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DESCRIPTIONS OF NINE NEW SPECIES OF THE GENUS COLEOPHORA FROM JAPAN, WITH NOTES ON OTHER SPECIES

(LEPIDOPTERA : COLEOPHORIDAE)

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It is well known that *Coleophora* is a large genus of the family Coleophoridae, comprising more than 500 species described mainly from the Northern hemisphere and Africa. As far as I am aware, however, only eight species have hitherto been recorded in Japan. In this paper will be added to the fauna other thirteen species, of which eight are new to science. Moreover, another new species, which has been recorded as *C. malivorella* Riley by Japanese authors, will be also described herein after.

I wish to express my sincere gratitude to Prof. C. Watanabe of the Hokkaido University for his continuous encouragement and kind advice. Thanks are also due to Dr. J. F. Gates Clarke of the Smithsonian Institution, U. S. A., and Dr. I. V. Kuznetzov of the Academia Nauk, U. S. S. R., who give material for comparison, and Dr. K. Kamijo of Hokkaido Prefectural Forestry Experiment Station and Dr. T. Kumata of the Hokkaido University for their kindness in offering invaluable specimens. All the specimens examined including the types of the new species described herein will be deposited in the collection of the Entomological Institute, Hokkaido University.

1. ***Coleophora ulmivorella***, sp. nov.

♂, ♀, 9 mm. Antenna simple; scape dark brown; flagellum white, annulated with dark yellowish-brown, whitish apically, the annulation becoming darker posteriorly and several basal segments more or less tinged with greyish-ochre. Palpus greyish-brown, paler internally, the apical segment being more than half as long as the median segment, which is about 1.3 times of diameter of ocellus in length. Head and thorax dark brown. Legs yellowish-brown; tarsi greyish. Abdomen grey; anal tuft light greyish-yellow. Fore wing smoothly scaled, dark yellowish-brown, not paler towards costa; cilia pale grey, somewhat tinged with brown at base. Hind wing grey; cilia somewhat paler.

Genitalia: ♂ (Pl. XVII, E & E 1). Valvula absent; sacculus produced into slender caudal process with a very narrow tooth at its base; aedoeagus stout, pointed; cornuti absent. ♀ (Pl. XVIII, D). Sterigma semicircular, narrowly chitinized along its margin; ductus bursae gradually broadened towards bursa copulatrix; signum absent.

Larval case (Pl. XX, A): Leaf-case slightly bent at base, dark greyish-brown, 4.5–

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5.5 mm. in length; mouth 3 (after Hering, 1951)*.

Holotype: ♂, Sapporo, Hokkaido, 22 VI, 1958 T. Oku leg. (host: *Ulmus davidiana* var. *japonica*). Paratypes: 1 ♂, 1 ♀, 28 VI–19 VII, 1956, 2♀, 28 VI, 1957, 5 ♂, 3 ♀, 14–18 VII, and 1 ♂, 3 ♀, 30 VI–4 VII, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *U. davidiana* var. *japonica*); 1 ♂, 22 VI, 1958, Sapporo, Hokkaido, T. Oku leg. (host: *U. laciniata*); 1 ♂, 19 VII, 1958, Sapporo, Hokkaido, T. Oku leg. (host: *Kalopanax ricinifolius*).

Notes:—On account of the absence of whitish costal streak, the shorter caudal process of sacculus, and the absence of signum, this species is distinct from *C. badiipennella* Duponchel occurring in Europe. The larva mines commonly into the leaf of *Ulmus* until mid June.

2. ***Coleophora japonicella***, sp. nov.

♂, 10.5 mm.; ♀, 11–13 mm. Antenna simple; scape and 2–3 basal segments of flagellum ochreous-brown, the remaining segments of flagellum being white and annulated with brown, and the annulation darker posteriorly. Palpus brown, the median segment being about 1.5 times as long as diameter of ocellus in length, and the apical segment more than half as long as the median. Head and thorax ochreous-brown, shining. Fore and middle legs pale greyish-brown, the tarsi being faintly spotted with whitish-yellow at apex; hind leg much paler. Abdomen light greyish-yellow. Fore wing smoothly scaled, ochreous-brown, often somewhat paler towards costa on basal 3/5 of wing; extreme costal edge dark grey towards base; dorsal cilia paler, very slightly tinged with grey. Hind wing grey; cilia light grey.

Genitalia: ♂ (Pl. XVII, F). Valvula developed; sacculus very broadly thickened, the caudal process being stout and acute, lying on apical margin of valva, with a flattened tooth near its base; aedoeagus pointed, often angulated laterally; cornuti absent. ♀ (Pl. XIX, C). Sterigma somewhat narrowed caudally, the cephalic margin being concave and the caudal margin broken at middle by circular ostium bursae; ductus bursae short and simple; bursa copulatrix large, transversely wrinkled; signum slender and curved.

Larval case (Pl. XX, B): Leaf-case brownish-grey, slightly bent towards base, 11–12 mm. in length; mouth 2–3.

Holotype: ♂, Sapporo, Hokkaido, 30 VI, 1961, T. Oku leg. (host: *Ulmus davidiana* var. *japonica*). Paratypes: 1 ♂, 3 ♀, 29 VI, 1958, and 1 ♂, 1♀, 30 VI, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *U. davidiana* var. *japonica*).

Notes:—The present species is very closely allied to *C. limosipennella* Duponchel feeding on *Ulmus* in Europe, but it is easily distinguishable from the latter by the absence of whitish costal streak of the fore wing as well as the different position of the caudal process of the sacculus. The larvae mine into the leaf of *Ulmus* usually until mid June, but some of them are full-grown before hibernation.

3. ***Coleophora milvipennis*** Zeller

Coleophora lutipennella var. *milvipennis* Zeller, Isis, 1839: 208, 1839.

* See: E. M. Hering, Biology of the Leaf Miners, p. 102, 1951.

Coleophora milvipennis: Benander, Opsc. Ent., 1939: 47, Taf. 1, Fig. 4, 1939; Toll, Acta Zool. Cracov., 7 (16): 605, Taf. 2 K, Fig. 21-22, Taf. 2 F, Fig. 14, Taf. 2 A, Fig. 25-27, Taf. 4 M, Fig. 22, Taf. 3 W, Fig. 16, Taf. 29 S, Fig. 278, 1961.

Eupista milvipennis: Toll, Docum. physiogr. Polon., 32: 62, Taf. 3, Fig. 16, Taf. 21, Fig. 177, Taf. 37, Fig. 116, 1952.

Specimens examined: 3 ♂, 28 VI-23 VII, 1956, and 3 ♂, 27 VI-1 VII, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *Betula platyphylla*); 2 ♂, 2 ♀, 4-19 VII, 1961, Kôshunai, Bibai, Hokkaido, T. Oku leg. (host: *B. platyphylla*).

Hab.: Europe; Japan (Hokkaido).

Notes:—The Japanese form is almost identical with the European in the general feature apart from the somewhat broader ostium and the very much slender signum (Pl. XVIII, C & C 1). In Japan some of the hibernating larvae gave rise to adults without feeding as Benander (1939) recorded in Sweden.

4. ***Coleophora fuscedinella*** Zeller

Coleophora fuscedinella Zeller, Linn. Ent., 4: 393, 1849; Barasch, Deuts. ent. Zeits., 1934: 32, 1934; Benander, Opsc. Ent., 1939: 56, Taf. 2, Fig. 21, 1939; McDunnough, Amer. Mus. Novit., 1829: 3, Fig. 2, 1957; Toll, Acta Zool. Cracov., 7 (16): 615, Taf. 3 K, Fig. 34, Taf. 10 A, Fig. 37-38, Taf. 5 M, Fig. 30-31, Taf. 4 W, Fig. 23-23 A, Taf. 1 S, Fig. 92, 1961.

Coleophora coracipennella: Lienig, Isis, 1846: 296, 1846.

Coleophora aethiopiformis Strand, Verh. zool.-bot. Ges., 52: 562, 1902.

Coleophora salmani Heinrich, Proc. ent. Soc. Wash., 31: 18, 1929; McDunnough, Canad. Ent., 77: 147, fig. 4, 1946.

Eupista fuscedinella: Toll, Docum. physiogr. Polon., 32: 68, Taf. 3, Fig. 22, Taf. 22, Fig. 188, Taf. 36, Fig. 94, 1952.

Specimens examined: 1♂, 3 VII, 1957, and 3 ♂, 2 ♀, 20-30 VII, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *Betula platyphylla*).

Hab.: Europe; Japan (Hokkaido); North America.

Notes:—According to the literature the adult of the species is more or less brownish in general colour, while the Japanese specimens examined are purely greyish. There is no special difference in the structure of the genitalia between the Japanese and the European forms.

5. ***Coleophora hancola***, sp. nov.

♂, ♀, about 12 mm. Antenna simple; scape dark grey, prominently thickened below with raised scales; flagellum greyish, gradually paler towards apex, almost white at apical 1/3, annulated faintly with grey. Palpus dark grey, the median segment being about 1.3 times as long as diameter of ocellus and the apical segment somewhat shorter than the median. Legs grey; tarsi spotted with whitish-grey at apex. Abdomen dark grey. Fore wing dark grey; cilia slightly paler. Hind wing grey.

Genitalia: ♂ (Pl. XVII, G). Valva gradually narrowed towards its apex, which is broadly rounded; sacculus simple, reaching before apex of valva; aedoeagus curved; cornuti in a bandle of about 10 short spines. ♀ (Pl. XVIII, A). Sterigma divided into a pair of lobes by ostium bursae; ductus bursae spiculate from initial 1/5 to 2/5 of its total length,

and scobinated with numerous minute spines on distal 1/4; signum slender, with well developed basal dilation.

Larval case (Pl. XX, C): Leaf-case grey-brownish, somewhat tubular, about 5 mm. in length, with short dorsal keel; mouth 2.

Holotype: ♂, Sapporo, Hokkaido, 4 VI, 1963, T. Oku leg. (host: *Alnus japonica*). Paratypes: 1 ♂, 2 ♀, 6–24, VI, 1963, Sapporo, Hokkaido, T. Oku leg. (host: *Alnus japonica*).

Notes:—This species may be distinguishable from *C. binderella* Kollar feeding on *Alnus* in Europe by the greyish fore wing, by the greyish basal half of antenna, by the valva more broadly rounded, and by the longer spiculate part of ductus bursae. The larva mines into the leaf of *Alnus* until October, and passes winter in full-grown stage within the case fastened on the twig.

6. ***Coleophora cercidiphyllella***, sp. nov.

♀, 9.5–11 mm. Antenna simple; scape dark grey with purplish gloss, much flattened towards base; flagellum apparently widened towards base, dark grey on basal half, then becoming gradually whitish and annulated with grey, the annulation being obscure at the apical 1/4 of flagellum. Palpus dark grey, the median segment being 1.3 times as long as diameter of ocellus and the apical segment almost as long as the median. Head and thorax shining dark grey, not whitish along upper margin of ocellus; patagium with purplish gloss at its apex. Legs dark grey, paler internally; tarsi ringed with pure white at base. Abdomen dark grey. Fore wing rather roughly scaled, dark grey, with purplish gloss; cilia slightly paler. Hind wing grey.

Genitalia: ♀ (Pl. XIX, B). Sterigma narrowed towards middle; ostium bursae semi-oval; ductus bursae spiculate on its initial half, and scobinated with minute spines on distal 1/5; signum large, curved, with basal dilation much developed.

Larval case (Pl. XX, D): Leaf-case tubular, gradually tapering towards anal end, light greyish-brown, 5–6 mm. in length, with a large blackish dorsal patch, which is transversely sculptured; ventro-lateral surface ribbed longitudinally; mouth 1.

Holotype: ♀, Sapporo, Hokkaido, 12 VI, 1961, T. Kumata leg. (host: *Cercidiphyllum japonicum*). Paratypes: 3 ♀, 12–20 VI, 1961, Sapporo, Hokkaido, T. Kumata & T. Oku leg. (host: *C. japonicum*).

Notes:—The species may be related to *C. albicornuella* Bradley described from Europe, but it is distinct from the latter by the sterigma much narrower at middle and the larval case gradually tapering towards the anal end. The larval mine is found on young leaf of *Cercidiphyllum* in May.

7. ***Coleophora uniformis***, sp. nov.

♂, ♀, 9–10 mm. Antenna simple; scape dark grey; flagellum dirty white, annulated with dark grey, the annulation being much faded towards base on ventral surface; apical segment dark greyish. Palpus brownish-grey, the median segment being almost as long as diameter of ocellus and the apical segment about half as long as the median. Head and thorax shining grey, the latter being somewhat darker. Legs brownish-grey; tarsi ringed with dirty white on apex, paler internally. Abdomen grey. Fore wing rather roughly scaled,

dark grey, slightly tinged with brown, without paler costal streak; cilia grey. Hind wing grey; cilia paler.

Genitalia: ♂ (Pl. XVII, I & I 1). Valva elongate, rounded apically; sacculus narrowly chitinized, pointed at caudal end; aedoeagus bent towards base, with several spine-like cornuti. ♀ (Pl. XIX, D). Sterigma deeply concave at middle of caudal margin; introrius vaginae very weakly chitinized; ostium bursae V-shaped; ductus bursae with very minute spines on its initial half; bursa copulatrix elongate and narrow, without signum.

Larval case (Pl. XX, E): Tubular case pale reddish-brown, about 4 mm. in length, with a blackish dorsal patch, which is definitely restricted from other parts of case and occupies from mouth to before anal flap; mouth 1.

Holotype: ♀, Sapporo, Hokkaido, 4 VII, 1956, T. Oku leg. (host: *Sorbus alnifolia*). Paratypes: 1 ♂, 2 ♀, 3-4 VII, 1956, Sapporo, Hokkaido, T. Oku leg. (host: *S. alnifolia*).

Notes:—The species is very closely related to *C. trigeminella* Fuchs feeding on *Sorbus* in Europe, from which it is distinct only by the greyish colour and the absence of paler costal streak of the fore wing. The larva mines the leaf of *Sorbus* until late June and fixes the case on the twig before pupation.

8. ***Coleophora ledi*** Stainton

Coleophora ledi Stainton, Nat. Hist. Tin., 5 (2): 210, 1860; Barasch, Deuts. ent. Zeits., 1934: 33, 1934; Benander, Opsc. Ent., 1939: 58, Taf. 2, Fig. 23, 1939; Toll, Acta Zool. Cracov., 7 (16): 628, Taf. 5 K, Fig. 51-52, Taf. 16 A, Fig. 61-62, Taf. 7 M, Fig. 50, Taf. 6 W, Fig. 40, Taf. 21 S, Fig. 209, 1961.

Eupista ledi: Toll, Docum. physiogr. Polon., 32: 80, Taf. 22, Fig. 193, Taf. 36, Fig. 95, 1952.

Specimens examined: 8 ♂, 7 ♀, 4-13 VI, 1963, Kawayu, Hokkaido, T. Oku leg. (host: *Ledum pallustre* var. *yezoense*).

Hab.: Europe; Japan (Hokkaido).

9. ***Coleophora platyphyllae***, sp. nov.

♂, ♀, 13 mm. Antenna white; scape with a conspicuous hair-tuft; flagellum annulated with dark brown, the annulation being much faded towards base of antenna. Palpus white, rather short, the median segment being slightly shorter than diameter of ocellus, mixed with brownish-grey scales dorsally, and the apical segment somewhat longer than the median. Head and thorax pure white. Legs white; tarsi spotted with brown near base. Abdomen pale brown, clothed with whitish scales. Fore wing rounded apically, white, speckled with brownish scales, which are prominent on posterior half of wing and often tend to confluent together along veins; lower surface brownish-grey except for whitish apical area; costo-apical cilia dark brownish-grey, much mixed with whitish scales, with an obscure whitish subbasal line; dorsal cilia white, somewhat tinged with yellow. Hind wing grey; cilia paler.

Genitalia: ♂ (Pl. XVII, D & D 1). Valva angulated at ventro-caudal corner, without any projection; valvula pointed at dorso-distal angle; aedoeagus simple, with two cornuti, one being very long. ♀ (Pl. XIX, E & E 1). Sterigma divided by quadrate concavation; introrius vaginae gradually narrowed; ductus bursae composed of 3 sections, the first section being spiculate, abruptly turning to the right at initial 1/6, beyond which it is almost straight,

the second containing a heavily chitinized strand, and the third scobinated with numerous minute spines on initial half and rolling over; signum horn-like, with very broad basal dilation, which is irregularly edged and furnished with two holes arranged longitudinally at middle.

Larval case (Pl. XX, F): Pistol-case blackish, rather slender, with some whitish fluffs along lateral line and around anal flap, about 8 mm. in length; ventral keel narrow, not reaching to base of case; mouth 4.

Holotype: ♂, Kôshunai, Bibai; Hokkaido, 29 VII, T. Oku leg. (host: *Betula platyphylla*). Paratypes: 2 ♂, 2 ♀, 27 VI–5 VII, 1961, Kôshunai, Bibai, Hokkaido, T. Oku leg., and 1 ♂, 10 VII, 1963, Kôshunai, Bibai, Hokkaido, K. Kamijo leg. (host: *Betula platyphylla*).

Notes:—The larva feeds on the upper surface of the host leaf without making mine. The present species may be separated from any other pistol-case-bearers feeding on *Betula* in the Palaearctic region by the following key:—

1. Fore wing dirty yellow in ground; sacculus not angulated; signum simple. . . . . *C. betulella* Heinemann.
- Fore wing whitish in ground; sacculus angulated or protruded at ventro-caudal corner; signum concave at middle of base, or furnished with two holes. . . . . 2.
2. Cilia of fore wing whitish; sacculus with narrow projection at ventro-caudal corner; signum concave at middle of basal dilation; cephalic margin of ostium bursae V-shaped. . . . . *C. anatipennella* Zeller.
- Cilia of fore wing brownish-grey around apex; sacculus angulated at ventro-caudal corner; signum with two holes arranged longitudinally; cephalic margin of ostium bursae quadrate. . . . . *C. platyphyllae*, sp. nov.

10. ***Coleophora ringoniella***, sp. nov.

Coleophora malivorella: Matsumura, Cat. Ins. Jap.: 238, 1905; Ibid., 6000 Ill. Ins. Jap.: 1100, 1931; Issiki, Color. Ill. Jap. Moth, I: 31, pl. 4, fig. 121, 1957; Okano, Icon. Ins. Jap. Color., 1: 275, pl. 112, fig. 3, 1959.

♂, ♀, 13–16 mm. Antenna white; scape with a prominent hair-tuft; flagellum annulated with light brown, the annulation being darker ventrally, faded towards base of flagellum. Palpus white, touched with greyish-brown dorsally, the median segment being rather roughly scaled, somewhat longer than diameter of ocellus, and the apical segment about half as long as the median. Head and thorax white, very slightly tinged with yellow on base of patagium and side of crown. Legs white; tarsi ringed with dark brownish-grey at base. Abdomen white; anal tuft yellowish. Fore wing rather elongate, rounded apically, whitish, sprinkled with dark greyish dots especially on posterior 2/3 of wing, much more prominently in ♂; costo-apical cilia grey, much darker at base, mixed sparsely with whitish scales; dorsal cilia much paler and somewhat brownish.

Genitalia: ♂ (Pl. XVII, C & C 1). Valva not narrowed towards base; valvula angulated at dorso-caudal corner; caudal process of sacculus not widened distally; aedoeagus with a long, sinuate, spine-like cornutus. ♀ (Pl. XIX, A). Sterigma broader than long, divided by semicircular ostium bursae, which is somewhat angulated at middle; ductus bursae composed of 3 sections, the first section being spiculate and curved gradually to the right, the second

with an internal strand, and the third turning to the right in a part of a large convolution at its initial 1/4, and then twisting irregularly; signum horn-like, with a large basal dilation.

Larval case (Pl. XX, G): Pistol-case blackish, 6-8 mm. in length, about 3 times as long as wide at middle, transversely wrinkled dorsally; ventral keel from near mouth to base of anal flap; lateral piece of anal flap somewhat swelling and dilated below; mouth 3.

Holotype: ♂, Sapporo, Hokkaido, 18 VI, 1961, T. Oku leg. (host: *Malus pumila*). Paratypes: 1 ♂, 5 VI, 1956, and 2 ♂, 3 ♀, 17-22 VI, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *Malus* spp.); 2 ♂, 27 VI-1 VII, 1960, Kamiyûbetsu, Hokkaido, T. Oku leg. (host: *Malus pumila*); 4 ♀, 18 VI-1 VII, 1962, and 1 ♂, 1 ♀, 14-16 VI, 1961, Sapporo, Hokkaido, T. Oku leg. (host: *Prunus Sargentii*).

Notes:—Up to the present time this species has been identified as *Coleophora malivorella* Riley described originally from North America. Having compared Japanese specimens at hand with a single male specimen of *C. malivorella* Riley from West Virginia (Pl. XVII, H), I have come to the conclusion that the Japanese form should be apparently treated as a distinct species being distinguished from *malivorella* as follows:—

	C. ringoniella	*C. malivorella*
Fore wing	whitish, scattered with dark greyish dots.	greyish, scattered with whitish dots.
Valva	rather broad, scarcely narrowed towards base.	slender, apparently narrowed towards base.
Cornuti	a long sinuate spine.	a bandle of several short spines.

11. ***Coleophora laripennella*** Zetterstedt

Ornix laripennella Zetterstedt, Ins. Lap. Lipsiae: 1011, 1840.

Coleophora laripennella: Barasch, Deuts. ent. Zeits., 1934: 20, 1934; Benander, Opsc. Ent., 1939: 94-95, Taf. 5, Fig. 72, 1939.

Eupista laripennella: Toll, Docum. physiogr. Polon., 32: 188, Taf. 15, Fig. 129, Taf. 30, Fig. 285, Taf. 36, Fig. 89, 1952.

Specimens examined: 7 ♂, 3 ♀, 20 VII-1 IX, 1960, Sapporo, Hokkaido, and 1 ♂, 19 VII, 1964, Shinobu-takayu, Fukushima-ken, Honshu, T. Oku leg.

Hab.: Europe; Japan (Hokkaido, Honshu).

Notes:—The adult lives commonly in sunny meadows, being easily collected by the light trap. Although the host plant has yet been unknown in Japan, it is said that the larva feeds on the seeds of *Chenopodium* and *Atriplex* in Europe.

12. ***Coleophora artemisicolella*** Bruand

Coleophora artemisicolella Bruand, Mem. d'emulation-Doudus; 1, 1854; Barasch, Deuts. ent. Zeits., 1934: 15, 1934; Benander, Opsc. Ent., 1939: 91, Taf. 5, Fig. 67, Taf. 7, Fig. 98, 1939.

Eupista artemisicolella: Toll, Docum. physiogr. Polon., 32: 188, Taf. 15, Fig. 129, Taf. 30, Fig. 285, Taf. 36, Fig. 89, 1952.

Specimens examined: 9 ♂, 7 ♀, 20 VII-1 IX, 1960, Sapporo, Hokkaido, T. Oku leg. (host: *Artemisia montana*); 2 larval cases, 14 X, 1960, Akita-city, Honshu, T. Oku leg.

(Host: *A. montana*).

Hab.: Europe; Japan (Hokkaido, Honshu).

Notes:—The larva feeds on the seeds of *Artemisia* within the case composed of a single seed capsule (Pl. XX, H), becoming full-grown before hibernation.

13. ***Coleophora chenopodii***, sp. nov.

♂, ♀, 13 mm. Antenna simple; scape ochreous; flagellum whitish, annulated with brown anteriorly. Palpus whitish-ochre, the median segment being about 1.5 times as long as diameter of ocellus, streaked longitudinally with brownish-grey; ventro-apical scale-tuft of median segment not reaching to middle of apical segment, which is about 1/2 of median segment in length. Head and thorax pale ochreous-brown, whitish along upper margin of ocellus. Fore and middle legs greyish-brown; hind leg whitish-ochre, the femur being darker externally, and the tibia with a longitudinal dark brownish streak. Abdomen ochreous-whitish. Fore wing pale brownish-ochre in ground, somewhat tinged with grey, rather broadly streaked with ochreous-white along costa, veins, fold, and dorsum; costa gradually arched throughout; first radial streak narrower than any other, and confluent with costal streak at about basal 2/3 of costa; 3 radial streaks usually anastomosing together towards base; dorsal streak distinct only on its basal half; dark greyish dots scattered on interspaces between whitish streaks and along fold; cilia whitish-ocher. Hind wing grey; cilia pale ochreous-grey.

In some of the specimens examined the whitish streaks of the fore wing are much suffused with the ground colour of wing, the annulation of the flagellum being very darker and more distinct than in my description. In some other specimens, the radial streaks are often so much broad that the interspaces between them are very much narrow and interrupted.

Genitalia: ♂ (Pl. XVII, B). Valva slightly broadened towards base; sacculus set with 4 or 5 minute teeth on its obtuse caudo-dorsal end, without any process on ventral thickening; transtilla transveresly wrinkled at base; aedoeagus divided, with a triangular apical tooth on upper prong; cornuti slender, 4 in number. ♀ (Pl. XVIII, E). Sterigma very long, gradually narrowed caudally; ostium bursae represented by a suboblong concavation of caudal margin of sterigma; introrius vaginae very broad and heavily chitinized; spiculate part of ductus bursae occupying initial 1/4 of total length, and convoluted; signum horn-like, with a very small basal dilation.

Larval case (Pl. XX, K): Tubular case much pale ochreous-brown, about 5.5 mm. in length, with some faint longitudinal streaks whitish, wrinkled on ventro-lateral side, and clothed with minute hairs and sand granules; mouth 1.

Holotype: ♂, Sapporo, Hokkaido, 8 VII, 1960, T. Oku leg. (host: *Chenopodium album* var. *centrorubrum*). Paratypes: 15 ♂, 11 ♀, 20 VII–1 IX, 1960, Sapporo, Hokkaido, T. Oku leg. (host: *C. album* var. *centrorubrum*).

Notes:—This species resembles *C. amaranthivora*, sp. nov., from which it may be readily distinguishable in the following aspects: fore wing somewhat broader; costa gradually arched; a tooth of aedoeagus situated on apical end of upper prong; base of transtilla transversely wrinkled; sterigma very long; bursa copulatrix without prickly plate. The

larva feeds on the seeds of *Chenopodium* until October.

14. ***Coleophora amaranthivora***, sp. nov.

♂, ♀, 12–13 mm. Antenna white; scape grey-brownish anteriorly; flagellum annulated with pale greyish-brown, the annulation being much faded posteriorly. Palpus whitish-ochre; median segment about 1.5 times as long as diameter of ocellus, with a broad longitudinal streak brownish-grey; ventro-apical scale-tuft of median segment not reaching to basal half of apical segment, which is about half of median segment in length. Head and thorax much pale greyish-ochre, with a white marking along upper margin of ocellus; base of patagium greyish-brown. Fore and middle legs greyish-brown. In hind leg; femur greyish-brown; tibia whitish-ochreous, with a longitudinal grey-brownish streak. Fore wing pale greyish-brown in ground, somewhat tinged with ochreous-yellow, and streaked with ochreous-white along costa, veins and fold; costa almost straight on basal 2/3 and then gradually arched; radial streaks connected together by a narrow whitish line towards base; a streak along fold narrow but distinct; dorsal line very narrowly whitish; dark greyish dots scattered on brownish interspaces between whitish streaks and along fold, and more numerous in ♂ than in ♀; cilia pale brownish-ochre, darker around apex, and somewhat tinged with grey on dorsal part. Hind wing grey; cilia light ochreous-grey.

Genitalia: ♂ (Pl. XVII, A & A 1). Valva slightly narrowed towards base; sacculus with a blunt process at about basal 3/4; caudo-dorsal angle of sacculus pointed triangularly and often set with a very small tooth; aedoeagus divided, the lower prong possessing a triangular upright projection at basal 5/6, the upper prong slightly longer or almost as long as the lower prong, and the cornutus represented by a stout and narrow spine. ♀ (Pl. XVIII, B). Ostium bursae U-shaped; introrius vaginae thickened and wrinkled laterally; ductus bursae with long spiculate part occupying initial 1/3 of total length, with an internal strand extending to the first large convolution of ductus bursae; distal half of ductus bursae forming small convolution and set with numerous minute spines; signum thorn-like, with a broad basal dilation; a prickly plate near distal end of bursa copulatrix.

Larval case (Pl. XX, J): Tubular case brownish-grey, about 6 mm. in length, clothed with many hairs, debris of plant tissue, and sand granules; mouth 2–3.

Holotype: ♂, Fukuoka, Iwate-ken, Honshu, 21 VIII, 1962, T. Oku leg. (host: *Amaranthus ascendens*). Paratypes: 2♂, 3♀, 4–12 VII, 1960, Sapporo, Hokkaido, T. Oku leg. (host: *A. retroflexus*); 12♂, 12♀, 1 VII–25 VIII, 1962, Fukuoka, Iwate-ken, Honshu, T. Oku leg. (host: *A. ascendens*).

Notes:—This species is very closely related to *C. versurella* Zeller occurring in Europe, but may be distinct from the latter by the following characters:—

	C. amaranthivora	*C. versurella*
Aedoeagus	with apical tooth at basal 5/6 of lower prong.	with apical tooth at top of upper prong.
Caudo-dorsal angle of sacculus	triangularly pointed, without or with only one tooth.	blunt, with 4 or 5 teeth.
Fore wing	rather greyish-brown.	ochreous-brown.

The larva of this species feeds on the seeds of *Amaranthus* spp. until October and then hibernates in the full-grown stage.

Explanation of plates

Plate XVII: Male genitalia

A: *Coleophora amaranthivora*, sp. nov.; A1: ibid. aedoeagus; B: *C. chenopodii*, sp. nov.; C: *C. ringoniella*, sp. nov.; C1: ibid. vesica with cornuti; D: *C. platyphyllae*, sp. nov.; D1: ibid. aedoeagus; E: *C. ulmivorella*, sp. nov.; E1: ibid. aedoeagus; F: *C. japonicella*, sp. nov.; G: *C. hancola*, sp. nov.; H: *C. malivorella* Riley (from W. Virginia); I: *C. uniformis*, sp. nov.; I1: ibid. aedoeagus.

Plate XVIII: Female genitalia

A: *Coleophora hancola*, sp. nov.; B: *C. amaranthivora*, sp. nov.; C: *C. milvipennis* Zeller (from Hokkaido); C1: ibid. signum; D: *C. ulmivorella*, sp. nov.; E: *C. chenopodii*, sp. nov.

Plate XIX: Female genitalia

A: *Coleophora ringoniella*, sp. nov.; B: *C. cercidiphyllella*, sp. nov.; C: *C. japonicella*, sp. nov.; D: *C. uniformis*, sp. nov.; E: *C. platyphyllae*, sp. nov.; E1: ibid. sterigma.

Plate XX: Larval cases

A: *Coleophora ulmivorella*, sp. nov.; B: *C. japonicella*, sp. nov.; C: *C. hancola*, sp. nov.; D: *C. cercidiphyllella*, sp. nov.; D1: ibid. dorsal view of anal flap; E: *C. uniformis*, sp. nov.; F: *C. platyphyllae*, sp. nov.; G: *C. ringoniella*, sp. nov.; H: *C. artemisicorella* Bruand; J: *C. chenopodii*, sp. nov.; K: *C. amaranthivora*, sp. nov.

SOME OLETHREUTINAE NEW TO JAPAN (Lep.: Tortricidae). In the following lines five species of Olethreutinae are added to the Japanese fauna.

1. ***Epinotia pentagonana*** (Kennel), comb. nov.

Epiblema pentagonana Kennel, Iris, 13: 289, 1900; Ibidem, Pal. Tort.: 582, 1921; Staudinger et Rebel, Cat. Lep. pal. Faun., II: 263, no. 2135 bis add., 1901.

Specimens examined: 1♂, Sannôkai, Iwate-ken, Honshu, 23 VII, 1957, M. Okano leg.; 1♂, Kotoni, Sapporo, Hokkaido, 14 VIII, 1961, T. Oku leg.

Hab.: Ussuri; Japan (Hokkaido).

Notes:—The present species may be transferred to *Epinotia* from *Epiblema* on account of the structure of the male genitalia, especially of the uncus, which is small but apparently developed.

2. ***Epinotia stroemiana*** (Fabricius)

Pyralis stroemiana Fabricius, Ent. Syst. Emend., III, 2: 255, 1794.

Epinotia stroemiana: Bradley, Ent. Gaz., 10(2): 72, pl. 2, fig. 126, 1959.

Tortrix similana Hübner, Samm. Vög. Schmett.: 71, 1794.

Tortrix bimaculana Donovan, Nat. Hist. Brit. Ins., 13: pl. 459, 1808.

Epinotia similana: Hübner, Verz. Schmet.: 377, 1826; Heinrich, Bull. U.S. Nat. Mus., 123: 200, figs. 38, 358, 1923.

Epiblema similana: Staudinger et Rebel, Cat. Lep. pal. Faun., II: 219, no. 2135, 1901; Kennel, Pal. Tort.: 585, 1921.

Astatia similana: Pierce et Metcalfe, Genit. Brit. Tort.: 60, pl. 20, 1921.

Specimens examined: 1♂, Ebeotsu, Hokkaido, 12 IX, 1960, T. Oku leg.; 1♀, Sapporo, Hokkaido, 23 IX, 1960, T. Oku leg.

Hab.: Europe; Amur; Japan (Hokkaido); North America.

Notes:—The specimens examined are almost identical with the European or the North American form in the general colour as well as the structure of the genitalia (cf. Pierce et Metcalfe, 1921, and Heinrich, 1923).

3. ***Ancylis laetana*** (Fabricius)

Pyralis laetana Fabricius, Syst. Ent.: 649, no. 20, 1775.

Ancylis laetana: Staudinger et Rebel, Cat. Lep. pal. Faun., II: 127, no. 2280, 1901; Pierce et Metcalfe, Genit. Brit. Tort.: 55, pl. 19, 1921; Bradley, Ent. Gaz., 10(2): 93, pl. 14, f. 163, 1959.

Specimens examined: 1♂, 1♀, Koshunai, Bibai, Hokkaido, 28 V, 1963, K. Kamijo leg.

Notes:—The specimens examined were collected in a nursery of *Populus*.

4. ***Laspeyresia glaucana*** (Kennel)

Pamene glaucana Kennel, Iris 13: 156, 1900; Ibidem, Pal. Tort.: 700, pl. 24, fig. 95, 1921.

Laspeyresia glaucana: Obraztsov, Tijds. Ent., 102(2): 189 & 198, pl. 24, fig. 2, 1959.

Specimen examined: 1♂, Kotoni, Sapporo, Hokkaido, 5 VII, 1962, T. Oku leg.

Hab.: Ussuri; Japan (Hokkaido).

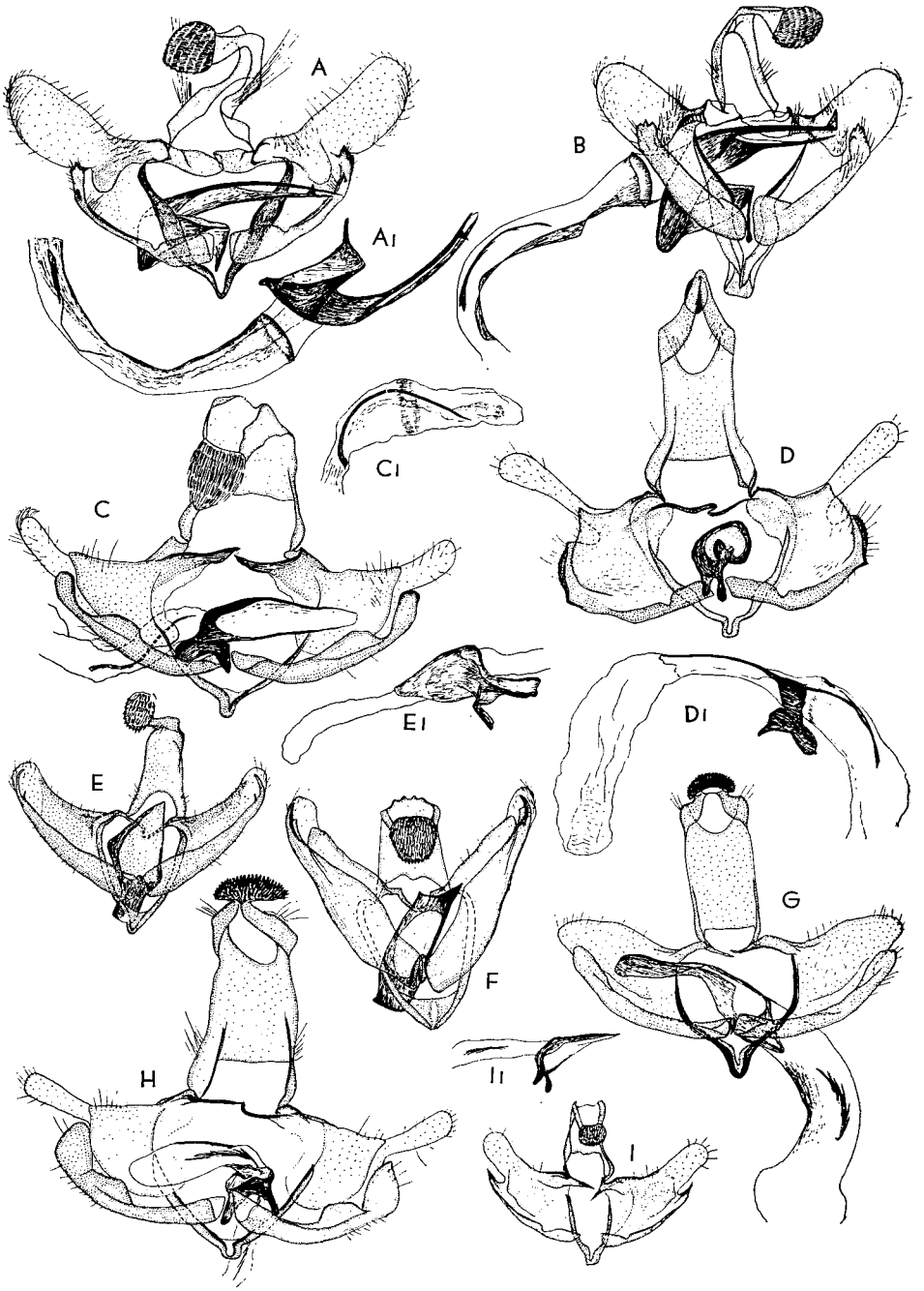
5. ***Pamene dichroramphana*** Kennel

Pamene dichroramphana Kennnel, Iris, 13: 156, 1900; Ibidem, Pal. Tort.: 700, pl. 24, fig. 96, 1921.

Specimen examined: 1♂, Ebeotsu, Hokkaido, 13 VI, 1960, T. Oku leg.

Hab.: Manchuria; Japan (Hokkaido).

TOSHIO OKU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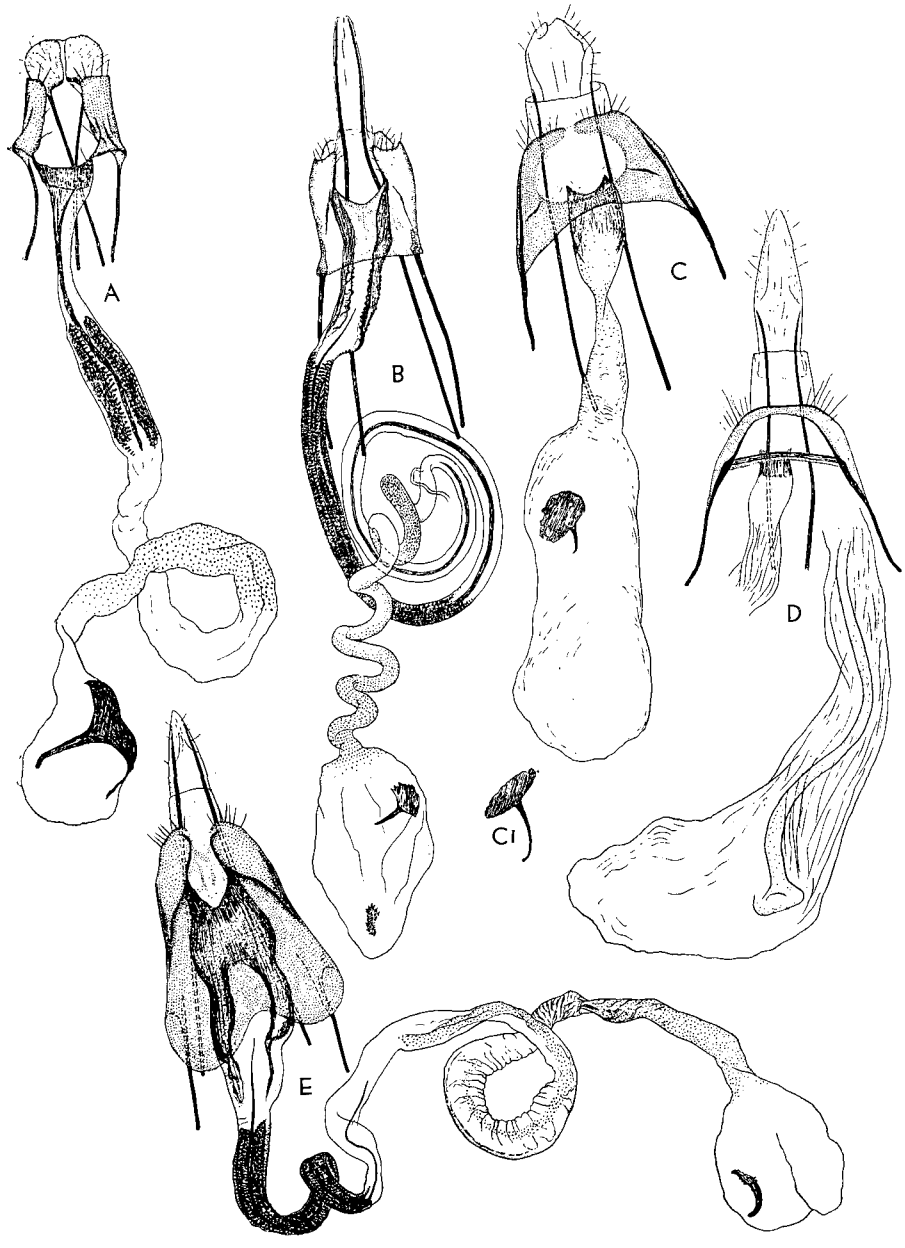
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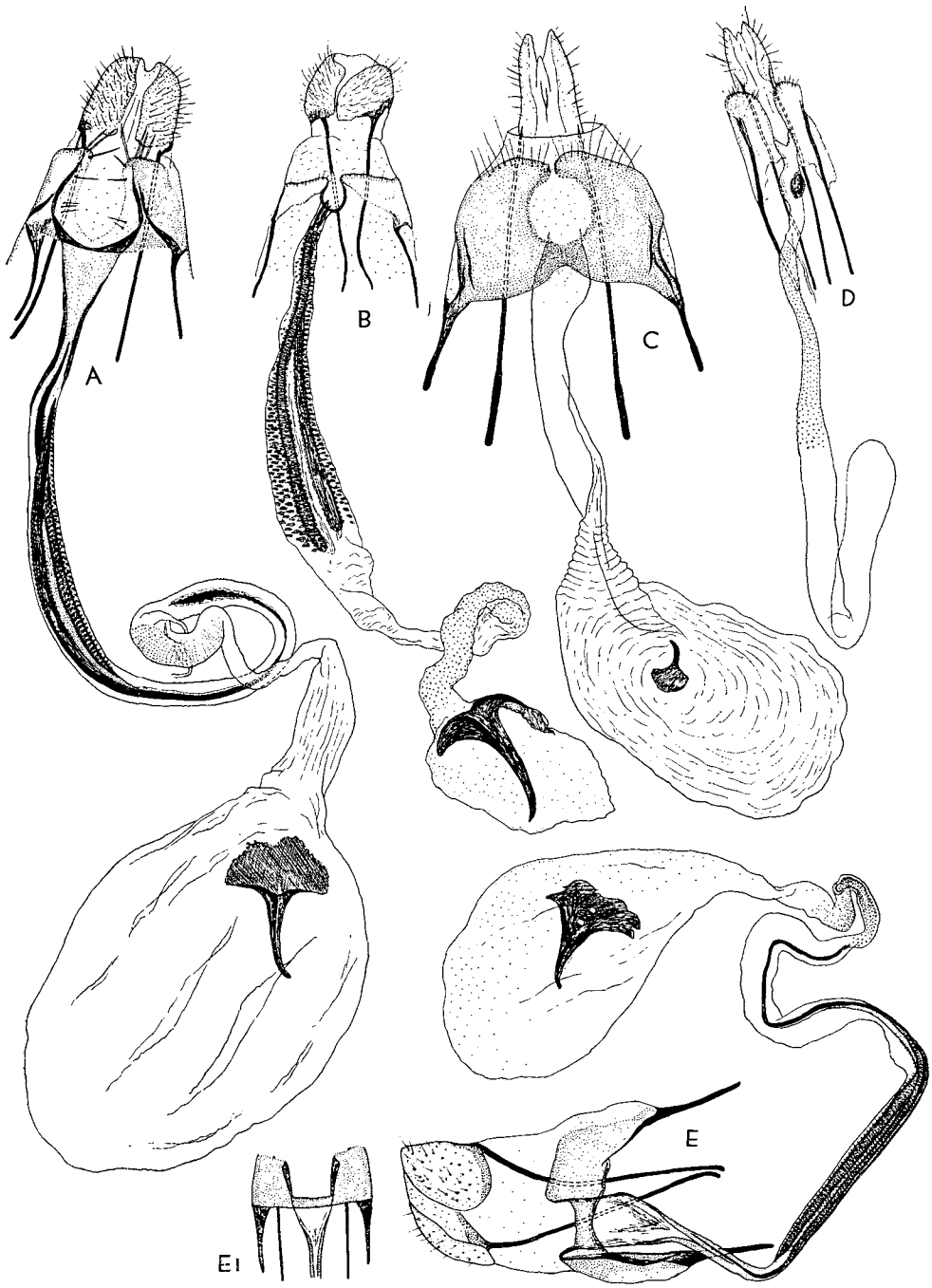
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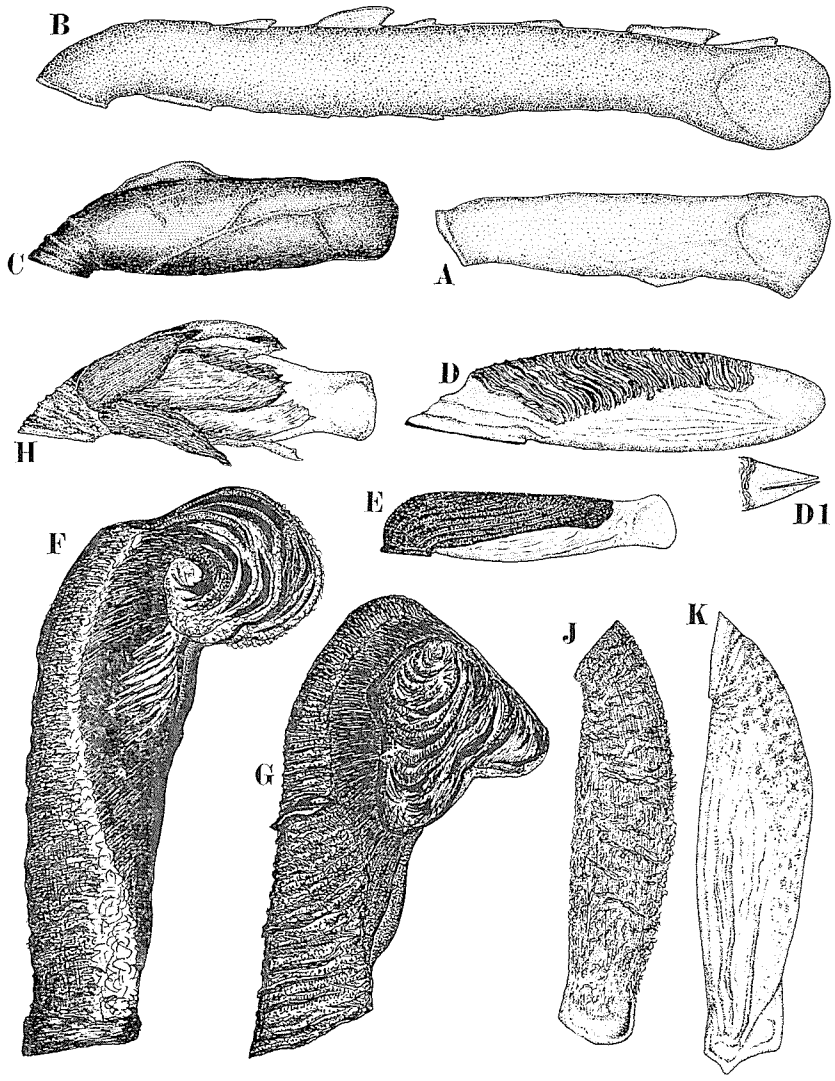
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Errata

Vol. 26, No. 1, 1963, p. 37, line 11 from bottom, for "ing" read "shading".
Vol. 26, No. 2, 1963, p. 79, line 10 from top, for "apically" read "basally".
Vol. 26, No. 2, 1963, p. 79, line 15 from top, for "basally" read "apically".
Vol. 27, No. 2, 1965, p. 82, line 9 from top, for "VII" read "VIII".
Vol. 27, No. 2, 1965, p. 98, between lines 3 and 4 from bottom add "Distribution: Marshall Is. and Caroline Is."
Vol. 27, No. 2, 1965, p. 114, line 10 from bottom; p. 115, line 15 from top; p. 116, line 7 from bottom; p. 117, line 17 from top and line 3 from bottom; p. 118, line 14 from bottom; p. 119, line 12 from bottom; p. 121, lines 8 and 11 from top; p. 122, lines 5 and 8 from top, for "ocellus" read "eye".

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