segments, showing modified eighth sternite). **14.** Vesica, paratype from Ookutizawa, slide no. 1295 of K. Sugisima (a: Whole vesica, largest cornutus surrounded by a square. b: Magnified view of squared area in Fig. 14a).

surface of valva (Fig. 16b) divided by a suture into equally long caudal and cephalic areas; caudal area sclerotised strongly along margin and weakly so elsewhere, with short setae scattered sparsely; cephalic area sclerotised moderately, with caudal margin medially projecting and forming strongly sclerotised club-shaped rod apically bearing one short seta. Outer surface of valva (Fig. 17) sclerotised strongly along dorso-cephalic margin near joint with tegumen and weakly to moderately so elsewhere, with dense group of very long hairs on cephalic part, with huge scales sparsely scattered on remaining part. Juxta (Figs. 15a, 16c) sub-triangular, on caudal margin



**Fig. 15.** ♂ genitalia of holotype of *Epimarptis hiranoi* sp. n. situated in standard position (a: Whole genitalia with ductus ejaculatorius omitted. b: Whole aedeagus).

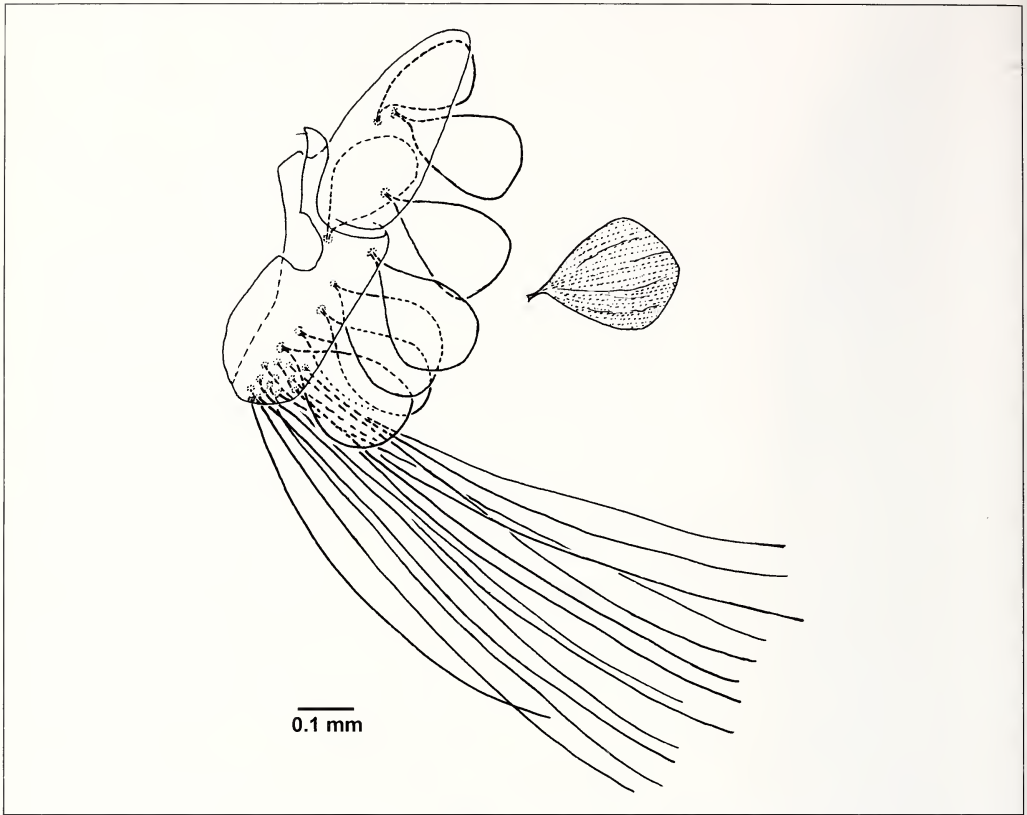
with pair of thumb-shaped projections separated by distance equal to their basal width and apically adorned with six to ten setae; with dorsally concave pouch-like sclerite connected with cephalo-ventral corner of juxta. Diaphragma with group of a few setae dorsad from lateral corners of juxta. Vinculum narrow, U-shaped, with dorsal ends fused with dorso-cephalic margin of outer surface of valva. Aedeagus obliquely truncate apically, membranous on dorsal side and on ventro-cephalic area (Fig. 15a); ductus ejaculatorius very long (Fig. 15b); vesica (Fig. 14) over three times as long as aedeagus, lined with group of numerous minute spines near caudal opening of aedeagus and bearing thorn-like sclerite (considerably reduced in some individuals) distant from the opening.



**Fig. 16.** ♂ genitalia of *Epimarptis hiranoi* sp. n. in lateral view (paratype from Fujihara-dam). a: Whole genitalia. b: Right valva viewed from left side. c: Juxta and setae on diaphragma.

♀ genitalia (Figs. 18–20). Papillae anales weakly sclerotised, ornamented with setae except on dorsal surface. Apophyses of equal length; apophysis anterioris composed of two branches apically fused, one branch derived from tergite, other from sternite (Fig. 20a). Eighth tergite (Figs. 19b, 20) sclerotised moderately, with several

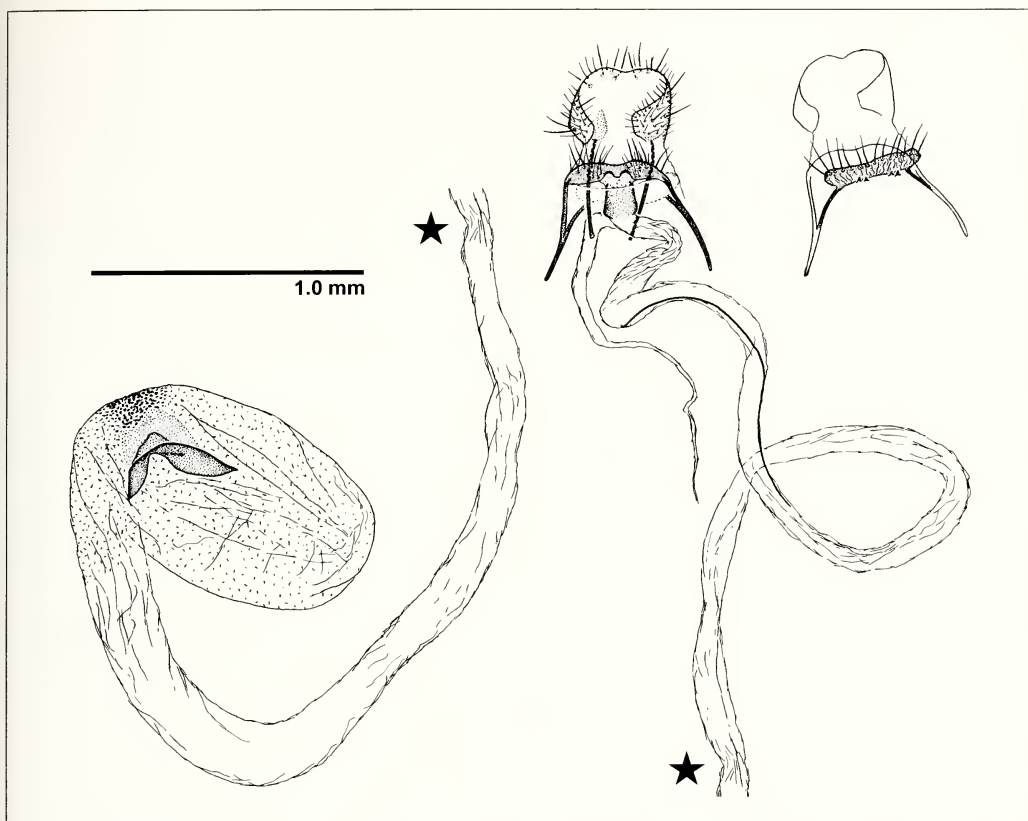




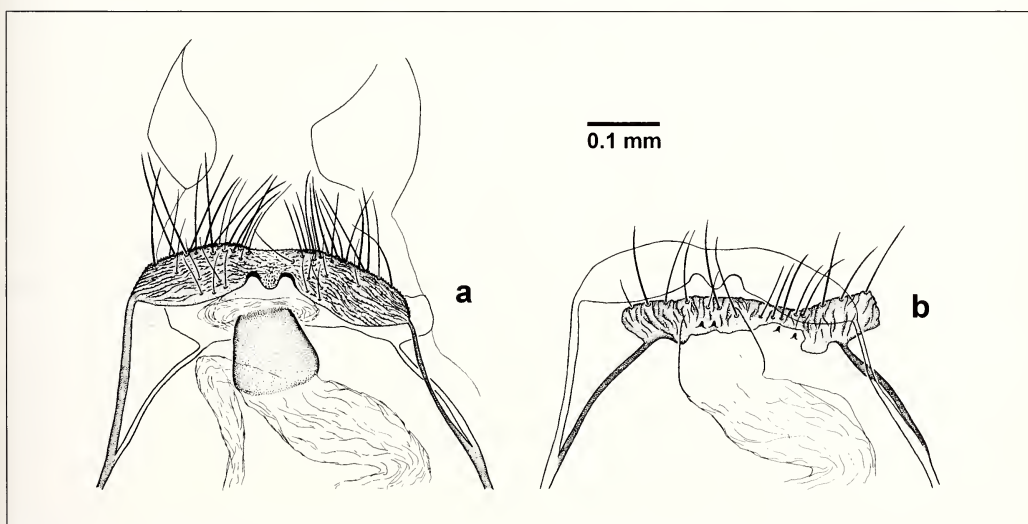
**Fig. 17.** Vestiture on the outer surface of right valva; diagram based on slides 0534 (paratype from Ohkuchi-zawa) and 1295 (paratype from Ookuti-zawa) of *K. Sugisima*.

setae of variable lengths along caudal margin; eighth sternite (Figs. 19a, 20) sclerotised strongly, finely spined, finely wrinkled, protruding over ninth sternite, with a pair of groups of setae of various lengths. Antrum a concavity from caudal part of seventh sternite to cephalic part of eighth sternite, weakly sclerotised except for caudal part; caudal wall strongly sclerotised, with paired indentations ventrally covered by cephalic part of eighth sternite, which gives the impression that the eighth sternite in ventral view has a round M-shaped rim near its cephalic margin (compare Figs. 19a and 20b). Colliculum (Figs. 19a, 20a) short, becoming wider cephalically, sclerotised moderately. Ductus bursae (Fig. 18) considerably long, nearly 20 times as long as apophyses posteriores, somewhat becoming wider near corpus bursae. Ductus seminalis (Figs. 19a, 20a) branching off from ductus bursae just cephalically from colliculum; corpus bursae (Fig. 18) ellipsoidal, with signum a keel-like plate.

**Diagnosis.** *Epimarptis hiranoi* sp. n. has three congeneric species as mentioned in the introduction. Both in size and colouration, *E. hiranoi* is most similar to *E. philocoma*, the type species. In the type species, the triangular dark patch at 2/5 of the forewing is dark brownish inwards and gradually becomes purplish outwards, while the corresponding marking of the new species does not have such a gradation. The new species



**Fig. 18.** ♀ genitalia of *Epimarptis hiranoi* sp. n. in standard position (paratype from Kamasawa, slide no. 0911 of K. Sugisima). Stars indicate the same position.



**Fig. 19.** ♀ genitalia of *Epimarptis hiranoi* sp. n., structures of area around eighth segment (paratype from Kamasawa, slide no. 0911 of K. Sugisima). **a:** Eighth sternite, antrum, and ductus seminalis. **b:** Eighth tergite.

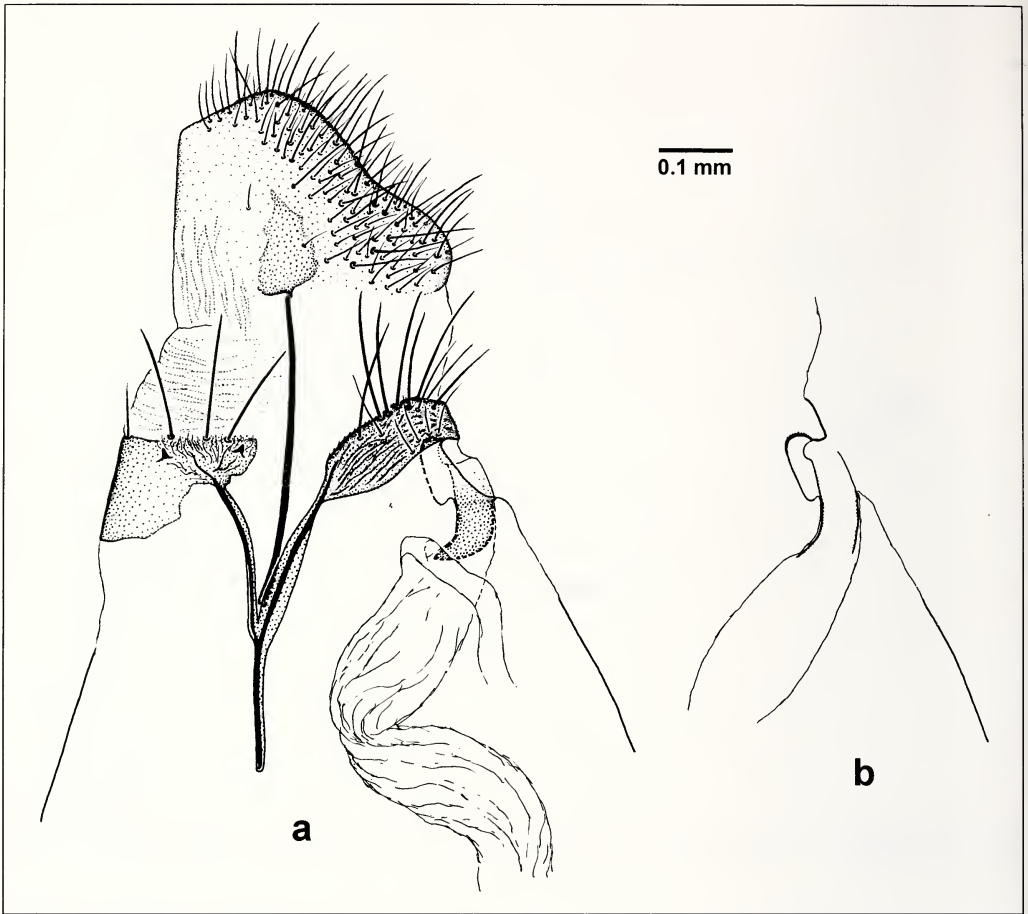


Fig. 20. ♀ genitalia of *Epimarptis hiranoi* sp. n. in lateral view (paratype from Inekoki, slide no. 0944 of K. Sugisima). a: Caudal part. b: Section along median line around ostium.

has only two M-veins in the forewing while the type species has three. In addition, there are some differences in their male genitalia. In the new species, the caudal area of the inner surface of the valva is as long as the cephalic area, the caudal projections of the juxta are separated by a length equal to the width of their bases, and the largest cornutus is at most a small conical sclerite. In the type species, the caudal area of the inner surface of the valva is 1.5 times as long as the cephalic area, the caudal projections of the juxta are closer to each other than in the new species, and the largest cornutus is C-shaped and much larger than in the new species. *E. hiranoi* can be separated from the other two congeneric species more easily. *E. septICODES* has dark brownish forewings and a greyish body, thus appearing much darker than the new species. *E. isoloxa* is 15–16 mm in wingspan and at a glance much larger than the new species. In colouration, the orange brownish area of the forewings is less distinct in *E. isoloxa* than in the new species.



**Derivatio nominis.** The specific name honours Mr Nagao Hirano, who provided many specimens and helped me in collecting others.

**Life history.** The immature stages are unknown. All moths were collected at light traps from mid June until late July. At Ôkuchi-zawa, Toyoshina, Nagano Pref., a total of 4♂, 3♀ were collected, and the collection dates range from June 10 to July 19, with a presumed peak in the second quarter of July.

**Distribution.** Japan, Honshû.

## Discussion

Based on a fairly thorough cladistic analysis within Gelechioidea, Kaila (2004) suggested that Coleophoridae should be expanded to include *Coelopoeta*, *Stathmopoda*, those genera formerly placed in Batrachedrinae of Hodges (1998) and the traditional coleophorids which mainly comprise *Coleophora* Hübner, 1822. The monophyly of his expanded Coleophoridae is supported by four characters: epinotum without median ridge; male retinaculum directly from Rs; hindwing without stem of M1 + M2 in cell; and hindwing costa with long stout scales. These characters are more or less homoplastic when Gelechioidea as a whole are considered, and only the two hindwing characters are present in *Epimarptis hiranoi*. Nevertheless, according to Kaila (2004), *Epimarptis* constantly fell in his Coleophoridae clade. In his analysis, *Epimarptis* shows numerous missing entries. Thus a comparison of important morphological features for *Epimarptis* and other coleophorid genera, including the observations of the present study may provide some light on the phylogenetic position of *Epimarptis*. This comparison is presented below. It takes into account information on the morphology of the following genera of the expanded Coleophoridae: *Batrachedra* Herrich-Schäffer, 1853, *Coelopoeta*, *Coleophora*, *Goniodoma* Zeller, 1849, *Homaledra* Busck, 1900, *Idioglossa* Walsingham, 1881, and *Stathmopoda* Herrich-Schäffer, 1853. Information on other coleophorid genera was obtained from Kaila (2004) and Sugisima and Arita (2000).

In *E. hiranoi*, the notch and covering tooth of the male antenna are present on the ventral side and are due to a modification of the third segment (Figs. 1b, 3). In the other coleophorid genera, similar structures are known in *Idioglossa*. However, the structures of *Idioglossa* are due to a modification of the fourth or fifth segment. The male antennal notch and covering tooth in *Epimarptis* and *Idioglossa* can be homoplastic. Minet (1990) regarded the antennal notch in *Epimarptis* as being related to that of some Blastobasidae, but the notch in the latter taxa is on the dorsal side and is not likely to be homologous with that of *Epimarptis*.

The maxillary palpus of *E. hiranoi* (Fig. 4) is five-segmented while this organ has not been examined in other *Epimarptis* species. The five-segmented maxillary palpus has not been reported in any other gelechioids. The ancestral condition of the maxillary palpus in Gelechioidea is considered to be four-segmented, and the five-segmented condition is probably a reversal. In the other coleophorid genera studied here, it is composed of four or fewer segments.

In wing venation *E. hiranoi* (Figs. 5, 6) is different from other coleophorid genera. In the forewing of *E. hiranoi*, the Radial vein has five branches and R5 reaches the termen. *Batrachedra*, *Coleophora*, and *Homaledra* lack R5. In other coleophorid genera the Radial vein has five branches and R5 reaches the costa. The forewing cell of *E. hiranoi* is almost closed basally; this character is rare in Gelechioidea and can be a generic diagnostic feature. The hindwing venation of *E. hiranoi* is the same as that of *E. philocoma* (see Hodges 1998: fig. 9.6N). Without any apparent analysis Hodges (1998) considered that the caudal branch of Rs in *E. philocoma* is a fused vein M1+2 and three branches arising from the CuA-stem as M3, CuA1, and CuA2. However, it seems to be impossible to discriminate the fusion of M1 and M2 from the loss of one of the three M-branches unless the ancestral condition is determined. In *Batrachedra* and *Homaledra* M1 and M2 are stalked and their common stem arises from Rs. In *Coelopoeta*, all three M-branches are present, with M2 and M3 stalked; this venation seems hardly related to that of *Epimarptis*. In *Coleophora*, two M-veins are recognised as in *Epimarptis*, but the posterior one is neither stalked with Rs nor with the CuA-stem. In *Idioglossa*, the branching pattern of the veins is the same as in *E. hiranoi*, but Rs reaches the termen instead of the costa. The hindwing of *Stathmopoda* has all veins, with M1 stalked with Rs, and with M2 and M3 arising from the CuA-stem.

The fore leg of *E. hiranoi* (Fig. 9) lacks the epiphysis on the tibia. The absence of epiphysis is sometimes observed in *Coleophora*, where the epiphysis tends to be vestigial. In other coleophorid genera, the epiphysis is well-developed.

In *E. hiranoi*, the cephalic margin of the metascutellum (Figs. 10, 11a) is evenly rounded and lacks distinct corners. In addition, the margin of the infraepisternum (Fig. 11b) has a weakly sclerotised part medio-caudally. In other coleophorid genera, the metascutellum has distinct cephalo-lateral corners and the infraepisternum is strongly sclerotised along the entire margin.

The ventral element of the abdominal supporting system of *E. hiranoi* (Fig. 13a) is composed of a strongly sclerotised sub-pentagonal area, a pair of short apodemes, and a pair of indistinct venulae. *Coelopoeta*, *Idioglossa*, *Stathmopoda*, and the traditional coleophorids are similar to *E. hiranoi*, but they have no or little-developed apodemes. *Batrachedra* and *Homaledra* are sexually dimorphic: in addition to the strongly sclerotised area, the male has distinct venulae while the female has long pointed apodemes and distinct venulae.

The male of *E. hiranoi* has the eighth sternite strongly sclerotised with a pair of apophyses (Fig. 13b). The same condition is observed in *Batrachedra* and *Idioglossa* (Sugisima & Arita 2000; Sugisima, unpubl.). According to L. Kaila (pers. commn), the apophyses of the male eighth sternite of *Homaledra* are not so distinct, and other coleophorid genera have a non-specialized eighth sternite.

In *E. hiranoi*, the second to seventh abdominal tergites have a pair of patches of spine-like scales (Fig. 13) and the male genitalia have the gnathos articulated with the tegumen (Figs. 15a, 16a); these are the defining characters of Batrachedridae of Hodges (1998). However, these character states need further examination. The spine-

like scales are arranged in paired patches in the traditional coleophorid genera as well as in the Batrachedridae of Hodges (1998). On the other hand, Kaila (2004) coded the spine-like scales of *Homaledra*, which was placed in Batrachedridae by Hodges (1998), as being arranged in a single patch. Moreover, *Stathmopoda haematosema* Meyrick, 1933 has the patch of spine-like scales arranged in an upside down paired “T” (Sugisima, unpubl.). This species appears to have the gnathos articulated with the tegumen rather than fused with it. These characters in *S. haematosema* show that the arrangement of spine-like scales and the articulation of the gnathos can be homoplastic in the clade of expanded Coleophoridae.

In the female genitalia of *E. hiranoi* (Figs. 18–20) the apophyses anteriores are composed of two apically fused branches, one arising from the eighth tergite and the other from the eighth sternite. The same structure is observed also in *Batrachedra* and *Homaledra*. Other coleophorid genera, except for *Idioglossa*, have the apophyses anteriores arising from the eighth tergite. In general, the apophyses anteriores originate from the eighth tergite. On the other hand, that structure in *Idioglossa* arises from the eighth sternite and it seems reasonable to consider that this condition is due to a loss of the tergite-branch from the condition observed in *Epimarptis*.

Based on the above observations the characters of *Epimarptis* show a rather mosaic pattern and it seems impossible to make any conclusions about its position within the coleophorid clade. The eighth sternite of the male abdomen and the apophyses anteriores of the female genitalia may suggest close affinities between *Epimarptis* and the Batrachedridae of Hodges (1998). The same affinities could be supported by the spine-like scales and the articulation of the gnathos, but these conditions may be homoplastic. In contrast, the absence of the epiphysis on the fore tibia suggests affinities between *Epimarptis* and the traditional coleophorids rather than the Batrachedridae of Hodges (1998). The characters of the wing venation and thoracic skeleton do not support any particular affinities, or even contradict the view that *Epimarptis* belongs to the Coleophoridae clade. In order to settle this contradiction, as stated by Kaila (2004: 321), it would be desirable to add more taxa and to reduce the number of missing entries into the analysis, especially with regard to the immature stages. As far as the present knowledge is concerned, *Epimarptis* seems to be rather uniform in morphology. Further discovery of undescribed species of *Epimarptis* is desired because they may possess intermediate characters between described *Epimarptis* species and some other gelechioids.

As mentioned in the introduction, there are no records of *Epimarptis* from Southeast Asia. It is not appropriate to regard a lack of research in this region as an explanation for this disjunction in distribution. Several expeditions for collecting micromoths, mainly by European and Japanese institutes, have been to Southeast Asia during recent decades. Judging from the habits of *E. hiranoi*, moths of *Epimarptis* are likely to be collected at light-traps. A more conceivable reason is that a shortage of information on the genus has kept many *Epimarptis* specimens remaining to be recognised in museum collections. This paper will hopefully lead to the discovery of many specimens of the genus in various micromoth collections from Southeast Asia.



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